2 Classification and subclassification of the Nyulnyulan languages

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1 Introduction

1.1 The language and dialect situation[1]

The term *Nyulnyulan* refers to a small cluster of non-Pama-Nyungan languages traditionally spoken on the Dampier Land peninsula and neighbouring regions in the Kimberley mainland, in the far north-west of Western Australia (O'Grady, Voegelin & Voegelin 1966:35–36; McGregor 1988a:49). It consists of around ten named languages, half of which come in two or more dialectal variants. They are given in Table 1, in alphabetical order.

Approximate traditional locations of these and neighbouring languages are indicated in Map 2. Dialects are not shown, nor are language boundaries marked. The major divisions

into three non-Pama-Nyungan families — Nyulnyulan (NN), Bunuban, and Worrorran — and Pama-Nyungan are indicated very roughly by broken lines.

Table 1: The Nyulnyulan languages and their dialectal variants[2]

Languages	Dialectal variants
Bardi	Mainland Bardi, Island Bardi (Metcalfe 1975:2)
Jabirrjabirr Jawi Jukun[3] Ngumbarl Nimanburru	
Nyikina	Big Nyikina, Small Nyikina (Stokes 1982:1)
Nyulnyul	Coastal Nyulnyul (Beagle Bay dialect, called Yowera, according to Bates n.d.), Inland Nyulnyul
Warrwa	
Yawuru	Julbayi (Southern coastal), Marangan (Eastern inland), and Jukun (see above) — Hosokawa (1991:5–6)

1.2 Proposed classification

Our proposed classification is as shown Figure 1. This is a genetic classification, based on application of the comparative method; independent support is provided from a lexicostatistical investigation.

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[2]   Neither the exact number of varieties nor their linguistic status is entirely certain, and different writers express different opinions. Those who take mutual intelligibility as the primary criterion for identification of dialects of a single language tend to identify only two or three languages, while those who take political and social considerations into account usually identify about ten. Unfortunately, information on most of the language varieties and political groups is quite limited, and it is impossible to deploy either criterion consistently in practice. This is largely because of the post-contact effects on both the sociopolitical situation and the varieties — Bardi, Nyikina, and Yawuru are the only varieties that have even small speech communities (perhaps around fifty, forty, and twenty full-speakers, respectively); the others are effectively moribund, and remembered only. We have adopted a division into languages and dialects that seems, on the basis of the information available to us, to be most consistent with apparent political labelling by speakers of the varieties and their descendants, and, in practical terms, with the organisation of the lexical and grammatical material in the secondary sources. Mutual intelligibility does not seem to be taken into consideration by Aboriginal people of the region. Nor is it easy to determine in multivarietal situations such as is found on the Dampier Land peninsular, and most who would employ this consideration can only base it on intuition from lexical and grammatical similarities.

[3]   Although Jukun is often treated as a separate language (Bates (n.d.), Nekes and Worms (1953), and McGregor (1988a)), it is, according to Hosokawa (1991:5), a dialect of Yawuru, spoken by three local groups, Jukun, Minyirr and Walman. Nekes and Worms (1953:499) agree that it is 'closely related to Yaoro'.
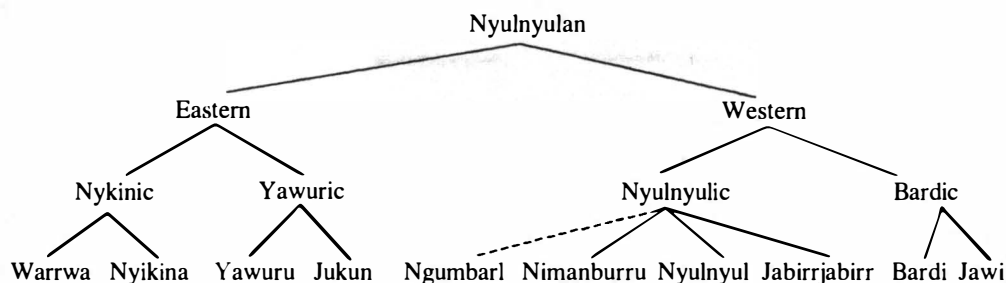
Figure 1: Genetic classification of the Nyulnyulan (dialects omitted)

There is a primary division between Eastern and Western groups; languages of the Eastern group are marked by a single underline in Map 2, those of the Western group, by double underlining.[4] Both groups fall into two subgroups, for which we employ labels based on the names of representative languages, following O'Grady, Voegelin and Voegelin (1966). This classification is somewhat tentative in terms of details, though we are relatively confident of the validity of the main picture. The placement of Ngumbarl is the least certain aspect of the classification: information is severely restricted — in all, only about fifty lexical items are known, and grammatical information is virtually non-existent.

In the remainder of this section we outline sources of data, and make brief mention of previous classifications. The next four sections, which constitute the core of the paper, develop arguments for our classification. Section 2 undertakes a lexicostatistical investigation; sections 3 and 4 apply the comparative method, first at the family level then at the group level. Due to considerations of space, we stop at group level, and do not attempt to justify the proposed subgrouping by the comparative method; this will be dealt with in a future publication. Section 5 identifies the necessary historical phonological processes. Section 6 concludes the paper with a summary and some remarks on possible relations to other non-Pama-Nyungan families.

1.3 Sources of data

The following list indicates the main sources that have been utilised in this investigation, with a few remarks on reliability and extensiveness (see further McGregor 1988a, 1998a):

BARDI The primary and most reliable source is taken to be the recently published dictionary Aklif (1999). Other significant modern sources are Metcalfe (1975, 1979, n.d.), and Nicolas (1998). Nekes and Worms (1953) also contains a good deal of information on the language; this has been treated as a tertiary source.[5]

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[4] Based on their relative locations, the two groups might be better labelled Northern and Southern. Our use of the terms Western and Eastern is based on the way that, in our experience, Dampier Land people tend to view the location of the languages: the former group is associated with coastal people who are predominantly located to the west; the latter group is considered to be inland, and hence located in the east.

[5] In general, Nekes and Worms (1953) is a quite reliable source of information. Many of the differences between it and more modern sources can be attributed to differences in dialects recorded (e.g. they apparently worked mainly with Mainland Bardi, whereas Metcalfe worked mainly with Islanders). A thorough evaluation of their work is in preparation by one of us (McGregor).
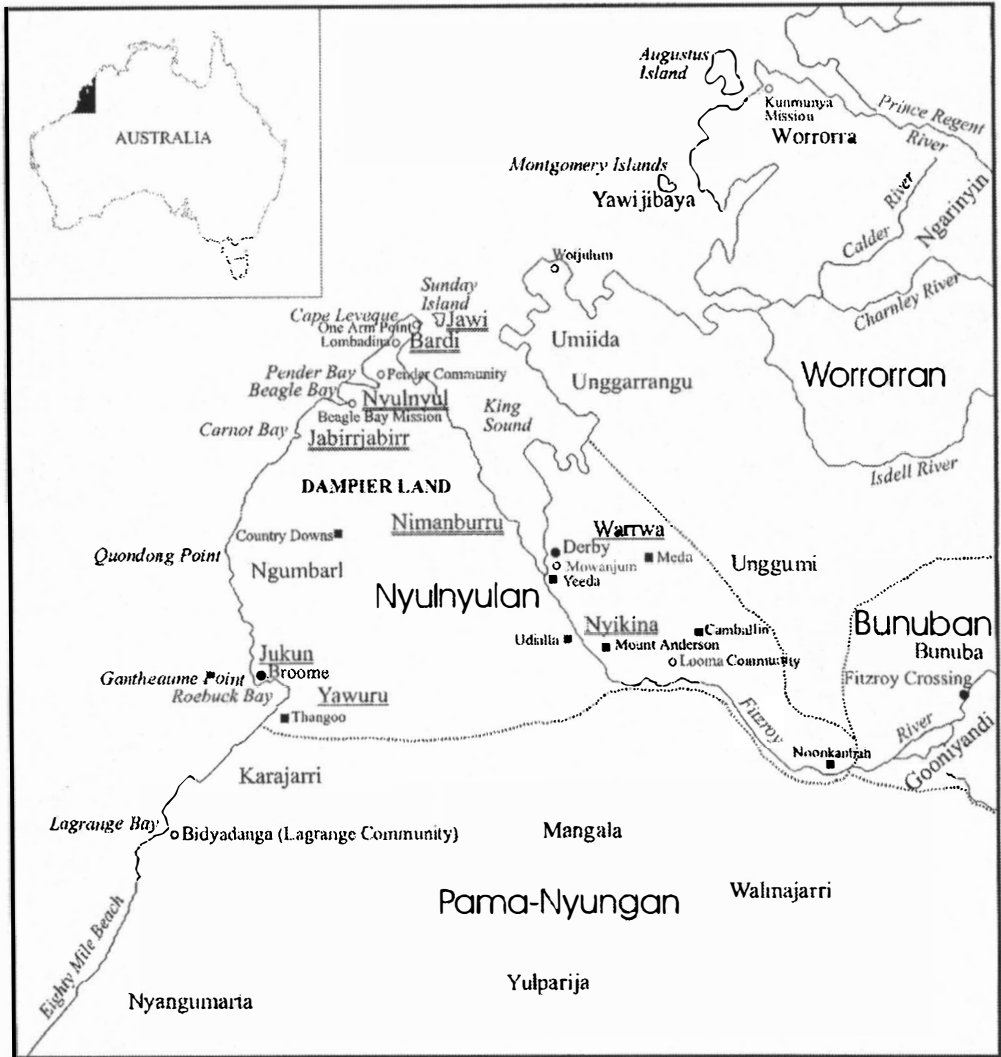
Map 2: Approximate traditional locations of Nyulnyulan and neighbouring languages

JABIRRJABIRR   Nekes and Worms (1953) is the major source; a few items also appear in Kerr (n.d.)

JAWI   Principal sources of information are Bird (1910), Bird (1915), and Bird and Hadley (n.d.); McGregor also has a few very limited fieldnotes.

JUKUN   The main source is Bates (n.d.). Unfortunately, it is not clear how much Ngumbarl is mixed up with the Jukun in Bates' manuscript — Hosokawa (pers. comm.) thinks it is a considerable amount (although there is also much that is peculiarly Eastern Nyulnyulan (henceforth ENN)). This is a significant problem given our tentative placement of the two languages in different groups. Neither Hosokawa (1991) nor Nekes and Worms (1953) provides more than a handful of words, though it appears that Hosokawa has some fieldnotes.

NGUMBARL Virtually no material, the only sources being Kerr (n.d.) and Bronwyn Stokes' fieldnotes, which together contain less than fifty items. Bates (n.d.) perhaps contains additional Ngumbarl material; but unfortunately the linguistic provenance is indicated only in vague terms, and could be any of Nyulnyul, Jabirrjabirr, Nimanburru, or Ngumbarl (see also previous remarks on Jukun).

NIMANBURRU Nekes and Worms (1953) is the only source.

NYIKINA Main sources are Stokes (1982) and Stokes, Johnson, and Marshall (1980).

NYULNYUL Diverse sources mostly of reasonable reliability, including: Tachon (1895 — see McGregor 2000a for an evaluation), Nekes and Worms (1953), and McGregor (1996). Additional are McGregor's and Stokes' fieldnotes.

WARRWA Main sources are McGregor (1994), and McGregor's and Stokes' fieldnotes. Capell (1952/1953) also contains useful information.

YAWURU Hosokawa (1991) and Yawuru Language Team (1998) are considered the most reliable sources; Stokes also has fieldnotes, and a brief description of the language (Stokes n.d.).

1.4 Previous attempts at classification and subclassification

Previous classifications of NN languages were based on typological and lexical considerations. Fr Wilhelm Schmidt, who made the first scholarly attempt at classifying Australian Aboriginal languages (Schmidt 1919), managed — despite serious inadequacies in the data — to distinguish a King Sound group within his Northern group (roughly non-Pama-Nyungan). This corresponds well with NN — amazingly, the boundaries he drew for the King Sound group in his language atlas (Schmidt 1926: Map IV) are fundamentally correct. He even suggested a possible division between coastal and inland 'dialects' of NN.

Likewise, using typological criteria, Arthur Capell also distinguished as a separate group the Dampier Land languages, designating them 'prefixing languages without noun classification' (Capell 1940). He made, however, no intermediate groupings either in that work or any subsequent writings.

O'Grady, Voegelin and Voegelin (1966:35–36) — who seem to have been the first to use the label *Nyulnyulan* in print — distinguish four languages, Nyulnyul (embracing our Nyulnyul, Bardi, Jawi, Jabirrjabirr, Nimanburr, Ngumbarl, and Jukun), Yawuru, Nyikina, and Warrwa. They did not recognise subgroups, although their Nyulnyul corresponds to our Western subgroup plus Jukun. The classification primarily employed lexicostatistical criteria on one hundred word lists (O'Grady, Voegelin & Voegelin 1966:23); though the lexicostatistical investigation of §2 does not support their proposals, and it is likely that other considerations were taken into account (Alpher & Nash 1999:46–47). Subsequent surveys of the 1970s merely repeat this classification, adding little if anything — e.g. Oates and Oates (1970:43), Oates (1975:58–61), and Wurm (1972:124–125). During the 1980s a few linguists commented on possible classifications, without going into details (e.g. Stokes 1982:8, Hudson & McConvell 1984:19, McGregor 1988b:97).

Summing up, previous classifications agree that the NN languages constitute a distinct family-like unit, consisting of between two and eight languages. None proposes intermediate

groups or subgroups. Criteria employed were typological, lexical, and/or lexicostatistical; the comparative method has not previously been applied.

2 Lexicostatistical classification

The lexicostatistical method has been heavily criticised on a number of fronts, including Australianist linguistics, where it has been particularly severely condemned by R.M.W. Dixon in diverse publications, most recently Dixon (1997:35–37). Whilst being mindful of the criticisms — many of which I consider valid — there is increasing evidence that the method is not totally unreliable, and can be used in conjunction with other methods, including the comparative method. As Paul Black observes (see also Embleton 2000:154–156):

> It is not surprising that we have no single reliable means of making inferences about prehistory [and thus about genetic relations — WM & BS]. In such a case it seems best to consider all of the evidence available. Lexicostatistics and the traditional use of the evidence of shared innovations complement each other in a valuable way because they are based on quite different sets of assumptions. When we are lucky enough to find that both approaches support the same results, we can be very confident that we are on the right track. (Black 1997:56)

The two methods do in fact yield comparable results for the NN languages, and thus we have support from both for the proposed classification. This is the motivation for the inclusion of the present section.

Seventeen languages were selected for the investigation, the ten NN languages, plus seven other languages from the region. These include four adjacent languages, Karajarri, Walmajarri, Gooniyandi, and Unggumi (two others, Mangala and Unggarrangu were omitted due to lack of information), and three languages at a slightly greater remove, Nyangumarta, Kukatja, and Ngarinyin (chosen primarily because lexical information is reasonably extensive and reliable).

A list of two hundred and twenty meanings was drawn up for the investigation, on the understanding that it is preferable to have the order of two hundred items if one wishes to draw inferences about subgrouping (David Nash pers. comm.).[6] These 220 items will be referred to as 'core vocabulary' in this section. For almost all of the chosen languages there were some gaps in the information, but for the better documented ones these were few in number; for most of the others, at least one hundred and eighty meanings were represented in the available corpora.

The results of the pair-wise comparison of the seventeen languages are shown in Table 2. Two values are given in each cell: first, an unreduced fraction indicating the actual number of shared items in relation to the actual number of common meanings; and following that, after a colon, this value converted to a percentage.

Before discussing the findings, it is necessary to make two remarks on methodological decisions made in arriving at the figures, since they were at times at variance with standard lexicostatistical practice.

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6   This list was based on the 151 item list of Alpher and Nash (1999:53–56), with a few emendations to tailor it to the NN languages. To this were added another seventy meanings, sixty of the most relevant additional items from the 215 item list of Bergsland and Vogt (1962:117–119), and another ten that were considered appropriate for NN languages.

