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Worroran revisited: the case for genetic relations among languages of the Northern Kimberley region of Western Australia

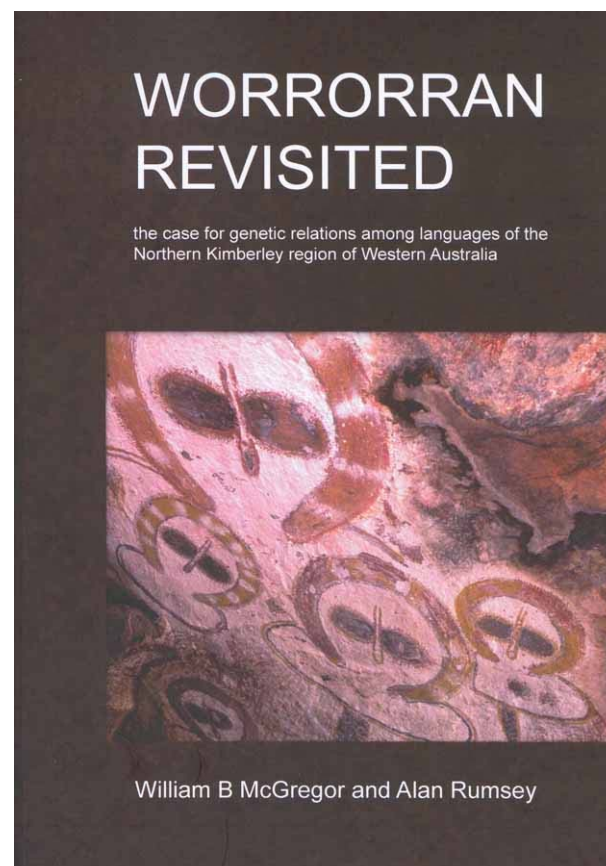
William B. McGregor and Alan Rumsey

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of Western Australia*

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**Worroran revisited:
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William B. McGregor and Alan Rumsey



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The Australian National University

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Cover Photo

Waanangga Wanjina Gallery

Although renowned throughout Australia and beyond, figures of the kind shown in the photo—Wanjina figures—are found only in the Northern Kimberley region, within an area that corresponds closely to that of the languages treated in this book. The photo was taken by Alan Rumsey in 1993 during a survey of sites that he undertook with Ngarinyin people. One of them, senior Ngarinyin spokesman Paddy Neowarra, when approached for permission to use the photo, kindly offered the following explanation of it:

The Waanangga [‘sugar bag’ or native honey] Wanjina is located in the Ngarinyin language speaking *dambun* or clan estate of the topside Warrgalingongo, who were its traditional owners. Those people have all passed away. When that happens, as we explained at the Wanjina/Wunggurr–Wilinggin Native Title hearing, in our law it is the *gamaliwa* or neighbouring *dambun* families that look after the deceased estate. The neighbours of the topside Warrgalingongo are the Umborrayigono, Barurrungarri and Manyarrngarri clans. Another person who has a special responsibility for this site is Amongunda, who is named after the son of Badmurro, one of the last of the topside Warrgalingongo. The boundary to the top of Warrgalingongo is Galarungarri *dambun* and the bottom side is Mejerrin; it is through our Wilinggin law that these people have been assigned the Waanangga Wanjina to look after.

There are four types of sugar bag that we eat, which have significant Wanjina sites attributed to them. One kind is *namirri*, which is found in the underground part of ant beds. There is a Wanjina site for that one in the *dambun* estate Jibilingarri in the Roe River area. That is like the king site, and is associated with the *manambarra* [law]men and women. Another kind of sugar bag that we find underground is *ngara*. *Waanangga* is found in the tops of the trees. Another kind of sugar bag called *nyunggarrgi* is found in rocks or under the bark of paperbark trees.

[Translated by Heather Winter in conversation with Paddy Neowarra, Derby, November 2008.]

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Abbreviations and conventions

ABL	ablative	MD	mood
ACC	accusative pronominal prefix	NEUT _M	neuter M class
ADV	adverbial	NEUT _N	neuter N class
ALL	allative	NEUT _W	neuter W class
AN	animal (class)	NOM	nominative pronominal prefix
ASP	aspect	NUM	number
C	consonant	OBL	oblique pronominal
COLL	collective	OPT	optative
COM	comitative	PA	paucal
CONT	continuous	PASS	passive
DAT	dative	pl	plural
DEF.SUB	definite subject	PROX	proximal
DEP	dependent clause marker	PST	past
DIR	directional	REF	reflexive/reciprocal
DU	dual	sg	singular
EMP	emphatic	SUBJ	subjunctive
excl	exclusive	TNS	tense
FEM	feminine	V	vowel
FUT	future	VCOMP	verbal complementiser
GEN	genitive	1	first person
HUM	human (class)	2	second person
IMP	imperative	3	third person
incl	inclusive		changes into
INS	instrumental	x y	x acts on y
IRR	irrealis	[]	phonetic representation
LOC	locative	//	phonemic representation
MAS	masculine	{ }	morphophonemic representation

Subscripted integers distinguish among different morphemes, morphophonemes, or glosses showing the same form.

Words are generally spelt according to the orthographic conventions of the language if any are accepted, or otherwise according to a standard system. Where relevant, phonetic forms are indicated in IPA.

Inflecting verb roots are cited in capitals, with an initial hyphen or plus sign (indicating that they are bound morphemes that obligatorially take at least one prefix; they optionally also take suffixes).

1 *Introduction*

1.1 The language and dialect situation

The term *Worrorran*—Wororan in O’Grady, Voegelin and Voegelin (1966)—refers to a group of over twenty named language varieties traditionally spoken throughout the Northern Kimberley region, which corresponds roughly with the Kimberley Block, a geological division consisting of some 180,000 square kilometres of mainly sandstone plateau. The main regional speech varieties that are either known to the authors or have been reported in earlier literature are listed in Table 1 in alphabetical order in the most widely used spelling; also indicated are the main alternative spellings and alternative terms for the language or its dialects, and an indication of viability (where information is available).

Table 1: The Worrorran languages/varieties

Variety	Alternative label	Viability
Andajin		two fluent speakers
Gambera	Gamberre, Gambere, Gambre	a few speakers
Gulunggulu		a few speakers
Gunin/Kwini	Gunan, Gwini, Kunan	a few speakers
Guwuj	Guidj, Guwidj (nowadays more or less equated with Wurla)	see Wurla
Miwa	Bagu, Miwi, Pela	a few speakers
Munumburru	Munumburu	no surviving speakers
Ngarinyin	Ungarinyin, Ngarinjin	c. 100 speakers
Ngarnawu	Nganaw (nowadays more or less equated with central and western Ngarinyin)	see Ngarinyin
Umiida	Umida, Umi:da	moribund
Unggarrangu	Unggarangi	moribund

Variety	Alternative label	Viability
Unggumi	Ungkami, Wunggumi	moribund
Wilawila	Wila-Wila	no surviving speakers
Winjarumi	Windjarumi	no surviving speakers
Wolyamidi	Woldjamidi, Wol'jamidi, Wolyamidi	no surviving speakers
Worrorra	Worora, Worrora, Wurora	moribund
Wunambal	Unambal, Wunambul	fewer than ten full speakers
Wurla	Worla, Ola, Walajangarri, Wula	fifteen to twenty speakers
Yawijibaya	Jawdjibara, Yaudjibara, Yawjibarra	moribund
Yiiji	Jeidji, Yeidji	some speakers

The language/dialect situation is complicated, particularly in the northernmost part of the region, which shows resemblances to the situation in the Western Desert (see Miller 1971; Berndt 1959), where the terms used by speakers are flexible, overlapping, and do not usually correspond to what would be seen as distinct 'tribal' groups. As Capell and Coate put it, based on their combined fieldwork beginning in the 1930s:

... some of these designations [i.e. language and dialect names] are made for convenience of treatment, especially in the northern subdivision, where the variations are slighter than the other two, and the application of names by the people themselves quite uncertain. There has been much disagreement among anthropologists as to the application of names to the various 'tribes' in the north and east of the NK [Northern Kimberley] area The people of the Forrest River (FR) area do not seem to have a tribal name at all. They have variously been called Miwa, Yeidji, Gwini, all of which terms have a validity, but none of them is currently accepted by all the people. The terms Walar and Manunggu refer to sections of the FR tribes and are not primarily linguistic terms even though they do seem to correspond with dialect variations within the north-eastern section. On the other hand, the names ... [of] the central and western [varieties] are used and recognised by the people themselves. One man is definitely a Worora, another Wunambal, another a Ngarinjin, and so on. The island communities, of course, are marked off by their natural boundaries, but these on the mainland are not so distinguishable, and it is sometimes difficult, if not impossible at the present day to determine just where the boundaries ran while Aboriginal civilisation was still intact. (Capell and Coate 1984:2)

In fact, it is not only in the northern part of the Worrوران region that the language situation is not entirely clear-cut, the above quote notwithstanding. Yawijibaya is sometimes treated as a separate language (e.g. by Capell and Coate 1984), and sometimes as a dialect of Worrorra (e.g. by Clendon 2000b); Unggumi, by contrast, seems to be consistently regarded as a separate language. At least these days, most relevant Aboriginal people who are familiar with the terms Ngarnawu, Walajangarri, Wurla and Guwij say that these are varieties of Ngarinyin (and indeed that Guwij and Wurla are alternative names for a single variety). Andajin, however, is never said to be a kind of Ngarinyin; it is consistently regarded as a separate language. In other words, it is difficult to separate languages and dialects on the basis of speakers' nomenclatures. It is likewise difficult to make the distinctions on grounds of apparent mutual intelligibility among the regional speech varieties. This difficulty arises

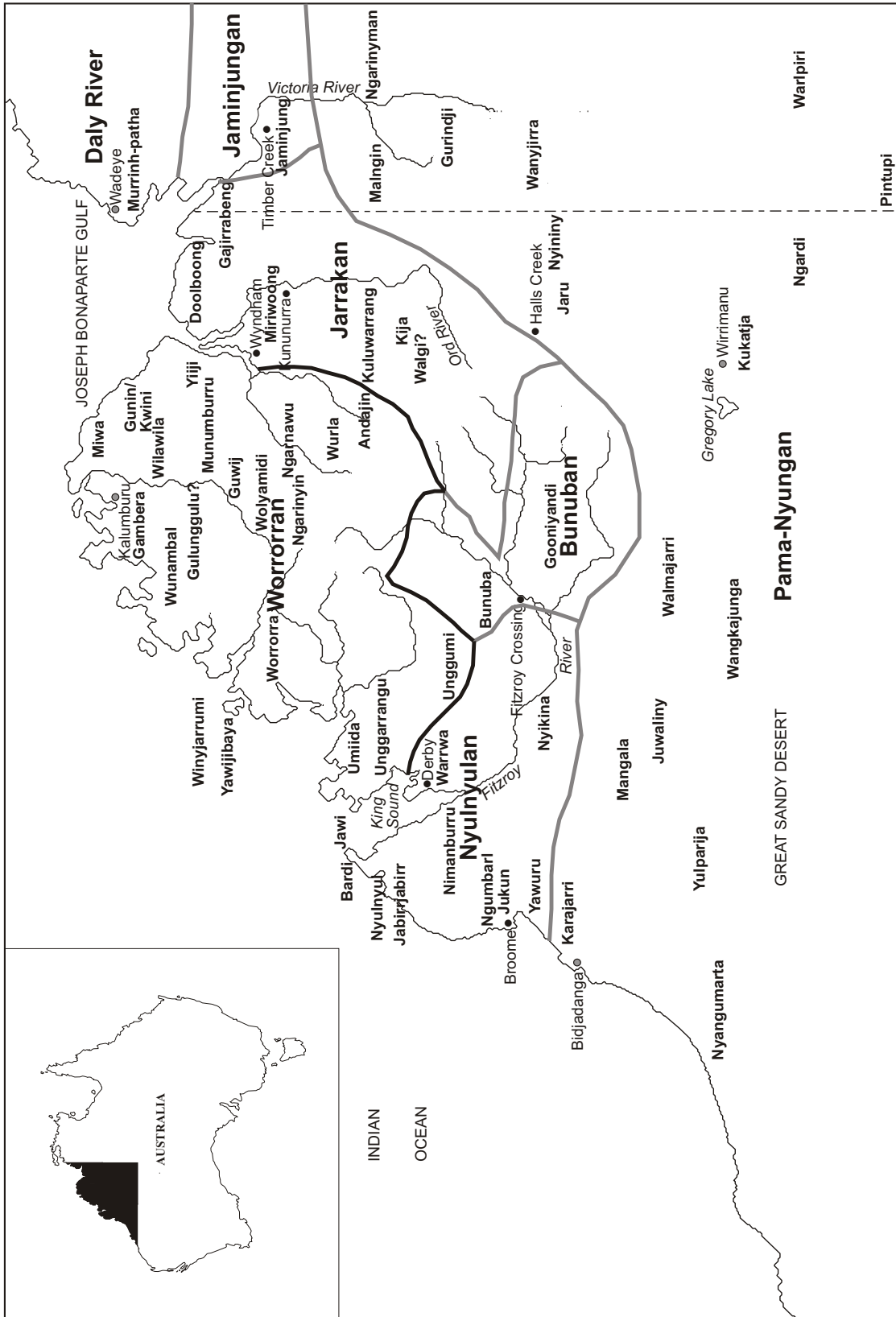


Figure 1: Map of Kimberley languages

both because of the paucity of data on many of the languages, and because of the high degree of multilingualism among speakers of Aboriginal languages here as elsewhere in Australia.

The approximate locations of the regions associated with each of the named speech varieties listed in Table 1 are shown in the map of Figure 1, which also shows other Kimberley languages, and the currently accepted divisions of the languages into families.

1.2 Sources of data

The list in Table 2 indicates the main sources of data on each of the languages/varieties (see McGregor 1988a for more extensive, though now somewhat dated, reference lists). Notice that for seven languages there is virtually no reliable information whatsoever; effectively we know little more than the language or variety name, its approximate location according to previous researchers, and perhaps a few words. These languages, of course, cannot be reliably classified, and are excluded from the present classification.

Table 2: Main sources of data on Worroran languages

Variety	Main sources of information
Andajin	Thomas Saunders, personal communication
Gambera	Capell and Coate (1984)
Gulunggulu	None
Gunin/Kwini	Capell and Coate (1984); Crawford (1982); McGregor (1993)
Guwuj	Capell and Coate (1984)
Miwa	None
Munumburru	None
Ngarinyin	Capell and Coate (1984); Coate and Oates (1970); Coate and Elkin (1974); Rumsey (1982)
Ngarnawu	None
Umiida	Capell and Coate (1984); Coate (n.d.a, n.d.b)
Unggarrangu	Capell and Coate (1984); Coate (n.d.a)
Unggumi	Capell and Coate (1984); Coate (n.d.c); McGregor (fieldnotes); Rumsey (fieldnotes)
Wilawila	Capell and Coate (1984)
Winjarumi	Capell and Coate (1984)
Wolyamidi	None
Worrorra	Capell and Coate (1984); Clendon (1999, 2000a, 2000b); Clendon, Lalbanda <i>et al.</i> (2000); Love (1931–2, 1934 (published as Love 2000), 1938); see also Love (1936)

Variety	Main sources of information
Wunambal	Capell (1941); Coate (1948); Capell and Coate (1984); Carr (2000); Vászolyi (1972, 1976a, 1976b); Vasse (1991)
Wurla	Rumsey (1990)
Yawijibaya	Capell and Coate (1984)
Yijji	None

1.3 Previous classifications

The first extensive linguistic survey of the Northern Kimberley region was carried out by Arthur Capell in the late 1930s. From the beginning Capell recognised the Worroran languages as a distinct group (Capell 1940).¹ His reasons were primarily typological: they were ‘prefixing languages with multiple classification of nouns’. These typological features distinguish the languages from their neighbours (though not from all other Australian languages), none of which show multiple classification of nouns—that is, none has four or more noun classes. Capell (1940:257) further divided the languages into two subgroups, including Wunambal, Gambera and Gunin/Kwini in one, and Ngarinyin, Wilawila, Munumburru, Guwuj, Walyamidi, Wurla, Worrora, Umiida and Unggumi in the other.² Again, this was primarily on typological grounds: the languages of the first group show four or six noun classes without a masculine/feminine gender distinction, while those of the second group have five classes with the gender distinction.

In subsequent work Capell distinguished three subgroups: West (Yawijibaya, Winjarumi, Worrora, Unggumi, Umiida, Unggarrangi), Central (Ngarinyin, Guwuj, Munumburru, Wolyamidi, Wurla), and Northern (Wunambal, Wilawila, Gunin/Kwini, Gambera) (Capell and Coate 1984:1). Here we will attempt to show that the languages represent both a typological unity and a genetic group, on the basis of shared lexicon and morphology, a view which Capell explicitly identified himself with in 1972 (Capell 1972:54).

In taking this view, Capell was no doubt influenced by O’Grady, Wurm and Hale (1966) and O’Grady, Voegelin and Voegelin (1966),³ who held that the Northern Kimberley languages form a family of languages, related by common descent from a single ancestral language. They used lexicostatistics (among other considerations—Alpher and Nash 1999: 46–47), not the comparative method, to justify the group. O’Grady, Voegelin and Voegelin (1966:35) distinguish three subgroups within the family: Ngarinyinic (Ngarinyin, Wilawila, Munumburru, Guwuj, and Wolyamidi), Wororic (Worrora, Mailnga, and Unggumi), and Wunambalic (Wunambal, Gambera, Miwa (Bagu), and Gunin/Kwini). This classification has been widely adopted—though with little revision, reworking, or empirical testing—in subsequent work, including the surveys of the 1970s (e.g. Wurm 1972:123–124), and in more recent grammatical descriptions and survey works (e.g. Hudson and McConvell 1984; McGregor 1988:81–82, 2004). As will be seen in Chapter 2, this classification accords

1 Schmidt (1919) distinguished the Nyulnyulan and Jarrakan languages as separate groups, but the Northern Kimberley region on his map is, rightly, left blank: none of his sources provided data on any of the languages.

2 Capell’s grouping includes other named varieties as well; here we have listed only those shown in Table 1.

3 O’Grady had been a student of Capell’s, and Wurm a colleague, at the University of Sydney in the 1950s.

substantially with our own statistical investigation, which is based on more complete and up-to-date information than was available to O'Grady and his colleagues.

Dixon (2001:102; 2002:xli, 672–674) treats the languages as an areal group (a 'small linguistic area') rather than a genetic unit.⁴ Dixon further distinguishes three languages within this group, each with several dialects which effectively correspond with the subgroups of O'Grady, Voegelin and Voegelin (1966). No evidence is presented or discussed in support of either claim.

Note in particular that the comparative method has not previously been seriously deployed on the Worroran languages. Despite the title *Comparative studies in Northern Kimberley languages*, Capell and Coate (1984) is primarily a typologically and descriptively oriented investigation, not a historical-comparative study.

1.4 Aims and methodology

This publication has two main aims: (a) to establish that the Worroran languages constitute a genetic unit; and (b) to present evidence of subgrouping within the family—specifically, to argue that it is possible to recognise three primary subgroups, as shown in Figure 2. A subsidiary aim, in aid of (a), is (c) to reconstruct some of the lexicon and grammar of Proto Worroran. Our arguments for (a) and (b) are based on two types of evidence: statistical (Chapter 2) and historical-comparative (Chapters 3 to 7). Though we consider the historical-comparative evidence to be the more compelling, especially with respect to (a), we believe that the fact that these two independent approaches yield similar results strengthens the case for our proposals (see Black 1997:56; Embleton 2000:154–156).⁵ In any case we have considered it worthwhile to do the statistical investigation along with the historical-comparative one and to include the results here, as none of the evidence for previous lexicostatistical classifications has ever been published or made widely available.

4 Dixon (2002:674) allows that it is possible that the languages do form a genetic group:

It is likely that these languages have been in their present location—a rugged mountainous terrain—for a considerable period. It is not impossible that they do constitute a genetic subgroup at considerable time-depth. However, the evidence is greatly in favour of the alternative scenario—that they are simply three languages which have been in contact for a long time, so that they have grown similar in their typological profile and have borrowed between each other a fair number of lexemes, together with just a few grammatical forms.

None of the evidence adduced in Dixon (2002:672–674) convincingly supports his alternative scenario. Mere typological similarity is an inadequate argument for an areal group if the typological features attributed to the group are shared by other nearby languages. In fact, it is clear that the entire Kimberley region—even the entire continent of Australia—is a region within which areal diffusion is rife. It is not clear which criteria motivate subgroups of this type: some of the typological parameters Dixon identifies for this group of languages are also shared with the Nyulnyulan, Bunuban and Jarrakan languages. It is not obvious on what basis they can be excluded from a putative areal group or subgroup.

Dixon (2002:673) says that the shared cognate rates amongst the three languages he distinguishes are between 40% and 60%, though he does not provide exact figures. Given the considerable lexical variation within these putative languages, one would require a list of the exact items in order to evaluate the proposal.

5 The lexicostatistical method has been condemned by a number of linguists, including Bergsland and Vogt (1962), Chrétien (1962), Dixon (1997:35–37), and not without reason. There is, however, increasing agreement amongst scholars (e.g. Dobson, Kruskal, Sankoff and Savage 1972; Embleton 1982, 2000; Black 1997; Gray and Jordan 2000; Brown, Holman, Wichmann and Vilupillai forthcoming) that it is not entirely unreliable, especially if used with caution; or, as Alpher and Nash (1999:48) put it, as 'a blunt but useful instrument'.

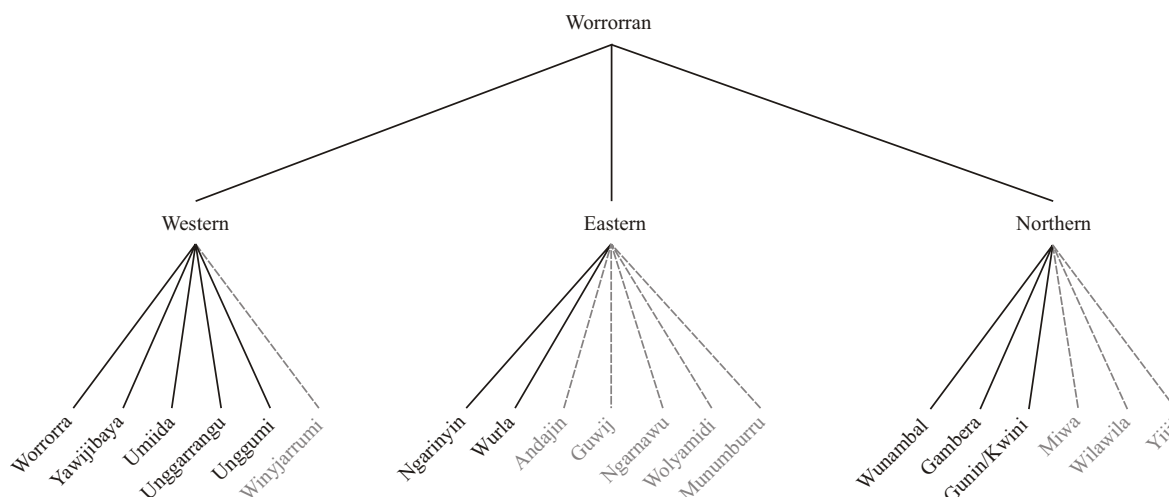


Figure 2: Proposed genetic classification of Worrوران languages

Furthermore, much more lexical information is now available for several of the languages than was the case in the mid 1960s and early 1970s when the previous classifications were produced.

Figure 3 shows the locations of the Worrوران languages, and indicates how the proposed subgroups are distributed geographically. Observe in particular that the groups are geographically contiguous.

The validity and usefulness of family tree representations of language relations in the Australian context has recently come under heavy criticism from R.M.W. Dixon, who promulgates a model of punctuated equilibrium for historical change (Dixon 1997, 2001, 2002). Dixon suggests that tree representations may be viable only in the relatively short periods at and following major punctuations in language development (as caused, for example, by population splits or natural disasters) in which new languages emerge. Dixon argues that, in the main, during periods of equilibrium, the family tree model fails to represent language interrelatedness correctly: specifically, he proposes that in the Australian linguistic area this failure is largely due to massive and widespread borrowing, that soon expunges the picture of genetic relations displayed on family trees.

This is not the place to enter into a thorough assessment of Dixon's model of the diachronic situation in Australia (for which see Evans 2005; Bower and Koch 2004; Koch 2004; Sutton and Koch 2008), or of his criticisms of the comparative method (Rankin 2003 contains a number of rebuttals of criticisms of the comparative method, not specific to Dixon's). Nevertheless, there are some specific points we would like to raise in view of their relevance for our argument.

The first is Dixon's claim that isoglosses in Australia do not bunch (Dixon 2001:64, 87). This may hold true for some areas; however, in the Kimberley region we do find significant bunching of isoglosses, although not all of them coincide. This is true of the Northern Kimberley region in particular, as will be demonstrated as the discussion unfolds. For each aspect of the Worrوران languages considered and compared among languages within the group, we will also be comparing them with the neighbouring non-Worrوران languages to establish that the corresponding forms they share are not shared by those other languages.

Second, there is Dixon's claim that core vocabulary in Australian languages is replaced at about the same rate as non-core vocabulary, unlike in all other areas of the world where it is



Figure 3: Detailed map of Worroran languages

replaced more slowly than non-core (Dixon 2001:83–84). This remains hypothetical: no empirical evidence is provided in Dixon (2001) or in any of his other publications that we are aware of. The evidence that *has* been presented on this issue, in careful treatments by Breen (1990) and Black (1997), has, quite to the contrary, shown that core vocabulary is replaced more slowly than non-core in Australia as elsewhere.⁶

Third, there is the problem of identifying genetic retentions, and distinguishing them from borrowings, chance, universal tendencies, iconic formations, and parallel or convergent development. This is indeed a difficult problem, though not peculiar to Australian languages. As pointed out by Koch (2004) and Watkins (2001), the problem of distinguishing retentions from borrowings has long been recognised and dealt with by practitioners of the comparative method as an integral aspect of the method, and not as something intractable to it. While recognising the importance of other processes alongside of shared retention, we see no reason to assume that any given case of resemblance between or among languages is less likely to have resulted from shared retention than from any other possible cause. On this matter we

6 As far as we know, Dixon has never responded to these arguments by Breen and Black, or taken account of them when arguing to the contrary.

disagree with the following methodological prescription proposed by Alan Dench and endorsed by Aikhenvald and Dixon (2001:6):

I take it for granted that a statement of shared inheritance as explanation for a shared feature should only be made once all other possible explanations for the shared feature have been exhausted. These other possibilities will include accidental similarity of form, borrowing, and genetic drift. (Dench 2001:113)

Why an inference of shared inheritance should require such special justification is not clear—how can all possible alternative explanations ever be thought of, let alone disposed of? And even if many alternatives could be dismissed, such negative evidence would not by itself argue positively for retention. More to the point is the well-established precept that *certain kinds* of shared features—namely systematic substantive resemblances in grammar and lexicon and shared irregularities not found in other languages—are more highly diagnostic of genetic relatedness than are other, less systematic resemblances, and can be taken as sound presumptive evidence for it. This provides a better methodological strategy than does the assumption that in all cases genetic explanation can only be used as a last resort.

Despite Dixon's endorsement of Dench's claim, and his recent, polemical stance against the applicability of the comparative method in Australia, in practice Dixon evidently still accepts the standard comparativist precept that we have just stated, as shown for example when he speaks of 'cognate sets, involving systematic correspondences of sound and meaning' as a 'sure criterion for genetic linking' (Dixon 2002:46). More particularly, with respect to the Kimberley region, although Dixon does not accept the genetic validity of what we are calling the Worroran language family (his 'North Kimberley small linguistic area'), in the case of all the other neighbouring non-Worroran languages he does readily accept the genetic validity of the three groups that they have long been held to belong to:⁷ Nyulnyulan, Bunbuban, and Jarrakan, as shown on Figure 1.⁸

In the remainder of this work we will be arguing the genetic validity of the Worroran group. We do this on the basis of the same kinds of evidence that scholars (including Dixon) have long taken to be reliable indicators of genetic relatedness for language groups in Australia and elsewhere: systematic correspondences with respect to form and function, and shared irregularities with respect to the fit between the two. But first we proceed with a statistical examination of lexical resemblances and differences of a kind which is no substitute for the comparative method, but which we would argue can provide useful collateral support for it.

7 Perhaps *too* readily—or at least, with a degree of alacrity that is surprising in view of Dixon's general stance toward the applicability of the comparative method in Australia. As of 2002 when Dixon published the book in which he treats these three groups as genetic units, no detailed comparative studies of any of them had been published. More recently, such a study of the Nyulnyulan group has been published by Stokes and McGregor (2003) (no draft of which is referred to in Dixon 2002, and not known by us to have been available to him) on the basis of which we believe it is now possible to say with proper justification that it is a genetic family. On the basis of our own detailed synchronic work on the only two languages in the Bunuban group—Bunuba (see e.g. Rumsey 2000) and Gooniyandi (e.g. McGregor 1990)—we suspect that the two are genetically related, but it remains to be demonstrated by the comparative method, as does the genetic validity of the Jarrakan group.

8 Dixon (2002:666–667) renames these groups the 'Fitzroy River subgroup', the 'South Kimberley subgroup' and the 'Kitja-Miriwung subgroup', respectively. (They are also coded NE, NF and ND in the arcane system of coding groups and subgroups of Australian languages presented in Dixon 2002.) His reason for departing from the established names for them remains unclear, as does his use of the term 'subgroup' in this context, since he proposes no higher level group to which they putatively belong. (Nor does any seem to be even remotely justifiable, as Dixon would no doubt agree; more recently Bowern (2004a) has explicitly argued against the Nyulnyulan languages belonging to any more inclusive genetic grouping.)

2 *A statistical investigation of the lexicons of some Worroran and nearby languages*

In this chapter we report on a statistical investigation of shared similarities in the lexicons of Worroran and nearby languages. Twenty-one languages were selected for this investigation: thirteen Worroran languages (the remaining seven varieties were omitted due to extreme paucity of lexical data), and eight nearby Kimberley languages: Bunuba, Gooniyandi, Nyikina, Warrwa, Kija, Miriwoong, Walmajarri, and Kukatja. These languages were chosen because relatively reliable information is available for each.

A list of 105 basic meanings was compiled, representing the ‘basic’ wordlist of McGregor (1992); this is comparable with Hale’s 100 item wordlist and other such standards, modified slightly for the region. It is somewhat shorter than desirable (Stokes and McGregor 2003:34), but this was unavoidable given the constraints of the available data. If the list were expanded to the more reliable size of two hundred lexical items, only a few languages would be represented by fairly complete lists; a number of languages are so poorly represented by wordlists that the overall reliability of the findings would not be greatly enhanced.

The wordlists in each language are based on the wordlists included in McGregor (1992), augmented by information from more recent sources.¹ The results of a pair-wise comparison of the languages are shown in Table 3,² which indicates both the percentage of shared items and the unreduced fraction of shared lexical items in relation to the actual number of common meanings represented.

To forestall possible objections, it is stressed from the outset that the approach we have adopted in this lexical comparison is *not* lexicostatistics, either in methodology or conceptualisation—and it is for this reason we have eschewed the term. Lexicostatistics is a method that can be applied to a set of languages known to be genetically related, in order to determine the internal hierarchical structure of its genetic tree. This of course presumes that

1 A tabulation containing the wordlists for each language is available online, linked to the entry for this monograph at <http://www.pacling.com/>.

2 An initial tabulation of the lexical data in eight Worroran languages was drawn up by Rumsey; this was extended and slightly emended by McGregor. The lexical comparisons were separately performed by Rumsey and McGregor: first, in the late 1990s Rumsey made a comparison of eight Worroran languages; in 2003 McGregor added in twelve more languages; subsequently, in 2006 he added in one more language and completely redid all of the counts, based on revised and extended wordlists. Checks of the various lexical comparisons reveal a high level of agreement amongst the various counts.

the comparative method has already been applied to the languages; the method could be used to independently test the grouping and subgrouping determined by application of the comparative method. What we wanted to do, however, was to make a comparison of languages based on shared similarities in basic lexicon as an initial step in testing their possible relatedness. The idea behind this is that, presuming the arbitrariness of the linguistic sign and that basic lexicon is most resistant to borrowing, we would expect a lower fraction of shared similar basic lexemes in genetically unrelated languages than in related languages, and that the proportion of lexical similarities would increase with genetic proximity.

What we did therefore was to compare items from the basic lexicons of each pair of languages, counting 1 for a match, and 0 for a non-match.³ As already indicated, no attempt was made to exclude borrowings, or separate them from lexical retentions or accidental similarities. The effect of this decision, of course, will be that the measured similarity of geographically contiguous pairs of languages will probably be higher than predicted from their actual genetic distance, because of the increased likelihood of borrowing between the languages. For geographically distant pairs of languages, borrowings from neighbouring languages might well result in a similarity measure lower than expected, especially if these neighbours are unrelated genetically. But provided that borrowing is not unconstrained (as in the case of basic lexicon) it seems reasonable to expect that a tree showing similarities based on basic lexicon would be isomorphic with a genetic tree for the same languages.

Another factor affecting the measured lexical similarity differentially is the existence of multiple synonyms or apparent synonyms. A given basic gloss frequently has multiple lexical realisations in a language. Since it is usually impossible to decide which of the apparent synonyms is the ‘best fit’, a score of 1 was recorded whenever for a given gloss at least one alternative lexeme was shared (see also Alpher and Nash 1999). (This is of course contrary to standard lexicostatistical procedures—Embleton 2000:148.) One consequence of this decision is to inflate the degree of lexical similarity amongst languages that are well represented with extensive wordlists at the expense of languages that are poorly represented, since for the well represented languages we find the highest frequency of apparent synonyms. It seems however that this did not drastically affect the global topology of the tree: the three best represented languages still show less similarity to one another than they do to the less well-documented languages of their respective subgroups.

Turning now to the figures shown in Table 3, it is clear that as a whole the Worrوران languages share more lexical similarities with one another than they do with any of the nearby languages. Lexical similarities with other languages are almost all below 20% (there are just two exceptions, both of which are only just above this figure, at 23%), and indeed over two thirds of them are below the 10% mark. By contrast, within the group the figures are consistently higher, in most instances considerably higher: just over half are at or above the 40% mark, and no pair shows less than 20% shared lexical similarities.

The overall significance of the pair-wise fractions in Table 3 is not immediately apparent, so further statistical analysis was carried out in an attempt to determine whether, in terms of

3 This in itself is a rather crude and non-mechanical procedure. In making the decisions we took into account our knowledge of Australian languages and the types of phonological correspondences typically encountered, as well as correspondences we have identified in Worrوران—for instance, correspondences of laminal stops and glides. The method could be improved by assigning different weights to different degrees of formal similarity amongst the matches, preferably by a mechanical procedure. Such an approach would give a better idea of overall lexical similarity amongst the languages, but would have presented a number of computational challenges we could not address in this investigation. Moreover, for the present purpose—to present independent support for the results of application of the comparative method—our rude measure is adequate.

Table 3: Lexical resemblance rates among

	W	G	GK	M	Ng	Wu	Mu	Wo	Wr	Un
G	35/56, 63									
GK	55/84, 65	25/49, 51								
M	11/15, 73	10/15, 67	13/15, 87							
Ng	50/100, 50	31/55, 56	38/86, 44	5/15, 33						
Wu	40/94, 43	17/50, 34	24/84, 29	6/15, 40	57/94, 61					
Mu	15/25, 60	12/19, 63	10/23, 43	7/15, 47	16/23, 70	14/23, 61				
Wo	18/29, 62	10/16, 62	13/28, 46	5/15, 33	19/28, 68	21/29, 72	15/20, 75			
Wr	47/100, 47	21/55, 38	26/88, 30	3/15, 20	55/102, 54	30/94, 32	6/23, 26	7/28, 25		
Un	38/96, 40	18/55, 33	20/87, 23	4/15, 27	46/98, 47	33/92, 36	6/23, 26	11/28, 39	51/100, 51	
Um	11/39, 28	5/21, 24	8/34, 24	2/7, 29	17/39, 44	12/37, 32	4/10, 40	4/13, 31	23/39, 59	19/37, 51
Y	28/72, 39	13/42, 31	15/62, 24	3/11, 27	32/73, 44	15/67, 22	4/19, 21	5/19, 26	55/74, 74	39/72, 54
Wi	7/25, 28	5/16, 31	5/24, 21	2/6, 33	5/25, 20	6/24, 25	4/7, 57	4/12, 33	16/26, 62	8/26, 31
B	8/100, 8	6/54, 11	8/88, 9	0/15, 0	8/102, 8	10/94, 11	1/23, 4	1/29, 3	12/103, 12	19/99, 19
Go	9/101, 9	3/55, 5	6/88, 7	0/15, 0	8/103, 8	12/95, 13	2/23, 9	3/29, 10	9/104, 9	12/100, 12
Nk	10/87, 11	3/50, 6	3/80, 4	0/15, 0	9/88, 10	12/82, 15	2/23, 9	3/29, 10	8/90, 9	10/87, 11
Ww	10/98, 10	5/55, 9	8/85, 9	0/15, 0	10/95, 11	11/90, 12	1/22, 5	3/28, 11	7/98, 7	12/96, 13
Kj	9/72, 13	3/43, 7	7/65, 11	1/15, 7	14/72, 19	17/73, 23	3/21, 14	2/23, 9	8/73, 11	6/72, 8
Mw	6/86, 7	3/51, 6	2/76, 3	1/15, 7	13/85, 15	18/79, 23	3/21, 14	2/24, 8	5/87, 6	6/81, 7
Wl	5/101, 5	4/55, 7	7/88, 8	2/15, 13	9/103, 9	10/95, 11	3/23, 13	3/28, 11	6/103, 6	11/100, 11
Kk	4/97, 4	2/51, 4	4/87, 5	0/15, 0	5/100, 5	6/94, 6	2/23, 9	1/29, 3	7/99, 7	10/97, 10

Key: W—Wunambal; G—Gambera; GK—Gunin/Kwini; M—Miwa; Ng—Ngarinyin; Wu—Wurla; Wi—Winjarumi; B—Bunuba; Go—Gooniyandi; Nk—Nyikina; Ww—Warrwa; Kj—Kija; Mw—Miriwoong;

Worroran and some nearby languages

	Um	Y	Wi	B	Go	Nk	Ww	Kj	Mw	Wl
G										
GK										
M										
Ng										
Wu										
Mu										
Wo										
Wr										
Un										
Um										
Y	19/32, 28									
Wi	7/16, 44	11/21, 52								
B	6/38, 16	7/72, 10	4/26, 15							
Go	4/38, 11	8/73, 11	3/26, 12	50/104, 48						
Nk	3/35, 9	5/62, 8	2/25, 8	12/90, 13	11/91, 12					
Ww	3/37, 8	6/72, 8	2/25, 8	9/101, 9	9/102, 9	57/88, 65				
Kj	3/30, 10	5/52, 10	2/20, 10	11/73, 15	23/74, 31	6/66, 9	7/74, 9			
Mw	3/34, 9	4/62, 6	3/22, 14	12/88, 14	15/90, 17	7/80, 9	5/90, 6	32/72, 44		
Wl	3/39, 8	5/70, 7	3/26, 12	17/104, 16	13/105, 12	18/90, 20	12/102, 12	11/74, 15	8/90, 9	
Kk	3/39, 8	5/71, 7	3/24, 13	15/100, 15	16/101, 16	12/88, 14	12/98, 12	8/74, 11	7/90, 8	42/101, 42

Mu—Munumburru; Wo—Wolyamidi; Wr—Worrorra; Un—Unggumi; Um—Umiida; Y—Yawijibaya; Wl—Walmajarri; Kk—Kukatja.

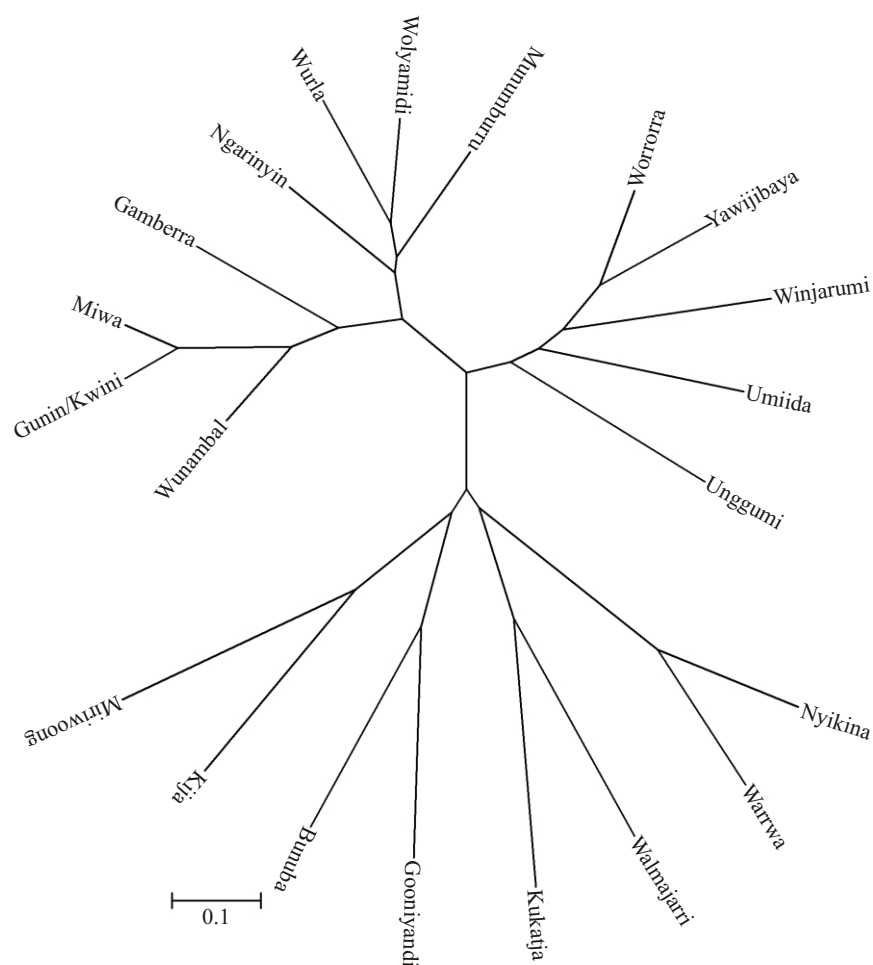


Figure 4: Neighbour-Joining analysis of lexical resemblance data in Table 3. Distance between nodes indicates degree of dissimilarity between the languages according to scale shown.

shared lexical resemblances, the languages actually do relate to one another in a tree-like fashion. Application of a Neighbour Net analysis (Hudson and Bryant 2006)⁴ revealed a tree-like relationship among the languages, which is evident in the Neighbour-Joining tree provided in Figure 4.

The Worrوران languages very clearly form a phylogenetic group together in contrast with all of the other languages in the sample, which are almost completely distinct from (i.e. close to a distance of 1 from) each Worrوران language. Moreover, the situation depicted for the other eight languages is basically consistent with our present understanding: Bunuba and Gooniyandi belong together, as do Nyikina and Warrwa, Kija and Miriwoong, and Walmajarri and Kukatja (see e.g. McGregor 2004:39–45). It is improbable that any of the higher order groupings are significant: they are, we suspect, artefacts of the small selection of representative languages, a number of which are geographically contiguous.

The network in Figure 4 identifies three clusterings within the Worrوران languages that are consistent with our proposed genetic division of the family into Northern, Eastern and Western groups. It also, however, identifies somewhat more hierarchical structure within the

⁴ We are grateful to Søren Wichmann (Max Planck Institute of Evolutionary Anthropology, Leipzig, and Leiden University) for performing the SplitsTree4 analyses for us, and providing us with high resolution images of the networks (slightly modified in the figures).

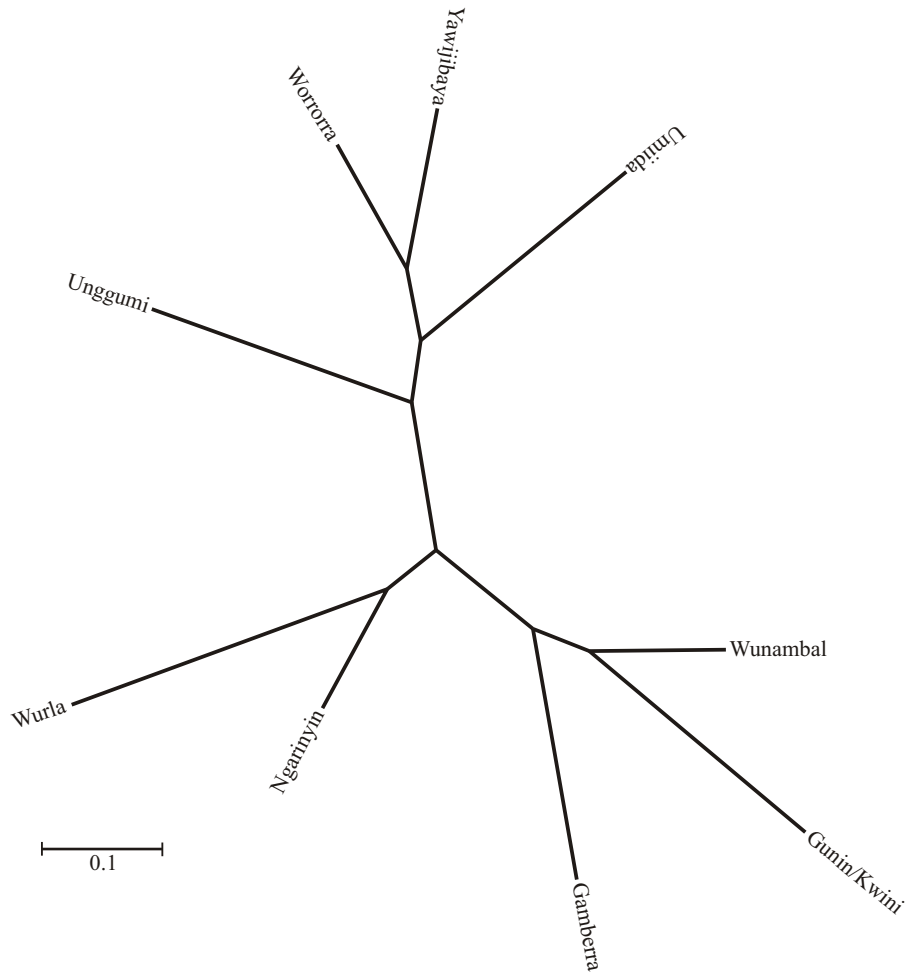


Figure 5: Neighbour-Joining analysis of Worrوران languages excluding poorly represented ones

Worrوران family than the more rake-like model we propose in Figure 2. Our suspicion was that much of this internal hierarchy was insignificant, and a consequence of the short wordlists available for some languages.⁵ To test this, four languages represented by wordlists of less than thirty items were removed from the comparison, along with all of the non-Worrوران languages. When the Neighbour-Joining analysis is redone on the remaining nine languages, the result is consistent with Figure 2, as shown in Figure 5.

The upshot of the statistical examination of the similarities in basic lexicons of a selection of Kimberley languages is that the Worrوران languages emerge as a distinct group, made up of three subgroups. This finding is in close agreement with the results of the previous studies discussed in §1.3, by O’Grady, Wurm and Hale (1966) and O’Grady, Voegelin and Voegelin (1966), but supersedes them in that it is based on a larger and more reliable data set. It is more transparent than the previous investigations in that we have made available the figures on which it is based, and the full set of data we have used for calculating them, in the form of comparisons of semantically corresponding terms in the 210 pairs of Worrوران and neighbouring languages (for which see <http://www.pacling.com>). To establish the genetic basis of grouping which emerges from this and previous statistical studies, we now proceed to an application of the comparative method.

⁵ Another reason for the discrepancy is that we have simply not pushed the historical-comparative investigation beyond the identification of the family and the most obvious highest order groups within it.

3 *Lexical correspondences*

In this chapter we present an initial list of 37 lexical correspondences (note that set 3 involves two items) in the basic 105 item lexicons of the Worrوران languages employed in the statistical investigation of Chapter 2. Basic lexical items such as these have been shown to be relatively stable in many languages of the world including Australian ones (Breen 1990; Black 1997), and the correspondences mostly involve a wide geographic range of languages, including at least one from each of the three Worrوران subgroups that we have established on statistical grounds in the previous chapter. These items thus provide a good starting point in the search for possible cognate sets in which apparent correspondences reflect common retentions from Proto Worrوران. These lexical sets will be used in later sections of the book, where we posit protoforms, identify some regular sound correspondences and propose rules to account for the range of attested forms.

We begin by listing eleven correspondence sets for preverbs—otherwise referred to as uninflecting verbs, coverbs, verbal particles, etc.—which are morphologically largely invariant verbal elements that typically cooccur with inflecting verbs in compound verb constructions (see McGregor 2002).

- 1 ‘sit’: Wunambal *ada* ~ *atha*; Gambera, Gunin/Kwini, Ngarinyin, and Winjarumi *ada*; Wurla *atha* ~ *ada*; Unggumi *atha*; Worrورا and Umiida *aja*; Yawijibaya *aja* ~ *atha*; Unggarrangu *aja* ~ *ada*
- 2 ‘stand, be standing’: Wunambal *tarr* ~ *dar* ~ *dad*; Gunin/Kwini and Ngarinyin *darr*; Wurla *tharr* ~ *darr*
- 3 ‘climb’: (a) Wunambal and Ngarinyin *baj*; Wurla *bayj-ba*; Worrورا *bayi* ~ *baay*; Yawijibaya, Umiida, and Unggarrangu *bai*; Unggumi *baj* ~ *bay*; Winjarumi *bari*; (b) Wunambal *ben*; Gunin/Kwini *been* ~ *bee*; Worrورا *bern*
- 4 ‘cry, weep’: Wunambal, Gambera, Gunin/Kwini and Worrورا *wala*; Ngarinyin *wa(r)da* ~ *wala*; Wurla *warda*; Unggumi *wara* ~ *wala(wa)*
- 5 ‘cut (something)’: Wunambal *did* ~ *dirr* ~ *d̄irr*; Ngarinyin *did* ~ *durr*; Wurla and Worrورا *durr*; Unggumi *thirr*
- 6 ‘die’: Wunambal and Ngarinyin *debarr* ~ *debad*; Gambera, Gunin/Kwini, and Wurla *debarr*; Worrورا *rdiabar* ~ *debar* ~ *debad*; Unggumi *thebad*; Yawijibaya *debad* ~ *rdebad*

- 7 ‘dig’: Wunambal, Ngarinyin, Worrorra, Umiida, Unggarrangu, and Unggumi *jarri*; Gunin/Kwini *jaarri*, Wurla *jarriwa*; Yawijibaya *jarri(ma)*
- 8 ‘eat’: Wunambal, Gambera, Gunin/Kwini, Wolyamidi, Yawijibaya and Unggumi *min(y)jal*; Ngarinyin, Wurla, and Worrorra *min(y)jarl*
- 9 ‘hear, listen’: Wunambal, Gambera, Ngarinyin, Wurla, and Worrorra *nguru*; Unggumi *ngarwe*
- 10 ‘see’: Wunambal, Gambera, Gunin/Kwini, Munumburru, Ngarinyin, Wurla, Wolyamidi, and Worrorra *mara*

Correspondences involving basic nominals include:

- 11 ‘arm’: Wunambal and Ngarinyin *-nunggu*; Gunin/Kwini *-nanggu* ~ *-nunggu*; Worrorra *nunggum*;¹ Unggumi *nungguma*
- 12 ‘armpit’: Wunambal and Gunin/Kwini *malambarr*; Ngarinyin *marlambarr*, Unggumi *malambarrma*, Worrorra *marlambard* ~ *marlambadba*; Yawijibaya *marlambardba*
- 13 ‘bone’: Wunambal *-narr*; Gunin/Kwini and Miwa *-(bu)narr*; Ngarinyin *-wurnarr*; Wolyamidi *-oonor*; Unggumi *-naarriya*; Worrorra *-rnaarri*; Yawijibaya *-no:rri*; cf. also Munumburru and Wurla *awurr*
- 14 ‘breast’: Wunambal and Wurla *ngamu*; Gunin/Kwini *ngaamu*; Ngarinyin *ngamun*; Unggumi *ngamungga*;² Worrorra, Yawijibaya and Winjarumi *nga(a)mugu*
- 15 ‘eye’: Wunambal, Gunin/Kwini, Miwa, and Gambera *-umbul*; Ngarinyin, Munumburru, Wolyamidi, and Wurla *-ambul*; Worrorra *-aambulu*; Unggumi *-nggubulngga*; Unggarrangu and Yawijibaya *-bulu*; Winjarumi *yubulu*; Umiida *-biilu*
- 16 ‘fingernail’: Gunin/Kwini *rirmirl*; Wurla *rerrmil* ~ *rerrmendel*; Unggumi *ridmindilma*
- 17 ‘heart’: Wunambal, Ngarinyin, Wurla, and Worrorra *rangu*; Yawijibaya *rangga*
- 18 ‘knee’: Wunambal *lenggal*; Ngarinyin *-lunggu*; Worrorra *-rlungkum*; Unggumi *-lhinggingga*; cf. the Umiida form involving *-lookee*
- 19 ‘lip’ or ‘mouth’: Wunambal and Gambera *minja* ‘lip’ and *minjal* ‘mouth’; Ngarinyin *minjarl* ‘mouth’ and *meminja(r)l* ‘lip(s)’—the former item also in Munumburru; Unggumi *minjal* ‘mouth’; Worrorra *minjarlb* ‘lip’; Yawijibaya *minjalbu* ‘lip’
- 20 ‘liver’: Wunambal *garri*; Gambera *gari*; Gunin/Kwini *ga:rri*; Ngarinyin *garrin*; Wurla *garri*; Unggumi *garriny*; Worrorra *garrimi* ~ *garima*
- 21 ‘many’: Wunambal and Gunin/Kwini *balanggarra*; Wurla, Wolyamidi, and perhaps also Ngarinyin *balanggarra*; Unggumi *balanggarr*; Umiida *bal-un-gurree*
- 22 ‘moon’: Wunambal and Ngarinyin *gunyili*; Worrorra and Unggumi *gunyila*; Umiida *goun-ee-la*; Yawijibaya *gunyili*

1 The *-m* that occurs on this form, and the *-ma* on the corresponding Unggumi form, are noun class suffixes indicating that the word belongs to the NEUT_M class as discussed in §5.3. The same suffix occurs on Worrorra, Unggumi or Wunambal words in sets 12, 16, 18, 20, 23 and 24.