Table 2: Lexicostatistical comparison of Nyulnyulan and some nearby languages

	Jw	Bd	Nnl	JJ	Nm	Ngb	Jk	Yw	Nyk	Ww	Kj	Ny	Wl	Kk	Ug	Ngr
Bd	171/201; 85%															
Nnl	127/203; 63%	149/216; 69%														
JJ	111/204; 54%	136/215; 63%	194/218; 89%													
Nm	116/188; 62%	142/200; 71%	190/203; 94%	177/203; 87%												
Ngb	24/45; 53%	28/45; 62%	33/45; 73%	36/46; 78%	34/44; 77%											
Jk	75/192; 39%	85/199; 43%	110/200; 55%	105/198; 53%	97/186; 52%	34/45; 76%										
Yw	61/201; 30%	76/210; 36%	88/211; 42%	87/211; 41%	77/198; 39%	29/45; 64%	112/195; 57%									
Nyk	57/200; 29%	68/211; 32%	81/211; 38%	81/211; 38%	73/197; 37%	28/46; 61%	96/195; 49%	108/209; 52%								
Ww	57/199; 29%	73/208; 35%	88/210; 42%	82/210; 39%	79/196; 40%	29/45; 64%	94/195; 48%	97/207; 47%	157/207; 76%							
Kj	22/194; 11%	21/197; 11%	32/199; 16%	31/198; 16%	29/181; 16%	14/46; 30%	29/183; 16%	71/192; 37%	43/190; 23%	34/190; 18%						
Ny	17/192; 9%	11/193; 6%	19/196; 10%	21/192; 11%	18/178; 10%	6/45; 13%	20/177; 11%	39/186; 21%	20/184; 11%	14/186; 8%	110/188; 59%					
Wl	13/197; 7%	8/198; 4%	12/198; 6%	16/195; 8%	10/182; 5%	4/46; 9%	11/185; 6%	19/187; 10%	32/189; 17%	20/168; 12%	41/200; 21%	40/190; 21%				
Kk	16/213; 8%	13/213; 6%	13/214; 6%	11/215; 5%	8/202; 4%	2/46; 4%	10/197; 5%	13/208; 6%	16/207; 8%	11/204; 5%	30/197; 15%	51/190; 27%	63/198; 32%			
Ug	10/168; 6%	10/171; 6%	16/178; 9%	17/179; 9%	14/166; 8%	7/44; 16%	12/167; 7%	20/171; 12%	22/171; 13%	22/173; 13%	8/174; 5%	6/169; 4%	23/178; 13%	8/182; 4%		
Ngr	11/194; 6%	9/183; 5%	14/192; 7%	13/193; 7%	13/178; 7%	5/46; 11%	8/175; 5%	23/195; 12%	12/184; 7%	18/183; 10%	6/187; 3%	6/185; 3%	12/191; 6%	9/191; 5%	62/171; 36%	
Go	10/211; 5%	7/200; 4%	12/211; 6%	11/211; 5%	13/198; 7%	5/46; 11%	10/195; 5%	21/203; 10%	25/202; 12%	21/202; 10%	10/199; 5%	11/189; 6%	34/197; 17%	25/213; 12%	25/179; 14%	17/191; 9%
	Jw	Bd	Nnl	JJ	Nm	Ngb	Jk	Yw	Nyk	Ww	Kj	Ny	Wl	Kk	Ug	Ngr

First, a given gloss frequently has multiple lexemes in a given language. Contrary to standard procedure (Embleton 2000:148) all multiple lexemes were admitted, and a single score recorded for a pair of languages provided at least one of the alternatives was shared. This practice was adopted — as also by Alpher and Nash (1999) — since it is usually impossible to decide which of the apparent synonyms is the 'best fit'.

Second, borrowings were not excluded. This decision was taken partly because in most cases it is difficult, on present knowledge, to distinguish what is borrowed from what has been retained (according to McGregor 2002: Chapter 8, even very ancient-looking putative cognates may be borrowings). And to make the distinction it is necessary to employ the comparative method, which would be fine for NN, but to do so for the other families represented is obviously beyond the scope of a single article. In fact, I suspect it is not unlikely, given the apparent genetic distance between the families, that most genuine cognates would be obscured by phonological and semantic change, and that many putative cognates are comparatively recent loans. In practice, then, I scored as cognates look-alike pairs such as Nyulnyul *kujarr* 'two' and Kukatja *kutjarra* 'two', even though it is quite on the cards that the former is a recent borrowing that has spread right through the NN languages. Also included were pairs such as Gooniyandi *gooji* 'bone' and Nyulnyul *kinyj* 'bone', on the basis of their phonemic and semantic similarity, although no reconstruction of Proto Bunuban-Nyulnyulan has yet been undertaken. This and the previous decision have the effect of increasing the ratios of cognates.

Even a cursory examination of Table 2 reveals that the NN languages share far more cognates with one another than with any other languages. Thus, with just two exceptions, every pair of NN languages shares at least 30% of their core vocabulary — and the two exceptions are only just below this figure, both 29%. By contrast, only two pairs involving a NN and another language share 30% or more core vocabulary. Examining the percentages in relation to the geographical locations of the languages it is clear that the few cases in which more than 20% core vocabulary is shared involve NN languages from the southern portion of the region, and the two Pama-Nyungan languages that are spoken just to the south of them, Karajarri and Nyangumarta. The percentage of shared core vocabulary items drops sharply as geographical distance increases, and quickly reaches 10% and lower. Looking at the shared figures for other non-Pama-Nyungan languages reveals figures ranging from a minimum of 4% for geographically separated languages to 10%–13% for nearby languages. (The maximum of 16% for Ngumbarl and Unggumi should not be taken seriously, as the actual numbers involved are too small to be considered meaningful — see below.)

The figures within the NN languages themselves seem also to support the proposed grouping. Jawi, Bardi, Nyulnyul, Jabirrjabirr, and Nimanburru all share high percentages of core vocabulary, consistently exceeding what they share with Jukun, Yawuru, Nyikina, and Warrwa. The latter languages also tend to share higher percentages among themselves than with the other five languages, though this is not particularly striking. Ngumbarl is somewhat problematic, sharing as it does roughly the same percentage of core items with all NN languages; this is doubtless a consequence of the limited corpus, that renders comparisions unreliable.

To verify the regularities just commented on, and to extract further information from the lexicostatistical data, cluster analysis software was employed, using the shared cognate ratios

between each pair of languages.[7] The results are shown in Figure 2, in which the *x* axis represents the degree of lexical similarity between languages and clusters of languages, varying from a minimum of 0 (completely disjoint) to a maximum of 1 (identity). Again Ngumbarl is omitted. This agrees very well with our genetic tree model (Figure 1), the only difference being in the addition of one intermediate node, grouping Nyulnyul and Nimanburru together in distinction from Jabirrjabirr.
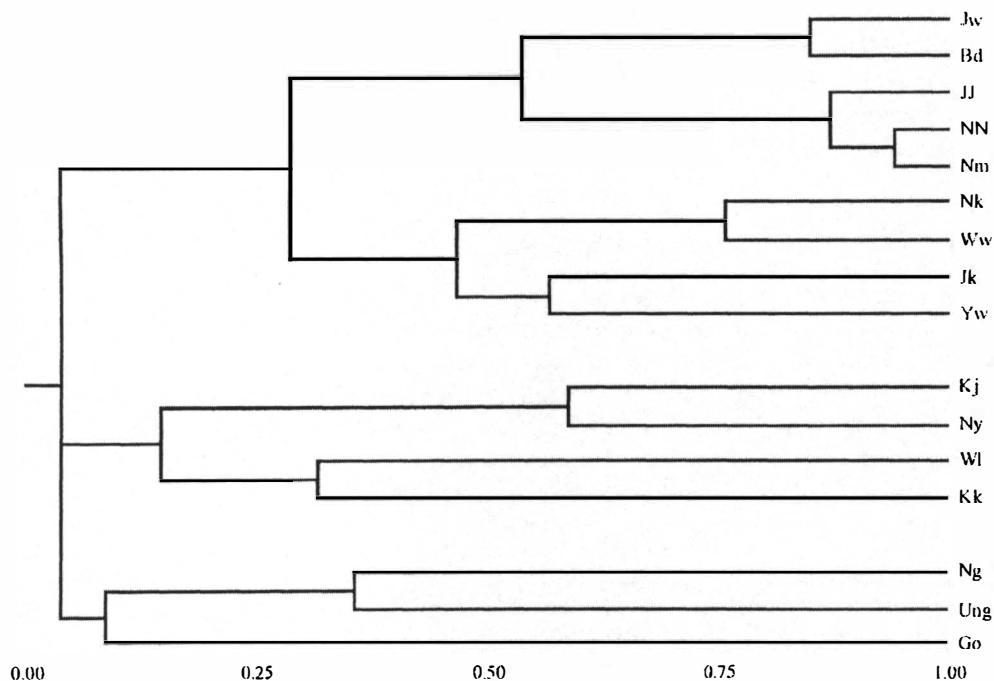
Figure 2: Groupings and subgroupings generated by cluster analysis
(length of branch indicated presumed genetic distance)

The results for the higher-level groupings are also in good agreement with generally accepted classification into families. (The grouping of Gooniyandi with the Worrorran languages is doubtless due to the small number of languages involved — had other languages been included, the level at which clustering is discernible would have dropped considerably.) The family-like groups identified by this procedure are clearly divergent in their core lexicons.

Given that we did not exclude borrowings, it seems that stability in the core lexicons of the NN languages is sufficient to counterbalance the effects of external loan-replacement. It seems plausible that the lower proportions of shared core vocabulary amongst the ENN languages are at least in part a reflection of borrowing between geographical neighbours. Lying in the buffer zone with languages of three other families they would be expected to show higher rates of loans with their non-Nyulnyulan neighbours than the more isolated WNN languages. For this reason we should be cautious of construing the length of dendrites as indicators of genetic distance or time depth.

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7   The program was made available to me courtesy of Bo Sommerlund, Institut for Psychology, Aarhus Universitet.

3 Genetic classification: application of the comparative method at the family level

In this section we apply the comparative method to reconstruct features of Proto Nyulnyulan (pNN); we also identify shared aberrations that distinguish NN from other language families in Australia. Following this, in §4 we present evidence for the primary grouping of the family into ENN and WNN (Western Nyulnyulan) by identifying shared innovations, primarily lexical. As we will see, however, it is quite difficult to identify convincing innovations in either group; the best that can be done is to single out some probable innovations. Throughout most of the discussion we ignore Ngumbarl.

The reconstruction of pNN is organised as follows: phonology (§3.1); lexicon (§3.2); the pronominal system (§3.3); nominal morphology (§3.4); and verbal morphology (§3.5).

3.1 Proto Nyulnyulan phonology

It is a reasonably straightforward exercise to reconstruct an inventory of phonemes for pNN; this is the quite unexceptional (for an Australian language) system shown in Tables 3 and 4. The only unusual segment in any language is the mid back vowel *o* in Bardi (and presumably Jawi), which derives historically from vowel–consonant–vowel sequences (see §5.4 below). It clearly should not be reconstructed for pNN. The only unresolved problem is whether we should identify long high vowels as separate proto-phonemes, or as sequences of vowel followed by glide. I have tentatively opted in favour of the long vowel solution.

Table 3: Proto Nyulnyulan consonants

	Bilabial	Apico-alveolar	Apico-postalveolar	Lamino-palatal	Dorso-velar
Stops	*b	*d	*rd	*j	*k
Nasals	*m	*n	*rn	*ny	*ng
Liquids		*l	*rl	*ly	
Tap/Trill		*rr			
Glides	*w		*r	*y	

Table 4: Proto Nyulnyulan vowels

	Front		Back	
	Short	Long	Short	Long
High	*i	?*ii	*u	?*uu
Low			*a	*aa

It is beyond the scope of the present paper to discuss pNN phonotactics. We simply mention, without going into detail, that on the basis of the reconstructed lexicon (see Appendix 1) it seems to have been not too unusual for an Australian language. The majority of lexical roots begin with a consonant, and end with a vowel; most are bisyllabic or longer. Just a few roots may have been vowel-initial, the best candidates being *a 'and' and the bound root *-alma 'head'. For the small number of roots that have been reconstructed with initial *yi* and *wu* (e.g. 'father', 'dog', 'give', 'water') it is difficult enough to decide whether reflexes in the modern languages have initial glides or vowels, let alone in pNN! They have been tentatively reconstructed with initial glides. A rather large proportion of pNN roots, however, ended in consonants, most frequently liquids and the apical glide /r/; a few roots ended in an apical nasal, even fewer in an apical stop. There is also a small number of roots ending in consonant clusters, primarily nasal stop clusters, both homorganic and heterorganic.

3.2 Proto Nyulnyulan lexicon[8]

Using the standard method of reconstruction an initial set of some two hundred putative pNN words was established; these are listed in alphabetical order in Appendix 1, which also specifies which modern languages reflexes can be found in. Space considerations preclude inclusion of the actual forms; it is planned to publish these separately at a later date, when the investigation is further advanced.[9] A number of reconstructed forms seem to be peculiarly NN, including core vocabulary items such as: *bana 'when', *buru 'camp, place, country', *-JALA 'see', *-JALKU 'fall', *-JANBU 'tread, trample', *kalbu 'up, above', *-lababa 'ear', *-mbala 'foot', *-RLI 'eat', *wamba 'man', *wula 'water', and *yila 'dog'.[10]

The reconstructed pNN items differ somewhat in terms of certainty: in the best cases reflexes can be found in every, or almost every, language. In other cases reflexes are found in only about half of the languages. A form was tentatively taken as pNN if reflexes could be found in modern languages from both branches, provided that there was some geographical separation between them. But if reflexes could only be identified in a few neighbours (e.g. just Nyulnyul, Nimanburru, Jabirrjabirr, and Jukun) this was not taken as a candidate pNN lexeme, since it could easily have been borrowed. On the other hand, the

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[8] The following abbreviations are used: 1,2,3, 1+2 – first, second, third, first and second person; ABL – ablative; CAR – cardinal; COM – comitative; ERG – ergative; LOC – locative; OBL – oblique. Rather than adopting a single consistent phonemic orthography for all languages, we employ the orthographies used by the various language communities, or recommended by the Kimberley Language Resource Centre (Kimberley Language Resource Centre (2000)). These orthographies in most instances are phonemic — or almost so — and differ from one another and Australian standards in relatively minor ways. The main point to note is that *oo* in Bardi and Nyikina orthographies represents the high back vowel written *u* in the other systems; in the Bardi system it also represents the long version of this vowel. Following a convention established in Stokes (1982), we cite inflecting verb roots and stems in capital letters. Names of languages, language groups and proto-languages are abbreviated only in tables and figures and are set out in the Abbreviation section at the beginning of this book.

[9] A few of these items are found in one or two non-Nyulnyul neighbours, such as Karajarri or Nyangumarta, but not in more distant Pama-Nyungan (or Marrngu) languages. Probably most are borrowings from NN.

[10] I am currently revising and editing Nekes and Worms (1953) for publication; many of the modern forms will be included in that work, in a more accessible form than in the original microfilm.

existence of reflexes in Bardi and Warrwa — from opposite extremes of the Nyulnyulan region — was taken as firmer evidence that the reconstructed form was pNN.

Even when reflexes are widely dispersed there is room for uncertainty: although the lowest rates of shared core vocabulary are found in such extreme pairs, borrowing cannot be dismissed. For, according to one of the last two speakers of Warrwa, there was (in historical times at least) contact between Warrwa and Bardi people, through visits of the former to the tip of the Dampier Land peninsular. The presence of similar lexemes in just these two languages (and none of the intermediate ones) might not then be the result of retention from pNN but from borrowing. As mentioned already, even when reflexes can be found in all NN languages there can remain a strong suspicion that the item was borrowed extensively; this is the case for reconstructions such as *kujarra* 'two' and *ngamarna* 'breast'. More clearly, terms for various post-contact items have been borrowed throughout the family — e.g. *bambu* 'didgeridoo' (not a traditional instrument in the Dampier Land region) — but obviously should not be reconstructed for pNN.

The attested forms in the modern languages show, of course, a number of phonological and semantic differences from the proto-forms listed in Appendix 1, and their glosses. Many (not yet all) of the differences can be accounted for by regular rules of phonological change; these also permit identification of loans at various stages of NN history.

3.3 Proto Nyulnyulan system of free pronominals

The pronominal systems of modern NN languages appear to be identical in terms of the major person and number features, and the distinct case forms. The modal qualification in the previous sentence is necessitated by the severe lack of information on a few languages; we can only guess that their systems were identical to those of the better attested languages. The systems are of the Ilokano type (Conklin 1962; Greenberg 1988), also found in various non-Pama-Nyungan languages of the Northern Territory — though not in other Kimberley languages. Four person categories are distinguished: first person (1); first and second person (1+2); second person (2); and third person (3). Two numbers are distinguished in the pronominal roots, minimal (smallest number consistent with a particular person category) and augmented (one or more individuals additional to the minimal number for a category). Further distinctions are made in ENN languages by number suffixes to the augmented forms. Each language shows two distinct roots for each person-number category, a cardinal form that is found in most syntactic environments (basically, where it is the head of an NP), and an oblique form, used in indicating a pronominal possessor (basically where the pronoun is a dependent of a noun in an NP). The cardinal and oblique forms generally differ in initial segment, the latter being characterised by an initial *j*.

Table 5 shows the attested forms of the free cardinal and oblique pronouns in each language; because of uncertainties in the corpora, it is in most cases impossible to be sure whether pronominal forms are Ngumbarl or Jukun, and hence the two columns are collapsed almost everywhere. Our tentative reconstructions of the pNN free pronouns are given in Table 6. Three reconstructions are questionable — the two 1+2 augmented forms and the 3 minimal cardinal form — while there remain uncertainties in reconstructions of some segments in a few other forms.

Table 5: Major pronominal forms in Nyulnyulan languages

			Jw	Bd	Nnl	JJ	Nm	Ngb	Jk	Yw	Nyk	Ww
Minimal	1	CAR	ngayoo	ngayoo	ngay	ngay	ngay	ngayu	ngayi	ngayu	ngayoo	ngayu
		OBL	ngajana	(nga)jana	jan	jan	jan		ngayjanu	janu	ngajanoo	ngajanu
	1&2	CAR	ay ~ ayol	ayoo	yay	yay	yay		jayi	yayu	yayoo	yawu
		OBL	joowa	jowa	jay	jay	jay		?yayini	jaw(u)	jaw(oo) (SN) yajiya (BN)	jawu
	2	CAR	joo	joo	juy	juy	juy		juw(u)	juyu	joowa	juwa
		OBL	jiy(a)	jiya	jiy	jiy	jiy		jiya	jiya	jiya	jiya
	3	CAR	kinyingk	ginyingg(i)	kinyingk	kinyingk	kinyingk		kinying	ginyangka	kinya	kinya
		OBL	jina	jina	jin	jin	jin		jina	jina	kinyjina	jina
Augmented	1	CAR	arrod(oo)	arroodoo	yarrad	yarrad	yarrad		yarrida	yarr-	yarrka	yarra
		OBL	jada	jarda	jarrad	jarrad	jarrad		jarrada	jarra	yajarra	jarra
	1&2	CAR	arrodol	arridil	yadir	yadir(r)	adil		yadir(r)i	yadiri	yarrjoo	yadirr
		OBL	jada	jarda	jadir	jadir(r)	jarrad			jayrda	jayida	jadirr
	2	CAR	koorr	goorr	kurr	kurr	kurr		kurr-	kurr-	koorrka	kurra
		OBL	jookarra	joogarra	jungkarr	jungkarr	jungkarr			jungkarra	joongkarra (SN) koojoongkoorra (BN)	jungkarra
	3	CAR	(y)irr	irr	yirr	yirr	yirr		yirra-	kangajun(u) ~ yirr-	yirrka	yirra
		OBL	jirra	jirra	jirr	jirr	jirr			jirra	yijirra	jirra

Table 6: Reconstructed free pronouns of Proto Nyulnyulan

	minimal		augmented	
	cardinal	oblique	cardinal	oblique
1	*ngayu	*janu	*yarr	*jarra
1+2	*yayu	*jayu	*yadir(r)	*jadir(r)
2	*juya	*jiya	*kurr	*jungkarra
3	*kinya ~ *yina	*jina	*yirr	*jirra

Reflexes of pan-Australian first person minimal *ngayu* are attested in all NN languages. The oblique form consistently involves *jan* (Nyulnyulic), *jana* (Bardic), or *janu* (other languages); *janu* seems the most likely source. There is an initial *nga* in Bardi and ENN languages other than Yawuru. Should the pNN form be reconstructed as *ngajanu* or *janu*? Two things suggest the shorter form. First, loss of an initial syllable seems somewhat implausible given that it would almost certainly have borne stress. Second, a case can be made that *ngajanu ~ ngajana* could have been independently innovated. The WNN languages have a possessive construction involving the cardinal form of the pronoun denoting the possessor linked to the possessed nominal by the appropriate oblique pronominal (McGregor 2001). If this became the usual means of expressing possession for the first person singular in some language, it could easily have happened that the oblique form fused onto the cardinal form (they are usually contiguous and occur in that order). Thus, in Jukun Bates consistently represents the form as *ngai-jannoo*, and in Jawi Bird consistently represents it as *ngai jenna* — probably representing *ngajana*.

Reconstruction of *yayu* as the 1+2 minimal cardinal pronoun is fairly straightforward, the only unexpected modern forms being Warrwa *yawu*, which involves replacement of the palatal glide by the peripheral, and the final *l* of one alternant in Jawi. The proto-form for the oblique 1+2 minimal is identical with the cardinal form except that — like all oblique forms — it involves an initial *j*. There are a few irregularities in the modern forms: not only Warrwa but also Yawuru, Small Nyikina, Bardi, and Jawi show the *y ~ w* replacement. And Big Nyikina has *yajiya*, which seems to involve the first syllable of the cardinal pronoun (*ya*) plus the second person minimal oblique pronoun (*jiya*) (see further below). Small Nyikina also has the irregular and rare variant *jarrajaw*, alongside regular *jaw(oo)*.

The second person minimal is a little less regular in the modern languages, but can still be plausibly reconstructed as *juya*. The third person minimal is reconstructed as *kinya* or *yina* (see below for further discussion). Most modern languages have a reflex of the former, involving the augment *-angka* (Yawuru) or *-ingk(i)* (WNN and Jukun); the short form is found only in Nyikina and Warrwa. This form is identical with an endophoric determiner 'this, the aforementioned'; it can, however, be distinguished from the latter by virtue of the irregular oblique *jina ~ jin* — the determiner is invariant in root form. Again in Nyikina we find the innovation *kinyjina*, formed in the same way as the 1 minimal oblique form.

The third person augmented forms *yirr* (cardinal) and *jirra* (oblique) show mostly expected reflexes in the modern languages. Yawuru has two cardinal forms: the expected reflex of *yirr*, along with irregular *kangajun(u)*. The former is used for dual or paucal number, and is always followed by the appropriate number suffix; the latter — which has the same form as the intensive form of the distal demonstrative *ka* — is used for other numbers.

The cardinal form in other ENN languages always shows a post-root augment: -*a* in Warrwa and perhaps Jukun, -*ka* in Nyikina. The oblique root shows an initial *j* in all languages except Nyikina which, as usual, has the initial CV of the cardinal form prefixed to the *j*-initial form.

Similarly for the second person augmented forms. Reflexes of cardinal *kurr and oblique *jungkarra show up in forms parallelling the reflexes of the corresponding third person forms. The only qualifications are: (i) in Small Nyikina the initial *ku* of the cardinal is not prefixed to the *j*-initial form, although it is in Big Nyikina; and (ii) the homorganic nasal–stop cluster has reduced to the plain stop in Bardic (see §5.5 below).

Reflexes of 1 augmented *yarr and *jarra in Yawuru, Nyikina, and Warrwa are precisely as expected given the two augmented forms just discussed (the prefixed *ya* to the oblique form occurs in both dialects of Nyikina). In WNN, however, we find the augment -*ad* to both the cardinal and the oblique forms in Nyulnyulic, and -(*o*)*odoo* to the cardinal in Bardic. Furthermore, Bardi and Jawi show the irregular oblique *ja(r)da* — identical with the 1+2 augmented form (see also Nekes 1939:144). Bates' manuscripts give *yarreeda* and *jarrada* for the cardinal and oblique forms respectively; given these augments, one is tempted to consider these as more likely Ngumbarl than Jukun.

There are many complexities in the 1+2 augmented forms. On the basis that it occurs in five languages, not all contiguous, it seems reasonable to postulate **yadir(r)* as the pNN cardinal form — the final segment is indeterminate between *r* and *rr* (see §5.5). Nimanburru *adil* is a not implausible reflex, involving loss of the initial glide, and a lateral corresponding to the *r* or *rr* of the other languages. This leaves the Bardi, Jawi, and Nyikina cardinal forms as irregular.

Three languages — Nyulnyul, Jabirrjabirr, and Warrwa — have oblique forms corresponding to the cardinal forms via the regular *y* ~ *j* alternation. Therefore **jadir(r)* could be the proto-form. This is, however, a less certain reconstruction than the cardinal form, and we must conclude that most languages have restructured their free oblique 1+2 augmented pronoun. Indeed, in three languages — Bardi, Jawi, and Nimanburru — the 1 augmented and 1+2 augmented have collapsed: in the former pair both have been replaced by a new irregular form, in the latter, the 1 augmented has expanded to cover 1+2 augmented.

Assuming the reconstruction of Table 6, most modern pronominal forms are reflexes of the proto-forms. By and large, the forms in the WNN languages show the effects of regular historical phonological processes. The ENN languages, by contrast, show few phonological changes, but more evidence of form-restructuring, especially in the augmented number. Nyikina also shows a good deal of renovation in the oblique pronouns, using as a prefix the initial syllable of the corresponding cardinal pronoun.

The 1 augmented forms, and especially the 1+2 augmented forms, show most evidence of restructuring. For 1 augmented, it has been by suffixation, in some cases by a regular form associated with augmented pronominals, in other cases by an apparently meaningless form. The cardinal 1+2 augmented has apparently been constructed on a base represented by the proto-form of the 1 augmented in Nyikina, Bardi, and Jawi. In Nyikina the first syllable of the second person minimal pronoun seems to have been added as a suffix, a perfectly plausible development. In Bardi and Jawi -*idil* ~ -*odol* (unknown provenance) has been added.

Only three languages show reflexes of the proto-forms of the oblique 1+2 augmented pronouns. We have already described the irregular modern forms in three other languages. This leaves us with the forms in Nyikina and Yawuru, both of which appear to have been constructed on a base of the oblique 1+2 minimal — which seems reasonable — to which has been added *-ida* or *-rda*, respectively.

Why should the 1+2 augmented be so unstable in NN?[11] The obvious answer is that the systems of bound pronominal prefixes to nominals, and to verbs in certain mood categories are what Greenberg (1988) has referred to as Assiniboine rather than Ilokano — that is, they have a 1 minimal form ('I'), a 1+2 minimal form ('me and you', the speaker–hearer dyad), and a 1 non-singular form (covering all other configurations involving 1).

Examination of the proto-forms of the 1 and 1+2 categories reveals that it is not implausible to suppose that at some stage in pre-pNN the system made a simple number contrast in the first person between singular **ngayu* (cardinal) ~ **janu* (oblique) and non-singular **ya* (cardinal) ~ **ja* (oblique).[12] The 1+2 minimal proto-form could have been formed by the addition of the second person singular **ju* (which subsequently lenited to **yu*), and the 1 augmented by the addition of the widespread non-Pama-Nyungan plural marker **rr*. Perhaps 1+2 augmented proto-forms were formed in a similar way to the modern Nyikina form, by addition of the second person non-singular **nurru* (one of two widespread second person non-singular forms in non-Pama-Nyungan languages — Capell and Coate (1984:99–104), and Blake (1988)). If so, the pNN forms would have been **yadirr* and **jadirr*, deriving from **yarr-nurru* and **jarr-nurru* by a plausible rule *rr-n > d* (attested as a morphophonemic process in Nyikina — Stokes (1982:xxvi, 206, 208)). Unfortunately, this leaves unexplained the final glide *r* of Warrwa (and possibly other languages).

Most modern oblique free pronominals begin with a palatal stop, which could be a reflex of a pre-pNN genitive prefix **ji-* — identical with the reconstructed pNN dative postposition. A couple of morphophonological rules could then be invoked that account for many of the modern forms: (a) **ji-yV > jV*; and (b) **ji-ku > jungka*. (a) is phonologically plausible; (b) is plausible for functional reasons: it serves to keep distinct forms in paradigmatic opposition that might otherwise have collapsed if lenition processes had occurred. And various modern languages show similar morphophonemic rules: a similar rule of prenasalisation is attested in second person pronominal prefixes to verbs in nearby Gooniyandi (McGregor 1990: 103–104); and in Ngarinyin comparable rules are found in certain morphologically restricted environments (Rumsey 1982:23).

Two modern obliques are clearly irregular under this scenario: the first and third person minimals. We have no explanation for the first person form. However, it is possible — though of course not certain — that the third person **kinya* is a post-pNN borrowing: a demonstrative or determiner with a similar form is found in a wide scattering of languages, Pama-Nyungan and non-Pama-Nyungan. An alternative, and in my view preferable, candidate for the pNN (or perhaps pre-pNN) third person minimal pronoun is **yina*, a

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[11]   The same 'instability' is apparent in the recent history of Nyulnyul itself. The category was entirely lost in the speech (and competence) of the last speaker, who consistently extended the 1 augmented forms to cover it. The 1+2 minimal was minimally present in her speech, though 90% of the time it was covered by the 1 augmented, which had effectively become a first person non-singular pronominal.

[12]   This is put forward as a possible scenario, that accounts for the forms of the bound pronominal prefixes as well as the free pronominals. Other scenarios are of course possible, as Nick Evans has pointed out to me.

plausible reflex of which exists in at least Nyulnyul, in the demonstrative *in* 'this' (McGregor 1996:17, 23).[13]   This form not only plausibly accounts for the third person minimal oblique **jina*, but also for various bound forms: the nominal prefix *ni-* (McGregor 1995), the verbal prefix allomorph *yi-*, and the conjugation marker *na- ~ ni- ~ n-* (see §3.5 below).

Finally, plausible cognates for virtually all pNN cardinal pronominals can be found in the non-Pama-Nyungan region.   The first person singular is, of course, pan-Australian. Forms with initial *ya* are not unusual in some first person non-singular category in non-Pama-Nyungan; nor are non-singular second person forms like *kurr*. The second person singular is more distinctive, although forms involving a laminal stop or nasal are common. Thus, many Kimberley languages have the form *ngVnyjV* (where V is a high vowel); and bound forms in various languages show a laminal stop or nasal (e.g. Ngarinyin ergative prefixes *ja- ~ jan-*, and absolutive *nyin- ~ nyun-* (Rumsey 1982:83, 86), and Dalabon absolutive prefix *dja-* (Nick Evans pers. comm.)).   Possible cognates of the third person minimal pronominal or demonstrative **yina* include the homophonous pronominal and endophoric determiner *niyi* in Gooniyandi (McGregor 1990:144), and the Bunuba pronominal *niy* (Rumsey 2000:71).   And further afield we find the Jaminjung distal demonstratives *yina(ya)* and *(ngi)yina* (Schultze-Berndt 2000:49).   The third person augmented **yirr* might be cognate with the widespread non-Pama-Nyungan *birri* via loss of the initial segment, followed later by glide epenthesis. Peculiarly NN are the oblique pronominals.

3.4 Proto Nyulnyulan nominal morphology

Nominal morphology is rather simple. There is a small set of derivational suffixes with meanings 'expert at', 'characterised by', 'collective', and so on. Little inflection is found; nominals are not inflected for case. Instead, like other languages of the region, each NN language has a set of postpositions that mark the grammatical relation of an NP in the clause or NP to which it belongs.   These are phrase-level enclitics that normally occur one per phrase, attached to its first word.   The only real inflection is by pronominal affixes to a small set of fifty or so bound nominals, and this is found in only some languages.   In this section we first attempt to reconstruct pNN postpositions, then pronominal prefixes; due to considerations of space derivational morphemes are not taken into account.

Table 7 lists the main postpositions in each language, so far as they are known, together with indication of their allomorphic variants.[14]   These are the postpositions that are found in most languages (except a few for which data is inadequate); a handful more, conveying more specific meanings, are found in some languages.

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[13]   Nekes and Worms (1953) give as alternative third person singular pronouns *yen* (Jabirrjabirr and Nyulnyul), *en* (Bardi), *yona* (Yawuru), and *yena* (Nyikina). Modern sources for the last three languages do not list these forms as either pronouns or determiners, though it seems improbable that Nekes and Worms would have invented them.