2 The *-ngga* that occurs on this and several other Unggumi nouns in this list (in sets 15, 18, 24 and 25) is a noun class suffix indicating that these nouns are of the NEUT_W class, as discussed in §5.3.

- 23 ‘river’: Wunambal and Gambera *marorlale*; Ngarinyin *marolale*; Wurla *modoore*; Worrorra *marolalem*
- 24 ‘small’: Wunambal *bardadee*; Gunin/Kwini *bideeni*; Ngarinyin *burdu*; Unggumi *burdungga* ~ *birdima*; Umiida *bee-dee*; Worrorra *birdinyja* ~ *birdeen*; Yawijibaya *bidi* ~ *badinjida*
- 25 ‘smoke’: Wunambal *binjagun*; Gambera and Ngarinyin *binjan*; Unggumi *binyjangga*; Worrorra *bijaku*
- 26 ‘sun’: Wunambal *murung* ~ *marangi*; Gambera *marango*; Gunin/Kwini *marangu* ~ *morong*; Miwa *morong*; Munumburru *meringun*; Ngarinyin and Wurla *marangi*; Wolyamidi *maarri*; Unggumi *maranginya*;³ Umiida *mir-age*, Worrorra and Winjarumi *marangunya*; Yawijibaya *maranganyi*
- 27 ‘tongue’: Wunambal, Ngarinyin, and Worrorra *a-nbula*; Unggumi *wanbulema*; Yawijibaya *-mbula*; cf. Wolyamidi *almbra*
- 28 ‘vegetable food’: Wunambal, Gunin/Kwini, Ngarinyin, Worrorra, Unggumi, and Umiida *mangarri* and *mee* ~ *mayi* ~ *maya*; Wurla *me*; Yawijibaya *mainymirri*

Three adverbial correspondences in the basic lexicon are:

- 29 ‘far’: Wunambal *borra*; Ngarinyin *bowarra* ~ *borra*; Worrorra *bawarra*; Yawijibaya *bowarra*
- 30 ‘near, close by’: Wunambal *wothulu*; Ngarinyin *wordulu*; Worrorra *wujulu* ~ *wujunu*; Yawijibaya *wujulu*
- 31 ‘up, above’: Wunambal *arrung*; Gambera *arangureiwe*; Ngarinyin and Wurla *arrangu*; Worrorra and Unggumi *garrangi*; Yawijibaya *garrangunyi*

The list of basic items includes just one personal pronoun, the first person singular, which shows probable cognates within all three Worroran subgroups:

- 32 ‘I, me’: Wunambal *ngay(a)*; Gambera *nгааа*; Gunin/Kwini *ngayu* ~ *ngaya*; Wurla *ngeen* ~ *ngiyini*; Munumburru, Wilawila and Wolyamidi *ngeen*; Worrorra *ngayu* Umiida *ngay(u)*; Unggumi *ngayingga*; Winjarumi *ngaya*; Yawijibaya *ngayu*

Finally we list a handful of possibly cognate inflecting verb roots from the basic lexicon, cited in capital letters, following a convention we have adopted elsewhere (McGregor 1990, 2002; Rumsey 2000). For practical reasons, what are given are highly normalised citation forms, which do not necessarily reflect underlying forms of the roots, let alone the range of allomorphic variation they exhibit. Forms from the poorly documented languages are taken directly from Capell and Coate (1984).⁴

- 33 ‘hit, act upon’: Wunambal, Gambera and Gunin/Kwini -BU; Ngarinyin -W₁U; Worrorra -^BWU; Unggumi and Unggarrangu -WU; Umiida -O

3 The *-nya* that occurs on this word and the corresponding Worrorra and Winjarumi ones, and the *-nyi* on the corresponding Yawijibaya one, are feminine (FEM) noun class markers, as discussed in §5.3.

4 Of course, a thorough historical-comparative investigation would compare the paradigms of inflected forms of the verbs, not the notional root forms shown here, or even the abstract underlying forms of the roots.

- 34 ‘do, say’: Wunambal -AMA; Gamberra and Gunin/Kwini -UMA; Ngarinyin -MA; Unggumi -UMA
- 35 ‘fall, downward motion’: Wunambal, Gamberra, and Gunin/Kwini -AWA; Ngarinyin -W₁A; Worrorra -^BWA; Unggumi, Unggarrangu, and Yawijibaya -AWA
- 36 ‘throw’: Wunambal -ABU; Ngarinyin -Y₁IBU; Worrorra -YABU; Unggumi -AYEBU; Unggarrangu and Yawijibaya -AYABU; Umiida -IYABU

Only a small number of the above correspondence sets can be expanded with similar forms in nearby non-Worrorran languages, adding to the case against their being borrowings.⁵ Among the ten preverbs there are only two exceptions: the words for ‘sit’ and ‘stand’ each of which has a very similar form associated with a virtually identical meaning in one neighbouring non-Worrorran language (Bunuba and Kija respectively).⁶ This matter is considered in detail in §7.1, where the full set of corresponding and non-corresponding forms is shown (in Tables 17 and 18), and evidence is presented for both of the apparent exceptions having resulted from borrowing.

Among the nominals, we find similar words for ‘liver’ in Nyulnyulan languages, e.g. *kawir* in Bardi and Warrwa (reflexes of Proto Nyulnyulan **kabir* ‘liver’), although the final rhotic is a glide rather than the tap/trill of most Worrorran languages. The words for ‘breast’ and ‘vegetable food’ are similar to forms found across the entire Kimberley region, indeed across the Australian continent, so it is difficult to argue against borrowing. However, it is possible that the latter pair of borrowings might be traceable back to Proto Worrorran, in which case the lexemes do indeed represent inherited material. In general, however, the words for the above basic meanings from nearby languages are completely different from the Worrorran ones. This is demonstrated in detail for body part terms in §5.1.2, where 38 Worrorran protoforms are reconstructed. It is shown that only three of these forms are at all similar to words in neighbouring non-Worrorran languages, and evidence is presented against any of those similarities being due to the borrowing of these words into individual Worrorran languages.

Correspondence sets such as 16 ‘fingernail’ are especially significant, as the relevant languages are not contiguous, and no similar forms appear to exist in intervening languages such as Ngarinyin and Worrorra. Similarly, in Wunambal and Gunin/Kwini we find the term *yirra* for ‘meat’, which is similar to Unggumi *thirri* ‘meat’ (see further §4.2 concerning lamino-dentals); no intervening language shows a similar form. The preverb *ba(r)da* ‘hit, kill’ may also show a discontinuous distribution: reflexes are found in Gambera, Ngarinyin, Umiida, and Unggarrangu; a plausible reflex also exists in the Unggumi preverb *ba(r)da* ‘bite’. The simplest explanation for these three correspondences is that they represent retentions from Proto Worrorran. Moreover, the simplest hypothesis consistent with the fact that no similar forms are attested in nearby languages is that they represent lexical peculiarities of Proto Worrorran.

5 Of course, these words (or some of them) could have been borrowed exclusively amongst languages within the family, from an innovating Worrorran language. But given that borrowing does not respect genetic boundaries, we would expect to find related forms in nearby languages. Thus borrowing would seem an unlikely explanation for all of the correspondences.

6 Western Nyulnyulan languages including Bardi and Nyulnyul have a preverb *darr* ‘arrive’, which is somewhat similar in meaning.

4 *Phonology*

4.1 Modern Worroran phonologies

As with any attempt to establish genetic relatedness among languages, a prime desideratum here is to reconstruct a phonology of the posited protolanguage from which all the Worroran languages descend. Ideally, any such attempt should be based on fairly full accounts of the phonology of all the languages being compared. These are available only for Worrorra (Clendon 2000a:1–20, 2000b:34–94), Ngarinyin (Rumsey 1982:1–30, Gunin/Kwini (McGregor 1993:14–23) and Wunambal (Carr 2000:30–65). The phonological inventories of Worrorra and Ngarinyin are similar or identical, and distinguish five vowels (Table 4)¹ and five places of articulation for stops and nasals (Table 5). These inventories are fairly typical of Australian languages, although five vowel systems are less common than three vowel systems.

The phonological inventories of Gunin/Kwini (as per McGregor 1993) and Wunambal (as analysed by Carr 2000) are very similar to those of Ngarinyin and Worrorra, including all the same consonants and vowels, plus the high central vowel /i/. Carr (2000:35) also notes the presence of phonetic lamino-dental stops in some Wunambal words for some speakers, but in effect treats them as free variants of /d/.²

Table 4: Vowel phonemes of Ngarinyin and Worrorra

	Front	Back
High	i	u
Mid	e	o
Low	a	

1 In all three of these languages, there is also a phonemic length distinction for at least one of the vowels, the low vowel /a/ (vs /a:/). For Worrorra, Clendon also posits a length distinction for the high vowels /i/ and /u/ (Clendon 2000b:40–43). Length distinctions for each of the vowels /i/, /u/, /e/, /o/ and /a/ are posited for Gunin/Kwini by McGregor (1993:14–16) and for Wunambal by Vászolyi (1972:2). Carr's (2000) analysis of Wunambal vowels differs from Vászolyi's, recognising a length distinction for at most two vowels, /a/ and /i/, and possibly only for /a/.

2 'Initial d is quite fronted or near dental in articulation for some speakers but I can establish no pattern to this articulation' (Carr 2000:32). Compare p. 35 where Carr records a phonetically lamino-dental pronunciation of the initial segment in the word /den/ 'to pile up'.

Table 5: Consonant phonemes of Ngarinyin and Worrorra

	Bilabial	Apico-alveolar	Apico-post-alveolar	Palatal	Velar
Stops	b	d	rd	j	g
Nasals	m	n	rn	ny	ng
Laterals		l	rl	ly	
Tap		rr			
Glides	w		r	y	

All of the segments shown in Tables 4 and 5 are in fact attested in matching vocabulary items across the Worrوران area. The following examples (with the consonants grouped by manner of articulation), are taken from the listed sets of lexical items in Chapter 3 (to which the parenthesised numbers refer), and from McGregor (1992), Clendon *et al.* (2000), and Rumsey's data on Ngarinyin.

Consonants:

Stops	<i>baj</i> 'climb' (#3); <i>debarr</i> 'die' (#6); <i>mardu(g)</i> 'walk' (Ngarinyin, Worrorra, Wunambal); <i>jarri</i> 'dig' (#7); <i>gunyila</i> 'moon' (#22)
Nasals	<i>mardu(g)</i> 'walk' (Ngarinyin, Worrorra, Wunambal); <i>-nunggu</i> 'arm' (#11); <i>barnmarnngarri</i> (Ngarinyin) <i>barnmarnja</i> (Worrorra), <i>barnman</i> (Yawijibaya) 'doctor, magician'; <i>gunyila</i> 'moon' (#22); <i>ranggu ~ rangga</i> 'heart' (#17)
Laterals	<i>marolale</i> (etc.) 'river' (#23); <i>yamarlba</i> (Ngarinyin), <i>yamarlbanya</i> (Worrorra), <i>yamarlba</i> (Wunambal) 'woomera, spear thrower'; <i>balya</i> (Ngarinyin), <i>balyaa</i> (Worrorra), <i>balyama</i> (Unggumi), <i>balya</i> (Wunambal) 'run, bring/take quickly'
Tap	<i>jarri</i> 'dig' (#7)
Glides	<i>wala</i> (etc.) 'cry, weep' (#4); <i>ranggu ~ rangga</i> 'heart' (#17); <i>ngaya</i> (etc.) 'I, me' (#32)

Vowels:

High	<i>jarri</i> 'dig' (#7); <i>-nunggu</i> 'arm' (#11)
Mid	<i>debarr</i> 'die' (#6); <i>ornmal</i> (Ngarinyin), <i>ornmol</i> (Wunambal) 'white ochre'
Low	<i>mardu(g)</i> 'walk' (Ngarinyin, Worrorra, Wunambal)

This is not to say that the phonologies of all Worrوران languages are identical, only that they are likely to be similar and that they show comparable sets of phonetic segments. Indeed, in some of the less well-documented languages or dialects, the phonology almost certainly differs from the pattern shown above. In at least one of them, Unggumi, it may be the case that there are only three, rather than five, contrasting vowels: /i/, /u/ and /a/. Here it is relevant to point out that even in Ngarinyin and Worrorra, many instances of the two mid vowels, /e/ and /o/ (perhaps even the majority by text count) arise at morpheme boundaries through morphophonemic processes from the underlying sequences {a+(y)i} and {a+(w)u} respectively (Rumsey 1982:28–29; Clendon 2000b:85–86). But in those and most other

Worrorran languages, unlike in Unggumi, there are also many instances of contrastive /e/ and /o/ within single morphemes. Examples are:

degulan ‘frilled lizard’, in Wunambal, Ngarinyin and Wurla
beja ‘alright’ in Ngarinyin
joli ‘return’, in Wunambal, Gunin, Ngarinyin, Wurla, Worrorra, and Yawijibaya
jo(ngarri) ‘big’ in Ngarinyin (cf. Worrorra and Ngarinyin *joy* ‘famous’)

By contrast, in Unggumi, among the several hundred recorded words in the language, there are very few examples of the mid vowels /e/ and /o/ within non-bound morphemes, especially within initial stressed syllables such as those shown above. In this environment there are only ten attested examples, five with *e* and five with *o* or *o:*. Moreover, in some of the words which have mid vowels in other Worrorran languages and apparent cognates in Unggumi, the latter have other vowels or sequences in place of the mid vowels. Thus, for the above words the corresponding forms in Unggumi (with the same meanings) are, respectively: *thayigulanya* (with feminine noun class suffix *-nya*), *batha*, *jali* and *jawingarri*. Given the naturalness of the phonological changes /awu/ > /o/ and /ayi/ > /e/, and the presence of both of these phonological processes in the morphophonemics of all Worrorran languages where this has been studied in detail, it seems likely that Unggumi is one of the most conservative of them in this respect. This language harks back to an earlier state of affairs in which there may have been only three phonemic vowels (possibly with length distinctions), as in the neighbouring non-Worrorran languages Bunuba (Rumsey 2000) and Nyikina (Stokes 1982) (although length is marginal in Bunuba, and non-distinctive in Nyikina).

4.2 Lamino-dental correspondences

The first two of the four Unggumi words discussed above exemplify another way in which Unggumi differs from the prevailing Worrorran phonological inventory shown in Table 5, namely through the presence of lamino-dental consonants. These include the stop /th/ (IPA [t̪]), pronounced with the blade of the tongue contacting the upper teeth; a corresponding nasal /nh/ ([ɲ]); and a glide /yh/ ([j̪]), which does not involve any contact between the tongue and the teeth or palate, and is produced with the blade of the tongue more spread than for *y*, and further forward. Of the attested lexemes from Unggumi, 53 have lamino-dental consonants in them. The attested instances of these consonants include: 46 of /th/, nine of /nh/ and seven of /yh/.³ Appendix 1 shows all of these instances in Unggumi, and all known instances of lamino-dental consonants from other Worrorran languages in which they are attested: Wurla, Yawijibaya and Wunambal.

The only lamino-dental consonant that is known to occur in Wurla is /th/. The few hundred words attested in this language include 23 instances of this consonant (each in a different word). The lamino-dentals that are attested from Yawijibaya are *th*, of which there are two instances, and *nh*, of which there is one (words 69, 78 and 1 in Appendix 1); all three of these lexemes have corresponding forms with lamino-dentals in other Worrorran languages as shown in Appendix 1.

3 The reason why the number of occurrences of these lamino-dental consonants exceeds the number of lexemes with these consonants is in them is that some of the lexemes show more than one instance of these consonants. In some cases there are two of them within a single lexeme, e.g. *thithe* ‘defecate’, *bunhtha* ‘bloodwood tree’, DU suffix *-nhtha*. In other cases, as discussed below, there is morphophonemic alternation for a single morpheme between *yh* and *th*.

As noted above, Carr (2000) records instances of lamino-dental stop phones in Wunambal, but does not treat them as distinctive. More extensive evidence on this question is available from Coate (1948), an unpublished English-Wunambal dictionary with approximately 2500 entries.⁴ These include sixteen words with what Coate in his introduction describes as a ‘th sound’, and indicates with a diacritic ´ over *d*. Most of these words occur several times, under different English head words, and Coate is very consistent in transcribing them with lamino-dentals.⁵ Many of them occur in environments where they are clearly in contrastive distribution both with /d/ and with /j/.⁶ Examples are:

atha ‘sit’—cf. *gada* ‘there’, *wajad* ‘boab tree’
thanga ‘let it be’—cf. *dad* ‘stand’, *jarri* ‘dig’
winthal ‘fire’—cf. *yinda* ‘other, different’, *binjan* ‘smoke’
mathen ‘paint, draw’—cf. *gadeji* ‘later on, soon’, *majerrima* ‘two’
wunthala ‘double raft’—cf. *bunda* ‘bloodwood tree’, *gunjala* ‘egg’

Lamino-dental consonants are also found in three of the non-Worrorran languages which border on the Worrorran region: Bunuba, Kija and Miriwoong. Given this areal distribution, one possible explanation for the presence of lamino-dentals in some but not all Worrorran languages would be that they have come in through borrowing of words from these other languages. But this seems unlikely, for several reasons.

First, relatively few words with lamino-dentals in Worrorran languages are found in any of these neighbouring languages, whilst on the other hand a large majority of these words are found in recognisably similar forms in other Worrorran languages (though with other consonants in place of the lamino-dental ones). This commonality is shown by the lexical sets in Appendix 1, which includes all the attested Wunambal, Wurla, Unggumi, and Yawijibaya words with lamino-dental consonants, and the attested words which resemble them in other Worrorran languages. The total number of lexemes in the list which have lamino-dentals in one or more languages is 85. Of these, as shown by Appendix 1, 52 (about 61%) have apparent cognates in other Worrorran languages.

Appendix 2 shows the same list of 85 words that have lamino-dentals in one or more Worrorran languages. In the three columns to the right, semantically corresponding words in Bunuba, Kija and Miriwoong are shown where these can be identified from the available sources.⁷ As can be seen from this tabulation, only 11 of the 85 (about 13%) of the Worrorran

4 Further confirmation of Coate’s observations comes from Love (1941:33), who comments that ‘the interdental *t* is absent [in Worrorra], being found, however, among the Wunambal immediately to the north’.

5 An additional attested word with a lamino-dental stop that appears in Table 6 is *thawuri/tho:ru* ‘beard’. In McGregor (1992) the word is spelled *t(h)awurri*, on the evidence of his own field notes from the mid-1980s. On a trip to the Kimberleys in 2004, working with a Wunambal speaker Louis Karadata, Alan Rumsey recorded this word as *tho:ru*. This is a rare instance where Coate (1948) shows an apico-alveolar *d* where other sources show a lamino-dental *th*.

6 The other linguist who worked on Wunambal (in the early 1970s), Eric Vászolyi (now Vasse), does not note the presence of lamino-dentals in Wunambal in his description of the phonetics and phonology (Vászolyi 1972) either as distinctive segments or as allophones.

7 Bunuba words are from Rumsey (2000), Kija from McGregor (1992) and Miriwoong from Kofod (1976). Kofod’s word list is quite extensive, numbering approximately 1,500 words, but is a Miriwoong-English list only, with no English-Miriwoong finder list. While it was thus impracticable to find all the Miriwoong words in Kofod’s list which correspond semantically to the 85 in Appendix 1, Rumsey did check for all Miriwoong word shapes corresponding to the ones in the table from Worrorran languages. The blank cells in the Miriwoong column of Appendix 2 may thus be taken as evidence of absence of corresponding forms

words with lamino-dentals have corresponding forms with lamino-dentals in any of the other three languages. This contrasts strongly with the figure of 61% for Worrوران languages. Moreover, of the items on the list with lamino-dentals in one or more Worrوران languages, eight ('barramundi', 'black cockatoo', 'call name', 'die', 'grow', 'hang', 'hurt', 'straight') show corresponding forms with other consonants (/d/ or /j/) in the non-Worrوران languages. Thus, while it seems likely that at least some of the words with lamino-dentals have come into these languages through borrowing, there is no evidence for an overall directionality to this diffusion, whereby the Worrوران languages would have acquired the lamino-dental series as a systemic aspect of their phonology by this means.⁸ Rather, the much higher rate of actual shared forms (as opposed to typological similarities alone) among the Worrوران languages instead provides strong evidence for this commonality being due to genetic relatedness.⁹

Further evidence for genetic relatedness is provided by looking at the distribution of Worrوران languages which do and do not have lamino-dentals (see Figure 3). Rather than being confined to the languages at the southern and eastern edges of the Worrوران region which border on Bunuba, Kija and Miriwoong, the languages with lamino-dentals are distributed around the periphery of the Worrوران region on all sides, including Yawijibaya to the west and Wunambal to the north. And for several items of basic vocabulary one finds lamino-dental correspondences between languages on opposite edges of the Worrوران area with apparent cognates in the intervening languages that have other segments in place of the lamino-dentals. Consider, for example, the forms in Table 6.

These correspondences are striking in view of the fact that Unggumi country lies some 200 kilometres away from Wunambal as the crow flies, with Ngarinyin and Worrوران in between, and also well away from Wurla, with Ngarinyin in between; Yawijibaya country lies some 300 kilometres from Wurla with Worrوران and Ngarinyin in between; and Wunambal some 200 from Wurla with Ngarinyin in between. Given this distribution of lamino-dentals within correspondence sets from across the Worrوران area, the spatially marginal distribution of lamino-dental languages within that area, and the fact that these include the distant outlier languages Yawijibaya and Wunambal, which do not border any language with lamino-dentals, it seems very unlikely that these could be the result of relatively recent, independent innovations in peripheral areas of the Worrوران region which somehow failed to spread to the geographically central languages Worrوران and Ngarinyin. A far more likely explanation is that lamino-dentals are an ancient feature of the Worrوران languages, which

with lamino-dentals rather than absence of evidence. In comparing the rates of attested shared forms among Worrوران languages with those between Worrوران and non-Worrوران in Appendix 2, one must also bear in mind the paucity of the available data on most of the Worrوران languages shown in Appendix 1, especially the ones that are known to have had lamino-dentals.

- 8 It is of course possible that some of the Miriwoong, Kija and Bunuba words with lamino-dentals could have been borrowed from Worrوران lamino-dental languages, and that words which show lamino-dentals in some Worrوران languages but not others could have been borrowed from the latter into neighbouring non-Worrوران languages, accounting for some of the lamino-dental to non-lamino-dental correspondences mentioned above. A likely example of the latter kind is *dabarra*, the Bunuba Gun.gunma (mother-in-law style) form for 'die', which is similar to the word form *debarr* from the neighbouring Ngarinyin and Wurla languages (among other Worrوران languages as shown in Appendix 2). (The contrasting Jadajada or everyday word for 'die' in Bunuba is *duluga*.) As shown by Dixon (1990), borrowing from neighbouring languages is one of the usual sources of replacement vocabulary for Australian mother-in-law registers.
- 9 The greater weight we are giving here to systematic substantive correspondences over typological similarities alone is in accord with the widely accepted principle of historical-comparative linguistics summarised by Dixon (2002:46) as follows: 'if two languages share typological similarities, these can most definitely NOT be taken as indicators of genetic relationship. The only type of similarity that provides a sure criterion for genetic linking is cognate sets, involving systematic correspondences of sound and meaning'.

were formerly present in all of them, but have been lost from some of the languages including Worrorra, Ngarinyin and Gunin/Kwini.¹⁰ This surmise is further supported by the fact that the one lamino-dental language for which we have an appreciable historical depth of documentation, Wunambal,¹¹ was apparently losing its lamino-dentals over that time rather than developing new ones. This is evident from comparing our earlier comments concerning Wunambal lamino-dentals as recorded in Coate (1948), with the quote from Carr (2000) in footnote 2 of this chapter.

Table 6: Some key lamino-dental correspondences across the Worrوران region

	Unggumi	Worrorra	Ngarinyin	Wunambal
‘beard’	<i>thawaru</i>	<i>dawuruma</i>	<i>dawuru</i>	<i>thawuri/tho:ru</i>
‘fire/firewood’	<i>winthalingga</i>	<i>wiyanu</i>	<i>winjangun</i>	<i>winthal</i>
‘one (W class)’	<i>wuntharri</i>	<i>jarrungu</i> (/øN-yarrungu/) ^a	<i>werri</i> (/wu-yarri/)	<i>wintharri</i>
‘sit’	<i>atha</i>	<i>aja</i>	<i>ada</i>	<i>atha</i>

	Unggumi	Worrorra	Ngarinyin	Wurla
‘grow’	<i>thalja</i>	<i>dalja</i>	<i>dalja</i>	<i>thalja</i>

	Yawijibaya	Wororra	Ngarinyin	Wurla
‘sit’	<i>atha</i>	<i>aja</i>	<i>ada</i>	<i>atha</i>

	Wunambal	Ngarinyin	Wurla
‘beard’	<i>thawuri/thawuru</i>	<i>dawuru</i>	<i>thawulunggurr</i>
‘sit’	<i>atha</i>	<i>ada</i>	<i>atha</i>

^a For explanation of this underlying form and its realisation as *jarrungu*, see footnote 20 and the references there to Clendon (2000b).