[14]   Two alternants shown in the table are dialectal, the Yawuru allative and ablative (ABL$_1$): the forms with final vowel occur in the inland dialect, the forms without, in the coastal dialect.

Table 7: Major postpositions of the Nyulnyulan languages

	Jw	Bd	Nnl	JJ	Nm	Ngb	Jk	Yw	Nyk	Ww
ERG	-nim	-nim	-in	-in	-in	-ni	-n ~ -na	-ni ~ -nyi ~ -rni -nimaa	-ni	-na ~ -ma ~ -nma
LOC	-on	-goon ~ -oon ~ -on ~ -ngon	-uk ~ -ik	-uk	-uk		-kun	-gun ~ -gan	-kan ~ -an	-n ~ -an ~ -ana ~ -kan ~ -wan
ALL		-ngan	-ung	-ung	-ung ~ -ing		-ngan	-ngarn ~ -ngana	-ngana	-ngana
ABL₁		-go ~ -o	-kun ~ -ikun	-kun(g) ~ -kab	-kab		-kab ~ -kabu	-gab ~ -gabu	-kaboo ~ -aboo	-nkawu ~ -kawu
ABL₂	-jun	-yoon ~ -joon	-jun ~ -ijun	-jun	-jun		-junu	-junu	-joonoo	-yunu ~ -junu
DAT								-yi ~ -ji	-yi ~ -ji	-yi ~ -ji
CAUS		-ji ~ -i	-ij	-(i)j	-ij					
COM		-nyarr	-nyirr ~ -inyirr	-nyirr	-nyirr			-ngany	-barri	-barri; -nyarri
INST		-nga ~ -ng	-ang	-ang	-ang			-barri	-ngany	-ngany
PER			-mirr ~ -imirr	-mirr	-mirr				-marroo	-marru

There can be little doubt that most of these postpositions are cognates, and that plausible reconstructions are possible for most. These are shown in Table 8; a single form is given for each, though it is likely that (as in the modern languages) initial palatal, bilabial, and velar stops alternated with the corresponding glides.

The presence of *m* in one allomorph of the ergative postposition in four languages from opposite extremes of the NN region attests to its presence in the proto-form, which has accordingly been tentatively reconstructed as *-*nima*. Admittedly there is little to justify the final vowel: it could just as easily have been innovated in Yawuru and Warrwa as lost in Jawi and Bardi. Other than loss of the final syllable (or segment) in most allomorphs in most languages, the only noteworthy thing is that Nyulnyulic languages have metathesised the CV sequence, as they have in a number of other postpositions. The nearest language that shows an ergative marker with anything like the NN shape is Jaminjung, where it is *-ni ~ -di* (Schultze-Berndt 2000:54); other Mindi languages show a similar form (Chadwick 1997:97–99). However, the *m* seems to be a peculiarity of NN.

Table 8: Reconstructed Proto Nyulnyulan postpositions

	Proto Nyulnyulan postpositions
ERG	*-*nima*
LOC	*-*kun*
ALL	*-*ngana*
OBL?	*-*ung*
ABL₁	*-*kabu*
ABL₂	*-*junu*
DAT	*-*ji*
COM	*-*ngany*
PER	*-*marru*

The locative postposition shows lenition or loss of the initial velar stop in many environments in the modern languages, which may or may not have occurred in pNN. The fact that the Nyulnyulic languages consistently show the stop in final position in their metathesised forms suggests that the weakening might be more recent. In Nyikina, Warrwa, and the inland dialect of Yawuru the vowel has lowered from *u* to *a*.

The allative postposition appears in two rather different forms, *-ung ~ -ing* in Nyulnyulic languages, and *-ngana ~ -ngan* elsewhere. One possibility is that the forms are reflexes of a single pNN form, presumably **-ngana*, the Nyulnyulic form showing loss of final syllable and metathesis of the remaining CV, as for various other postpositions. This leaves the quality of the initial vowel exceptional, though not inexplicable (for instance, it may be motivated by functional pressure to keep the allative and instrumental distinct). Alternatively, they may be reflexes of two distinct postpositions, **-ngana*, presumably an allative, and **-ung* which may have been some sort of oblique or purposive marker.[15] It is difficult to decide between these two possibilities, though the second could account for the range of senses of the modern forms in WNN, presuming that the allative was lost in Nyulnyulic, its functions taken over by the oblique, the oblique in Bardic, its functions taken over by the allative.

All reasonably well-documented NN languages show two distinct ablatives, here labelled ABL_1 and ABL_2. These contrast semantically: ABL_1 always has the more local meaning, indicating the immediate source or origin from which an event or thing moves, while ABL_2 has a less local meaning, and indicates a source that characterises the event or entity, without implying motion (real or figurative). As this suggests, the ABL_2 shows derivational uses that the ABL_1 does not; however, the former does not seem to have reduced to a derivational affix in any language.

The WNN causal postposition (which marks prior causes, reasons, or connections) and ENN dative are clearly cognates, and we tentatively take them to be reflexes of a pNN dative. Its form, **-ji*, is, of course, unusual for an Australian language — most have a form resembling *-wu* or *-ku*; Gooniyandi, however, shows the perhaps cognate *-yoo ~ -joo*.

All modern NN languages have distinct instrumental and comitative postpositions. There is reason, however, to believe that pNN had a single postposition, **-ngany*, that covered both functions. The other instrumental and comitative markers shown in Table 7 are perhaps more recent borrowings. Evidence for this is too complicated to go into here, but is discussed more fully in McGregor (1997). I know of no plausible cognates for **-ngany* in other non-Pama-Nyungan languages.

All WNN languages, as well as Warrwa and perhaps Jukun, have a system of pronominal prefixes that attach to a small set of nominals referring primarily to inseparable body parts and a few other items closely associated with the 'personal sphere' (such as 'name', 'reflection', 'self', and so on) — see McGregor (1995) and McGregor (1999).[16] The fact that cognates in the languages without systems of pronominal prefixes invariably show the

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[15]   We are grateful to Nick Evans (pers. comm.) for pointing this possibility out to us, and drawing our attention to the similar oblique markers in distant Northern Territory languages — including oblique marker *-ung* for pronouns in Iwaidja and Maung.

[16]   There is some evidence that the set of prefix-taking nominals may have been somewhat larger in pNN, and also included certain nominals denoting inherent or defining properties. Thus, we find words for 'long', 'many', and various others with an initial *ni*, which might well be a relic of the third person minimal prefix.

erstwhile third person minimal prefix strongly suggests that the system can be traced back to pNN. These prefixes indicate the person to which the part or representation 'belongs', and show an Assiniboine type person-number system (see §3.3 above). Table 9 shows the reconstructed system. Similarities to the corresponding cardinal pronouns are manifest, though the second and third person minimals differ somewhat.

Table 9: Proto Nyulnyulan pronominal prefixes to nouns

	minimal	augmented
1	*nga-	*yarr-
1+2	*ya-	
2	*nyi-	*kurr-
3	*ni-	*yirr-

3.5 Proto Nyulnyulan verbal morphology

All modern NN languages — like most other languages of the northwest of the continent (McGregor 2002) — show two very different types of verbal construction: simple and compound verb constructions. The former consist of a morphologically complex INFLECTING VERB that takes a number of inflectional prefixes (pronominal, tense, and mood) and suffixes (tense and/or aspect), as well as a few derivational affixes (notably the reflexive/ reciprocal prefix and suffix) and enclitics (e.g. cross-referencing pronominals, and relators of various types). Inflecting verbs lend themselves well to item-arrangement description — see Metcalfe (1975:4) for Bardi; Stokes (1982:237, 293) for Nyikina; Hosokawa (1991:114) for Yawuru; McGregor (1994:38) for Warrwa; and McGregor (1996:38) for Nyulnyul. The template in Figure 3, which shows the structure of the inflecting verb in Yawuru, is fairly representative.

NN languages have quite large sets of inflecting verbs for north-western languages — a minimum of sixty or so in ENN to over two hundred in WNN.

Compound verb constructions consist of an inflecting verb together with a non-inflecting PREVERB, which normally precedes the inflecting verb. The preverbs are open classes having several hundred members. In all NN languages about a score of inflecting verbs have the potential of occurring in compound verb constructions, the majority of these being high frequency and semantically basic verbs.

There is reason to believe that the compound verb construction is a fairly recent innovation that has been widely diffused across northern Australia (McGregor 2002: Chapter 8). How recent is impossible to say, though it cannot be traced back to a putative proto-language for all of the languages, e.g. to Proto non-Pama-Nyungan. This raises the question: was the compound verb construction present in pNN, or is it a more recent innovation that has diffused through the languages? There can be little doubt that some ancestral language did not have the construction, and had only the simple verb construction — but was this pNN or pre-pNN?

−7	(−6)	−5	(−4)	(−3)	(−2)	(−1)	**Stem**	(+1)	(+2)	(+3)	(+4)	(+5)	(+6)
subject pronoun	(nasal)	tense/mood	(number)	(conjugation marker)	(reflexive-reciprocal)	(nasal)	stem	(reflexive-reciprocal)	(aspect)	(applicative)	(dative-imperative/ subordinator)	(object/oblique pronoun)	(vocative)

Figure 3: Template structure of the inflecting verb in Yawuru

The fact that we have been able to reconstruct preverbs for pNN might seem to suggest in favour of the construction's presence in the proto-language. So also might the high degree of consistency between the languages in terms of both the sets of inflecting verbs that occur in compound verb constructions, and the numbers of different preverbs each collocates with. However, neither characteristic is telling. Reconstruction of lexical items filling certain roles in modern languages does not imply existence of the grammatical role in the proto-language. Some of the modern preverbs are quite likely reflexes of pNN nominals and ideophones. The second characteristic could well be a result of similar statistical patterns in the distribution of verbal lexemes, and borrowing. The fact that the system is more entrenched and grammaticalised in ENN is a point in favour of the diffusion of the construction, probably from the east and north-east. If so, extensive borrowing of preverb lexemes may have occurred subsequent to the separation of pNN. Given present evidence I can see no way of deciding between the two historical scenarios, and the arguments for each are explicable in the alternative scenario.

In any event, it seems clear that inflecting verbs represent older lexical material than preverbs, and they are the obvious things to investigate in a comparative investigation — they are most likely to provide us with good evidence for subgrouping. However, they also present numerous problems, not the least of which result from the different analytical decisions by the linguists who have worked on the various languages. It is beyond the scope of the present paper to delve into pNN inflecting verb morphology (an investigation is planned for the near future). For our purposes it is sufficient to mention a few characteristic features of NN inflecting verb morphology that perhaps represent shared aberrations that argue for the genetic unity of the family, and its distinctiveness from other Australian families.

First, many modern NN languages have an infinitival inflecting verb form involving the prefix *ma-* replacing the nominative pronominal prefix. For instance, in Nyulnyul we have *ma-jal-in* (INF-see-IMP) 'seeing' and *ma-lurr-in* (INF-burn-IMP) — cf. e.g *nga-ni-ny-jal-ø* (1minNOM-TR-EN-see-3minACC) 'I saw him/her/it', *i-ni-ny-jal-ø* (3minNOM-TR-EN-see-3minACC) 'he/she/it saw him/her/it', etc. Infinitival forms are attested in Bardi, Nyulnyul, Nyikina, Warrwa, and, according to Nekes Worms (1953), Jabirrjabirr, Nimanburru, Jukun, and Yawuru.[17] It is therefore reasonable to reconstruct the infinitival prefix **ma-* for pNN. This seems to be a peculiarity of NN.

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17 Stokes (1982:13) also reports this verb form. However, according to Hosokawa (1991:193) it is never used in natural speech by native speakers of Yawuru, although those who are fluent speakers of Nyikina often accept the *ma-* infinitival forms.

Second, every language shows a second person minimal pronominal prefix *mi-*, normally in the non-future; in Nyikina it is restricted to the transitive conjugation class, while in Nyulnyul it is also found in the future of the intransitive conjugation. It is reasonable to reconstruct **mi-* as one allomorph of the second person minimal nominative pronominal prefix in pNN. This also seems to be a NN aberration — I am not aware of any other Australian languages that show this prefix form in the second person minimal/singular. (See, however, §6 below.)

Third, reflexive/reciprocal forms of inflecting verbs in NN languages are consistently formed by the prefix *ma-* plus suffix *-nyji* (there are a number of qualifications and allomorphic variations that need not concern us here — see McGregor 2000b for details). This construction can doubtless be traced back to pNN. Although the suffix is widespread in northern Australia as a marker of reflexive/reciprocal (see Evans (1995:37) and Alpher, Evans & Harvey this volume), the prefix seems to be peculiarly NN.

Fourth, it seems that all modern NN languages show two primary conjugation classes, *na* and *ø*. These are distinguished by different prefix- rather than suffix-inflections, as is usually the case in Australian languages; conjugation prefixes *na-* ~ *a-* and *ø-* are apparent in many of the paradigmatic alternants. The *na* class is predominantly transitive, the *ø* class predominantly intransitive. (Some languages (e.g. Yawuru) show subclasses.) It is tempting to trace the conjugation classes back to pNN. However, some caution is required: the former marker most likely derives from a third person minimal accusative prefix (McGregor 2002: §5.2.1). Apparently at some stage in the history of NN there were systems of nominative and accusative pronominal prefixes; the latter were lost, and the third person minimal adopted throughout the paradigm of transitive inflecting verbs. This is not a particularly remarkable development, and it could well have occurred independently more than once subsequent to the differentiation of pNN. Nor is it implausible that it might have diffused, as could have the encliticisation of accusative pronominals (which are almost identical in form to the free cardinals) — indeed, the two could have gone hand in hand, reinforcing one another.

Finally, two inflecting verb root suppletions are characteristic of NN languages, and doubtless go back to pNN. They are the suppletive roots -DI and -JI ~ -JU ~-J of the 'say, do' inflecting verb, and -NGA and -NI ~ -N of 'be, sit'; the first form in both cases is found in the past tense and minimal numbers in most NN languages.

4 The two primary groups

In this section we present some comparative evidence in favour of the primary division of the NN languages. This evidence is almost entirely lexical. To make a convincing case, reconstruction of their distinctive morphologies would be desirable. This, however, is beyond the scope of the present paper, and we make just a few preliminary observations in §4.2. But first let us look at the lexical evidence.

4.1 Lexical differences and innovations

It is possible to identify a number of lexical items peculiar to ENN and WNN languages — which would thus be candidate reflexes of proto-lexemes distinctive of one or the other (putative) proto-language. So far, it has been possible to reconstruct about one hundred

plausible pWNN peculiarities, and about fifty pENN. These are listed in Appendices 2 and 3 respectively. Only when cognates were found exclusively in one group was a form attributed to its proto-language. Of course, it is quite likely that in some cases lexemes were borrowed from a language belonging to one group into an adjacent language from another. For practical reasons such lexemes were excluded from the reconstructed proto-lexicons, except when the adjacent language was Ngumbarl; also excluded were reconstructions restricted either to subgroups within a group, or to adjacent languages, both of which are quite numerous. Careful investigation is required to determine whether or not such items are retentions from pWNN or pENN.

Of course, it is improbable that each reconstructed proto-form represents an innovation of the proto-language; some doubtless go back to pNN itself, reflexes having simply been lost in one modern group. Others could well have been diffused across regions that accidentally coincide with groups. Some, however, are surely innovations of the two lower-level proto-languages. We now attempt to identify some of these.