Returning now to the question of mid vowels in Worrوران languages, if their scarcity (or perhaps even non-distinctive status) in Unggumi represents the earlier state of affairs in other Worrوران languages, then we should consider the possibility that the presence or absence of phonemic mid vowels is systematically related to the presence or absence of phonologically

10 For the less well-documented Worrوران languages such as Gambera, Unggarrangu and Winjarumu, it is impossible to say whether they had lamino-dentals or not. For Wunambal the much better available evidence suggests that the language has been changing over the past sixty years, such that lamino-dentals have gone from being a relatively well-established part of the phonology—albeit with a low functional load—to a matter of free variation among the surviving speakers of the language (as noted in the previous quote from Carr 2000).

11 Coate’s (1948) and Capell’s (1941) writings on Wunambal were based on fieldwork which began in the 1930s, Vászolyi’s (1976a, 1976b) in the early 1970s and Carr’s (2000) in the 1990s. The Wunambal data in Appendix 1 is also based in part on work done by Rumsey with a Wunambal speaker in 2004.

distinct lamino-dentals. Such a relationship is suggested by the existence of apparent cognate sets where a lamino-dental in Unggumi corresponds to an apical or lamino-palatal in one or more other languages which is preceded or followed by a mid vowel. Examples from among the items in Appendix 1 are:

Unggumi <i>batha</i> ‘all right’;	Ngarinyin <i>beja</i> ‘already, all right’
Unggumi <i>-lathungga</i> ‘backbone’;	Yawijibaya <i>-ledu</i> ‘backbone’
Unggumi <i>thal(ba)</i> ‘burst out’;	Ngarinyin and Wurla <i>dol</i> ‘burst out’; Umiida <i>do:l</i> ‘burst out’
Unggumi <i>bayhal</i> ‘Come here!’;	Yawijibaya <i>beyagal</i> ‘Come here!’
Unggumi <i>thabad</i> ‘die’;	Wunambal, Gambera, Gunin, Ngarinyin and Worrorra ¹² <i>debarr</i>
Unggumi <i>ga:yhe</i> ‘dog’;	Wunambal <i>gaia</i> ‘dog’
Unggumi <i>thayikulanya</i> ‘frilled lizard’;	Wunambal and Ngarinyin <i>degulan</i> ‘frilled lizard’
Unggumi <i>thali:</i> ‘go hunting’;	Wunambal <i>yele</i> ‘go hunting’
Unggumi <i>yhale:ma</i> ‘his mouth’;	Yawijibaya <i>-yelem/-delem</i> ‘mouth’
Unggumi <i>thawurramale</i> ‘barramundi’;	Wurla <i>dewul</i> ‘barramundi’

Further examples are presented and discussed below. Given that the lamino-dentals are produced with a flattened tongue at or near its maximally raised position, there is good reason to expect that a preceding or following phonemic low vowel might be phonetically raised to mid position, especially in a language without distinctive mid vowels, where it could still count as an allophone of /a/.¹³ If the conditioning lamino-dentals from such a language were eventually lost, it could give rise to a phonemic contrast of mid vs. low vowels. This could well have been one of the pathways by which the Worrorran languages developed this contrast, in addition the /a(w)u/ > /o/ and /a(y)i/ > /e/ route discussed previously. And note that the ‘frilled lizard’ example above shows evidence of both at once.

We now proceed to a more systematic attempt to reconstruct the protoforms of Worrorran words with lamino-dental consonants in them, and trace their development within the attested daughter languages. For this purpose it will be useful to take as our presumed cognate sets only those forms which are widely attested throughout the Worrorran region. This has two methodological advantages. First, it lowers the chance that any of correspondences in the set are due to lexical borrowing. Second, it assures that, for any of the posited protoforms, there will be a greater number of presumed reflexes, hence a richer body of data on which to base our inferences concerning the likely shape of the protoform. To this end, we have gone through the 85 correspondence sets in Appendix 1 and eliminated those that are not attested in all three of the subgroups shown in Figure 2. The resulting pared-down list of 24 lexical items is shown in Appendix 3. After each gloss we have provided a presumed protoform (or

12 In Worrorra, the form *debarr* is used only when the subject is singular. For plural subjects, the form is *debadi* (Clendon *et al.* 2000:17).

13 Conditioning of this kind is attested, for example, in Martuthunira, a language of the Pilbara region which has three distinctive lamino-dental consonants (/th/, /nh/ and /lh/) and a three-vowel system without distinctive mid vowels. Dench (1995:29) says ‘The low vowel /a/ has the widest range of allophones. Following a lamino-dental, and to a lesser extent a lamino-palatal, consonant the vowel is well fronted and raised, approaching cardinal [ɪ].’ In Gooniyandi the situation is somewhat similar: in the environment of lamino-dentals the low vowel allophone is raised and centralised to about [e] (McGregor 1990:68).

in a few cases, more speculative possible alternative ones). In arriving at these hypothetical forms we have operated on two assumptions that have been argued for above.

The first assumption, based on the areal distribution of the lamino-dentals and their documented history within Wunambal, is that they were present in Proto Worrوران; and hence that where we find the correspondences *t-th*, *y-yh* and *n-nh*, we may assume that the lamino-dentals were in the original forms. For example:

* <i>atha</i> ‘sit’	<i>atha</i> Wunambal, Wurla, Unggumi <i>ada</i> Gunin, Ngarinyin <i>aja</i> Worrورا
* <i>thiba(g)</i> ‘spit’	<i>thibag</i> Wurla <i>jiba</i> Ngarinyin <i>jibaa</i> Worrورا
* <i>bunhtha</i> ‘bloodwood tree’	<i>bunhtha</i> Unggumi <i>bunda</i> Ngarinyin
* <i>wayha</i> ‘skin’	<i>waya</i> Wunambal, Ngarinyin, Wurla <i>wayaa</i> Worrورا <i>wayhai</i> Unggumi
* <i>nguyhul</i> ‘hit, whip’	<i>nguyhul</i> Unggumi <i>nguyul</i> Wunambal, Ngarinyin, Worrورا, Yawijibaya

The second assumption is that the protolanguage had only three distinctive vowels.¹⁴ This assumption is further supported by the data in Appendix 3, since, of the eleven items which show a mid vowel in any of the 24 correspondence sets (items 1, 6, 8, 10, 13, 14, 15, 16, 17, 23 and 24), none of them shows a corresponding mid vowel in *all* the attested forms. And among the 28 instances of mid vowels that are found in those sets, it is notable that: (i) in 26 of them (the exceptions being Wunambal *ngoiil* in set 13 and Yawijibaya *wothiya* in set 24), the mid vowel corresponds to an *a* in at least one other Worrوران language; and (ii) in all but four of them—including the two exceptions to (i)—the mid vowel is adjacent to a consonant which is reflected as a lamino-dental in at least one of the other members of the set. The four exceptions to (ii) are: in set 14, the second vowel in Wunambal *yele* and Ngarinyin *yalej* ‘hunt’; and in set 15, the second vowel in Unggumi *y(h)ale:ma* and Yawijibaya *yelem ~ delem* ‘mouth’. In none of these four cases is it likely that the *e* is inherited from a Proto Worrوران form with an *e*, because all four of them correspond to an *a* in the matching Worrورا words *yala* ‘hunt’ and *yalam* ‘mouth’. Since Worrورا has distinctive mid vowels, if these were found in the protoforms of these words, then one would expect to find them in their Worrورا reflexes as well. The same is true of the Ngarinyin word for ‘hunt’ and the Wunambal word for ‘mouth’, both of which instead have an *a* in this position (see Appendix 3, items 14 and 15). Thus, it seems likely that the vowels in both syllables of these two (nearly homophonous) words were originally *a* rather than *e*. Indeed, it is still not at all certain that either Unggumi or Yawijibaya had phonologically distinct mid vowels, so the *e* that has been recorded in the word for ‘mouth’ in these languages (as in other words in them) could be an

14 We leave aside the question here of whether any of those three vowels had a length distinction.

allophone of /a/. The phonological conditioning for this would remain unclear, as would the reason why these languages have a phonemic mid vowel in this word even if they do have distinctive mid vowels. What does seem clear given the Worrorra and Wunambal evidence is that the Proto Worrوران form of the word must have had an *a* in both syllables.

Be that as it may, the main point is that eighteen of the 22 instances of mid vowels among the forms in Appendix 3 can be accounted for by the historical scenario proposed above, whereby they were originally allophones of /a/ in the environment of lamino-dentals and then became distinctive mid vowels following the loss of the lamino-dental as a conditioning environment. For the other four instances of mid vowels, there is good reason to believe that they have arisen relatively recently within the prehistory of particular languages rather than being inherited forms.

It should be noted that although it is possible to account for almost every instance of mid vowels in Appendix 3 as having arisen from /*a/ in the environment of a lamino-dental, it is by no means the case that every instance of /*a/ in this environment became a mid vowel. Indeed, if we look at word-initial instances of **tha*, we find only one example of the *a* becoming a mid vowel, namely item number 8, ‘die’. (Item 10, ‘frilled lizard’ is a case of *ayi* becoming *e*, which happens with or without a preceding lamino-dental). Items 1, 4, 11 and 22 all show completely regular correspondences between **tha* and **da*. What distinguishes item 8 from items 1, 4, 11 and 22 in this respect remains an open question. So also does the original form behind sets 12 and 14, which show apparent correspondences between word-initial *y* and *th*.¹⁵

Note also that not every instance of **th* in non-lamino-dental languages gives rise to *d*. In items 5, 9, 16, 19 and 23 it is sometimes or always reflected as *j*. It is notable that this does not happen always and only before *i* (as posited in Dixon 1970; but cf. Dixon 2002), as shown by comparing those items with each other and with 7 and 18. Some of these developments seem quite language specific. For example in the two instances of intervocalic **th* on the list, items 19 and 23, it is reflected in Worrorra as *j* but in Ngarinyin as *d* or *rd*. Given examples of this kind, and the relative paucity of comparative data for any other sequences involving lamino-dentals besides word-initial **tha*, it is unlikely that anything like a complete account of their undoubtedly complex history in Worrوران languages can ever be developed. But given the spatial distribution of corresponding lamino-dental forms within the Worrوران area, and the almost completely regular relationship between lamino-dentals and mid vowels discussed above,¹⁶ it seems highly likely that the Worrوران languages are genetically

15 One possibility here is that the original forms began with *yh*, and that this strengthened to *th* in Unggumi. Though the evidence is scanty, this could possibly be accounted for by a restriction against word-initial *yh* in Unggumi. The only attested apparent instances of this in Unggumi are *yhalema* ‘his mouth’ and *yherre* ‘one (masculine)’, but these are morphologically complex forms, which as we shall see below may actually derive from /*yi-yhalema*/ and /*yi-yharri*/.

16 Note that we are not claiming that *all* instances of distinctive mid vowels in Worrوران languages arose in the way that we have posited here for protoenvironments involving lamino-dentals. On the contrary, since not all of them occur in environments of that kind it is evident that, if mid vowels were indeed not distinctive in Proto Worrوران, some of the ones we find in the daughter languages must have arisen in other ways, such as the /a(w)u/ > /o/ and /a(y)i/ > /e/ routes discussed above. Regarding the Worrorra case, Mark Clendon (personal communication, 4 August 2006) has remarked ‘it seems to me that inter- and intra-morphemic cluster assimilations alone can motivate Worora mid vowels. I think that this combined with the wide allophonic ranges of short /a/ and /u/ (see Clendon 2000b:40–41) might be enough to generate mid vowels’. Note that Clendon here in effect agrees with us that mid vowels in Worrorra have arisen through phonological conditioning rather than being attributable to the earliest reconstructable stage of the language. He also accepts our arguments that at an early stage Worrorra had lamino-dental consonants (ibid.). He disagrees with us only about whether the loss of the latter figured in the rise of the former in the way that we

related, and that the ancestral language from which they developed had lamino-dental consonants, and three vowels /i/, /u/, and /a/.

4.3 Morphophonemic processes involving lamino-dentals

If lamino-dentals are an archaic feature of the Worrوران languages, then given the morphological complexity of these languages, the associated morphophonemics (see e.g. Clendon 2000a:8–20, 2000b:70–94; Rumsey 1982:16–30), and the general tendency for morphophonemic processes to show traces of a language’s earlier phonology, we might expect to find evidence of former lamino-dentals in the morphophonemics of non-lamino-dental Worrوران languages. And this is indeed what we find. In particular, a number of bound morphemes whose corresponding forms in most of the Worrوران languages begin with /y/ have corresponding forms in Unggumi which begin with /yh/, and the evidence suggests that their Proto Worrوران forms did too. For the reader to be able to understand this evidence, it is necessary first to present some background details about the morphophonemics of the Worrوران languages.

Many of the consonant-initial bound morphemes in these languages, especially roots, suffixes and postpositions, have initial segments which alternate between a continuant and a corresponding stop depending on what sound they follow. For example, in Ngarinyin and Unggumi the verb root -WA ‘fall, downward motion’ is realised as *wa* when following a vowel, as shown by the following examples:

Ngarinyin:	Unggumi: ¹⁷
<i>ngarrwa ngawani</i>	<i>bugula ngawana</i>
<i>ngarrwa nga-WA-ni</i>	<i>bugula nga-WA-na</i>
fall 1sg-WA-PST	fall 1sg-WA-PST
‘I fell.’	‘I fell.’

But when -WA follows a nasal consonant, the initial segment is realised as *b*:

Ngarinyin:	Unggumi:
<i>ngarrwa nyinbani</i>	<i>bugula nyimbana</i>
<i>ngarrwa nyin-WA-ni</i>	<i>bugula nyin(>m)-WA-na</i>
fall 2sg-WA-PST	fall 2sg-WA-PST
‘You fell.’	‘You fell.’

The same process of consonant ‘strengthening’ applies in Worrورا, for example, to the root -YI ‘do’:

gunjingeerri
kuN-ø-YI-ng-eerri
 VCOMP-3-do-PST-CONT
 ‘He/she was doing it.’ (Clendon 2000b:178)

have argued for here. In the absence of arguments about how cluster assimilations could have given rise to the specific instances of Worrورا mid vowels that we discuss here in connection with lamino-dentals, the matter remains moot.

17 This and other Unggumi data, unless otherwise attributed, comes from Rumsey (1984).

In Unggumi the corresponding form (minus the continuative aspect marker) is *gunthinga* ‘he/she did it’. While Unggumi verb morphology has not been analysed exhaustively enough to allow us to parse this form with certainty, it is clear the *th* in it corresponds to the *j* in the Worrorra form, and that this is the initial segment of the verb root which corresponds to Worrorra -YI (the latter being realised in this environment as *-ji-* as exemplified above). Another pair supporting this inference is Worrorra *guba(rr>ø jungu* ‘they did it’ (Clendon 2000a:128) and Unggumi *gubathinga* ‘they did it’.

In Worrorra when the underlying form of the morpheme preceding -YI ‘do’ ends in /a/, the resulting sequence {a+yi} yields /e/, as in *gungeng*, underlyingly *kuN-nga-YI-ng* (VCOMP-1sg-do-PST) ‘I did it’.

In Unggumi, in keeping with its paucity of mid vowels, the corresponding form to the Worrorra one above is *gungang* ‘I did it’. Here the root has apparently disappeared altogether from the surface form. But given that this root takes the form *-thi-* in ‘hardening’ environments in Unggumi, on the model of the parallel alternations /w/ ~ /b/ and /y/ ~ /j/ (as exemplified above from Ngarinyin and Worrorra), the most appropriate underlying form to posit for this root in Unggumi is -YHI. We have not come across any inflected forms of this verb where the root is realised phonemically as /yhi/ (nor, for that matter, any Worrorra forms where -YI is realised as /yi/),¹⁸ but there are other Unggumi roots beginning with {yh} where it is indeed realised as a lamino-dental glide.

One example is the root for ‘go’ and ‘come’ (the two being distinguished by presence or absence of a ‘motion-toward-speaker’ suffix *-(a)l*). In Worrorra, the underlying form of this root is {ya} (Clendon 2000a:122–124 *et passim*, 2000b:153; Clendon *et al.* 2000:75). In Unggumi the underlying form is probably {yha}, which is realised as such, in for instance the imperative forms (with imperative prefix *ba-*) *bayha* ‘go!’ and *bayhal* ‘come here!’. These forms are shown in Appendix 1 (item 15), along with corresponding forms from six other Worrوران languages, suggesting that the root -YA ~ -YHA is an old inherited one within this group of languages.¹⁹

Other *yh*-initial roots are found among the set of prefixing body part terms and adjectives in Unggumi (cf. §5.1). These include *-yhalema* ‘mouth’ and *-yharri* ‘one’. Both of these roots are attested in ‘strengthened’ form, with root initial /th/, following certain prefixes which, like their Worrorra counterparts (Clendon 2000b:164, 193–195) apparently end in /n/, or an assimilating underlying nasal {N}. The attested examples are: *nyinthalema* ‘her mouth’, *nginthelema* ‘your mouth’, and *wintharri* ‘one (W class)’ (cf. the corresponding Worrorra

18 Mark Clendon (personal communication 4 August, 2006) reports that he has not come across any instances of this verb root being overtly realised as *-yi* either, but that he would not rule out the possibility of finding it in a frozen form, as he has for the *y-* initial form of the root *ya* ‘go’.

19 In Ngarinyin the underlying form posited for this root by Rumsey (1982:81 *et passim*) is *-a*. While this accounts for most of its occurring forms in that language, there are some exceptions that have to be treated as irregularities under this analysis. As noted by Rumsey (1982:84), this root when following /rr/ yields not the expected form /rra/, but /ya/, for example:

<i>buya</i>	<i>nyaya</i>
/burr-a/	/nyarr-a/
3pl-go	1pl.excl-go
‘They go.’	‘We go.’

In Rumsey (1982:84) this was handled by in effect treating the relevant prefixes as having root-specific allomorphs ending in *y* instead of *rr*. An alternative treatment, which would have accorded more closely with the comparative evidence from other Worrوران languages, would have been to posit /ya/ as the underlying form of the root, which loses its *y* when following vowels and retains it when following *rr*, displacing the *rr* in line with an overall restriction against the cluster *-rry-* (cf. Rumsey 1982:15).

forms *nyinjalama*, *ngunjalema* and *jarrungu* respectively).²⁰ The equivalent third person singular masculine forms of these words are *yhalema* ‘his tongue’, and *yherre* ‘one (masculine)’. Though these forms clearly show the initial *yh* of these roots in its unstrengthened underlying version, they are somewhat unexpected, because the third person singular masculine prefix for all other attested prefixing body part and adjective roots in Unggumi is *yi-* (or *yV-*), as shown by the following examples:

<i>ngarnangga</i> ‘my finger/hand’	<i>ngaabama</i> ‘my head’
<i>yirnangga</i> ‘his finger/hand’	<i>ngunggubama</i> ‘your (sg) head’
<i>nyirnangga</i> ‘our (excl) finger/hand’	<i>nyunggubama</i> ‘her head’
<i>nyidanarngga</i> ‘your (pl) finger/hand’	
<i>arrarnangga</i> ‘their finger/hand’	
<i>ngambul</i> ‘my eye’	<i>ngarlathungga</i> ‘my backbone’
<i>yumbul</i> ‘his eye’	<i>yirlathungga</i> ‘his backbone’
<i>nyumbul</i> ‘her eye’	<i>nyirlathunga</i> ‘her backbone’
<i>yinarriya</i> ‘his bone’	<i>yilyamarriya</i> ‘bad one (MAS)’
<i>nyinarriya</i> ‘her bone’	<i>nyilyamarrinya</i> ‘bad one (FEM)’
	<i>malyamarrima</i> ‘bad one (M class)’
<i>yiridjil</i> ‘his shin’	<i>wulyamarr(wa)</i> ‘bad one (W class)’
<i>nyiridjil</i> ‘her shin’	<i>alyamarrwa</i> ‘bad ones’

The unexpected forms *yhalema* ‘his tongue’, and *yherre* ‘one (MAS)’ (cf. Worrorra *iyalama* and *iyarrungu*) as realisations of presumably underlying $\{yi-yhalema\}$ and $\{yi-yharri\}$ are perhaps due to phonological restrictions forbidding sequences $/yVyhV/$ (which are not attested in any of the available data on Unggumi or any other Worroran lamino-dental language), and associated phonological processes which in effect convert such sequences to a single syllable $/yhV/$. In any case it is clear both from their realisation as *yh* in this environment and from their realisation in strengthening environments with root-initial *th*, that these roots have underlying forms beginning in $\{yh\}$, and that they are cognates of the forms shown on the chart such as, respectively: Worrorra *-yalam*, Yawijibaya *yelem* ~ *delem* ‘mouth’; and Wunambal *-yarra*, Ngarinyin *-yirri*, and Worrorra *-yarrungu* ‘one’. Especially telling in this connection is the apparent survival in Wunambal (at least into the 1930s) of an archaic W class form *wuntharri* ‘one’, which preserves the lamino-dental articulation of the root-initial consonant even after its corresponding continuant-initial form was being pronounced with a *y* (*a-yarra*, etc.).

Another body part root that probably began with *yh* in Proto Worroran was the one for ‘neck’ (item 54 in Appendix 1). In Unggumi this word happens to be attested only in its strengthened form, in two words: *nganthurruma* ‘my neck’ and *nyundurruma* ‘her neck’. However this clearly corresponds with the forms in Ngarinyin *-yirru*, Wurla *-yurru*, Worrorra *-yurrub*, and Yawijibaya *-yurrub* ~ *-jurrub*.

²⁰ These Worrorra forms were provided by Mark Clendon (personal communication, 4 August, 2006). The underlying form of the word *jarrungu* in Clendon’s analysis is $\{\emptyset N-yarrungu\}$, with an underlying nasal-final prefix which strengthens the following *y* to *j* and then disappears, by a regular phonological process in Worrorra (Clendon 2000b:74–75, 336).

In the discussion of morphophonemics so far we have been considering apparently cognate forms which have a *y_h* in a least one attested Worroran language, on the basis of which it is possible to posit a protoform which also had one. The hypothesis that Proto Worroran had this sound, and that it alternated with *th*, is also supported by a general feature of the morphophonemics of at least two of the non-lamino-dental Worroran languages. We refer to the existence in Ngarinyin and Worrorra of two morphophonemically distinct laminal glides, one of which alternates with /j/ and the other with /d/. Examples are:

In Ngarinyin:

{*y₁*}

jirriyu

jirri-y₁u

that.one-ALL

‘to that one’

nyanganju

nyangan-y₁u

you-ALL

‘to you’

ngarrwa ngendengga

ngarrwa nga-y₁inde-ngga

fall 1sg-do.clumsily-PST

‘I staggered.’

ngarrwa nyinjindengga

ngarrwa nyin-y₁inde-ngga

fall 2sg-do.clumsily-PST

‘You staggered.’

{*y₂*}

jirriyali

jirri-y₂ali

that one-indeed

‘that one indeed’

nyangandali

nyangan-y₂ali

you-indeed

‘you indeed’

nge

nga-y₂i

1sg-be

‘I am’

nyindi

nyin-y₂i

2sg-be

‘You are.’

For other examples see Rumsey (1982:18).

In Worrorra:²¹

{*y₁*}

ngunjole

ngun-y₁ole

2sg-travel

‘You travel.’

21 The *y₁* example comes from Clendon (2000b:79), and the *y₂* examples from Clendon (2000b:75); the orthography has been altered for consistency with the one used in the present work. We wish to thank Mark Clendon (personal communication 4 August, 2006) for alerting us to the existence of distinct *y-d* vs *y-j* alternations—or what Clendon (2000b:75) calls ‘strange hardening’—in Worrorra.

{y₂}

anjoldirdaka
anjol-y₂irdaka
 sky-from
 ‘out of the sky’

bungajindaka
bungajin-y₂aka
 we.should.tell.him/her-EMP
 ‘We really should tell him/her.’

From a synchronic viewpoint, patterning of this kind—*y* in some morphemes alternating with *j* and in others with *d*—appears to be an inscrutable lexically-specific irregularity. But it is precisely its apparent irregularity that makes patterning of this kind highly revealing from a historical-comparative viewpoint, especially when it is found in two or more languages, and is consistent with other reconstructable aspects of the protolanguages from which they descend. In this case the patterning makes sense, and provides strong evidence for genetic relatedness, if we assume that:

- (1) Proto Worrوران had a **y* which alternated with **j* and a **yh* which alternated with **th* (as attested in Unggumi);
- (2) At least in Ngarinyin and Worrورا, **yh* was replaced by (i.e., merged phonologically with) *y* and the relevant instances of **th* were replaced by *d*²² (as were most other instances of **th* in those languages, as shown in §4.2);

22 Mark Clendon (personal communication 4 August 2006) has questioned this proposed chronology. He points out the Unggumi verb root *yhi~thi* ‘say, do’ (and the matching Worrورا one *yi~ji*) apparently correspond to ‘a root /ju ~ ji/, with the same semantics, widely used across western and northern Australia’. He adds that ‘this might suggest that Unggumi is innovative in this respect, deriving /yhi ~ thi/ from an earlier and very widespread form /yi ~ ji/. In similar vein the Unggumi root YHA ‘go’ must surely be derived from an earlier shape /ya/ ‘go’ common across most of Australia, and have become dentalised in Unggumi subsequently. Implicit in this reasoning is the conclusion that [lamino-dentals] in Worrوران languages are innovative.’ We agree that the similarity in form and meaning between Unggumi *yha* and the common Australian root *ya* is highly suggestive, as is that between Unggumi /yhi ~ thi/ and the /ju ~ ji/ found elsewhere. But even if we accept that they are in some sense ‘the same’ roots (pre)historically, this does not negate our claim that lamino-dentals were present in Proto Worrوران, and that the form of the root for ‘go’ in Proto Worrوران was **yha*. (We leave aside for now the question of Unggumi *yhi~thi* and Worrورا *yi~ji* as there is insufficient evidence regarding its status vis à vis Proto Worrوران). If we are right about this, then it is possible that the Worrوران form of the root, with initial *yh*, may have once been more widespread. The possibility seems at least worth looking into in other, non-Worrوران languages, on the basis, for example, of morphophonemic oddities such as the *y₁/y₂* differentiation that has been found in Ngarinyin and Worrورا. Alternatively, it may be the case, as Clendon says, that ‘Worrوران languages are innovative’ in having lamino-dentals, or at least in having three of them. But whereas Clendon would apparently see that innovation as a recent, independent development within particular Worrوران languages, we would see it as one that goes back at least as far as Proto Worrوران. This is supported by the evidence discussed in §4.2 regarding the distribution of corresponding lexemes with lamino-dentals in Worrوران languages, and the comparison with the neighbouring non-Worrوران ones.

- (3) Following (2), the instances of *y* which derived historically from **y* (the ones we label *y*₁) have continued to alternate with *j*, while those which derived from **yh* (the ones we label *y*₂), now alternate with *d*.²³

4.4 Summary: Proto Worrوران phonology

To summarise the discussion of this chapter, we have suggested that the phonology of Proto Worrوران was somewhat different from that of the typical modern Worrوران language in terms of the number of contrasting vowel phonemes (three rather than five, though the status of vowel length is uncertain) and the existence of two series of laminal consonants, as shown in Tables 7 and 8 respectively. This allows us to account for a number of correspondences in the modern languages in an economical way, by means of a few historical-phonological rules. Admittedly we cannot at this stage account for all of the correspondences in the modern languages; but we believe that we have accounted for enough of the most significant and unlikely-seeming correspondences to be confident in the relatedness of the Worrوران languages. Further intensive research on the historical phonology of Worrوران is necessary.

Table 7: Vowel phonemes of Proto Worrوران

	Front	Back
High	*i	*u
Low	*a	

Table 8: Consonant phonemes of Proto Worrوران

	Bilabial	Apico-alveolar	Apico-post-alveolar	Lamino-Dental	Lamino-Palatal	Velar
Stops	*b	*d	*rd	*th	*j	*g
Nasals	*m	*n	*rn	*nh	*ny	*ng
Laterals		*l	*rl		*ly	
Tap		*rr				
Glides	*w	*r		*yh	*y	

²³ It is interesting to note in this connection that when Rumsey (1982) first posited the *y*₁ vs. *y*₂ distinction, he had no idea that lamino-dentals were to be found in any Worrوران languages, nor of the existence of lamino-dental glides in any language, and that he posited *y*₂ purely as an abstract morphophonemic unit, without the knowledge that it might be of interest from a historical-comparative viewpoint.

5 *Nominal morphology*

Unlike the majority of Australian languages, Worroran languages distinguish grammatically between adjectives and nouns. Nouns are assigned inherent gender, and each noun typically has a unique gender, which is usually not marked on the word itself, but rather is determined by agreement; Worroran genders thus satisfy the fundamental criterion for genders (Corbett 1991:145ff). In Worrorra, Unggumi, and other Western Worroran languages, however, at least some nouns also take class marking prefixes and/or suffixes. This noun marking system is not productive in Worrorra (Clendon 2000b:104), and perhaps not in other Western languages. Adjectives, by contrast, are not assigned a unique gender, but take gender agreement prefixes or suffixes (depending on the language and the word).

In general, nominal morphology is relatively simple: the typical language possesses a set of derivational suffixes, and a number of bound postpositions that mark case relations and number. In all Worroran languages a subset of nominals, mainly designating parts of the body, take pronominal prefixes cross-referencing the possessor.

In the rest of this chapter we focus on three areas of the grammar of nouns and noun phrases which we believe offer evidence that is particularly valuable for establishing genetic relatedness: the morphosyntax of nominal prefixation and body part possession (§5.1); nominal postpositions and enclitics (§5.2); and the morphology of noun class marking (§5.3).

5.1 Nominal prefixation and body part possession

We begin with pronominal prefixes which attach to some—never all—body part nouns, and usually a few other nouns and adjectives. The prefixes are identical in form regardless of whether they occur on nouns or adjectives, but they have a rather different function on the two lexical categories. When occurring on adjectives these prefixes refer to or specify the gender/(number) of the person or thing that the adjective pertains to. For example, in Ngarinyin the word for ‘old’ occurs only in prefixed form:

<i>ari</i>	<i>alwa</i>	<i>wongay</i>	<i>nyalwa</i>	<i>(ngin)</i>	<i>ngiyalwa</i>
<i>ari</i>	<i>a-alwa</i>	<i>wongay</i>	<i>nya-alwa</i>	<i>(ngin)</i>	<i>ngiya-alwa</i>
man	3sg.MAS-old	woman	3sg.FEM-old	(I)	1sg-old
‘old man’		‘old woman’		‘I, who am old’	

When occurring on nouns, the prefixes refer to, or specify the gender and/or number of, the possessor of the thing referred to by the prefixed noun, or the whole of which it is a part. This structure has already been encountered in the terms for ‘arm’, ‘bone’, ‘eye’, etc., which are cited in the preceding chapter. In Ngarinyin, for instance, we find *ambul* ‘his eye’, *nyambul* ‘her eye’, *ngiyambul* ‘my eye’, *nyungambul* ‘your eye’, *wumbul* ‘it’s (e.g. a peaceful dove’s) eye’, *mumbul*, ‘it’s (e.g. a red tailed black cockatoo’s) eye’, and so forth. Other examples showing the morphemic composition are:

<i>ngiyarnamala</i>	<i>arnamala</i>
<i>ngiya-rnamala</i>	<i>a-rnamala</i>
1sg-hand	3sg.MAS-hand
‘my hand’	‘his hand’
<i>ngiyornarr</i>	<i>nyornarr</i>
<i>ngiya-wurnarr</i>	<i>nya-wurnarr</i>
1sg-bone	3sg.FEM-bone
‘my bone’	‘her bone’

Further examples from Unggumi and Worrorra may be found in §4.3.

Not all body part terms occur in this kind of possessive prefixing construction. In all known Worroran languages, some body part terms show possession in other ways, with the body part term occurring in unprefixing form. Examples from Ngarinyin are:

<i>ari-nangga ranggu</i>	<i>nginingga ranggu</i>
man-GEN heart	my heart
‘a/the man’s heart’	‘my heart’
<i>yali-nangga garrin</i>	<i>nyanganangga garrin</i>
kangaroo-GEN liver	your (sg) liver
‘a/the kangaroo’s liver’	‘your liver’

In the rest of this section we will not be dealing with non-prefixal possessive constructions such as those immediately above, or with the use of pronominal prefixes on adjectives. Rather, we will be focusing exclusively on the body part nouns and discussing them from a comparative perspective with respect to three different features: (1) the form of the prefixes; (2) the forms of the body part lexemes; and (3) the question of which body part lexemes take prefixes and which do not.

5.1.1 Forms of the pronominal prefixes

Table 9 shows the forms of the prefixes used with nouns in three languages.¹ Morphophonemic forms and allomorphic alternations are represented as in Rumsey (1982), Clendon (2000a), and McGregor (1993), respectively, with two changes to the morphophonemic forms from Rumsey (1982) in the light of subsequent revision (as shown in the current Pacific Linguistics electronic edition of Rumsey 1982).

1 The third person singular forms have been arranged in this table according to corresponding forms, and for simplicity labelled with letters. The classes marked by these forms cannot be presumed to correspond exactly across the languages, since languages with differing numbers of classes will necessarily differ in how they partition the nominal lexicon.

Table 9: Pronominal prefixes to nouns in three languages

	Ngarinyin	Worrorra	Gunin/Kwini
1sg	<i>ngiya₁-</i>	<i>nga-</i>	<i>ng- ~ ngV-</i>
2sg	<i>nyunga₁-</i>	<i>ngun-</i>	<i>g- ~ gV-</i>
3sg	a <i>a₁-</i>	<i>i- ~ a-</i>	<i>a-</i>
	b <i>nya₁-</i>	<i>nyi(N)-</i>	
	c <i>wu-</i>	<i>∅N- ~ ^gwuN-</i>	<i>w- ~ wV-</i>
	d <i>ma₁-</i>	<i>ma-</i>	<i>m- ~ mV-</i>
	e		<i>n-</i>
	f		<i>b- ~ bV-</i>
1pl.incl	<i>ngarra₂-</i>	<i>ngarr-</i>	<i>ngarr-</i>
1pl.excl	<i>nyarra₂-</i>	<i>arr-</i>	<i>nyarr-</i>
2pl	<i>gurra₂-</i>	<i>nyirr-</i>	<i>grr-</i>
3pl	<i>burra₂- ~ burra₁</i>	<i>arr-</i>	<i>brr- ~ brra</i>

Capell and Coate (1984:115) provide a tabulation of the forms of the noun prefixes in thirteen Worroran languages, though they represent just a few of the allomorphic alternations. Their summary, revised in the light of further information available to us, and information presented by Capell and Coate themselves, is given in Table 10.

Table 10: Distribution of forms of pronominal prefixes to nouns

Person	Prefix form	Distribution
1sg	<i>ng(V)-</i> <i>ngiya₁-</i>	all languages; the vowel shows up in various forms Ngarinyin and possibly Munumburru (Capell and Coate 1984:113 give the same form as Ngarinyin)
1pl.incl	<i>ngarr-</i> <i>ngarra₂</i>	all languages except Ngarinyin Ngarinyin
1pl.excl	<i>nyarr-</i> <i>yarr-</i> <i>arr-</i>	all languages except Worrorra, Unggumi and Unggarrangu Unggumi and Unggarrangu Worrorra

Person	Prefix form	Distribution
2sg	<i>ngun-</i>	Worrorra, Yawijibaya, Unggarrangu, Umiida
	<i>nyun-</i>	Unggumi
	<i>nyunga₁-</i>	Ngarinyin; Capell and Coate (1984:115) say that the forms <i>nyang-</i> ~ <i>nying-</i> are characteristic of 'Ngarinyin and dialects'; the tabulation Capell and Coate provide (1984:113) gives <i>nyingi-</i> for Wolyamidi and Munumburru (the form given for Ngarinyin is clearly an error)
	<i>g-</i>	Northern Worrorran
2pl	<i>nyin-</i>	Western Worrorran
	<i>gurr-</i>	Eastern Worrorran except Wilawila
	<i>grr-</i>	Northern Worrorran and Wilawila
3sg	<i>i- ~ a-</i>	masculine in Western Worrorran
	<i>a₁-</i>	Ngarinyin (and other Eastern Worrorran?)
	<i>a-</i>	animate in Northern Worrorran
	<i>ny-</i>	feminine in Western and Eastern Worrorran
	<i>b- ~ bV-</i>	human class in Northern Worrorran
	<i>w-</i>	W class, all languages
	<i>m-</i>	M class, all languages
	<i>n-</i>	N class, Northern Worrorran
3pl	<i>burra₂- ~ burra₁</i>	Ngarinyin (and other Eastern Worrorran?)
	<i>brr- ~ brra</i>	Northern Worrorran and Wilawila
	<i>arr-</i>	Worrorra and Unggumi
	<i>ya-</i>	Yawijibaya and Umiida

It is clear from the summary in Table 10 that, although there is a good deal of similarity amongst the forms, reconstruction of a Proto Worrorran system is not a straightforward exercise: the system must have been productive for some time beyond the splitting up of the protolanguage, when various pronominal forms were replaced, and the class systems (re)structured. In any event, let us make some hypotheses, if for no other reason than to show that things are not entirely impenetrable.

We can be relatively confident that the first person forms can all be traced back to single forms in Proto Worrorran: something like **ngV-* for the singular; **ngarr-* for plural inclusive; and **nyarr-* for plural exclusive. The final *-rr-* of the latter two forms occurs finally on all the non-singular prefixes in almost every language and may be readily analysed as a non-singular number marker. This marker corresponds in form to a non-singular marker (*-rrV-*) that is

found elsewhere in the morphology of the Worrوران languages,² and is widely attested in other prefixing languages of northern Australia (Blake 1988; Dixon 2002:252–256).

If our reconstruction **nyarr-* is correct for the plural exclusive form, this prefix may have undergone denasalisation of its first segment in some Western Worrوران languages, and may have subsequently been lost in Worrورا (see further Chapter 6). The three forms **ngV-*, **ngarr-*, and **nyarr-* also show up in the first person free personal pronouns and verb prefixes (Capell and Coate 1984:98–99, 218), and in corresponding forms in other non-Pama-Nyungan languages (Blake 1988:246–253).

One might hypothesise a second person singular form like **nyI* (where upper-case I represents a high vowel of undetermined quality) and plural form **gurr* (compare the Proto Nyulnyulan second person pronominal prefixes to nouns, **nyi-* and **kurr-*; see Stokes and McGregor 2003:48). The Western Worrوران group has apparently restructured the system, ousting reflexes of **gurr*. It could be that this was an analogical change motivated by the corresponding free pronouns in this subgroup, which show initial syllables *ngu* and *nyirr* respectively (see Chapter 6). Perhaps this was reinforced by pressure to maintain a form distinct from the feminine prefix, which could also account for the additional linking syllable in Ngarinyin. In the Northern Worrوران languages it appears that the second person plural form served as the basis for a new singular form, backformed from the plural by omission of the number marker *rr*.

Presumably we can also reconstruct **w-*, **m-* and perhaps **a-* class prefixes in the third person singular. More speculatively, we could hypothesise a third person plural form **bIrra-*, the initial segment of which was lost in the Western Worrوران languages. The *b-* class human prefix of Northern Worrوران may have been formed analogically in parallel with the second person singular.

Thus a plausible Proto Worrوران system might be as shown in Table 11. If this is correct, we have our first clear historical-comparative evidence for grouping in the Worrوران languages, in the form of distinct shared innovations within the Western and Northern Worrوران subgroups: denasalisation of the initial segment of the first person plural exclusive form and replacement of the inherited second person plural form in Western Worrوران, and backformation of a new second person singular from the erstwhile plural form in Northern Worrوران.

Table 11: Tentative initial reconstruction of Proto Worrوران pronominal prefixes to nouns

	singular	plural
1 exclusive	<i>*ngV-</i>	<i>*nyarr-</i>
1 inclusive		<i>*ngarr-</i>
2	<i>*nyI-</i>	<i>*gIrra-</i>
3	<i>*a-</i>	<i>*bIrra-</i>
	<i>*w-</i>	
	<i>*m-</i>	

2 Other forms on which this non-singular marker occurs are person pronouns and verb prefixes. For examples see Capell and Coate (1984:98–99, 218) respectively.

Now let us look at how these Worrوران noun prefixes compare with those in the neighbouring non-Worrوران languages. In the case of Miriwoong, Kija, and Bunuba, there is no comparison to be made because none of these languages has noun prefixation. Some Nyulnyulan languages, however, do have a system of pronominal prefixes which is mainly applicable to body part nouns. These languages include all Western Nyulnyulan languages, and one Eastern language, Warrwa. A comparison between pronominal forms in Worrوران and Nyulnyulan languages can only be approximate, because the person-number systems of these languages are different, and because Nyulnyulan languages have no noun class systems. As a consequence, of the seven grammatical categories which are shown in Tables 10 and 11, only two have exact categorical equivalents in Nyulnyulan languages: first person singular and second person singular. The prefixes for those and the other categories in Western Nyulnyulan Bardi (Bower 2004b:37), Eastern Nyulnyulan Warrwa (McGregor 1994:16), and Proto Nyulnyulan (Stokes and McGregor 2003:48) are shown in Table 12.

Table 12: Pronominal prefixes used with nouns in some Nyulnyulan languages

	Bardi	Warrwa	Proto Nyulnyulan
1sg	<i>nga-</i>	<i>nga-</i>	* <i>nga-</i>
1&2	<i>a-</i>	<i>ya-</i> ~ <i>ngarr-</i>	* <i>ya-</i>
1pl ^a	<i>arr-</i>	<i>yarr-</i> ~ <i>ngarr-</i>	* <i>yarr-</i>
2sg	<i>nyi-</i>	<i>nyi-</i> ~ <i>nya-</i>	* <i>nyi-</i>
2pl	<i>goorr-</i>	<i>kurr-</i> ~ <i>kurri-</i>	* <i>kurr-</i>
3sg	<i>ni-</i>	<i>ni-</i>	* <i>ni-</i>
3pl	<i>irr-</i>	<i>yirri-</i> ~ <i>yurr-</i>	* <i>yirr-</i>

^a In this system 1pl refers to all plural groups including the first person singular except for the speaker-hearer dyad, which is accorded its own separate form.

It is clear that there is a good deal of formal similarity between the Nyulnyulan pronominal prefixes and the Worrوران ones. The second person singular forms reconstructed for the protolanguages are almost identical, and the first person singular ones differ only in the quality of the vowels (uncertain in Proto Worrوران); as we have seen, the second person singular form of the protolanguage has been replaced in Western and Northern Worrوران. The third person singular form of Nyulnyulan shows similarity to just one of the third person singular forms of Northern Worrوران. In the plurals, we see the recurrent *rr* segment in both groups of languages, except in the case of the speaker-hearer dyad in Nyulnyulan. This segment does, it will be observed, show up in Warrwa in the prefix *ngarr-*, which covers all non-singular first person categories including the speaker-hearer dyad. However, this is almost certainly a recent innovation in Warrwa that has not yet become entrenched: it alternates in apparent free variation with prefixes involving *ya*. Given that its shape and semantics is exceptional for a pronominal prefix to nouns in Nyulnyulan languages, it is possible that it is a recent borrowing from a Worrوران language, probably Unggumi. Alternatively, it could have been analogically formed on one of the first person augmented prefixes to inflecting verbs that generalised to all first person categories (a related generalisation is attested in pronominal prefixes to nouns in Nyulnyul also, doubtless a

consequence of language obsolescence; see McGregor 1995). The second person plural forms in Nyulnyulan and Worrوران are almost identical, and there is a close similarity between the first plural of Nyulnyulan and the first person plural exclusive of Worrوران. The third person plural forms also show similarity, except for the initial segments.

To sum up, the evidence from pronominal prefix forms shows similarities which could be due to a remote genetic relationship between the Worrوران and Nyulnyulan families, but it also shows clearly that they have followed their own paths of historical development, and at least one of them must have restructured an earlier common system (presuming its existence). This evidence, it should be noted, does not support a higher level genetic group consisting only of Worrوران and Nyulnyulan, since the pronominal forms of both also resemble pronominal forms found in many other non-Pama-Nyungan families of northern Australia (where their similarity has been taken as evidence for genetic relation among those families; see Blake 1988).

5.1.2 Body part lexemes in Worrوران languages

Let us now consider the forms of the body part lexemes, and the matter of which ones take prefixes and which ones do not. Why the body part lexicon should be differentiated in regard to prefix taking is a complicated question that has been much discussed in the literature on Worrوران and other northwestern Australian languages (see McGregor 1995 and references cited therein). We cannot and need not go into that issue in detail here. Suffice it to say that the difference seems to be motivated partly on semantic grounds, partly on phonotactic ones, and to be partly arbitrary. What is most relevant here is that there is a high degree of agreement among the Worrوران languages with respect to the forms of the words or roots for a given body part and with respect to the matter of which of them take prefixes and which do not. This can be observed in the data presented in Appendix 5, which shows the words from the eight best-documented Worrوران languages for the 30 body part terms which are found in the 105-item wordlist of core vocabulary in Appendix 4. For most of the entries it can be seen whether or not the body part term takes a prefix by whether there is a hyphen at the beginning of the word or root, or by the inclusion of forms with alternative prefixes. For example, Wunambal ‘bone’ is listed as *unarr* (‘its bone’), *bunarr* (‘his/her bone’), *nganarr* (‘my bone’), *ganarr* (‘your bone’), showing that it is a prefix-taking term.

In Appendix 5 we give our reconstructed protoforms for the apparent cognates which are attested within two or more of the eight languages. The eight languages include three from the Northern group, Wunambal, Gambera, and Gunin/Kwini; two from the Eastern group, Ngarinyin and Wurla; and three from the Western group, Unggumi, Umiida, Worrوران.

The first thing to note about Appendix 5 is the degree of similarity among the words and roots for a given body part, and how widely the matching forms are distributed across the group as a whole. It can be seen that, for the 30 body parts listed, fifteen of them have matching forms in all three of the subgroups, 23 have matching forms in at least two of the subgroups, and another 5 have at least two matching forms within one subgroup. In this respect these body part terms are a representative sample of the 105-item wordlist of core vocabulary in Appendix 4, from which the statistics in Chapter 2 were compiled. They also attest to a relatively greater resemblance among the forms from languages within a given subgroup.

Let us now consider the evidence for consistency in the matter of which body part terms take prefixes and which ones do not. First, note that although the list has terms for 30 body parts, there are 38 sets of matching forms. This is because for some of the body parts, there are two sets of forms, presumably reflecting near synonymy or differences of meaning that are

not captured by some of the English glosses. Of those 38 sets of matching forms, for 32 of them there is clear agreement among all members of the set as to whether they do or do not take prefixes. For three of the six sets in which this is not the case—(-)*miyal* ‘hand’, (-)*winji* ‘nose’, and (-)*marnu* ‘shoulder’—there is disagreement among Wunambal sources which makes it impossible to determine whether or not it agrees with the other Northern Worrوران language(s) in this matter, so these sets must be put aside.³ The three other heterogeneous sets are for (-)*nunggu* ‘arm’, (-)*mayi(r)l* ‘neck (exterior)’ and (-)(*a*)*mbul* ‘eye’. The latter is prefix taking in both of the Eastern Worrوران languages and in all three of the Western Worrوران ones, but non-prefix taking in all three of the Northern Worrوران ones. However, there is evidence that it was once prefix taking in Northern Worrوران as well, as the Northern Worrوران form *wumbul* does not correspond to the bare root in the other languages (as does Ngarinyin/Worrوران *nunggu* in the ‘arm’ set). Rather it corresponds to the W class prefixed form in those languages which means ‘its eye’.⁴

In sum, in 32 of the 38 basic body part correspondence sets in the Worrوران languages there is complete agreement as to whether or not the members of the set are prefixing. In only two sets is there clear disagreement in this respect at the earliest reconstructable stage of the languages’ history. Interestingly, the agreement extends even to cases where there are alternative words for the same body part. For example, there are two correspondence sets for ‘mouth’—each including members from all three subgroups—suggesting the quite distinct protoforms **-yhalem* and **minja*. In every language, **-yhalem* is reflected in a prefixing form and **minja* in a non-prefixing one. The same goes for the alternative sets of words for ‘head’, and ‘nape of neck’. Conversely, there are pairs or sets of roots with the same initial segment, for different body parts, where one member takes prefixes and other does not.⁵ These include: **manambarr* ‘armpit’ vs. **-mularr* ‘forehead’; **-gulum* ~ **-ngulum* ‘forehead vs. **gulmed* ‘tail’; and **-lunggu* ‘knee’ vs. **lina* ‘tooth’.

5.1.3 Body part lexemes in neighbouring non-Worrوران languages

Now let us again see how the Worrوران languages compare with the neighbouring ones with respect to these data. Appendix 6 shows the same 30 body part meanings as Appendix 5, with the available attested forms from the six neighbouring non-Worrوران languages.

Of the 38 protoforms derived from the correspondence sets in Appendix 5, only three correspond to forms with the same meanings in Appendix 6. These are: **ngamu* ‘breast’, ‘milk’, for which there are more-or-less similar forms in five of six neighbouring languages; **jakarra* ‘hair’, which has matching forms in Nyikina and Warrwa; and **durlwa* ‘heart’, for which there are similar forms in Bunuba (*durlu*), Nyikina (*doorlboo*), and Warrwa (*durlbu*).

The first of these three items, **ngamu* ‘breast’ and similar forms such *ngama-* and *ngami-*, are widely attested words for ‘breast’ and ‘milk’ in Australian languages, and show a continent-wide distribution. Thus the presence of this word does not provide good evidence for genetic relatedness at any level that is likely to be demonstrable by the comparative method.

3 In the case of ‘shoulder’ there is also disagreement among the sources for Worrوران, but the two most reliable sources, Love (1934) and Clendon et al (2000), agree that it is prefixing.

4 Carr (2000:72) notes that ‘There are many W class body parts, some of which appear to be derived from other (prefixing) body parts, e.g. *wumanda* ‘sole of the foot’, literally: ‘its (the foot’s) chest’.’

5 The relevant pairs or sets of roots are mainly consonant-initial ones, since there is a strong tendency within Worrوران languages for vowel-initial body part roots to be prefix taking (see e.g. Capell 1972; Rumsey 1982:42–46).

The second, **jagarra* ‘hair’, is a word that is attested in all three subgroups of Worrوران, but within the Nyulnyulan family it is attested just in Nyikina and Warrwa. For that reason, it was not included among the 236 lexemes reconstructed by Stokes and McGregor (2003) for Proto Nyulnyulan, or even among the additional 54 lexemes they reconstructed for the Eastern subgroup of the family to which Nyikina and Warrwa belong, along with Yawuru and Jukun.⁶ Given both of these facts, and the fact Warrwa and Nyikina are the only Nyulnyulan languages that border upon Worrوران ones, it seems plausible that the word *jagarra* for ‘head hair’ could have been borrowed into those two languages from Worrوران ones.

In the third case where one of our presumed Worrوران protoforms is found in a neighbouring non-Worrوران language—**durlwa*, ‘heart’—there is only a partial correspondence between the Worrوران forms and the non-Worrوران ones. It is only in the Worrوران forms there is a *w* in the second syllable, whereas in the Nyulnyulan languages Nyikina and Warrwa there is a *b*,⁷ and in Bunuba there is neither (as is also the case in the corresponding form in Gooniyandi). This suggests that even if this form owes its present distribution in part to diffusion, the diffusion may have occurred at a stage prior to the internal genetic differentiation of the Worrوران, Nyulnyulan and Bunuban families, accounting for its distinctive, internally shared form in each. An alternative possibility is that the form may have been borrowed independently into Gambera and Unggumi from non-Worrوران languages, and that we are therefore mistaken to attribute it to Proto Worrوران. But unlike the shared-retention hypothesis, the independent borrowing one would leave unexplained: (i) how the word could have gotten into Gambera, since that language lies several hundred kilometres away from any other one which is known to have a form which is at all similar to it; and (ii) why the form which is found in Unggumi should resemble the Gambera one more closely than the Nyikina and Warrwa ones, notwithstanding the fact that Unggumi territory abuts Nyikina and Warrwa, but not Gambera, which lies some 400 kilometres away to the northeast.⁸

6 The other members of the Eastern subgroup of Nyulnyulan besides Nyikina and Warrwa are Yawuru and Jukun. The word for ‘head hair’ in Jukun is unavailable. In the much more fully documented language Yawuru, no such word as *jagarra* is to be found among the approximately 4000 lexical items that have been recorded by Komei Hosokawa (1988), and there is a different word for ‘head hair’, *gun.gulu*. In the Western subgroup of Nyulnyulan, to which Bardi belongs, the word for ‘head hair’ in all six languages is either *muwarn* or *mukarn*, which illustrate a continuant-stop correspondence that is well attested within both subgroups of Western Nyulnyulan (for details see Stokes and McGregor 2003:56–57).