It is possible to set up a number of contrasting Proto Western and Proto Eastern forms with the same apparent meanings. These include the following twenty items:

Table 10: Contrasting Proto Western and Proto Eastern Nyulnyulan synonyms

	pWN	pEN
'rotten'	*biini*	*mandu*
'leaf'	*bilibil*	*wirrkiny*
'bush country'	*bindan*	*birra*
'kangaroo'	*burruk*	*barrjaniny*
'tree, stick'	*bardangk*	*baalu*
'arrive, come'	*darr*	*-BULA
'yes'	*iyi*	*ngawayi*
'later, soon'	*karrm*	*wanyji*
'egg'	*lakurr*	*kambiy*
'good'	*layib*	*maabu*
'nose'	*-mal*	*nguni*
'seek'	*-MI	*-MURUNGU
'knowledgeable'	*-mungk*	*nila*
'small'	*murrul*	*wuba*
'mud'	*ngijil*	*jabula* ~ *jakula*
'sister'	*marrir*	*ngunu*
'forehead'	*-nkarra*	*jirrbal*
'thigh'	*-nmurr*	*balngany*
'tail'	*-warla*	*makarra*
'woman'	*wurany*	*jarndu*

In most cases there is either no phonologically similar lexeme in a nearby non-Nyulnyulan language (e.g. for 'nose' and 'later'), or if there is, it is restricted to just the nearby languages, and is not found in close relatives of that language (e.g. for pENN 'woman', 'knowledgeable', and 'rotten'). Of course, it is possible that one or the other of the pairs is a

reflex of the pNN form; in fact, it is possible that both are reflexes of pNN lexemes, and that at least one reflex has undergone distinctive semantic or grammatical changes in the process of splitting of the two groups from pNN. This will normally leave one at least lexical item as an innovation — perhaps of form, perhaps in meaning, and/or perhaps in grammatical properties. The question is which item is innovated?

These are difficult questions to provide definitive answers to. In some cases it is possible to make an informed guess. We have reconstructed a system of bound pronominal prefixes to certain nominals in pNN, this system being more extensive than in any modern language. This suggests that the pENN terms for 'nose', 'forehead', 'thigh', and 'tail' are innovations, while the corresponding prefixing nominals of pWNN might well be retentions from pNN.[18] Quite likely pENN *nila 'knowledgeable' is also an innovation — it is evidently a clipping of the third person minimal form of the pNN *-lababa 'ear'. Such a meaning extension is of course natural in Australian languages (Evans & Wilkins 2000). But if it went back as far as pNN we would have to assume that it was lost in pWNN, which innovated the prefixing form *-mungk 'knowledgeable'.[19]

Likewise, the preverb *darr 'arrive, emerge' is a probable innovation of pWNN, granted the account of the historical development of the compound verb construction adumbrated in §3.5 above. Similar reasoning — plus the reconstructed pNN forms — leads us to identify *kabu 'eat' and *wangkurr 'cry' as probable pENN innovations.

Knowledge of the pNN form can sometimes permit identification of innovations: *marlu is almost certainly a pENN innovation, that replaced the earlier pNN *yarri 'no, not, without', leaving only a relic of the earlier form in one of the Yawuru forms for 'without', and possibly Nyikina and Warrwa preverbs yarri(j) 'disappear'. Unfortunately, most cases are less clear-cut than this, and it is usually impossible to rule out the possibility that a term restricted to the languages of one group is a reflex of a pNN form. For instance consider the pWNN inflecting verb *-MURRAR 'smell', reflexes of which exist alongside of reflexes of pNN *-BANYJU 'smell'. The former could just as well have been lost to the ENN languages as their fund of inflecting verbs dwindled. Only by a somewhat dubious application of Occam's razor can we conclude *-MURRAR 'smell' was a pWNN innovation.

Semantic considerations also permit us to make informed guesses. *-JIMB 'die' is a probable innovation, a semantic extension of pNN *jimbi 'down, below, inside'; the fact that reflexes are restricted to WNN suggests that the innovation occurred after the split between pWNN and pENN.

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[18]   In line with remarks of the previous paragraph we cannot presume that the forms with these meanings in ENN are innovations. It is not impossible that they are reflexes of pNN terms for other, presumably nearby and less inalienable, body parts that replaced the original prefix-taking terms. The same qualification applies to all the 'informed guesses' below; I gloss over it in the interests of making the strongest guesses consistent with known facts. The tentative nature of the guesses should not be forgotten, and 'innovation' should be interpreted as innovation in the correspondence of phonological form, meaning, and part-of-speech — not exclusively the first. Innovation of all the three types could potentially be taken as evidence of subgrouping, though innovation of form is the most convincing.

[19]   This case is not, of course, entirely convincing — an alternative (only slightly more complex) possibility would be that *-mungk 'knowledgeable' was an innovation of pWNN that replaced a pNN prefixing root *-la 'knowledgeable'. Nick Evans (pers. comm.) has pointed out to me that Kayardild has the related form mungurru 'know, knowledgeable', which is consistent with the hypothesis that *-mungk 'knowledgeable' is the older form.

We now turn briefly to closed class grammatical words, which provide us with some support for subgrouping. Assuming the correctness of the reconstruction of the first person augmented cardinal pronoun **yarr* in pNN, it is possible that the augment found in modern WNN languages can be traced back to an innovation in pWNN. This leaves aside the problem of the different vowels of the augment: *-ad* in Nyulnyulic, *-o(o)doo* in Bardic. We cannot rule out analogical innovation in one of the subgroups, but a perhaps more likely alternative is that pWNN innovated the augment **-adu*, and that subsequently the final vowel was lost in Proto Nyulnyulic, and vowel harmony occurred in Proto Bardic.

A few other minor irregularities in closed class words in WNN languages suggest innovations in pWNN. One is the term for 'east', which involves the augment *-warr* in Nyulnyulic, *-(a)rr* in Bardic, but which is absent in ENN languages. It is plausible to reconstruct the pWNN form with augment **-warr*, representing an innovation in that language. Another is the term for 'when, today', which involves what looks like the temporal postposition attached to the pNN form **bana* 'when, today' — thus, *banangkarr* 'when, today' in Nyulnyulic, *baniigarr* 'when' in Bardic. A third irregularity is exemplified by the interrogative 'who, what' and negative 'no, not', reflexes of which have lost their initial glide in all WNN languages, not only those that show this as regular process (see §5.2 below). Of course, neither borrowing nor parallel development can be ruled out in any of these cases; the simplest assumption would seem, however, to be that the unexpected forms in the modern WNN languages are unexpected because of innovations or irregularities jointly inherited from pWNN.

4.2 Morphological peculiarities

It is difficult to identify shared morphological peculiarities or irregularities in either group of languages that can be convincingly traced back to innovations of the proto-languages. Almost all cases of irregularities so far identified are more plausibly traced back to pNN, the irregularities having been lost in some of the modern languages — which just happen to coincide with the groups. The *wa- ~ wi-* allomorph of the third person irrealis (usually also future) pronominal prefix to inflecting verbs that occurs in first position in the IV, and is characteristic of ENN, is more likely a reflex of a pNN irrealis pronominal prefix than an innovation of pENN. The WNN languages simply lost this prefix, extending either the future or non-future prefix (depending on subgroup) to the irrealis.[20] Likewise for the *ya-* allomorphs of the irrealis mood prefix, that are exclusive to ENN.

In many cases morphological innovations are of the types that lend themselves well to diffusion. Thus, the general subordinate clause marker *-jarri ~ -yarri* of ENN is a readily segmented (and presumably psychologically prominent) morpheme occurring in the penultimate order-class of the inflecting verb, and (one would think) highly borrowable. So also is the ENN comitative/instrumental postposition *-barri* (see §3.4 above). These do not represent clear cases of ENN innovations.

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[20]   The mismatch between the paradigms for Bardic and Nyulnyulic is the main reason for hypothesising *wi- ~ wa-* as pNN. A similar loss of a form and consequent paradigm restructuring could have happened with the three postpositions **-ngana* ALL, **-ung* OBL, and **-ji* DAT, again providing no convincing evidence of subgrouping.

Most plausible morphological innovations can be traced back to the proto-languages at subgroup rather than group level. One that might be traced back to the proto-language of a group, pENN, is the system of possessive pronominal suffixes attached to (some) inalienably possessed nominals, including e.g. Warrwa *ngunii-* 'nose', *kurndi-* 'shoulder', and *balngany-* 'thigh'. Unlike the possessive prefixes (see §3.4 above), the possessive suffixes are almost everywhere formally identical to the free oblique pronominals. Only in Big Nyikina and Warrwa is the system viable, and the full paradigm of person and number combinations found. In Small Nyikina and Yawuru only the form corresponding to the third person minimal possessor is found, and then for only a relatively small number of nominals, and usually without the *j > y* lenition characteristic of Big Nyikina and Warrwa. Yet there are facts that seem to suggest that the Yawuru forms were not simply borrowed. For instance, *marlu-jina ~ marlu-yina* (not-3min) 'without' has no absolutely certain source in either Nyikina or Warrwa, where the closest corresponding term *mali(i)na* 'without' involves a plain apical lateral, and may have a different etymology — the base form is not the negative particle *marlu* 'no, not'.

We cannot be certain, however, that it was the system of possessive pronominal suffixes that was innovated in pENN, rather than just a single suffix, the third person minimal *-jina*, which could have served either as a general marker of possession or just as an isolated third person possessor marker — systems (almost) as attenuated do exist in nearby languages, including Gooniyandi (McGregor 1998b) and Miriwoong (Kofod 1978:144). The system in Big Nyikina and Warrwa could well have arisen by reanalysis of *-jina* as a bound pronominal.

5 Nyulnyulan historical phonology

In this section we outline some of the major historical phonological processes that seem to have occurred in the development of NN languages, given the sound correspondences in the modern languages. All of the processes we discuss involve consonants; vowel alternations present a more complex and (on the face of it) less regular situation, and are left for another occasion. Admittedly, there remain a number consonant correspondences that have yet to be accounted for, as well as conditioning factors that require more precise specification. In a number of cases it is obvious that irregularities result from borrowings of back into the language of old lexical material, subsequent to the period of application of the phonological rule.

5.1 Loss of final vowels

Three WNN languages, namely Nyulnyul, Jabirrjabirr, and Nimanburru, show loss of root final vowels, as illustrated in the examples under Table 11. The fact that the loss is widespread, and very few final vowels are found in the corpora for Nyulnyul, Jabirrjabirr, and Nimanburru, suggests this is a relatively recent process.

Table 11: Loss of final vowels in Nyulnyul, Jabirrjabirr, and Nimanburru

	proto-form		Nyulnyul	Jabirrjabirr	Nimanburru
'back'	*-ka*	(pNN)	*-k*	*-k*	*-k*
'black'	*maanka*	(pNN)	*maank*	*mank*	*mank*
'alive'	*nunyji*	(pNN)	*ninyj*	*nunyj*	*ninyj*
'shin, knee'	*-midi*	(pNN)	*-mid*	*-mid*	*-mid*
'tread, trample'	*-JANYBU*	(pNN)	-JANYB	-JANYB	-JANYB
'place, country'	*buru*	(pNN)	*bur*	*bur*	*bur*

In Nyulnyul at least an anaptyctic vowel with an indeterminate schwa-like quality may appear at the juncture between one word and a following consonant-initial postposition, enclitic, or word.

Of course, this historical process is fairly common, and is not a reliable indicator of subgrouping. Indeed, we find in nearby Mainland Bardi what appears to be the beginning of a similar process of truncation, which has barely begun in either Island Bardi or Jawi:

> One of the significant linguistic distinctions between the two groups [i.e. Mainlanders and Islanders — WM & BS] concerns final vowels. A characteristic of Badi speech is the de-voicing of final vowels but this is less pronounced with the Island group. Nekes Worms (1953), who concentrated on the 'Mainland' group at Lombadina, recognise comparatively few final vowels. (Metcalfe 1975:2)

Areal influence from Nyulnyul presumably accounts for the presence of this phonological process in Mainland Bardi.

5.2 Loss of initial glides

Loss of initial consonants is also a not uncommon historical process, and has occurred in various geographically disparate languages on the Australian continent (e.g. northern Cape York languages and some Arandic languages of Central Australia). In the NN family it is restricted to word-initial glides *y* and *w* in Bardi and Jawi; initial glides of prefixing roots are not affected by this process. Some examples are:

Table 12: Loss of initial *y* in Bardi and Jawi

	proto-form		Bardi	Jawi
'together'	*yambun*	(pWNN)	*amboon*	*ambun*
'mother-in-law'	*yalirr*	(pWNN)	*aloorr*	*ala(rr??)*
'dog'	*yila*	(pNN)	*iila*	*ila*
'sickness'	*yiika*	(pNN)	*iiga*	*ika*

Table 13: Loss of initial *w* in Bardi and Jawi

	proto-form		Bardi	Jawi
'man'	*wamba	(pNN)	amba	amba
'meat, fish'	*warli	(pNN)	aarli	arli
'emu'	*winini	(pNN)	iniini	inini
'rib'	*wiirri	(pNN)	iirri	irri
'woman'	*wurany	(pWNN)	oorany	urany

Since there are a fair number of words in the modern languages with initial glides *y* and *w*, it would seem that (assuming sound changes to be exceptionless) this process occurred and went out of use some time ago, quite probably at an earlier time than the loss of final vowels discussed in §5.1. Words with initial *y* and *w* could thus be presumed to be more recent borrowings. These include, for instance Bardi *wara* 'rag', *wiirri* 'rib of human being' (the regular *iirri* refers specifically to the ribs of dugongs), and Bardi and Jawi *yardab* 'crawl'.[21]

5.3 Lenition

Peripheral and palatal stops lenite to the corresponding glides in certain environments in Bardi and Jawi. The following are illustrative examples:

Table 14: Lenition of *j*

	proto-form		Bardi	Jawi
'sharp'	*karrji	(pWNN)	karrya	
'two'	*kujarra	(pNN)	guyarr	kuyarr
'sit'	*mijala	(pNN)	miyala	miyala
'mud'[22]	*ngijil	(pWNN)	ngiil	ngiil

Table 15: Lenition of *b*

	proto-form		Bardi	Jawi
'child'	*baaba	(pNN)	baawa	bawa
'boomerang'	*jiiba	(pNN)	jiiwa	jiwa
'liver'	*kabir	(pNN)	gawir	kawir
'long'	*ni-birndi	(pWNN)	niwarndi	niwarndi

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[21] The fact that *yardab* 'crawl' occurs throughout Nyulnyulan illustrates the observation that borrowings can reach throughout the family, and presence of similar forms across the languages is no guarantee of cognation.

[22] The glide has either been lost between the two identical high vowels, giving rise to a long vowel, or the sequence *iyi* is not distinguishable from the long high vowel.

Table 16: Lenition of *k*

	proto-form		Bardi	Jawi
'dream'	*bukarri*		*boowarra*	-BUWARR
'hair of head'	*mukarn*	(pWNN)	*moowarn*	*muwarn*

The lenition of the palatal stop seems to be quite general, and is attested intervocalically, and following liquids. Lenition of the peripherals is more restricted, and does not occur following liquids — as shown by the Bardi examples: *lalga* 'dry' (<pNN *lalka* 'dry'), *kurrbal* 'throat' (<pWNN *kurrbal*).

In one environment *k* lenites to the palatal glide *y* rather than to the peripheral glide: this is following the high front vowel *i*:

Table 17: Lenition of *k* to *y*

	proto-form		Bardi	Jawi
'his/her/its back'	*ni-ka*	(pNN)	*ni-ya*	*ni-ya*
'his/her/its body'	*ni-karda*	(pWNN)	*ni-yarda*	*ni-yarda*
'eagle'	*warrikana*	(pWNN)	*arriyana*	*arriyan?*

Notice that in the first two examples lenition occurs across a morpheme boundary — and the corresponding forms following other phonological segments involve initial *k*; the third example indicates, however, that this is not merely a morphophonemic process.

Lenition is also found in ENN languages, though it seems to be virtually restricted to Warrwa, where we find a number of cases of *b* > *w* intervocalically, as shown by the examples in Table 18. The palatal stop does not lenite, and there are just a couple of examples of lenition of *k*, as in Nyikina and Warrwa *wirrwiny* 'leaf', from pENN *wirrkiny*.

Table 18: Lenition of intervocalic *b* in Warrwa

	proto-form		Warrwa
'liver'	*kabir*	(pNN)	*kawir*
'child'	*baaba*	(pNN)	*baawa*
'good'	*maabu*	(pENN)	*maawu*
'think'[23]	*-BARRIBARRI*	(pNN)	-WARRIWARRI

Occasionally Warrwa *b* corresponds to *b*, as in *babala* 'brother' and *kulibil* 'saltwater turtle'. Presumably these were recently borrowed back into Warrwa, the genuine cognates having gone out of use. As in WNN, lenition does not normally occur following liquids, although there are occasional exceptions, including *jirrwal* 'forehead', from pENN *jirrbal* (cf. *kalbu* 'up, above', *karrbina*, and *malbulu* 'coolamon', which preserve the pNN stop).