7 Here again as in the case of *jagarra*, among the Nyulnyulan languages the form in question is found only in the Eastern subgroup of Nyulnyulan, in this case including also Yawuru which has the form *du(r)lbu*. For the Proto Eastern Nyulnyulan form, Stokes and McGregor (2003) posit **durlbu*.

8 The words for ‘hand’ in Appendices 5 and 6 attest to another possible case of borrowing across the Worrوران/non-Worrوران border, in this case from the latter into one of the former, namely Ngarinyin. Note from Appendix 6 that both the Jarrakan languages Miriwung and Kija and the Nyulnyulan languages Warrwa and Bardi have words for ‘hand’ containing the shape *ma(r)la*. Like *ngamu* ‘breast’, this is a very widespread word in Australian languages (Capell 1956; Dixon 2002:106–107). However, it is not attested in any of the Worrوران ones. The only form among the entries for ‘hand’ in Appendix 5 that is at all similar to it is the Ngarinyin prefixing root *-(r)namala*. But how can we account for the first syllable of that root, *(r)na*? In that connection, it is relevant to note that the Warrwa and Nyikina words also have a similar initial syllable in their words for ‘hand’ *ni-*, and that in Warrwa this is the same 3sg prefix that can be seen on the Bardi form *nimarl* ‘his/her hand’. Among the Western Nyulnyulan subgroup to which Bardi belongs, there is a fully productive system of nominal possessive prefixation of the same kind as in Worrوران. But among the Eastern Nyulnyulan languages, this system has been lost altogether in Nyikina and Yawuru and is used with a greatly reduced set of roots in Warrwa. In Nyikina and Yawuru cognates of prefixing nouns in Western Nyulnyulan languages do not occur in what would correspond to their bare root form in the latter languages, but rather with an initial *ni*, which corresponds in form to the 3sg prefix in the languages that have prefixes

To sum up the evidence from neighbouring non-Worrorran languages regarding the form of words and roots for body parts, of the 38 correspondence sets we have assembled for Worrorran languages, only three resemble words or roots for the same body parts in any of the six neighbouring non-Worrorran languages. One of these is very widely attested elsewhere and so does not by itself provide strong evidence for genetic relatedness; one is likely to have been borrowed from Worrorran languages into the non-Worrorran languages that have it; and in one the correspondence is only partial.

We now compare Worrorran languages with the neighbouring non-Worrorran languages with respect to the matter of which body part terms (if any) take prefixes. Above we have seen that in every Worrorran language, some of the terms take prefixes and some do not, and there is very high degree of agreement across the languages in regard to this feature for each set of corresponding terms. By contrast, in four of the six neighbouring non-Worrorran languages—Mirwoong, Kija, Bunuba, and Nyikina—there are no possessive prefixes at all. In the late 1980s and 1990s when McGregor worked with the last two speakers of Warrwa, there was a vestigial prefixing system which was used by only one speaker, and then inconsistently. This applied to about a dozen nominals, including: *-(u)ngu* ‘stomach’, *-lirr* ‘mouth’, *-liwa* ‘ear’, *-alma* ‘head’, *-mala* ‘hand’, *-(m)barrma* ‘armpit’, *-midi* ‘leg’, *-(ng)kurinykuriny* ‘navel’, *-yambala* ‘foot’, *-yangalany* ‘tongue’ and *-nyji* ‘back’. Given the speaker’s inconsistency in this matter and the fact that the other speaker did not use the nominal prefixing system at all, this data is perhaps not to be given much weight as evidence. However, it is at least worth noting that of the fourteen Worrorran correspondence sets and protoforms we have established for nine of the above meanings (‘stomach’, ‘mouth’, ‘ear’, ‘head’, ‘hand’, ‘armpit’, ‘foot’, ‘tongue’, and ‘back’), eight of them are uniformly non-prefix taking, viz: **marndu* ‘stomach’, **mala* ‘stomach’, **manambarr* ‘armpit’, **wuyyu* ‘ear’, **bandi* ‘head’, **angga* ‘foot’, **anbula* ‘tongue’, and **kayila* ‘back’.

Of greater weight is the evidence from the only neighbouring non-Worrorran language that currently has a fully functioning nominal prefixing system, Bardi.⁹ In this language, the body part words that denote the same items as the eight Worrorran protoforms listed above are all prefix taking, in this case with complete consistency among speakers and within the speech of each.¹⁰ There is thus agreement between Bardi and Warrwa as regards the lexicalisation of these eight meanings as prefix-taking terms. By contrast, there is a striking lack of agreement between the Worrorran languages and both Warrwa and Bardi with respect to which body parts are prefix taking: disagreement in 8 cases of 14, or, in other words, an almost perfect non-correlation (as opposed to a positive or negative one).¹¹

(McGregor 2004:145). This is obviously a case of the cross-linguistically well-attested tendency for forms associated with the functionally least marked categories, including third person singular, to be reanalysed as formally unmarked ones, i.e. as morphological zeroes (cf. for example Kuryłowicz 1964; Koch 1995). The presence of a similar initial syllable on the Ngarinyin root for ‘hand’ suggests that this form may have been borrowed into that language from Eastern Nyulnyulan ones. The evidence for this would be stronger if the initial syllable in Ngarinyin were *ni* instead of *(r)na* and if a similar root for ‘hand’ were found in Unggumi, as it lies between Ngarinyin country and Nyikina and Warrwa territories. However we offer it as a not implausible hypothesis awaiting further investigation.

9 Although Bardi is spoken at the tip of the Dampier Land peninsula and not geographically contiguous with any Worrorran language, there was significant contact with Western Worrorran languages of the islands and mainland.

10 For the forms see Appendix 6.

11 Since so few of the Warrwa and Bardi body part terms bear any resemblance to the semantically corresponding Worrorran ones, it is not possible to make this comparison in as precise a way as we have been able to among the Worrorran languages, where we can compare lexical items which correspond both in

To sum up §5.1, all of the Worrوران languages have systems of noun prefixation of a kind which is absent in three of the neighbouring non-Worrوران languages, fully present in two, and present in a vestigial form in another. There is a high degree of resemblance among the prefixation systems in all the Worrوران languages with respect to: (1) the forms of the prefixes; (2) the forms of the body part nominals; and (3) the assignment of corresponding forms into prefixing vs non-prefixing classes. In each of these respects the correspondences are such as to have allowed us to reconstruct a protosystem of noun prefixing from which those in the attested Worrوران languages have developed. All of the neighbouring non-Worrوران languages are very different from the Worrوران in all three respects, and do not show the kind of systematic correspondence to them which would allow us to posit a genetic relationship amongst the groups, either at the level of Proto Worrوران or at some putatively more remote level.

5.2 Postpositions and enclitics

Worrوران languages all appear to have had smallish sets of bound case marking postpositions. These are phrase-level enclitics normally attached to the final word of an NP, and marking only peripheral grammatical relations. Neither subject nor object NPs host case-marking postpositions. Thus, unlike the neighbouring Bunuba and Nyulnyulan languages to the south and west, there is no ergative postposition for marking transitive subjects, nor is there an accusative postposition. (Pronominal verb prefixes do however have a distinct accusative case inflection, discussed in §7.2.) Table 13 shows the main case-marking postpositions in a selection of languages; some of these have more general functions, and are not restricted to nominal hosts (see further below).

As this tabulation reveals, there is a fair amount of diversity in the forms of the postpositions, particularly among those that mark spatial relations, that is, the locative, ablative, and allative. Some postpositions appear by and large to be distributed according to group (Northern, Eastern, or Western). It should be cautioned, however, that the presence of different forms under the same case-heading in different languages does not necessarily imply that related forms do not exist in the languages. For example, Ngarinyin has a second locative postposition *-ngunda*, referred to as an adessive in Rumsey (1982:63), that is apparently cognate with the (ordinary) locative of Wunambal, Gamberra and Gunin/Kwini. It is quite likely that deeper investigation of other Worrوران languages will reveal the presence of cognates, perhaps in other types of grammatical morphemes, perhaps in lexical items. The other postpositions are rather more widely distributed across the family.

A genitive with a form like *-nangga* seems to be universal in the Worrوران languages, as does one of the comitatives, COM₂, which shows a form resembling *-ngarri* (see Capell and Coate 1984:91, which does not, however, specify the full range of shapes these morphemes exhibit in the various languages). All of the languages have another comitative, COM₁, with

meaning and in form. In particular, we are left with more indeterminacy in the case of words for ‘mouth’, ‘head’ and ‘back’ where there are in each case two different words for the body part, one of which is prefix taking and the other of which is not. If for argument’s sake we exclude those three words—or, in the case of Worrوران, six lexical items—from the comparison, we are left with a total of eight Worrوران lexical items (i.e., all the correspondence sets for ‘stomach’, ‘ear’, ‘armpit’, ‘foot’ and ‘tongue’) which correspond in meaning to the prefixing terms in our Bardi-Warrwa sample. Of those eight, not a single one is prefixing in the Worrوران languages.

Table 13: Major postpositions in Worroran languages

	LOC	ABL	ALL	DAT	GEN	INS	COM ₁	COM ₂
Wunambal	-ngɪndalu	-yanga	-gu		-ningge	-nyine	-gude	-ngarri
Gambera	-ngɪndalu	-yanga	-gu		(-ningge) ^a	-nyine	-gude	-ngarri
Gunin/Kwini	-ngɪndalu	-yanga		-gu	-nangga	-nyine	-gude	-ngay
Ngarinyin	-ra ~ -rda ~ -da		-biyny, -yu ~ -ju	-gu	-nangga	-nyine ~ -nyinengga	-gurde	-ngarri
Munumburru	-ra		-gu		(-nangga)	-nyingge		-ngarri
Wolyamidi	-re		-gu		(-nangga)	-nyingge		-ngarri
Worrorra	-rnanya	-aalb(a)	-ngurru	- ^s wunya	-(a)nangga	-nyine ~ -ningka ~ -nyiningka	-gurde	-ngarri ~ -ngarra
Yawijibaya	-nanya	-ga	-ngurru	-wu	(-nangga)	-jane ~ -jarra	-gude	-ngarri
Unggumi	-wirren	-alma ~ -walu	-ngurru ~ -giya		(-nangga)	-nyinda	-gude	-ngarri
Umiida		-naga	-ngurru		(-nangga)	-nyini	-gude	(-ngarri)

^a Bracketed forms are postpositions claimed to exist in the language (e.g. in Capell and Coate 1984), but not actually attested.

the form *-gude* or *-gurde*.¹² The two comitatives seem to be semantically and grammatically different. Of the two, *-ngarri* COM₂ appears to be the older: it is not restricted to nominal hosts, and shows a wider range of functions. Attached to nominals it has derivational functions (in addition to phrase- and clause-level functions), and conveys a meaning something like ‘characterised by’, ‘concerning’, as in the Ngarinyin word for ‘magician’, *barnman-ngarri* (magic.qualities-COM₂). It can also be attached to inflecting verbs in languages from all three subgroups, where it serves as a subordinate clause marker, and/or (less frequently) an aspect marker (McGregor 2003a, 2003b). The other comitative, *-gude* ~ *-gurde*, seems to be limited to nominal hosts, and shows no clear evidence of derivational uses in any Worrوران language. Rather, it serves only the comitative case-marking function, that is, it specifies the grammatical role of an accompanying entity.¹³

There may be an even more ancient comitative marker in the languages, which is still partly productive in the Northern Worrوران group, but has grammaticalised to a derivational morpheme elsewhere. This can be reconstructed as Proto Worrوران **-wa* (which is possibly a reflex of a very widespread comitative *-barri* ~ *-warri*). The story of these comitatives cannot be discussed here (for details see McGregor 2003a, 2003b).

The instrumental postpositions also form a clear correspondence set, with a form similar to *-nyine* being present in all of the languages; in the Northern group a high central vowel corresponds to the high front vowel of the other languages. A few languages have an additional syllable involving the augment *ngga*; this trisyllabic form is often shortened by loss of the second syllable. Instead of an initial laminal nasal, Yawijibaya shows the corresponding laminal glide /y/. There are one or two other minor oddities.

The distribution of locative, ablative, and allative postpositional forms, as already mentioned, tends to be according to the three groups. For the Northern Worrوران group it seems reasonable to reconstruct ablative **-yanga* and locative **-ngindalu*; for the Eastern group, it is reasonable to posit a locative postposition **-ra*, and for the Western group an allative **-ngurru*. As already remarked upon, these four forms are not all necessarily peculiar to their group; however, they appear to be the unmarked and semantically least specific locative, ablative, and allative postpositions in the respective languages. For instance, the Ngarinyin adessive *-ngunda* is a highly specialised locative indicating ‘in the vicinity of, but not at’ (Rumsey 1982:63), whilst the ordinary locative postposition *-ra* covers a wide range of spatial relations of proximity. This suggests that *-ra* is the older form in Ngarinyin, and *-ngunda* is more recent, which is also consistent with Rumsey’s (1982:63) suggestion that *-ngunda* derives from a sequence of postpositions, *-ngun* (not attested in the modern language) and the locative *-ra*. Alternatively, it may be a borrowing from the Northern locative *-ngindalu*, again consistent with the suggested relative youth of this form.¹⁴

If the suggestions of the previous paragraph are correct, the two general locative postpositions would presumably represent innovations in the respective groups. Even in the

12 It may well be that there is a single form for this postposition, the apico-alveolar form reflecting a mishearing.

13 Insofar as the comitative case function may be seen as the basic one on which the others are founded, our surmise regarding the historical priority of *-ngarri* in this function is supported by Kuryłowicz’s generalisation, supported by many examples in the Indo-Europeanist field and elsewhere, that ‘When as a result of a morphological transformation a form undergoes differentiation, the new form corresponds to its primary (fundamental) function, the old form is reserved for the secondary, (founded) function’ (Kuryłowicz 1995:136).

14 Interestingly, the proximal demonstratives of Bunuban languages are *ngirnda* ~ *ngirndaji* (Bunuba) and *ngirndaji* (Gooniyandi). One wonders whether these might represent lexical sources for the locative of Northern Worrوران and the Ngarinyin adessive.

alternative scenario in which *-ngunda* is older, and a reflex of a Proto Worrوران locative, at least *-ra* would emerge as an innovation of Proto Eastern Worrوران. The allomorphy in the instrumental postposition also follows group membership. Thus although it is impossible to identify with certainty innovations as distinct from retentions, it seems that at least some differences must represent group-level innovations.

Case marking in nearby non-Pama-Nyungan languages is generally also by means of phrase-level enclitic postpositions. In Nyulnyulan languages, however, they are attached to the first word of the NP, while in Bunuban they are attached either to the information focus of the NP (Gooniyandi), or to the first word (Bunuba). In Jarrakan languages the locative seems to be a word-level case inflection, while the other cases are marked by postpositions, only one of which is required per phrase; it is not entirely clear from the available descriptions, however, which word of a multiple word NP the postposition is preferentially attached to. By contrast, in the Pama-Nyungan languages bordering the Kimberley region, case markers appear to be generally word-level inflectional suffixes that normally attach to each word of an NP. Worrوران languages thus seem to be distinct from other Kimberley languages in that case marking is by means of postpositions regularly attached to the final word of an NP.

The forms of the corresponding case markers in a selection of non-Worrوران languages of the region are shown in Table 14. It is notable that the only language that has a genitive case is Miriwoong. A distinct instrumental marker is found only in Nyulnyulan and Jarrakan languages: in the other languages (i.e. Bunuban and Pama-Nyungan) instruments are indicated by the comitative and/or ergative markers, either in combination or separately. The forms of these two Worrوران postpositions are unlike the corresponding forms in Jarrakan and Nyulnyulan.

The locative and ablative postpositions of Worrوران languages show few formal similarities with the corresponding postpositions in non-Worrوران languages. The only obvious similarity is between the ablative *-yanga* of Wunambal, Gambera and Gunin/Kwini, and one Gooniyandi ablative, *-yangga*. The *-gu* allative of some Worrوران languages, along with the dative forms *-gu*, *-wu*, and *-^gwunya*, is presumably identifiable with the pan-Australian dative *-gu*, which also marks allative in various other languages. The other allatives however seem peculiarly Worrوران, although the Ngarinyin form *-biny* finds correspondences in a Bunuban perlative and Jarrakan locative.

For both comitatives similar forms exist in neighbouring languages. A form closely resembling the Worrوران COM₂ is also found in both Bunuban languages. The fact that its range of uses in Worrوران languages seems wider than in Bunuban suggests that *-ngarri* COM₂ is more likely a retention from Proto Worrوران, than a subsequent borrowing from Bunuban. As mentioned above, *-gu(r)de* COM₁ appears to be a younger comitative in Worrوران, and it is possible that it may have been borrowed into these languages from Nyulnyulan, where we find the associative derivational suffix *-kurdany* ~ *-wudany* ~ *-wirrany* ~ *-wurrany* in Warrwa, and reflexes in other Nyulnyulan languages; *-guda* COM₁ is also found as a postposition in nearby Bunuba (though not in Gooniyandi). The quality of the final vowel of the Worrوران form may be a reflex of the final palatal segment of the Nyulnyulan form.

The upshot of this is that it does indeed look like we may be able to reconstruct three or four postpositions in Proto Worrوران, at least those expressing the non-spatial grammatical relations. These include a genitive **-nangga*, an instrumental **-nyine*, and a comitative **-ngarri* COM₂ (vowel qualities are rather uncertain, there being some variation within the cognate forms that we cannot account for), all of which may well have been peculiar to Proto Worrوران. The dative and/or allative *-gu* and the comitative *-gu(r)de* COM₁ are probable

Table 14: Major case markers in some neighbouring non-Worrorran languages

	LOC	ABL	ALL	DAT	GEN	INS	COM ₁	COM ₂
Bunuba	-yuwa ~ -juwa	-nhingi ~ -nhi	-yawu ~ -jawu	-gu ~ -u			-guda	-ngarri
Gooniyandi	-ya ~ -ja	-nhingi ~ -yangga	-jirra ~ -jirra	-yoo ~ -joo				-ngarri
Warrwa	-n ~ -an ~ -kan	-kawu	-ngana	-yi ~ -ji		-ngany	-nyarri	-barri
Nyikina	-an ~ -kan	-kaboo ~ -aboo	-ngana	-yi ~ -ji		-ngany		-barri
Nyulnyul	-uk ~ -ik	-kun ~ -ikun	-ung	-ij		-ang	-nyirr ~ -inyirr	
Miriwoong	-m ~ -em, -biny	-banjiling	-bag, -melig	-geny	-gering	-berri, -theb		-bang
Walmajarri	-rta	-ngurni	-karti ~ -rluwa ~ -rlawu	-ku ~ -purru				-jarti
Jaru	-ngka ~ -ka ~ -la ~ -kula ~ -Da ^a ~ -a	-ngurlu ~ -ngu	-ngka-wu ~ -ka-wu ~ -la-wu ~ -kula-wu ~ -Da-wu ~ -a-wu					-jaru ~ -yaru

^a *D* indicates a stop homorganic with the preceding root- or stem-final stop or nasal (other than bilabial or velar).

borrowings, but at this stage it is impossible to be sure when they were borrowed: the lack of lenition of the velar stop in the COM₁ suggests that it may be recent, while the lenition for the dative suggests it is much older, perhaps even traceable back to Proto Worrوران. It is also possible that we can reconstruct a locative **-ra* in Proto Eastern, an ablative **-yanga* and possibly a locative **-ngindalu* in Proto Northern, and an allative **-ngurru* in Proto Western.

5.3 Noun classes

As mentioned in §1.3 and exemplified to some extent in Chapter 4 and §5.1, a typological characteristic of Worrوران languages is their possession of noun classes. As Capell (1940) put it, they show ‘multiple classification of nouns’, which feature distinguishes them from all other Kimberley languages. In all Worrوران languages the classes are agreement classes, marked by (a) the form of a cooccurring determiner or adjective, and (b) the form of pronominal prefixes to prefixing nouns cross-referencing the possessor and to inflecting verbs cross-referencing intransitive subject and transitive object NPs. In some languages (including Worrوران and Unggumi) class membership is to some extent indicated by the form of the noun itself, though this is never entirely consistent. Features (a) and (b) are illustrated by the following examples from Gunin/Kwini, where the agreement markers are bolded:

<i>benyjin</i>	<i>bi</i> - <i>nya</i>	<i>bi</i> - <i>yangga</i>	<i>leewa</i>	<i>a</i> - <i>nya</i>	<i>gadi</i>	<i>a</i> - <i>yangga</i>
man	HUM-this	HUM-goes	dog	AN-this	run	AN-goes
‘This man is walking.’			‘This dog is running.’			

Worrوران languages differ in terms of the number of noun classes they distinguish: Northern languages distinguish four or five depending on variety, Eastern and Western languages distinguish just four. (These figures exclude the plural category, which is included as a separate class in Capell and Coate 1984:63.) The four classes distinguished in Eastern and Western languages include masculine and feminine gender, and two inanimate classes. The Northern languages have a distinct human class with no masculine/feminine distinction, an animate class, and two or three inanimate classes. The composition of corresponding classes in different languages differs somewhat, though not randomly.

It is well known that languages can borrow systems of noun classes, and that such systems are thus subject to areal diffusion (see e.g. Heath 1978:88). Dixon (2002:673–674) implies that this is the situation for the Worrوران languages, i.e. that the systems of noun classes result from diffusion. He suggests that they show few recurrent shared forms, that the systems themselves differ, and that there is considerable variation in the manner of realisation of the classes. These suggestions are refutable. The forms do show a number of similarities, as is evident from the pronominal prefixes presented in Tables 9 and 10. Although the systems differ, this does not argue against retention of the noun classes from a protolanguage. Further, while it is true that there is some variation in the manner of realisation of classes, it remains the case that both (a) and (b) are satisfied in all Worrوران languages—that is, that the classes are marked in all languages by agreement markers in the NP and inflecting verb.

McGregor (2008) presents evidence that the noun class system in modern Worrوران is indeed a retention from Proto Worrوران. The main features of the historical scenario he proposes are sketched out below.

The class system in Proto Worrوران was like the four gender system of the modern Eastern and Western languages, distinguishing two human genders and two neuters. These were marked by the following pronominal prefixes attached to dependents in the NP, and to the inflecting verb:

* <i>a</i> -	MAS
* <i>nh(a)</i> -	FEM
* <i>g(V)</i> -	NEUT _W
* <i>m(a)</i> -	NEUT _M

In the Northern languages this system was restructured. The original MAS class became the animate (AN), while the original FEM class became the NEUT_N class, which eventually disappeared in Southern Wunambal. There is evidence from both the forms of the pronominal prefixes and the lexical constitution of the AN and NEUT_N classes in favour of their correlations with MAS and FEM, respectively. At the same time a new HUM class emerged via a process of backformation from the original plural prefix **bIrra*- (see Table 11) by truncation of the plural augment *-rra*-; and human nominals were consistently assigned to this class. This is not unreasonable either morphologically (backformation is a well-attested historical process) or semantically (due to the strong association of plural forms with humans).

This outline scenario argues that the noun classes represent inherited genetic material in the Worrوران languages, and are not the results of areal distribution of a typological feature as per Dixon (2002). It also provides evidence for the Northern group in the form of an innovation.

Looking beyond Worrوران languages, in the immediate geographical region noun classes are found only in the Jarrakan family, though they are found more widely in non-Pama-Nyungan languages in the Daly River and Arnhem Land regions, as well as in a scattering of Pama-Nyungan languages. In Jarrakan languages, the noun classes are marked by suffixes rather than prefixes to dependents of the noun, and often to the noun itself. They are also indicated by cross-referencing pronominal affixes and enclitics to the inflecting verb.

The forms of the class marking morphemes in Jarrakan languages do bear resemblances with those of Worrوران languages. An *-m* marker is found in Kija—though not in its genetic relative Miriwoong—where it marks a neuter plural class (Kofod n.d.; McGregor 2004:146–147). Indeed, an *m* or *ma* class is found in a large number of Australian languages distinguishing noun classes, where in most cases the prototypical members are edible vegetables. Consistent with this, in Northern and Eastern Worrوران languages, edible vegetable matter typically belongs to the NEUT_M class. In Western Worrوران, however, this correlation does not obtain: in Unggumi vegetable matter denoted by NEUT_M nominals is consistently inedible, and in Worrorra foods of all types are primarily assigned to a small marginal fifth noun class (Clendon 2000b:143–144). This is indicative of semantic change in the Western languages. (See further McGregor 2008 on this and other semantic realignments in the noun class systems.) The feminine class marker *-ny* of Miriwoong, and identical masculine marker in Kija are also reminiscent of the FEM class marker in Eastern and Western Worrوران.

These brief comparative observations suggest that if the noun class system of Worrوران can be traced back to an ancestor language including some other northern Australian languages, Worrوران has undergone restructuring of the system, attesting to its separate genetic status. They are also consistent with borrowing of noun class systems in the distant past, and even with their independent innovation in Worrوران. Regardless of the scenario, the Worrوران languages emerge as a distinct group.

6 *Personal pronouns*

We have already seen that it is possible to reconstruct a system of pronominal prefixes to nouns in Proto Worrوران. The forms of these prefixes are quite similar to the forms of intransitive subject pronouns and transitive object pronouns; in non-singular number the transitive object pronouns usually show an apical nasal corresponding to a tap in the transitive subject pronouns, which is perhaps the relic of an accusative case marker (see Heath 1987). It is probable that the pronominal prefixes ultimately derive from free pronouns that lost the ability to occur independently (see e.g. Blake 1988; McGregor 1995). The reconstructed pronominal prefixes may thus reflect (though of course need not be identical with) earlier free pronoun forms of pre-Proto Worrوران. Worrوران free pronouns are less frequent in usage than bound pronominal prefixes to inflecting verbs, and thus are presumably less resistant to innovation and replacement than bound pronouns. It is therefore reasonable to presume that forms peculiar to the free pronouns are more recent innovations than forms of bound pronouns.

We provide in Table 15 a list of the cardinal forms of the first and second person free pronouns in a range of Worrوران languages. Only the singular and plural forms are shown; dual and trial forms are not included. The latter are mostly formed by the addition of number suffixes to the plural forms, with some morphophonemic changes.

Table 15: Cardinal forms of free personal pronouns in a selection of Worrوران languages

	Wurla	Guwuj	Ngarinyin	Munumburru, Walyamidi	Worrورا	Yawijibaya
1sg	<i>ngiyini ~ ngeen</i>	<i>ngiin^a</i>	<i>ngin ~ ngen</i>	<i>ngeen</i>	<i>ngayu</i>	<i>ngayu</i>
1pl.incl	<i>ngarrun</i>	<i>ngarrun</i>	<i>ngarrun</i>	<i>ngarrun</i>	<i>ngarri</i>	<i>ngarri</i>
1pl.excl	<i>nyarrun</i>	<i>nyarrun</i>	<i>nyarrun</i>	<i>nyarrun</i>	<i>arri</i>	<i>jarri</i>
2sg	<i>nyangan</i>	<i>nyingan</i>	<i>nyangan</i>	<i>nyangan</i>	<i>ngunju</i>	<i>ngunyju(na)</i>
2pl	<i>nurrun</i>	<i>nurrun</i>	<i>nurrun</i>	<i>nurrun</i>	<i>nyirri</i>	<i>nyirri</i>

	Umiida	Unggarra- ngu	Unggumi	Wilawila	Wunambal	Gunin/ Kwini	Gambera
1sg	<i>ngaayu</i>	<i>ngooga</i>	<i>ngayingga</i>	<i>ngeen</i>	<i>ngay(a)</i>	<i>ngaya</i>	<i>ngaaya</i>
1pl.incl	<i>ngarri</i>	<i>ngarri</i>	<i>ngarrada</i>	<i>nangarra</i>	<i>(na)ngarra</i>	<i>nangarra</i>	<i>nangarra</i>
1pl.excl	<i>yarri</i>	<i>yarri</i>	<i>nyarrada</i>	<i>nyarrun</i>	<i>nyarra</i>	<i>nyarra ~ nyarru</i>	<i>nyarra</i>
2sg	<i>nguju</i>	<i>ngujuga</i>	<i>nginjingga</i>	<i>nyangan</i>	<i>naa</i>	<i>naa</i>	<i>naa</i>
2pl	<i>(n)yowe(i)</i>	<i>nyirri</i>	<i>nyirrada</i>	<i>nuurr(a) ~ noorr</i>	<i>nurra</i>	<i>nirra ~ nirru</i>	<i>nuurra</i>

^a Greyed cells indicate forms provided in Capell and Coate (1984:98–99) that are not otherwise attested.

For the purposes of comparison, Table 16 shows the forms of first and second person pronouns in four nearby Kimberley languages. Notice that only in Walmajarri and Miriwoong (optionally) is the inclusive-exclusive contrast made in the first person non-singular. Neither Nyikina nor Gooniyandi shows the standard inclusive-exclusive system in the first person: Nyikina distinguishes 1 from 1&2 and a minimal-augmented number system (Stokes 1982:154; McGregor 2004:113–114), while Gooniyandi makes a non-standard inclusive-exclusive distinction in which what is included or excluded is not the addressee but rather a non-minimal group of addressees (see McGregor 1996, 2004:114–115 for discussion). These facts attest further to the separateness of the Worrوران languages.

Table 16: Cardinal forms of free personal pronouns in a selection of non-Worrوران languages

	Nyikina	Gooniyandi	Miriwoong	Walmajarri
1 ^a	<i>ngayu</i>	<i>nganyi</i>	<i>ngayu</i>	<i>ngaju ~ ngaji</i>
1&3	<i>yarrkamirri</i>	<i>ngidi</i>	<i>yarrubu</i>	<i>yuwurrubu^b</i> <i>ngajarra</i>
1&3&3 (&3)	<i>yarrka</i>		<i>yarru</i>	<i>yuwurru</i> <i>nganimpa ~ nganampa</i>
1&2	<i>yayu</i>		<i>yayibu ~ yayimeleng</i>	<i>yuwurrubu</i> <i>ngalijarra</i>
1&2&3	<i>yarrjumirri</i>	<i>yaadi</i>	<i>yayi</i>	<i>yuwurru</i> <i>ngalimpa</i>

^a Because of the fact that the pronominal systems distinguish different first person categories in each of the languages, we use a set of fundamental elements as per Greenberg (1988). In this system 1 and 2 denote the unique speaker and hearer respectively, 3 a third person (non-unique).

^b The forms in this column are dual and plural first person forms that alternate with the dual and plural inclusive forms: in other words, the inclusive-exclusive distinction is optionally maintained in Miriwoong.

The Eastern Worrوران languages show a characteristic final /n/ in all of the personal pronouns. The simplest assumption is that this is an innovation of Proto Eastern Worrوران,

that has spread slightly to some forms in poorly attested Wilawila (which appears to show some characteristics of Eastern and some of Northern Worrوران, and has been variously classified into each group; see §1.3).

The first person forms show considerable similarity with the reconstructed first person prefixes of Table 11, which, as we have suggested, are likely to reflect the protoforms of the free pronouns.

The first person singular forms are reminiscent of the pan-Australian form *ngayu*. This form is found in three of the Western Worrوران languages (in one language the first vowel is long), and one guesses might be a retention from Proto Worrوران **ngayu*. In this case the other languages would have innovated at this grammatical site. Northern Worrوران languages (with the exception of Wilawila) show a characteristic final low vowel, *ngaya*. In Eastern Worrوران a form like *nge(e)n ~ ngi(i)n* is widespread. It is possible that this form is also a reflex of **ngayu*, deriving historically from a form involving an additional *n* or *ni*. The absence of mid vowels in Proto Worrوران suggests that the form *nge(e)n* derives from **ngayin*. The Wurla allomorph *ngiyini* attests further to this possibility: an irregular process of vowel harmony may have raised the initial vowel to *i*. Interestingly, in nearby Bunuba we find the form *ngayini*; it is possible that this form (or a historically earlier form without the final vowel) was borrowed into Proto Eastern Worrوران, and that it subsequently spread by borrowing to the adjacent Northern language Wilawila.

Moving on to the first person plural forms, *ngarr* recurs throughout the inclusive forms, and is most likely a reflex of the Proto Worrوران form involving the same sequence. Interestingly, in the Northern Worrوران languages we find an innovation in the first person inclusive: a prefixed *na*,¹ which can plausibly be identified as the second person singular. In the first person plural exclusive, plausible reflexes of *nyarr* are found throughout Worrوران languages. It is possible that denasalisation of the first segment is an innovation of Proto Western Worrوران, with subsequent weakening and loss in some varieties. This leaves unexplained the still nasal-initial Unggumi form *nyarrada*. This could of course be a subsequent borrowing (e.g. from Ngarinyin), or it could indicate that the weakening of the initial segment is a more recent process, datable to post-Proto Western Worrوران times. The fact that the corresponding bound pronominal in Unggumi shows weakening of the first segment suggests that innovation in Unggumi is the more likely story, and that the weakening is indeed traceable to Proto Western Worrوران. (Weakening in the corresponding bound form may be an analogical process restricted to a few languages subsequent to the break-up of Proto Western Worrوران.)

The second person free pronouns appear to have been the sites of some major changes. It is not obvious which (if any) forms might be reflexes of the Proto Worrوران second person singular free pronominal. The forms of the pronominal prefixes to nouns (see Table 11), however, suggest that the Eastern Worrوران may reflect the Proto Worrوران form of the pronoun, perhaps with an innovated augment *-ngan*. If this is so, the form resembling *ngunju ~ nginji* (with a syllabic augment in some languages) in Western Worrوران languages may be a borrowing from Bunuban *nginyji*. Although this requires an irregular backing of the vowel in most Western Worrوران varieties (perhaps under influence of the initial velar nasal, and subsequent vowel harmony), it is perhaps significant that in Unggumi, the variety geographically adjacent to Bunuba, the vowel remains /i/. It is possible then that the recurrent *naa* of Northern Worrوران varieties could represent a backformation from the second person

1 Carr 2000 gives for Wunambal only a form without the initial *na*, although Capell and Coate (1984:99) indicate a *na*-initial form is present in both Northern and Southern dialects of Wunambal. Perhaps the initial syllable was lost in recent times under the influence of neighbouring languages.

plural pronoun in those languages, as apparently happened in the bound pronoun prefixes to nouns.

In the second person plural no forms exist that are likely reflexes of Proto Worrوران **gIrra-* (see Table 11). It would seem that distinct forms have been innovated in each group. The second person plural free form of Proto Worrوران was apparently replaced in Western Worrوران by an analogical formation based on the old singular form, with an added plural augment *rrV*. In the other two groups we find forms similar to *nIrrV*. These forms would seem to be reflexes of a second person plural form widespread in northern Australia, which appears to be more recent in origin than the forms with an initial velar stop (Blake 1988:11–12).

The above remarks serve to indicate that it is possible to say more than ‘[t]here are some formal similarities [in pronominal forms] between pairs of languages’ (Dixon 2002:674). The pronominal systems of modern Worrوران languages can be plausibly traced back in time to a common origin in a Proto Worrوران system resembling that shown in Table 11. Although we cannot identify fully regular phonological processes giving rise to the modern forms from the protoforms, it is possible to postulate sets of simple and reasonable morphological changes (along with some plausible though irregular phonological changes). Moreover, each of the three postulated Worrوران groups seems to be supported by at least one innovation, sometimes peculiar to the group, while in other cases borrowing may have obscured the simple picture.

7 *Verbs*

7.1 Compound verbs

In common with many Australian Aboriginal languages, especially in northern and northwestern Australia, all Worroran languages have systems of compound verbs (for details see McGregor 2002). Compound verbs consist of a preverb such as the ones shown in cognate sets 1–10 in Chapter 3, followed by an inflected verb such as the ones whose roots are shown in sets 33–36. Examples of such two-word, compound verb constructions from Ngarinyin and Unggumi may be found in §4.3. A fairly large set of inflecting verbs is found in each of the Eastern and Western Worroran languages, amounting to a hundred or more in the more extensively studied languages. In the Northern Worroran languages, however, the inflecting verbs form a smaller, apparently closed class of around twenty members (Vászolyi 1976a:642; McGregor 1993:48; Carr 2000:93–98; see also Capell and Coate 1984:173). Regardless of the size of the class of inflecting verbs, only a relatively small subset of them (around ten to twenty) may occur as the inflecting verb in a compound verb construction. In many, perhaps all the languages, this subset includes all of the verbs shown in 33–36, plus others, most of which when occurring by themselves (i.e. without a preverb) also have relatively basic meanings such as ‘go’, ‘be’, and ‘put’. Moreover, verbs with these basic meanings tend strongly to be amongst the high frequency verbs in actual usage in many languages (McGregor 2002:152).

When they occur in compound verb constructions with a preverb, inflecting verbs lack much of the lexical specificity that they have as independent verbs, and instead serve a more abstract classificatory function, in which they semantically categorise the event which is predicated by the verb construction as a whole (McGregor 2002). Accordingly, each of the preverbs occurs with only a certain limited set of inflecting verbs—usually between one and three. Table 17 shows the inflecting verbs that each of the preverbs listed in cognate sets 1–10 occurs with in the three Worroran languages for which fairly full information about this is available: Worrora, Ngarinyin and Wunambal.

Table 17: Common preverbs and inflecting verbs that they occur with in three Worroran languages

	Gloss	Worrorra	Ngarinyin	Wunambal
1	‘climb’	<i>baay</i> +NU/NI ‘be’: ‘climb’	<i>baj</i> +YI ‘be’: ‘climb, ascend’	<i>baiba</i> +N ‘be’: ‘climb, ascend’
2	‘cry, weep’	<i>wala</i> +NU/NI ‘be’: ‘cry’ <i>wala</i> +YI ‘say, do’: ‘cry’ <i>wala</i> +MA ‘get’: ‘cry’	<i>warda</i> +YI ‘be’: ‘cry’ <i>warda</i> +MA ‘say, do’: ‘cry’ <i>warda</i> +MA(RA) ‘get, take’: ‘cry for’ <i>warda</i> +YILA ‘hold’: ‘cry for’	<i>wala</i> +MA ‘say, do’: ‘be crying’ <i>wala</i> +MIRRA ‘go to’: ‘cry for’
3	‘cut’	<i>durr</i> + ^B WU ‘hit’: ‘cut (it)’ <i>durr</i> + ^B WEE ‘hit self’: ‘cut oneself’	<i>durr</i> +WU ‘act on’: ‘cut’ <i>durr</i> +A ‘go’: ‘cut off, cease’	<i>dirr</i> +WU ‘hit’: ‘cut (it), cut off’ <i>dirr</i> +WU ₁ ‘hit self’: ‘cut oneself’ ^a
4	‘die’	<i>debarr</i> +YA ‘go’: ‘die’	<i>debarr</i> +A ‘go’: ‘die’	<i>debarr</i> +YA(N) ‘go’: ‘die’
5	‘dig’	<i>jarri</i> + ^B WU ‘hit’: ‘dig’	<i>jarri</i> +WU ‘act on’: ‘dig’	<i>jarri</i> +WU ‘hit’: ‘dig (a hole)’ <i>jarri</i> +MA ‘say, do’: ‘dig, dig for’ <i>jarri</i> +YA(N) ‘go’: ‘dig, go digging’
6	‘eat’	<i>minjarl</i> +NU/NI ‘be’: ‘eat’ <i>minjarl</i> + ^B WU ‘hit’: ‘eat’	<i>minjarl</i> +YI ‘be’: ‘eat, be eating’ <i>minjarl</i> +WU ‘act on’: ‘eat (something)’	<i>minja(l)</i> +N ‘be’: ‘be/ begin eating’ <i>minja(l)</i> +MA ‘say, do’: ‘eat’
7	‘hear’	<i>nguru</i> +NU/NI ‘be’: ‘hear, listen’ <i>nguru</i> +AANGURRU ‘carry’: ‘listen to’	<i>nguru</i> +YI ‘be’: ‘hear, listen’ <i>nguru</i> +MINDA ‘take’: ‘hear, listen to’	<i>nguru</i> +N ‘be’: ‘be listening’ <i>nguru</i> +MINDA ‘take’: ‘listen to, take notice of’
8	‘see’	<i>mara</i> + ^B WU ‘hit’: ‘see, find’	<i>mara</i> +WU ‘act on’: ‘see, find’	<i>mara</i> +WU ‘hit’: ‘see, find’

	Gloss	Worrorra	Ngarinyin	Wunambal
9	'sit'	<i>aja</i> +NU/NI 'be': 'sit' <i>aja</i> + ^B WA 'fall, downward motion': 'sit down' <i>ajag</i> + ^B WA 'fall, downward motion': 'sit down abruptly'	<i>ada</i> +YI 'be': 'be sitting' <i>ada</i> +WA 'fall, downward motion': 'sit down' <i>adag</i> +WA 'fall, downward motion': 'sit down quickly'	<i>atha/ada</i> +N 'be': 'sit, stay' <i>ada</i> +MA 'say, do': 'sit down' <i>athag/adag</i> +(A)WA 'fall, downward motion': 'sit down quickly'
10	'stand'	—	<i>darr</i> +MA 'say, do': 'stand' (intr.) <i>darr</i> +ININGA 'put': 'stand' (tr.)	<i>dad</i> +MA 'do': 'stand' (intr.) <i>dad</i> +NINU? 'put': 'stand' (tr.)

^a -WU₁ is a monovalent version of -WU 'hit', taking just a single pronominal prefix, cross-referencing the subject.

As can be seen, there is remarkable agreement among the languages in several important respects:

- (a) All ten of these meanings are expressed by compound verb constructions using preverbs which are similar or identical in form in all the languages;¹
- (b) The particular inflecting verbs that combine with given preverbs are ones which can be cross-linguistically identified with each other in so far as the meanings they have when occurring as independent verbs are similar or identical;²
- (c) In addition to their semantic similarity, the roots of many of the inflecting verbs that occur with given preverbs are similar or identical to each other in form.

With respect to all three of these points, there is far less similarity between any of the Worrorran languages and any of the neighbouring non-Worrorran ones. The evidence for this claim is presented in Table 18, which shows, within the limits of the available data, how the same verbal meanings are expressed in each of these languages.

With respect to point (a), whereas the Worrorran languages show matching preverb forms in all of the 30 cells in Table 17 except one ('stand' in Worrorra, which is only a partial exception for reasons explained in footnote 1), the non-Worrorran languages show forms which are different from the Worrorran ones in all of the 60 filled cells in Table 18 except for

1 The one exception is 'stand' in Worrorra, which is expressed by an inflecting verb -^BWALKE (Clendon *et al* 2000:65) and in the other languages by compound verb constructions using the preverb *darr* ~ *dad* (cf. Appendix 1 for similar or identical forms in Gunin/Kwini and Wurla). Interestingly, there is a preverb *darr* in Worrorra with a related meaning 'occur or place in a vertical or standing position', which occurs in compound verb constructions with the inflecting verbs -EE 'put down' and -^BWA 'fall, downward motion' (Clendon *et al* 2000:17). (The examples given are Worrorra sentences glossed as 'Drop me off right here' and 'Lightning flashed all around', where in the latter case we take it that a relevant fact about lightning is its 'vertical' orientation with respect to the horizon).

2 An apparent exception here is the Ngarinyin inflecting verb -WU which occurs in the compound verbs meaning 'dig', 'eat' and 'see'. But this is not really an exception, because, unlike in Worrorra and Wunambal, in Ngarinyin -WU never occurs as an independent inflected verb. It has been glossed 'act on' as a rough gloss of its very general semantic value when occurring in compound verb constructions.

two: ‘sit’ in Bunuba and ‘stand’ in Kija. The former, *yatha* is especially similar to the Wunambal (and Unggumi) form *atha*, and the latter, Kija form *that* is especially similar to *dad/darr* (and even more similar to the word for ‘stand’ in Wurla, which is *tharr ~ darr*, as shown in cognate set 2). These resemblances are especially interesting in view of the argument of §4.2–4.3 that Proto Worrوران had lamino-dental consonants, and that the Proto Worrوران forms of these words were **atha* and **tharr*. But again, there is reason to believe that these two exceptions can be accounted for, in this case by borrowing from the Worrوران languages into the non-Worrوران ones.

In the case of Bunuba *yatha*, borrowing is suggested by the fact that no such form is found in the only language with which Bunuba shares many words in common (about 45% of its core vocabulary) and is almost certainly quite closely genetically related to, Gooniyandi (in which the form for ‘sit’ is *warang-*). The word could have been borrowed into Bunuba from Unggumi, which was a neighbouring language (see Figures 1 and 3), and one whose speakers had close ties with Bunuba people (see for example Munro 1996:65 *et passim*). The addition of an initial *y* in the Bunuba form is consistent with the fact that word-initial vowels do not occur in Bunuba. Such a borrowing would have been less likely to occur in Gooniyandi, as Gooniyandi country does not border on that of any Worrوران language, and there is less evidence for close ties between Gooniyandi people and speakers of Worrوران languages.

In the case of Kija *that*, borrowing is suggested by the fact that this word is not attested from any other Jarrakan language. For instance, in Miriwoong the word for ‘stand’ is *bare*, as shown in Table 18. Here it is relevant to note that Kija country borders upon Wurla to a greater extent than does Miriwoong, and that Kija people have had close ties with Wurla.

Furthermore, among the 60 semantically corresponding cells in Table 18 from neighbouring non-Worrوران languages, ten of them (all in the three Nyulnyulan languages Nyikina, Warrwa and Bardi) are filled exclusively by independent inflecting verbs rather than compound verb constructions. That is, there is overall 83% agreement in representation of the corresponding verb meanings by a compound verb construction, as against 97% within the Worrوران languages.

With respect to point (b), among the Worrوران languages there is considerable agreement in terms of the inflecting verb roots—matched according to their meanings as independent verbs—that collocate with the ten preverbs. This can be seen from the correspondences shown in Table 19, which lists the inflecting verb roots in the three languages employed in the compound verb constructions of Table 17. As can be seen from the final column, most of the inflecting verb correspondences are instantiated by at least one triplet of compound verb constructions employing the preverb and corresponding inflecting verb. Indeed, for four of the ten basic meanings of Table 17 we find complete agreement in expression: cognate preverbs are matched with the semantically corresponding inflecting verb or verbs. For five of the remaining six basic meanings we find at least one triplet of preverb and corresponding inflecting verb; the exception, ‘stand’, shows agreement between the two languages that express this meaning in a compound verb construction.

Table 18: Common verbal expressions in neighbouring non-Worrorran languages

	Miriwoong ^a	Kija ^b	Bunuba ^c	Nyikina	Warrwa	Bardi
'climb'	<i>berdij</i> + 'do'	<i>pertij</i> + 'do'	<i>bara</i> +NI (-NI: monovalent, telic, action or change of state)	<i>lakarr</i> +I 'say'	<i>lagarr</i> +YI 'say'	<i>lakal</i> +GANYI ^f 'climb'
	<i>berdij</i> + 'go'	<i>pertij</i> + 'be' ^d		<i>lakarr</i> +WANYYJI 'climb'	[-WANYYJI]	[-GANYI]
				[-WANYYJI] ^e		
'cry, weep'	<i>nyuringbe</i> + 'do'	<i>ngartawu</i> + 'do'	<i>wala</i> +RA (RA: monovalent, atelic, active or stative)	<i>wangkoorr</i> +I 'say'	<i>wangkurr</i> +YI 'say'	<i>anggoorr</i> +MOOROO 'spill'
				[-LOOKA]	<i>wangkurr</i> +NGARLA 'cry'	<i>anggoorr</i> +MA 'put'
					[-NGARLA]	[-NGALGA]
'cut'	<i>gad</i> + 'go'	<i>katij</i> + 'do to each other'	<i>gayga</i> +MA ₂ (MA ₂ : bivalent, telic, active)	<i>joob</i> +BARNJI 'ex- change' (reflexive)	<i>jub</i> +ANDI 'get, catch'	<i>girr</i> (<i>girr</i>)+ø 'give'
	[-JJ]				<i>jub</i> +BARNJI 'ex- change' (reflexive)	
					<i>kud</i> +ARNDI 'go'	[-JIIBI]
'die'	<i>juwarig</i> + 'sit'	<i>tijpila</i> + 'fall'	<i>duluga</i> +WU (WU: monovalent, telic, active)	<i>koord</i> +MA 'go'		
	<i>juwarig</i> + 'fall'	<i>tijpila</i> + 'be'		<i>koord</i> +NI 'sit'		[-BANYI]

	Miriwoong ^a	Kija ^b	Bunuba ^c	Nyikina	Warrwa	Bardi
‘dig’	<i>guraj</i> +‘do’ <i>guraj</i> +‘gather’	<i>jiijjata</i> +‘do’	<i>wirriya</i> +MA ₂ (MA ₂ : bivalent, telic, active)	<i>widij</i> +I ‘say’	<i>widij</i> +YI ‘say’	[-GALBOO-]
‘eat’	<i>jangab</i> +‘sit’ [-NGAN]	<i>jang</i> +‘do’ <i>jang</i> +‘take’ [-NGUN]	<i>nga(g)</i> +RA (RA: monovalent, atelic, active or stative)	<i>kab</i> +I ‘say’ [-LI]	<i>kab</i> +YI ‘say’ <i>kab-kay</i> +WANI ‘be’	[-(A)RLI-]
‘hear’	<i>rangga</i> +‘sit’ <i>ranga</i> +‘take’	<i>rangka</i> +‘be’ <i>rangka</i> +‘take’	<i>nga(g)</i> +RA ₂ (RA ₂ : bivalent, atelic, active)	<i>winyi</i> +RA ₂ (RA ₂ : bivalent, atelic, active)	[-LARRA]	[-LAMANKA]
‘see’	<i>ranga</i> +‘hit’ <i>balaj</i> +‘do’ <i>balaj</i> +‘hit’	<i>rangka</i> +‘do’ ^s <i>tek</i> +‘do’ <i>tek</i> +‘get’ <i>tek</i> +‘take’	<i>mila</i> +RA ₂ (RA ₂ : bivalent, atelic, active)	[-BA(RA)]	[-JALA]	[-JALA]
		<i>tek</i> +‘do to one another’				

	Miriwoong ^a	Kija ^b	Bunuba ^c	Nyikina	Warrwa	Bardi
'sit'	<i>lulu</i> + 'sit'	<i>rurt</i> + 'do'	<i>yatha</i> +RA (RA: monovalent, atelic, active or stative)	<i>mijala</i> +NI 'sit' [-NI]	<i>mijala</i> +WANI 'be'	[-NI]
	<i>lulu</i> + 'fall'	<i>rurt</i> + 'be'				
	[-NI]	<i>rurt</i> + 'fall'				
		[-N]				
'stand'	<i>bare</i> + 'sit'	<i>that</i> + 'do'	<i>wara</i> +RA (RA: monovalent, atelic, active or stative)	<i>yalkoo</i> + ^h	<i>yaalu</i> +WANI 'be'	<i>jirrijirr</i> +JOO 'do'
	<i>bare</i> + 'fall'	<i>that</i> + 'be'			<i>yaalu</i> +JARRA 'stand'	<i>jirrijirr</i> + (I)NYA 'get'
		<i>that</i> + 'fall'			<i>yaalu</i> +BULA 'emerge'	
					<i>yaalu</i> +MA 'put'	
					[+JARRA]	

^a All Miriwoong data comes from Kofod (1976, 1978). Because of the large amount of root suppletion and morphophonemic alternation in Miriwoong verb forms, Kofod does not try to give underlying forms for the roots. Therefore we have listed just their glosses ('do', 'be', 'fall', etc.), except in the case of simple verb constructions, where one of the allomorphs only is given. For a larger (though not necessarily complete) listing of allomorphs see Table 20.

^b All Kija forms showing the preverbs paired with English glosses for their auxiliary verbs come from Taylor (1967), Taylor and Hudson (1976), and Kofod (nd). Again, as for Miriwoong, we list just the glosses of the inflecting verbs that occur with the preverbs, and one of the allomorphs when the inflecting verb is used independently in a simple verb construction. For a larger (though not necessarily complete) listing of allomorphs see Table 20.