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[23] The initial segment of Warrwa -WARRIWARRI 'think' usually appears as /w/ since it almost always follows either a vowel- or liquid- final prefix. (Just occasionally an epenthetic nasal prevents this lenition.)

5.4 Contraction

The mid back vowel *o* of Bardi and Jawi arises, as mentioned previously, as a result of contraction of a VCV sequence where the first vowel is low, and the intervening consonant a peripheral stop or glide. Examples include:

Table 19: Contractions involving medial *b*

	proto-form		Bardi	Jawi
'brother'	*babal*	(pNN)	*borla*	*bola*
'from' (ABL postposition)	*-kabu*	(pNN)	*-go*	
'kangaroo species'	*karrabulu*	(pNN)	*garrol*	
'father's mother'	*kabali*	(pNN)	*goli*	

Table 20: Contractions involving medial *k* or *w*

	proto-form		Bardi	Jawi
'path, road'	*makirr*	(pNN)	*morr*	*morr*
'wattle type (spears)'	*yirrakulu*		*irrol(a)*	*irrol*
'club'	*nawurla*	(pNN)	*nola*	*nola*

We saw in the previous section that peripheral stops in Bardi and Jawi lenite intervocalically. This suggests that the process of contraction discussed in the present section came about in two stages: first the lenition of the stops, then contraction in more restricted environments. Thus we suggest the following two ordered rules for Bardic:

$$(1) \quad \begin{bmatrix} +\text{stop} \\ +\text{peripheral} \end{bmatrix} \; > \; \begin{bmatrix} \text{glide} \\ +\text{peripheral} \end{bmatrix} / \text{V} \_\_\_ \text{V} \qquad \text{Lenition}$$

$$(2) \quad \begin{bmatrix} +\text{vocalic} \\ +\text{low} \\ -\text{long} \end{bmatrix}\begin{bmatrix} \text{glide} \\ +\text{peripheral} \end{bmatrix}\text{V} \; > \; o \qquad \text{Contraction}$$

The restriction in (2) to the short low vowel is based on the fact that pNN *baaba* 'child' shows up as *baawa*, not *bo*. Rule (1) also requires a condition, namely that it does not apply to the velar stop when the preceding vowel is *i*.[24] As usual, exceptional forms can be found, including Bardi *gawir* and Jawi *kabir* 'liver', which appear not to involve a long vowel; these suggest a later borrowing of the pNN term back into the languages after its loss.

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[24]   In fact, there is more to the story than this, namely the existence of correspondences between the Bardic palatal glide (and sometimes stop) and the Nyulnyulic peripheral glide — e.g. *-yala* ↔ *-wal* 'tail', *-yorda* > *-jorda* ↔ *-ward* 'chin'. Further investigation is demanded.

5.5 A few minor and irregular processes

To conclude this section we mention a few phonological processes attested in a small number of words, and that appear to be sporadic. These are in need of further careful investigation.

A small number of correspondences can be set up between stops in Bardic and homorganic nasal–stop clusters in other languages; these appear to be restricted to peripherals. The balance of evidence indicates that the process involved is loss of the nasal segment in Bardic. The following are some illustrative examples:

Table 21: Loss of *m* in Bardi and Jawi

	proto-form		Bardi	Jawi
'bird'	*karrambal*	(pWNN)	*garrabal*	*karrabal*
'die'	*-JIMB	(pWNN)	-JIIBI	-JIBI

Table 22: Loss of *ng* in Bardi and Jawi

	proto-form		Bardi	Jawi
'tree'	*bardangk*	(pWNN)	*bardag*	*bardak*
'when'	*banangkarr*	(pWNN)	*baanigarr*	*banakarra*
'break'	*-JANGKULU	(pNN)	-JOOGOOLOO	-JUKUL
'know'	*-LANGKA	(pNN)	-LAGA	

Many other correspondences involve nasal–stop clusters in Bardic and other NN languages — e.g. Bardi and Jawi *jimbin* 'down' (<pNN *jimbin* 'down'), Bardi *jarrangg* 'tooth' (<pNN *jarringk* 'tooth'), and Bardi and Jawi *angga* 'what' (<pNN *yangka* 'who, what'). Unfortunately, however, examples are too few to permit specification of conditions under which the loss occurred. Also in Bardi and Jawi we find loss of final *k* at least in the one reconstructed pWNN nominal with this segment: *boorroo* 'kangaroo', from *burruk*. (Other instances of final *k* are in inflecting verbs, where they seem to be preserved, presumably thanks to the following suffixes.)

A number of correspondences involving WNN and ENN liquids and glides are not yet understood, primarily because they are so poorly attested. These seem to occur in the final syllables of words, or final position in closed syllables. Below are some examples (where no language is specified, the corresponding terms are attested in most relevant languages):

(3)   *l*   ↔   *rr*
        WNN   ENN
        lakal   *lakarr*   'climb'
        gumbil (Bardi, Jawi)   *kumbarri*   'yellow (ochre)'

(4)   *r*   ↔   *rr*
        WNN   ENN
        kabur   *kaburra*   'guts, liver'
        dumbar   *dumbarr* (Yawuru)   'fly'
                                   ~ *doomarr* (Nyikina)

(5)   *rr*   ↔   *rr*
        WNN   ENN
        kururr   *kururr*   'blood'

(6)   *rr*   ↔   *rl*
        WNN   ENN
        barrkarra   *barlkarra* (Yawuru)   'turkey'

In consonant clusters in initial position, glides and liquids correspond exactly, as in (6).

Finally, Warrwa shows a small number of examples of sporadic loss of *k* and *b* following liquids. Examples include -JALU 'fall' from pNN *-JALKU 'fall', and *durlu* 'heart' from pENN *durlbu*. And in Nyikina a few inflecting verbs lose their initial stop when following a vowel final prefix; this is the case for the high frequency inflecting verbs -A 'carry' (<pNN *-KA) and -I 'say, do' (<pNN *-JI ~ *-JU). Nyikina -ALKA 'beat, hit' is a possible cognate of Yawuru -BILKA, and could involve loss of the initial stop, with vowel harmony. (Warrwa -NKA may also be cognate.)

6 Summary and conclusions

In this paper we have discussed the classification of the Nyulnyulan languages of the Dampier Land peninsula and the western Kimberley. We have argued that they do indeed constitute a genetic family-like unit, differing markedly from nearby languages and language families in lexicon and morphology. We have also proposed a subgrouping hypothesis: the languages fall into two primary groups, Eastern Nyulnyulan and Western Nyulnyulan, which in turn each divide into two subgroups.

The case was argued by two very different methods, lexicostatistics and the comparative method; these provide independent support for the classification and subclassification. It was possible to reconstruct a couple of hundred potential pNN lexemes, as well as pronouns, pronominal prefixes, and postpositions; various historical phonological processes were proposed that account for the bulk of reflexes in the modern languages. The case for the primary groups ENN and WNN by the comparative method was rather less convincing. It proved extremely difficult to identify shared aberrations that could be convincingly traced back to innovations of either pENN or pWNN; in almost every case an alternative equally or more likely scenario could be mooted. Whilst no single aberration furnished decisive evidence taken in isolation, put together, the aberrations would seem to render the case for binary groups more likely. Limitations of space prevented detailed discussion of the four subgroups, though it is fairly obvious that the comparative evidence for them is far more convincing than the evidence for the primary groups.

One difficulty that confronted us at every point was the problem of distinguishing loans from inherited genetic material. Methods do exist, including determining whether the item in question has undergone expected phonological processes, and whether it satisfies the reconstructed grammar of the proto-language. In the end I am doubtful whether these methods will succeed in more than a minority of cases: there is reason to believe that a genuine inherited lexeme in one language can be replaced by a borrowed cognate from another; similarly, an innovated or borrowed item in one language could be replaced by a borrowed genuine cognate from a neighbour. And considerations based on reconstructed grammar will at present work only in the case of bound nominals and inflecting verbs.

Finally, our claim of family-like status for the NN languages is not a claim that they are genetically unrelated to other languages of northern Australia, merely that an entirely compelling case has yet to be made that they are. There are a number of striking similarities in the pronominals of non-Pama-Nyungan languages, bound and free, that suggest a common origin (see also Harvey this volume). More intriguing are a number of morphological correlations with the Mindi languages — a discontinuous family embracing Jaminjungan in the Victoria River region and the Barkly Tablelands languages far to the east (Chadwick 1997). Two of these have been commented on already — the similarity in form of the ergative marker, and the third person singular pronominal (though this is not peculiar to the two families). More significant is the NN second person minimal inflecting verb prefix *mi-*, which is a not implausible cognate of the Mindi dual inclusive *-mirndi- ~ -mindi-* (cf. Chadwick 1997:100); in fact, Jaminjung shows *mi* in the second person singular absolutive pronoun *nami* (Schultze-Berndt 2000:64). Both ENN and Jaminjung exhibit a *ya-* irrealis prefix allomorph, although it precedes rather than follows the pronominal prefix in Jaminjung (Schultze-Berndt 2000:93). Although these are all monosyllabic segments, increasing the probability that the forms are accidental look-alikes, their number suggests that the possibility of a shared ancestor more immediate than Proto non-Pama-Nyungan is worth exploring.

Appendix 1: Reconstructed Proto Nyulnyulan lexemes

The following list of potential pNN lexemes indicates the reconstructed phonological form, together with suggested meaning. Where a group or language shows a related meaning, this is indicated in brackets.

1.	**a*	and	Jw, Bd, Nnl, JJ, Nm; Jk, Yw, Nyk, Ww
2.	**-alma*	head	Jw, Bd, Nnl, JJ, Nm; Ngb; Jk, Nyk, Ww
3.	**baaba*	child	Jw, Bd, Nnl, JJ, Nm; Ngb; Jk, Yw, Nyk, Ww
4.	**baarn*	scorpion	Bd, Nnl, JJ; Yw, Nyk, Ww
5.	**bab*	deaf (ENN 'forget')	Bd, Nnl, JJ, Nm; Yw, Nyk, Ww
6.	**babala*	brother (older) (B+)	Bd, Nnl, JJ, Nm; Ngb; Jk, Yw, Ww
7.	**bakarl*	paperbark coolamon	Bd, Nnl, JJ, Nm; Ww
8.	**bana*	when	Bd, Nnl, JJ, Nm; Jk, Yw, Nyk, Ww
9.	**bandal*	feather (ENN 'bird')	Nnl, JJ, Nm; Jk, Yw, Ww?
10.	**baninyburu*	carpet snake	Bd, Nnl, JJ, Nm; Jk, Yw, Nyk, Ww
11.	**-BANYJU*	smell	Nnl, JJ, Nm; Jk, Yw, Nyk, Ww
12.	**banyjud*	poison for stunning fish	Bd, Nnl, JJ, Nm; Yw, Ww
13.	**banu*	east	Jw, Bd, Nnl, JJ, Nm; Jk, Yw, Nyk, Ww
14.	**-BARDIKA*	full up	Nnl, JJ, Nm; Yw, Nyk
15.	**-BARND*	cover over, extinguish	Jw, Bd, Nnl, JJ, Nm; Yw, Ww
16.	**barni*	goanna	Bd, Nnl, JJ; Yw, Nyk, Ww
17.	**-BARNJ*	exchange, reflexive/reciprocal IV	Bd, Nnl, JJ; Yw, Nyk, Ww
18.	**-BARRIBARRI*	think	Nnl, JJ, Nm; Nyk, Ww
19.	**barrjaniny*	wallaby	Nnl, JJ, Nm; Jk, Yw, Nyk, Ww

20.	*barrkana*	cold season, winter	Jw, Bd, Nnl, JJ; Jk, Yw, Nyk
21.	*barrkar*	turkey, bustard	Jw, Bd, JJ, Nm; Yw
22.	*barulu*	catfish	Nnl; Jk, Yw, Nyk, Ww
23.	*baybirr*	behind	Jw, Bd, Nnl, JJ, Nm; Jk, Yw, Nyk, Ww
24.	*biika*	shade	Nnl, JJ, Nm; Yw
25.	*bilbil*	twinkle, twitch	Bd, Nnl, JJ, Nm; Yw, Nyk
26.	*bili*	aggressive, wild, angry, fight	Jw, Bd, Nnl, JJ, Nm; Jk, Yw, Nyk, Ww
27.	*bilyurr*	soul, spirit	Nnl, JJ, Nm; Yw, Nyk, Ww
28.	*bindabinda*	butterfly, moth	Nnl, JJ; Jk, Yw, Nyk
29.	*binyjabinyja*	long pearlshell pendant	Bd, Nnl, JJ; Yw, Nyk
30.	*binyjin*	bark coolamon	Nnl, JJ, Nm; Jk, Yw, Ww
31.	*birlarr*	spring	Bd, Nnl, JJ, Nm; Jk, Yw
32.	*-BU	hit, kill	Jw, Bd; Nyk
33.	*bubu*	flower	Nnl, JJ, Nm; Yw, Nyk
34.	*buda*	nape of neck	Jw, Bd, Nnl, Nm; Yw, Nyk, Ww
35.	*bukarri*	dream, dreamtime	Jw, Bd, Nnl, JJ, Nm; Jk, Yw, Nyk, Ww
36.	*bulngurru*	middle, in between, on the way	Jw, Bd, Nnl, JJ, Nm; Jk, Yw, Nyk, Ww
37.	*bulyji*	tired, exhausted	Jw, Bd, Nnl, JJ,Nm; Yw, Nyk
38.	*-BUNDARR(A)	bite	Jw, Bd, Nnl, Nm; Jk, Yw
39.	*burda*	shit, excrement	Nnl, JJ, Nm; Yw
40.	*burrb*	dance	Jw, Bd, Nnl, JJ; Jk, Yw, Nyk, Ww
41.	*burrurr*	string	Bd, Nnl, JJ, Nm; Jk, Ww
42.	*buru*	camp, place, country	Jw, Bd, Nnl, JJ, Nm; Jk, Yw, Nyk, Ww
43.	*buu*	blow	Jw, Bd, Nnl, JJ, Nm; Jk, Yw, Nyk, Ww
44.	*buya*	ant species	Jw, Bd, Nnl, JJ, Nm; Jk, Yw
45.	*da*	hammer	Bd, Nnl, JJ; Nyk
46.	*dakidaki*	deaf	Bd, Nnl, JJ, Nm; Jk, Yw
47.	*dangku*	chin, lower jaw	Jw, Bd, Nnl, JJ, Nm; Ngb; Yw, Nyk
48.	*dibirr*	turn	Nnl, JJ, Nm; Ww
49.	*dilba*	kidney	Jw, Bd, Nnl, JJ, Nm; Nyk
50.	*dumbarra*	fly	Nnl, JJ, Nm; Yw, Nyk, Ww?
51.	*-(I)BI	drink	Jw, Bd, Nnl?; Yw, Nyk
52.	*-JABALA	ask	Bd, Nnl, JJ, Nm; Yw, Nyk, Ww
53.	*-JALA	see	Jw, Bd, Nnl, JJ, Nm; Jk, Yw & Nyk ('look after'), Ww
54.	*jalinymarr*	pelican	Jw, Bd, Nnl, JJ, Nm; Jk, Yw, Nyk, Ww
55.	*-JALKU	fall	Jw, Bd, Nnl, JJ, Nm; Jk, Yw, Nyk, Ww
56.	*jalngka*	magic power, healing potential	Bd, Nnl, JJ, Nm; Jk, Yw, Nyk
57.	*jalngkangurru*	doctor ('medicine man')	Jw, Bd, Nnl, JJ, Nm; Jk, Yw, Nyk, Ww
58.	*jalwal*	cousin	Bd, Nnl, JJ, Nm; Yw, Nyk, Ww
59.	*jam*	mother's father (MF)	Bd, Nnl, JJ, Nm; Yw, Nyk, Ww
60.	*jamiyunu*	axe	Bd, Nnl, JJ, Nm; Yw, Nyk, Ww
61.	*jamunyarri*	wife's father (WF)	Jw, Bd, Nnl, JJ, Nm; Jk?, Yw, Ww

62.	*jana	where	Jw, Bd; Ngb; Jk, Yw, Nyk, Ww
63.	*-JANBU	tread, step, trample	Bd, Nnl, JJ, Nm; Jk & Yw ('kick'), Nyk, Ww
64.	*jangkala	calf	Jw, Bd, JJ, Nm; Ngb; Jk, Yw
65.	*-JANGKULU	break	Jw, Bd; Yw, Nyk, Ww
66.	*ja(r)l	split	Nnl, JJ, Nm; Jk?, Yw, Nyk, Ww
67.	*jarndu	harmonic generation	Bd, Nnl, JJ; Yw & Nyk ('countryman, relative')
68.	*jarrbard	lift up, carry	Bd?, Nnl, JJ; Nyk, Ww
69.	*jarringk	tooth	Jw, Bd, Nnl, JJ, Nm; Ngb; Jk
70.	*-JI ~ *-DI	say, do	Jw, Bd, Nnl, JJ, Nm; Jk, Yw, Nyk, Ww
71.	*jidlarra	downwards	Bd, Nnl; Yw, Nyk, Ww
72.	*jiiba	boomerang	Jw, Bd, Nnl, JJ, Nm; Nyk, Ww
73.	*jimbin	down, below, inside	Jw, Bd, Nnl, JJ, Nm; Jk, Yw, Nyk, Ww
74.	*jinal	spear type	Jw, Bd, Nnl, JJ, Nm; Jk, Yw, Nyk, Ww
75.	*jirirr	shooting star	Bd, JJ; Nyk, Yw
76.	*jirrmu	sing	Jw, Bd, Nnl; Yw
77.	*jiwarri	corpse	Bd, Nnl, Nm; Jk, Yw
78.	*-JULNGA	tell	Bd, Nnl, JJ, Nm; Yw, Nyk, Ww
79.	*jungku	fire	Nnl, JJ, Nm; Ngb; Jk, Yw, Nyk, Ww
80.	*juny	suck	Bd, Nnl, JJ, Nm; Yw, Nyk
81.	*jurnk	run	Jw, Bd, Nnl, JJ, Nm; Jk, Yw, Nyk?
82.	*jurr	downwards	Nnl, JJ, Nm; Yw
83.	*jurru	snake	Jw, Bd, Nnl, JJ, Nm; Jk, Yw, Nyk, Ww
84.	*jur(r)urr	pour out	Bd, Nnl, JJ, Nm; Yw, Nyk
85.	*-KA	carry	Jw, Bd, Nnl, JJ, Nm; Jk, Yw, Nyk, Ww
86.	*kaanyji	bone	Jw, Bd, Nnl, JJ, Nm; Jk, Yw, Nyk, Ww
87.	*kabali	father's mother	Bd, Nnl, JJ, Nm; Jk, Yw, Ww
88.	*kabir	liver (ENN, except Jk 'guts')	Jw, Bd, Nnl, JJ, Nm; Jk, Yw, Nyk, Ww
89.	*kajurd	ashes (cold)	Jw, Bd, Nnl; Jk, Nyk, Ww
90.	*-KALBARR	lose, drop	Bd, Nnl, JJ, Nm; Yw, Nyk
91.	*kalbu	up, above	Nnl, JJ, Nm; Jk, Yw, Nyk, Ww
92.	*kaliya	already, finished	Bd, Nnl?; Yw, Nyk, Ww
93.	*kalurd	father's father (FF)	Bd, Nnl, JJ, Nm; Nyk, Ww
94.	*kamirda	mother's mother (MM)	Jw, Bd, Nnl, JJ, Nm; Ngb; Jk, Yw, Nyk, Ww
95.	*kanarbin	murderer, ritual killer	Bd, Nnl, JJ, Nm; Jk, Yw, Nyk
96.	*-KANB	become fat/well nourished	Bd, Nnl, JJ, Nm; Yw, Nyk
97.	*-KA(N)MA	laugh	Jw, Bd, Nnl, Nm; Jk, Yw, Nyk, Ww
98.	*kararr	spit, saliva	Nnl, JJ, Nm; Jk, Yw, Nyk, Ww
99.	*-KARD	enter, go in	Jw, Bd, Nnl, JJ, Nm; Yw ('disappear'), Nyk, Ww
100.	*karn-	clapsticks	Bd, Nnl, JJ, Nm; Yw, Nyk
101.	*karrabulu	kangaroo species, large	Bd, Nnl; Jk, Yw, Nyk

102.	*karrbina	shield	Nnl, JJ, Nm; Jk, Yw, Nyk, Ww
103.	*kawu	call out	Bd?, Nnl, JJ, Nm; Jk, Yw, Nyk, Ww
104.	*kiny	choke, strangle	Bd & Nnl (also 'shut'), JJ, Nm; Yw, Nyk, Ww
105.	*kinya	this, he, she, it	Jw, Bd, Nnl, JJ, Nm; Ngb; Jk, Yw, Nyk, Ww
106.	*kudarrawany	brolga	Jw, Bd, Nnl; Jk, Yw
107.	*kujarra	two	Jw, Bd, Nnl, JJ, Nm; Jk, Yw, Nyk, Ww
108.	*kularr	west	Jw, Bd, Nnl, JJ, Nm; Jk, Yw, Nyk, Ww
109.	*kulamana	frill-necked lizard	Jw, Bd, Nnl, JJ, Nm; Yw, Nyk, Ww
110.	*kulin	sleep	Bd, JJ; Ngb; Jk, Yw, Nyk, Ww
111.	*kumbarri	yellow	Jw, Bd, Nnl, Nm; Jk, Yw, Nyk, Ww
112.	*kunbulu	blood	Bd, Nnl, JJ; Yw, Nyk, Ww
113.	*kundi	carry on shoulder, shoulder	Jw, Bd, Nnl, JJ, Nm; Jk, Yw, Nyk, Ww
114.	*kunykuny	brain, spinal marrow	Bd, Nnl, JJ, Nm; Yw, Nyk, Ww
115.	*kurlibil	saltwater turtle	Jw, Bd, Nnl, JJ, Nm; Jk, Yw, Nyk, Ww
116.	*kurridi	dingo	Jw, Bd, Nnl, JJ, Nm; Jk, Yw, Nyk, Ww
117.	*kurrwal	sky	Jw, Bd, Nnl, JJ, Nm; Jk, Nyk, Ww
118.	*kururr	blood	Bd, Nnl, JJ; Jk, Nyk
119.	*kuwan	pearlshell	Jw, Bd, Nnl, JJ, Nm; Jk, Yw, Nyk
120.	*-lababa	ear	Nnl, JJ, Nm; Ngb; Jk, Nyk, Ww?
121.	*lakal	climb	Jw, Bd, Nnl, JJ, Nm; Jk, Yw, Nyk, Ww
122.	*-LAKARRA	hear	Jw, Nnl, JJ, Nm; Jk, Nyk, Ww
123.	*lalka	dry	Jw, Bd, Nnl, JJ, Nm; Yw
124.	*-lamarr	ear passage	Jw, Bd; Nyk ('burrow')
125.	*langan	throat, neck	Jw, Bd, Nnl, JJ, Nm; Jk, Nyk, Ww
126.	*-LANGKA	know, understand, recognise	Bd, Nnl, JJ, Nm; Yw, Nyk, Ww
127.	*langkurr	possum	Jw, Bd, Nnl, JJ, Nm; Jk, Yw, Nyk
128.	*lanyb	steal, abduct	Jw, Bd, Nnl, JJ, Nm; Jk, Yw, Ww
129.	*layda	fat, grease	Jw, Bd, Nnl, JJ; Jk, Yw
130.	*limba	sour taste	Bd, Nnl, JJ, Nm; Yw
131.	*linyju	sour taste	Bd, Nnl, JJ, Nm; Nyk
132.	*linykurra	saltwater crocodile	Jw, Bd, Nnl, JJ; Jk, Yw, Nyk, Ww
133.	*-lirr	mouth	Jw, Bd, Nnl, JJ, Nm; Ngb; Jk, Yw, Nyk, Ww
134.	*liyan	heart, emotion	Jw, Bd, Nnl, JJ, Nm; Ngb; Jk, Yw, Nyk, Ww
135.	*lungkura	bluetongue lizard	Bd, Nnl, JJ, Nm; Yw, Nyk
136.	*-LURRU	burn	Jw, Bd, Nnl, JJ, Nm; Yw, Ww
137.	*-MA	put	Jw, Bd, Nnl, JJ, Nm; Jk, Yw, Nyk, Ww
138.	*majal	afternoon	Bd, Nnl, Nm; Jk, Yw & Ww ('yesterday')
139.	*makirr	path, road	Jw, Bd, Nnl, JJ, Nm; Jk, Yw, Nyk
140.	*malbulu	bag, coolamon	Bd, Nnl, JJ, Nm; Jk, Nyk, Ww
141.	*-mal(ul)	nose	Jw, Bd, Nnl, JJ, Nm; Ngb; Yw

142.	*-mandarr	shadow, reflected image	Jw, Bd, Nnl, JJ, Nm; Jk, Yw
143.	*mangkayarra	bustard, scrub turkey	Nnl; Yw, Nyk, Ww
144.	*-manya	throat	Bd, Nnl, JJ, Nm; Jk ('nape'), Yw
145.	*-marla	arm, hand	Jw, Bd, Nnl, JJ, Nm; Jk, Yw, Ww
146.	*marr-	hungry	Nnl, JJ, Nm; Jk, Yw, Nyk, Ww
147.	*-MARRA	burn	Jw, Bd, Nnl, Nm; Nyk, Ww
148.	*-marraj	shadow, reflection	Bd?, Nnl, JJ, Nm; Nyk, Ww
149.	*marru	head	Bd, Nm; Yw, Nyk
150.	*mayi	vegetable food	Jw, Bd, Nnl, JJ, Nm; Jk, Yw, Nyk, Ww
151.	*-mbarrma	armpit	Nnl; Jk, Ww
152.	*-mbala	foot	Jw, Bd, Nnl, JJ, Nm; Ngb; Jk, Yw?, Nyk, Ww
153.	*mida	male of species	Bd, Nnl, JJ; Jk, Nyk, Ww
154.	*-midi	shin, knee	Jw, Bd, Nnl, JJ, Nm; Ngb; Jk, Yw, Nyk, Ww
155.	*miila	lie, untruth	Bd, Nnl, Nm; Nyk, Ww
156.	*mijala	be sitting down	Jw, Bd, Nnl, JJ, Nm; Ngb; Jk, Yw, Nyk, Ww
157.	*-MILKA	arise, get up, wake up	Jw, Bd, Nnl, JJ, Nm; Yw?, Nyk, Ww
158.	*milkin	stick implement	Jw, Bd, Nnl, JJ, Nm; Ngb; Jk, Nyk, Ww
159.	*mil(y)ku	ankle, joint	Bd, Nnl, JJ, Nm; Yw, Nyk, Ww ('knee')
160.	*mimi	grandparent/grandchild (dimin.)	JJ; Ngb; Yw, Nyk
161.	*-miny	eye	Jw, Bd, Nnl, JJ, Nm; Ngb; Jk, Yw
162.	*minyjan	only	Bd, Nnl, JJ, Nm; Yw, Nyk, Ww
163.	*nawurla	club, nulla nulla	Jw, Bd, Nnl, JJ, Nm; Jk, Nyk, Ww
164.	*ngaarri	devil, bad spirit	Jw, Bd, Nnl; Jk, Yw ('cannibal'), Nyk, Ww
165.	*ngabaliny	woomera	Bd, Nnl, JJ, Nm; Yw, Nyk
166.	*ngak	spongy, hollow	Bd, Nnl, JJ, Nm; Nyk
167.	*-NGALKA	cry	Jw, Bd, Nnl, JJ, Nm; Ww
168.	*ngamarna	breast	Jw, Bd, Nnl, JJ, Nm; Yw, Nyk, Ww
169.	*nganka	language, speech, speak	Jw, Bd, Nnl, JJ, Nm; Jk, Yw, Nyk, Ww
170.	*nganyji	interrogative particle	Jw, Bd, Nnl, JJ, Nm; Jk, Yw, Nyk, Ww
171.	*-NGARI	leave	JJ; Yw, Nyk, Ww
172.	*ngimbirr	night?	Nnl, JJ, Nm; Nyk ('tomorrow, morning')
173.	*-ngu	belly	Jw, Bd, Nnl, JJ, Nm; Jk, Yw, Nyk, Ww
174.	*ngudirr	alone, by oneself	Bd, Nnl, JJ, Nm; Yw, Nyk
175.	*-NGULA	throw	Jw, Bd, Nnl, JJ, Nm; Jk, Yw
176.	*ngul(y)ku	beard (WNN 'feelers of catfish')	Nnl, JJ, Nm; Yw, Nyk, Ww
177.	*ngurlun	ashes	Bd ('hot sand'); Jk, Yw, Nyk, Ww ('cooked')
178.	*ngurndu	piss, urine	Bd, Nnl, JJ, Nm; Nyk
179.	*ngurra	night	Jw, Bd; Jk, Yw, Ww
180.	*-NI ~ *-NGA	be, sit	Bd, Nnl, JJ, Nm; Jk, Yw, Nyk, Ww

181.	*niimar(r)*	sandhill	Bd, Nnl, JJ, Nm; Yw, Nyk
182.	*nimanburru*	flying fox	Jw, Bd, Nnl, JJ, Nm; Jk, Yw
183.	*ningarra*	true, really	Bd, Nnl, JJ, Nm; Jk, Nyk, Ww
184.	*niyarra*	tasty, sweet	Bd, Nnl, JJ, Nm; Yw, Nyk, Ww
185.	*nulu*	corroboree, song	Nnl, JJ, Nm; Jk, Yw, Nyk, Ww
186.	*nundurr*	hot, sweat	Jw, Bd, Nnl, JJ, Nm; Jk, Yw?, Nyk
187.	*nunyji*	alive	Jw, Bd, Nnl, JJ, Nm; Yw, Nyk, Ww
188.	*nurru*	fire, (hot) coals	Jw, Bd; Jk, Yw ('burn out'), Nyk
189.	*-NYA*	get, catch, pick up	Jw, Bd, Nnl, JJ, Nm; Jk, Yw
190.	*-RA*	pierce, spear	Bd ('pick lice'), Nnl, JJ, Nm; Jk, Yw, Nyk, Ww
191.	*rambarr*	parent-in-law (male) (WF?, HF)	Bd, Nnl, JJ; Jk, Yw, Nyk, Ww
192.	*rangin*	parent-in-law (female) (WM, HM)	Bd, Nnl, JJ; Yw, Nyk, Ww
193.	*riiji*	pubic covering for initiated man	Bd, Nnl, JJ; Yw, Nyk
194.	*rirrka*	charcoal	Jw, Bd, Nnl, JJ, Nm; Jk, Yw
195.	*-RLI*	eat	Jw, Bd; Yw, Nyk, Ww
196.	*rurrb*	exchange, return, in turn, barter	Bd ('pass, surpass'), Nnl, JJ; Jk, Yw, Nyk
197.	*-uru*	anus	Bd, Nnl, JJ, Nm; Yw, Nyk
198.	*waangka*	suddenly, unexpectedly	Bd, Nnl, JJ, Nm; Yw, Nyk
199.	*walak*	frog type	Nnl, Nm; Jk, Yw, Nyk, Ww
200.	*walka*	sun	Jw, Bd, Nnl, JJ, Nm; Yw ('dry up'), Nyk
201.	*wamba*	man	Bd, Nnl, JJ, Nm; Ngb; Jk, Yw, Nyk, Ww
202.	*wandarl*	coolamon type	Nnl, JJ; Jk, Yw, Nyk
203.	*wangal*	wind	Nnl, JJ, Nm; Jk, Yw, Nyk, Ww
204.	*wangalangu*	young man	Jw, Bd, Nnl, JJ, Nm; Yw, Nyk, Ww
205.	*wangkarra*	spider, spider's web, net	Jw, Bd, Nnl, Nm; Jk, Yw, Nyk, Ww
206.	*wangkaya*	wattle type	Bd, Nnl, JJ; Yw, Nyk, Ww
207.	*wangkidi*	crow	Jw, Bd, Nnl, JJ, Nm; Jk, Ww
208.	*warany*	other	Jw, Bd, Nnl, JJ, Nm; Jk, Yw, Nyk, Ww
209.	*waranyjarri*	one	Jw, Bd, Nnl, JJ, Nm; Jk, Yw, Nyk, Ww
210.	*wardiya*	north	Bd, Nnl, JJ, Nm; Jk, Ww ('west')
211.	*warli*	meat	Jw, Bd, Nnl, JJ, Nm; Jk, Yw, Nyk, Ww
212.	*wara*	rag, cloth	Bd, Nnl, JJ, Nm; Yw, Nyk
213.	*wiirri*	rib	Jw, Bd, Nnl; Jk, Yw, Nyk, Ww
214.	*winini*	emu	Jw, Bd, Nnl, JJ, Nm; Jk, Nyk & Ww ('emu chick')
215.	*wirnka*	louse	Bd?, Nnl, JJ, Nm; Nyk
216.	*-WIRRIK*	taste, try	Nnl, JJ, Nm; Yw, Nyk
217.	*-WU*	give	Jw, Bd, Nnl, JJ, Nm; Jk, Yw, Nyk, Ww
218.	*wula*	water	Jw, Bd, Nnl, JJ, Nm; Ngb; Jk, Yw, Nyk, Ww
219.	*wungul*	joke, fun	Bd ('unborn child, be pregnant'), Nnl, JJ; Jk, Yw, Nyk, Ww

220.	**yadab*	crawl	Jw, Bd, Nnl, JJ, Nm; Jk, Yw, Nyk, Ww
221.	**yaku*	husband (H, HB)	Nnl, JJ, Nm; Jk, Yw, Nyk, Ww
222.	**yalirr*	ahead, front, first	Bd, Nnl, JJ, Nm; Yw
223.	**yalku*	standing	Nnl, JJ; Jk, Yw, Nyk, Ww
224.	**yalmban*	south (WNN 'south wind')	Jw, Bd, Nm; Jk, Yw, Nyk, Ww
225.	**yaly*	lick	Nnl, JJ; Yw, Nyk, Ww
226.	**-yangala*	tongue	Jw, Bd, Nnl, JJ, Nm; Ngb; Jk, Nyk, Ww
227.	**yangki*	who, what	Jw, Bd, Nnl, JJ, Nm; Jk, Yw, Nyk, Ww
228.	**yarnkal*	woomera	Jw, Bd, JJ, Nm; Ww
229.	**yarri*	no, not	Jw, Bd, Nnl, JJ, Nm; Yw ('nothing'), Nyk & Ww ('disappear')
230.	**yibala*	father (F, FB)	Nnl, JJ, Nm; Ngb; Jk, Nyk, Ww
231.	**yiika*	sickness	Jw, Bd, Nnl, JJ, Nm; Nyk, Ww
232.	**yila*	dog	Jw, Bd, Nnl, JJ, Nm; Ngb; Jk, Yw, Nyk, Ww
233.	**yinar*	disharmonic generation	Bd, Nnl, JJ; Jk ('relative'), Nyk, Ww
234.	**yirrakulu*	wattle type (used for spears)	Jw & Bd ('spear'); Jk, Yw, Nyk
235.	**yirrkili*	tree type (boomerang)	Bd, JJ, Nm; Yw, Nyk, Ww
236.	**yuwurr*	descend, sink, go down	Bd, Nnl; Nyk, Ww

Appendix 2: Reconstructed Proto Western Nyulnyulan lexemes

237.	**alik*	bad, sick, trouble	Bd, Nnl, JJ, Nm
238.	**arri*	no, not	Jw, Bd, Nnl, JJ, Nm
239.	**baab*	open	Bd, Nnl, JJ, Nm
240.	**baali*	belt, girdle	Jw, Bd, Nnl, JJ, Nm
241.	**bamburr*	blind	Jw, Bd, Nnl, JJ, Nm
242.	**banangkarr*	now, today, when	Jw, Bd, Nnl, JJ, Nm
243.	**bandakar(r)*	groin	Bd, Nnl, JJ, Nm
244.	**-(BA)NGAR*	praise	Bd, Nnl, JJ, Nm
245.	**-BANY*	finish	Bd, Nnl, JJ, Nm
246.	**bardangk*	stick, tree	Jw, Bd, Nnl, JJ, Nm; Ngb
247.	**bardun*	skin, bark (of tree)	Jw, Bd, Nnl, JJ, Nm
248.	**barnkard*	king brown snake	Bd, Nnl, JJ, Nm
249.	**-BARRKAND*	tie	Jw, Bd, Nnl, JJ
250.	**bavirdi*	yesterday	Jw, Bd, Nnl, JJ, Nm
251.	**bini*	rotten	Bd, Nnl, JJ, Nm
252.	**bunmal*	strong, firm, fearless	Bd, Nnl, JJ, Nm
253.	**bilibil*	leaf	Jw, Bd, Nnl, JJ, Nm
254.	**bindan*	bush country	Jw, Bd, Nnl, JJ, Nm; Jk?
255.	**bindikal*	bad luck	Bd, Nnl, JJ, Nm
256.	**binyj*	cold	Bd, Nnl, JJ, Nm

257.	*-birndi	long	Jw, Bd, Nnl, Nm
258.	*birray	mother (M, MZ)	Jw, Bd, Nnl, JJ, Nm
259.	*buna	blunt	Bd, Nnl, JJ, Nm
260.	*-BUNGKUM	swell up	Bd, Nnl, JJ, Nm
261.	*burruk	kangaroo (generic)	Jw, Bd, Nnl, JJ, Nm
262.	*darr	arrive, emerge, come	Jw, Bd, Nnl, JJ, Nm
263.	*darrgal	true	Bd, Nnl, Nm
264.	*diwa	hard (not soft)	Jw, Bd, Nnl, JJ, Nm
265.	*duk	wipe	Bd, Nnl, JJ, Nm
266.	*irrjuwarr	three	Jw, Bd, Nnl, JJ, Nm
267.	*iyi	yes	Bd, Nnl, JJ, Nm
268.	*jakurd	return	Bd, Nnl, JJ, Nm
269.	*-JARIK	fear	Jw, Bd, Nnl, JJ, Nm
270.	*-JID	go	Jw, Bd, Nnl, JJ, Nm
271.	*-JIDING	touch	Jw, Bd, Nnl, JJ, Nm
272.	*-JIMB	die	Jw, Bd, Nnl, JJ, Nm
273.	*jimbijimb	arms akimbo	Bd, Nnl, JJ, Nm
274.	*jimbilad	downwards	Bd, Nnl, JJ, Nm
275.	*jirrjirr	stand up, come to a stand	Jw, Bd, Nnl, JJ?, Nm
276.	*-JULUK	wash	Jw, Bd, Nnl, JJ, Nm
277.	*-ka	back	Jw, Bd, Nnl, JJ, Nm
278.	*-KAL	wander about, roam	Bd ('live at place'), Nnl, JJ, Nm
279.	*-KALAK	approach, come up to	Bd, Nnl, JJ, Nm
280.	*kalib	fire drill	Bd, Nnl, JJ
281.	*-KAND	scratch	Jw, Bd, Nnl, JJ
282.	*-KANYB	vomit	Bd, Nnl, JJ, Nm
283.	*karangkam	yam type	Jw, Bd, Nnl, JJ, Nm
284.	*-karda	body	Jw, Bd, Nnl, JJ, Nm
285.	*karrambal	bird	Jw, Bd, Nnl, Nm
286.	*karrji	sharp	Bd, Nnl, JJ, Nm
287.	*karrm	later, soon	Bd, Nnl, JJ, Nm
288.	*kiir	scent, smell	Bd, Nnl, JJ, Nm
289.	*-kinbal	appearance, shape, form	Bd, Nnl, JJ, Nm
290.	*kubad	wet (of object)	Jw, Bd, Nnl, JJ, Nm
291.	*kubul	father	Jw, Bd, Nnl, JJ
292.	*kuly	squeeze	Bd, JJ, Nm
293.	*kumb	wedge	Bd, Nnl, JJ, Nm
294.	*kurrbal	throat	Jw, Bd, Nnl, JJ, Nm
295.	*laaban	feather	Bd, Nnl, Nm
296.	*labalab	light (not heavy)	Bd, Nnl, JJ?, Nm
297.	*lakurr	egg	Jw, Bd, Nnl, JJ, Nm
298.	*-LANDA	sit down	Jw, Bd, Nnl, JJ, Nm
299.	*layib	good	Bd, Nnl, JJ, Nm

300.	*maanka	black	Jw, Bd, Nnl, JJ, Nm
301.	*maara	far	Jw, Bd, Nnl, JJ, Nm
302.	*malirr	wife	Jw, Bd, Nnl, JJ, Nm
303.	*-mana	many	Jw, Bd, Nm
304.	*-MANKARDA	leave	Jw, Bd, Nnl, Nm
305.	*-MANY	wave (hand)	Bd, Nnl, JJ, Nm
306.	*marrir	sister (Z)	Jw, Bd, Nnl, JJ, Nm; Ngb
307.	*mayala	goanna	Jw, Bd, Nm
308.	*-MI	search, look for	Jw, Bd, Nnl, JJ, Nm
309.	*mijaw	native rat	Jw, Bd, Nnl, JJ, Nm; Jk/Ngb?
310.	*-MIL	sing	Bd, Nnl, JJ, Nm
311.	*milamb	tired	Bd, Nnl, JJ, Nm
312.	*-MINGKA	choke (on something)	Jw, Bd, Nnl, JJ, Nm
313.	*mula	warm, hot (of weather)	Jw, Bd, Nnl, JJ, Nm
314.	*mukarn	head hair	Jw, Bd, Nnl, JJ, Nm; Ngb
315.	*-mungku	knowledge, knowledgeable	Jw, Bd, Nnl, JJ, Nm
316.	*-mungkul	root	Jw, Bd, Nnl, JJ, Nm
317.	*mungu	honey	Jw, Bd, Nnl, JJ, Nm
318.	*-MUR	pour, spill out, flow	Jw, Bd, Nnl, JJ, Nm
319.	*-MURRAR	smell	Bd, Nnl, JJ, Nm
320.	*murrulu	small	Jw, Bd, Nnl, JJ, Nm
321.	*-NGALI	soil, make dirty, become dirty	Bd, Nnl, JJ, Nm
322.	*-NGALINY	defend, take sides with	Bd, JJ, Nm
323.	*-NGA(N)NY	deny, refuse	Bd, Nnl, JJ, Nm
324.	*ngijil	mud	Jw, Bd, Nnl, JJ, Nm
325.	*-ngkan	neck (exterior)	Jw, Bd, Nnl, JJ, Nm; Ngb
326.	*ngub	soft	Jw, Bd, Nnl, JJ, Nm
327.	*ngunyb	dirty	Jw, Bd, Nnl, JJ, Nm
328.	*ngurrungk	knee	Bd, Nnl, JJ, Nm
329.	*-nkarra	forehead	Jw, Bd, Nnl, JJ, Nm
330.	*-nmurr	thigh	Jw, Bd, Nnl, JJ, Nm
331.	*nyungurl	old man	Jw, Bd, Nnl, JJ
332.	*-RALK	dry	Bd?, Nnl, JJ, Nm
333.	*-RAMB	warm oneself	Bd, Nnl, JJ, Nm
334.	*rambin	heavy	Jw, Bd, Nnl, Nm
335.	*rung	suck	Bd, Nnl, JJ, Nm
336.	*wadan	cloud	Bd, Nnl, JJ
337.	*-wala	tail	Jw, Bd, Nnl, JJ, Nm
338.	*walirr	lie on back	Bd, Nnl, JJ, Nm; Ngb
339.	*warrikana	eagle	Jw, Bd, Nnl, JJ, Nm; Ngb?
340.	*wardi	north	Jw, Bd, Nnl, JJ, Nm
341.	*wungur	rain	Bd, Nnl, JJ
342.	*wurany	woman	Jw, Bd, Nnl, JJ, Nm

343.	*wurrul	fingernail	Jw, Bd, Nnl, JJ, Nm
344.	*yalangkun	elbow	Jw, Bd, Nnl, JJ, Nm
345.	*yalirr .	mother-in-law of man (WM)	Jw, Bd, Nnl, JJ, Nm
346.	*yambun	together	Jw, Bd, Nnl, JJ, Nm; Jk
347.	*yandal	inquest sticks	Bd, Nnl, JJ, Nm
348.	*yangan	near, close	Jw, Bd, Nnl, JJ, Nm
349.	*yarr	pull	Jw, Bd, Nnl, JJ, Nm
350.	*yubur(r)yubur(r)	native mouse	Bd, Nnl, JJ, Nm

Appendix 3: Reconstructed Proto Eastern Nyulnyulan lexemes

351.	*baalu	tree, stick	Jk, Yw, Nyk, Ww
352.	*bakuna	hither, this way	Jk, Yw, Nyk, Ww1
353.	*balngan(y)-	thigh	Jk, Nyk, Ww
354.	*-BANYJU	smell	Jk, Yw, Nyk, Ww
355.	*barra	thirsty	Jk?, Yw, Nyk?, Ww
356.	*-BARRI	hit by throwing	Yw, Nyk, Ww
357.	*barrjanin	kangaroo	Jk, Yw, Nyk; Ngb
358.	*barulu	catfish	Jk, Yw, Nyk, Ww
359.	*bilyi	red	Yw, Nyk, Ww
360.	*birra	bush country	Yw, Nyk, Ww
361.	*birrb	turn off	Yw, Nyk, Ww
362.	*-BULA	arrive, come	Jk, Yw, Nyk, Ww
363.	*dub	white	Yw, Nyk, Ww
364.	*durlbu	heart	Yw, Nyk, Ww
365.	*inyja	walk, walkabout	Jk, Nyk, Ww
366.	*jabula ~*jakula	mud	Jk, Yw, Nyk, Ww
367.	*jalbi	camp	Yw, Nyk, Ww
368.	*jarndu	woman	Jk, Yw, Nyk, Ww; Ngb
369.	*jarrbal	hip	Jk, Yw, Nyk
370.	*jirrbal	forehead	Jk ('cloud'), Yw, Nyk, Ww
371.	*ka-	that	Jk, Yw, Nyk, Ww
372.	*kabu	eat	Jk, Yw, Nyk, Ww
373.	*kambiy	egg	Yw ('testicle'), Nyk, Ww
374.	*kanyjirr	watch, stare at	Yw, Nyk, Ww
375.	*kirridiny	moon	Jk, Yw, Nyk
376.	*karrikin	body	Yw, Nyk, Ww
377.	*-KULA	tie	Yw, Nyk, Ww
378.	*kurrbuk	vomit	Yw, Nyk, Ww
379.	*laj	throw	Yw, Nyk, Ww
380.	*-lany	flesh, muscle	Yw, Nyk, Ww
381.	*maabu	good	Jk, Yw, Nyk, Ww
382.	*makarra	tail	Jk, Yw, Nyk, Ww

383.	*mandu	rotten, stink	Jk, Yw, Nyk, Ww
384.	*mangul	spear type	Jk, Yw, Ww
385.	*manyja	many	Jk, Yw, Nyk, Ww
386.	*marlu	no, not	Jk, Yw, Nyk, Ww
387.	*-marrangka	hand	Jk, Nyk, Ww
388.	*-MURUNGU	search, look for	Yw, Nyk, Ww
389.	*ngalyak	blue tongue lizard	Yw, Nyk, Ww
390.	*ngawayi	yes	Jk, Yw, Nyk, Ww
391.	*nguni-	nose	Jk, Yw, Nyk, Ww
392.	*ngunu	sister (Z)	Jk, Yw, Nyk, Ww
393.	*ngurrangurra	afternoon	Yw, Nyk, Ww
394.	*ngurun	smoke	Jk, Yw, Nyk, Ww
395.	*nila	knowledge, knowledgeable	Jk, Yw, Nyk, Ww
396.	*walakurru	eagle-hawk	Yw, Ww
397.	*wanangarri	stone	Jk, Yw, Nyk, Ww
398.	*wangkurr	cry	Jk, Yw, Nyk, Ww
399.	*wanyji	later, soon	Jk, Yw, Nyk, Ww
400.	*widij	dig	Jk, Yw, Nyk, Ww
401.	*windirri	belt	Yw, Nyk, Ww
402.	*wirdu	big	Jk, Yw, Nyk
403.	*wirrkiny	leaf	Jk, Yw, Nyk, Ww
404.	*wuba	small	Jk, Yw, Nyk, Ww; Ngb
405.	*wurr	rub	Yw, Nyk, Ww

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