- c None of the Bunuba inflecting verbs whose roots are shown here (-NI, -WU, etc.) ever occurs outside of a compound verb construction, so it is impossible to give a gloss for them that is comparable in lexical specificity to the ones for other languages shown in this table and for most of the ones shown in Table 1.7. What we have given instead are the semantic and syntactic features in terms of which Rumsey (2000) characterises the value of these verbs in their function as classifiers in compound verb constructions.
- d **Bolding** indicates compound verb constructions that employ the inflecting verb best corresponding in meaning to an inflecting verb used in at least one corresponding compound verb construction in a Worrorran language.
- e Where inflecting verb roots can occur alone (in simple verb constructions) in the expression of the given meaning they are enclosed in square brackets.
- f Both the preverb and the auxiliary are glossed as ‘climb’, by Aklif (1999) and Bowerm (2004b) respectively.
- g Textual examples in Taylor (1967) show *rangka+* ‘do’ glossed as ‘listen’.
- h Neither Stokes (1982) nor Stokes et al (1980) illustrate this preverb in combination with an inflecting verb. One may presume, however, that it collocates with a similar range of inflecting verbs as the corresponding preverb in closely related Warrwa.

Table 19: Correspondences among inflecting verbs used as auxiliaries in three Worroran languages according to glosses

	Worrorra	Ngarinyin	Wunambal	Cognate set ^a
‘be’	-NU ~ -NI	-YI	-N	1, (2), 6, 7, 9
‘say, do’	-YI	-MA	-MA	2, (10)
‘get, take’	-MA	-MA(RA)	-MIRA	(2)
‘hit’	- ^B WU	-WU ^b	-WU	3, 5, (6), 8
‘hit self’	- ^B WEE	— ^c	-WU ₁	(3)
‘go’ (intr.)	-YA	-A	-YA(N)	4
‘go to’ (tr.)	—	—	-MIRRA	—
‘carry, take’	-AANGURRU	-MINDA	-MINDA	7
‘fall’	- ^B WA	-WA	-(A)WA	9
‘put’	—	-ININGA	-NINU?	(10)
‘hold’	—	-YILA	—	—

^a Shown here are just cognate sets where the particular correspondence of inflecting verbs (according to their glosses) is attested in at least two of the languages. Numbers in brackets indicate that only two languages show the correspondence.

^b See footnote 2. For the earlier state of Ngarinyin, there is good reason to believe that the -WU verb could occur as an independent verb meaning ‘hit’ as it does in Worrorra and Wunambal, and in many other Aboriginal languages right across the continent (Capell 1956; Dixon 1980). Indeed, it is virtually inconceivable that it does not have this lexical source, given its formal and functional resemblance to -WU in those other languages, and the universal tendency for bound forms to develop from free ones rather than vice versa.

^c Ngarinyin has a comparable reflexivised form of the root -WU (+*yi wi*), but it is not used by itself to mean ‘hit self’, since -WU in Ngarinyin functions solely as an auxiliary verb with the more general sense of ‘act upon’.

The level of agreement is much lower in neighbouring languages with respect to the pairing of inflecting verbs and preverbs. Of the 107 verbal expressions shown in Table 18, just under a third of them (33) involve inflecting verbs with the same lexical meanings as ones which are paired with the semantically corresponding preverbs in a Worroran language. By contrast, of the 55 verbal expressions shown in Table 17, just nine (16%) involve a unique inflecting verb that does not correspond semantically to an inflecting verb used in the matching verbal expression in at least one other language.

With respect to point (c), Table 19 reveals that many of the semantically corresponding inflecting verbs are likely cognates. There are three obvious exceptions. First, Ngarinyin -YI ‘be’ is different in form from Worrorra -NU ~ -NI and Wunambal -N. Second, Worrorra -YI ‘say, do’ is evidently not cognate with the corresponding -MA of Ngarinyin and Wunambal. Third, Worrorra -AANGURRU ‘carry, take’ is formally quite unlike the corresponding -MINDA and -MINDA in Ngarinyin and Wunambal respectively. Examination of Table 17 shows that the cognate inflecting verbs that agree in lexical glosses (e.g. Worrorra -MA ‘get’ would not be grouped with Ngarinyin and Wunambal -MA ‘say, do’) are similarly distributed in the languages in which they occur.

For a number of the inflecting verbs shown in Table 19 there are inflecting verbs in nearby languages with similar root forms or root allomorphs, as can be seen from the data presented in Table 20. Nevertheless, of the 50 semantically corresponding inflecting verbs, just 21 (42%) show a root allomorph that might be a cognate of one of the corresponding inflecting verbs in a Worroran language. This is a considerably lower degree of agreement than is found amongst Worroran languages.

Table 20: Corresponding inflecting verbs in six non-Worroran languages according to glosses

	Miriwoong	Kija	Bunuba ^a
'be, sit'	-N ~ -NI ~ -IN ^b	-N ~ -NIYIN ~ -IN	-NI ^c
'say, do'	-MIN(DA) ~ -MA(YA) ~ -IYANG ~ -ANG	-ARN ~ -ERNE ~ -URN ~ -INI ~ -IRN	-MA
'get, take'	-MIN(DA) ~ -MANG ~ -NG	-MEN ~ -MA ~ -MANY ~ -MANG ~ -M	-YHA ~ -YA
'hit'	-IN(DA) ~ -ID ~ -IJ	-IYIN ~ -IYIT ~ -IJ ~ -IYI	-WU ₂
'go' (intr.)	-R ~ -D ~ -ND ~ -NI ~ -NDI ~ -RI ~ -A	-T ~ -IYI ~ -IYA	-RA
'carry, take'	-AN(DA) ~ -ANJ ~ -G	-AAN ~ -ANY ~ -IK ~ -IT	-RA ₂
'fall'	-WIN ~ -WAD ~ -WI	-WUN ~ -WART ~ -UWUN	
'put'	-LIN(DA) ~ -LAN(DA) ~ -AYITH	-LIN ~ -LUN ~ -YA ~ -YANG ~ -YAJ ~ -AJ	-NGARRI
'hold'		-MURLUN ~ -MURLUWART ~ -MURLAART ~ -MURLU ~ -MURLI	
	Nyikina	Warrwa	Bardi
'be, sit'	-NI ~ -NGA	-NI ~ -NGA ~ -WANI	-NI
'say, do'	-DI ~ -I	-YI ~ -DI	-JOO ~ -(D)I
'get, take'		-ANDI	-(I)NYA ('catch')
'hit'	-BU	-NKA	-BU
'go' (intr.)	-MA	-ARNDA	-JIIDI

	Nyikina	Warrwa	Bardi
‘carry, take’	-A ~ -KA	-A ~ -KA	-GA ~ -GAJA
‘fall’	-JALKI	-JALU	-JALGOO
‘put’	-MA	-MA	-MA
‘hold’	-BIKA (‘have’)	-BA	-LABA (‘have’)

- ^a Recall that in Bunuba the majority of what were formerly inflecting verbs have lost their ability to occur freely, and have become grammaticalised. They thus no longer express lexical meaning; we indicate here what seems to be the grammatical element corresponding to the given lexical meaning, and probably derives historically from the lexical item. See further McGregor (2002:96–98).
- ^b Allomorphs that are formally similar to semantically corresponding inflecting verb root forms in a Worrوران language are indicated in boldface.
- ^c In Bunuba -NI indicates a telic change of state or activity, and thus (if it is a genuine cognate of the other ‘sit, be’ inflecting verbs) shows semantic change from atelic ‘sit, be’ to telic ‘sit down, become’.

Turning to the pairings with preverbs, we find that there is even less agreement with Worrوران languages. To begin with, although -WU ‘hit’ shows almost identical distribution in the ten meanings in Worrوران languages (in sets 3, 5, 6 (two languages), and 8), the only place where a ‘hit’ root with a similar form is found is in the Bunuba expression for ‘die’, where a monovalent form of the inflecting verb occurs. The uses of the apparently cognate forms are disjoint. Likewise for the possible cognates of the ‘go’ verb, found in Miriwoong, Kija, and Bunuba: there is no agreement with Worrوران in terms of the preverbs these collocate with. Possible cognates of the ‘get, take’ inflecting verb are found only in Jarrakan languages, and these share no common distribution with the Worrوران ‘get, take’ inflecting verb. There is slightly more similarity in the pairings of the possible (but not very close) cognates in Jarrakan languages of the Worrوران ‘fall’ inflecting verb. These are used with the ‘sit’ preverb, as in Worrوران; however they are also used with ‘die’ and ‘stand’, which usages are not found in Worrوران.

Thus among these four potentially cognate inflecting verbs in the non-Worrوران languages there is almost no agreement in terms of the preverbs they collocate with. This leaves us with the ‘say, do’ and ‘be, sit’ verbs. For the -NI ~ -NU ~ -N ‘be, sit’ inflecting verbs of Worrوران and Wunambal there is almost perfect agreement in terms of the preverbs they collocate with. There is considerably less agreement in the preverbs collocating with the possible cognate inflecting verbs in our non-Worrوران languages, where the corresponding inflecting verb is represented in compound verb constructions in five of the languages, Miriwoong, Kija, Bunuba, Nyikina, and Warrwa. There is no more than 50% agreement between either Worrوران or Wunambal and any of these five languages in terms of the sets of preverbs the ‘sit, be’ verb collocates with, and in most cases less. By contrast the figure is 80% for the two Worrوران languages. For the non-Worrوران languages, this degree of agreement is found for only one of the preverbs, ‘sit’: of the five languages in the sample which have such a preverb, it occurs with -NI in four of them (Miriwoong, Kija, Nyikina, and Warrwa). In only two languages, Kija and Miriwoong, does this inflecting verb collocate with ‘hear’, while in Kija and Bunuba it collocates with ‘climb’. Otherwise, the only point of agreement is that in Warrwa -NI ‘be, sit’ collocates with a derived continuous form of *kab* ‘eat’. Beyond this, Kija and Nyikina match the ‘be, sit’ inflecting verb with their ‘die’ preverb, and Miriwoong, Kija, and Warrwa match it with ‘stand’. Neither of these combinations occurs in Worrوران or Wunambal.

A similar picture emerges for the -MA ‘say, do’ and -YI ‘say, do’ inflecting verbs of Worrوران. Possible cognates of the former are found in Miriwoong and Bunuba. The proportion of collocating preverbs that are common in each pairing of these languages with a Worrوران language is less than 30%, somewhat below the figure for Ngarinyin and Wunambal (40%). Possible cognates of the second ‘say, do’ inflecting verb exist in the three Nyulnyulan languages, though the only point of agreement in preverb collocations is in the preverb ‘cry’ in Nyikina and Warrwa.

In summary, what we find among the Worrوران languages is not just an overall typological similarity, but a remarkable degree of substantive similarity or identity in both the preverbs and inflecting verbs that figure in the system, and in the pairing of specific preverbs with specific inflecting verbs. There is a much higher degree of agreement among the Worrوران languages in this respect across the entire region (including languages from all three groups) than there is between any of the Worrوران languages and their immediate non-Worrوران neighbours. This evidence is especially compelling for purposes of establishing genetic relatedness among the Worrوران languages, both because the degree of resemblance among preverbs and verbs is such as to render borrowing an inadequate explanation for them, and even more importantly, because the *systematic* resemblance in preverb-inflecting verb combinations is of a kind that is even less likely to be a result of borrowing than is the resemblance among the forms themselves.

7.2 Some observations on inflecting verbs

Inflecting verbs are the most complex aspect of the morphology of Worrوران languages. Not only does the inflecting verb consist of a considerable number of potential order-classes, but the morphemes filling these classes also show a fair degree of allomorphy and various morphophonemic alternations affecting their shapes. The morphological structure of the inflecting verb is more synthetic than that of any other part-of-speech in the language. Below are order-class specifications of the inflecting verb in the three best-described languages, based on the descriptions provided in Rumsey (1982:75); Carr (2000:127–128); and Clendon (2000b:152), somewhat emended for analytical and terminological consistency. Not indicated are optionality of the order classes or cooccurrence restrictions among them, these not being germane to the concerns of this paper.

IMP+ACC+NOM+FUT+IRR+DEF.SUB+**ROOT**+REF+TNS/MD+DU/PA+CONT+DIR+
OBL+OBL.NUM Ngarinyin

ACC+IRR+NOM/IMP+IRR+NUM+**ROOT**+TNS/MD/ASP+DIR+CONT+DEP+OBL+
DU/PA+EMP Wunambal³

SUBJ+ACC+NOM+OPT+PROX+NUM+**ROOT**+PASS+TNS+DIR+OBL+DU+ASP+
COLL+ADV Worrورا

It will be observed that there is a fair amount of similarity amongst the three languages in terms of the order-class formulae for inflecting verbs. In particular, in initial or near-initial position are pronominal prefixes cross-referencing subject and object; the object prefix

3 Carr (2000:127) identifies an inverse marker in second position; this we have reinterpreted for comparative purposes (but see footnote 4) as a part of an initial accusative pronominal prefix. Alternating with her inverse marker is also a morpheme which Carr glosses ‘negative’, interpreted here (again for comparative purposes) as an irrealis mood marker; Carr identifies in addition a second negative slot, apparently an alternative position for the irrealis morpheme. We thus interpret this as a second irrealis slot.

precedes the subject prefix when both occur. The only thing that can precede the first pronominal prefix is a mood marker, imperative (Ngarinyin) or subjunctive (Worrorra). Between the pronominal prefixes and the verb root (or, in the case of transitive inflecting verbs in Wunambal, between the pronominal prefixes themselves) we find some sort of irrealis mood marker in each of the languages. Following the verb root are other tense, mood, and/or aspect markers, and an oblique pronominal that cross-references a non-core argument, such as a beneficiary or indirect object. A following morpheme may further specify the number of this non-core argument. Similar structures are found in other Worrorran languages—see e.g. Capell and Coate (1984:171ff); McGregor (1993:24).

Comparable structures are also found in nearby non-Pama-Nyungan languages, including Nyulnyulan, Bunuban, and Jarrakan languages. There are some notable divergences, however. In Nyulnyulan languages we find only nominative pronominal prefixes; cross-referencing of objects is by means of accusative pronominal enclitics, which (in most languages) compete with oblique pronominal enclitics. In pre-Proto Nyulnyulan, by contrast, there was evidently a series of accusative pronominal prefixes; these however appear to have consistently followed the nominative prefix. In Bunuban and Jarrakan languages the ordering of nominative and accusative pronominal prefixes is more complex, and is dependent on the relative position of subject and object on a person hierarchy. In Jarrakan languages there is also a high degree of root suppletion, making it impossible to distinguish separate root and tense morphemes, and a set of pronominal enclitics that distinguish amongst person-number-case categories that are conflated in the pronominal prefixes.

We now turn to a comparison of the pronominal prefixes that occur with inflecting verbs, beginning with the single series of pronominal prefixes to intransitive inflecting verbs. Table 21 shows the forms of the prefixes in four languages. Notice that the forms and system in each language are very similar—indeed almost identical—to the forms of the pronominal prefixes to nouns, as shown in Tables 9 and 10. The remarks made in §5.1.1 on the historical development of the systems of pronominal prefixes to nouns in the modern languages apply equally to pronominal prefixes to intransitive inflecting verbs. We can thus reasonably reconstruct protoforms of the prefixes as shown in the final column of Table 21. Again, it is possible that the *nV-* third person prefix of the Northern group is cognate with the feminine prefix *nyV-* of the other two groups.

Table 21: Pronominal prefixes to intransitive indicative verbs in four Worrorran languages

	Ngarinyin ^a	Worrorra	Gunin/Kwini	Wunambal	Proto Worrorran	
1sg	<i>nga</i> ₁ -	<i>nga-</i>	<i>ng-</i> ~ <i>ngV-</i>	<i>ngV-</i>	* <i>ngV-</i>	
2sg	<i>nyin-</i>	<i>ngun-</i>	<i>g-</i> ~ <i>gV-</i>	<i>gV-</i>	* <i>nyi-</i>	
3sg	a	<i>a</i> ₁ -	<i>a-</i>	<i>a-</i>	* <i>a-</i>	
	b	<i>nya</i> ₂ -	<i>nyiN-</i>		* <i>nyV-</i>	
	c	<i>w</i> ₁ <i>u-</i>	<i>kuN-</i>	<i>w-</i> ~ <i>wV-</i>	<i>wV-</i>	* <i>wV-</i>
	d	<i>ma</i> ₂ -	<i>ma-</i>	<i>m-</i> ~ <i>mV-</i>	<i>mV-</i>	* <i>mV-</i>
e			<i>n-</i> ~ <i>nV-</i>	<i>nV-</i>	* <i>nV-</i> (Proto Northern)	
f			<i>b-</i> ~ <i>bV-</i>	<i>bV-</i>	* <i>bV-</i> (Proto Northern)	

	Ngarinyin ^a	Worrorra	Gunin/Kwini	Wunambal	Proto Worrorran
1pl.incl	<i>ngarr-</i>	<i>ngarr-</i>	<i>ngarr-</i>	<i>ngarr(a)-</i>	* <i>ngarr-</i>
1pl.excl	<i>nyarr-</i>	<i>arr-</i>	<i>nyarr-</i>	<i>nyarr(a)-</i>	* <i>nyarr-</i>
2pl	<i>gurr-</i>	<i>nyirr-</i>	<i>grr-</i>	<i>gVrr-</i>	* <i>g^Hrr</i>
3pl	<i>burr-</i>	<i>garr-</i>	<i>brr- ~ brra</i>	<i>bVrr(a)-</i>	* <i>b^Hrr</i>

^a Sources of data are: Clendon (2000a:164–168) for Worrorra; Rumsey (1982:83–85) for Ngarinyin; McGregor (1993:44) for Gunin/Kwini; and Carr (2000:161, 201–202) for Wunambal.

The situation for transitive inflecting verbs is considerably more complicated, and in order to analyse the pronominal prefixes into separate component prefixes requires the postulation of underlying forms and morphophonemic processes. Table 22 shows the forms for the pronominal prefixes in three Worrorran languages, along with some analysis into component morphemes.

Table 22: Prefixes for transitive indicative verbs in three Worrorran languages

	Ngarinyin	Worrorra	Wunambal
1 2	<i>nyun-</i>	<i>ngun-</i>	<i>gun-</i>
1 3a	<i>anga₂-</i>	<i>ganga-</i>	<i>anga-</i>
1 3b	<i>nyunga₂-</i>	<i>nyanga-</i>	—
1 3c	<i>wunga₂-</i>	<i>gunga-</i>	<i>wunga-</i>
1 3d	<i>munga₂-</i>	<i>manga-</i>	<i>munga-</i>
1 3e	—	—	<i>nunga-</i>
1 3f	—	—	<i>bunga-</i>
1 2pl	<i>gunda₂-</i>	<i>nyin-</i> ({ <i>nyirr-n-</i> })	<i>gun-</i>
1 3pl	<i>bunga₂-</i>	<i>gaanga-</i> ({ <i>garr-nga</i> })	<i>burrnga-</i> <i>bung-</i> (Capell and Coate 1984:232)
2 1	<i>jan-</i>	<i>jan-</i>	<i>jan-</i>
2 3a	<i>anyja₂-</i>	<i>ganja-</i>	<i>a-</i>
2 3b	<i>nyinyja₂-</i>	<i>nyinja-</i>	—
2 3c	<i>winyja₂-</i>	<i>gunja-</i>	<i>wu-</i>
2 3d	<i>minyja₂-</i>	<i>manja-</i>	<i>mu-</i>
2 3e	—	—	(<i>nu-</i>)
2 3f	—	—	<i>bu-</i>
2 1pl.excl	<i>nyada-</i>	<i>gaanja-</i> ({ <i>gaarr-nja</i> })	<i>nyandu-</i>

		Ngarinyin	Worrorra	Wunambal
2	3pl	<i>binyja₂-</i>	<i>gaanja-</i> (<i>{gaarr-nja}</i>)	? <i>bu-</i> <i>bu-</i> (Capell and Coate 1984:232)
3	1	<i>ngan-</i>	<i>ngan-</i>	<i>ngandu-</i> (for class f agent) <i>ngan-</i> (for any other 3sg agent)
3	2	<i>nyun-</i>	<i>ngun-</i>	<i>gundu-</i> (for class f agent) <i>gun-</i> (for any other 3sg agent)
3	3a	<i>a₁-</i>	<i>ga-</i>	<i>a-</i> (for class f agent) <i>an-</i> (for any other 3sg agent)
3	3b	<i>nya₂-</i>	<i>nyiN-</i>	—
3	3c	<i>wa₂^a-</i>	<i>guN-</i>	<i>ga-</i> (for class f agent) <i>wun-</i> (for any other 3sg agent)
3	3d	<i>ma₂-</i>	<i>ma-</i>	<i>ma-</i> (for class f agent) <i>mun-</i> (for any other 3sg agent)
3	3e	—	—	<i>na-</i> (for class f agent) <i>nun-</i> (for any other 3sg agent)
3	3f	—	—	<i>bun-</i> (for class f agent, per Capell and Coate 1984:233)
3	1pl.incl	<i>ngada₂-</i>	<i>ngarr-</i>	<i>ngandu-</i> (for class f agent) <i>ngan-</i> (for any other 3sg agent)
3	1pl.excl	<i>nyada₂-</i>	<i>an-</i> (<i>{arr-n- }</i>)	<i>nyandu-</i> (for class f agent) <i>nyan-</i> (for any other 3sg agent)
3	2pl	<i>gunda₂-</i>	<i>nyin</i> (<i>{nyirr-n- }</i>)	<i>gundu-</i> (for class f agent) <i>gun-</i> (for any other 3sg agent)
3	3pl	<i>anda₂-</i>	<i>gaan-</i> (<i>{gaarr-n-ø}</i>)	<i>bun-</i> (for class f agent, per Capell and Coate 1984:233)
1pl.incl	3a	<i>arr-</i>	<i>garr-</i>	<i>angarr-</i>
1pl.incl	3b	<i>nyarr-</i>	<i>nyarr-</i>	—
1pl.incl	3c	<i>warr-</i>	<i>warr-</i>	<i>wungarr-</i>
1pl.incl	3d	<i>marr-</i>	<i>marr-</i>	<i>mungarr-</i>
1pl.incl	3e	—	—	<i>nungarr-</i>
1pl.incl	3f	—	—	<i>bungarr-</i>
1pl.incl	3pl	<i>barr-</i>	<i>gaangarr-</i> (<i>{gaarr-ngarr}</i>)	<i>bungarr-</i> (Capell and Coate 1984:233)
1pl.excl	2	<i>nyinda₂-</i>	<i>ngunbarr-</i> (<i>{ngun-(n)-^bwarr }</i>)	<i>gunyarr-</i> (Capell and Coate 1984:232)

		Ngarinyin	Worrorra	Wunambal
1pl.excl	3a	<i>anyirr-</i>	<i>gerr-</i> ({ka-nyarr})	<i>anyarr-</i>
1pl.excl	3b	<i>nyanjirr-</i>	<i>nyerr-</i> ({nyaN-nyarr})	—
1pl.excl	3c	<i>wanjirr-</i>	<i>gunyarr-</i> ({guN-nyarr})	<i>winyarr-</i>
1pl.excl	3d	<i>manjirr-</i>	<i>merr-</i> ({maN-nyarr})	<i>minyarr-</i>
1pl.excl	3e	—	—	<i>nunyarr-</i>
1pl.excl	3f	—	—	<i>binyarr-</i>
1pl.excl	2pl	<i>gunda₂-</i>	<i>nyinbarr-</i> ({nyirr-n ^b warr})	<i>gun-</i> <i>gunyarr-</i> (Capell and Coate 1984: 232)
1pl.excl	3pl	<i>banyirr-</i>	<i>gaanyarr-</i> ({gaar-nyarr})	<i>birrnyarr-</i> <i>binyarr-</i> (Capell and Coate 1984: 232)
2pl	1	<i>nganda₂-</i>	<i>jarra-</i> ({jan-rra})	<i>ngunbirr-</i> <i>nganburr-</i> (‘Wunambal north’, per Capell and Coate 1984:233) <i>ngunburr-</i> (‘Wunambal south’, per Capell and Coate 1984:233)
2pl	3a	<i>ina₂-</i>	<i>garra-</i> ({ga-rra})	<i>arr-</i>
2pl	3b	<i>nyuna₂-</i>	<i>nyirra-</i> ({nyin-rra})	—
2pl	3c	<i>wuna₂-</i>	<i>gurra-</i> ({guN-rra})	<i>wurr-</i>
2pl	3d	<i>muna₂-</i>	<i>marra-</i> ({ma-rra})	<i>murr-</i>
2pl	3e	—	—	<i>nurr-</i>
2pl	3f	—	—	<i>burr-</i>
2pl	1pl.excl	<i>nyada₂-</i>	<i>gaarra-</i> ({karr-rra})	<i>nyanburr-</i>

		Ngarinyin	Worrorra	Wunambal
2pl	3pl	<i>buna</i> ₂₋	<i>gaarra-</i> ({karr-rra})	<i>burr-gurr-</i> <i>burr-runburr-</i> ('Wunambal north', per Capell and Coate 1984:233) <i>burr-run-</i> ('Wunambal south', per Capell and Coate 1984:233)
3pl	1	<i>nganda</i> ₂₋	<i>nganbarr-</i> ({nga-n ^b warr})	<i>ngunburr-</i> ('Wunambal north', per Capell and Coate 1984:233) <i>ngund-</i> ('Wunambal south', per Capell and Coate 1984:233)
3pl	2	<i>nyinda</i> ₂₋	<i>ngunbarr-</i> ({ngun-n ^b warr})	<i>gunburr-</i>
3pl	3a	<i>irr-</i>	<i>gawarra-</i> ({ga- ^b warr-a})	<i>awurr-</i> <i>nganburr-</i> <i>nga:nburr-</i> (Capell and Coate 1984:233)
3pl	3b	<i>nyirr-</i>	<i>nyimbarr-</i> ({nyin- ^b warr})	—
3pl	3c	<i>wurr-</i>	<i>gubarr-</i> ({gun- ^b warr})	<i>gawurr-</i>
3pl	3d	<i>murr-</i>	<i>maarr-</i> ({ma- ^b warr})	<i>mawurr-</i>
3pl	3e	—	—	<i>nawurr-</i>
3pl	3f	—	—	<i>anbirr-</i>
3pl	1pl.incl	<i>ngada</i> ₂₋	<i>ngarrbarr-</i> ({ngarr- ^b warr})	<i>nganburr-</i> <i>nga:nburr-</i> (Capell and Coate 1984:233)
3pl	1pl.excl	<i>nyada</i> ₂₋	<i>anbarr-</i> ({arr-n ^b warr})	<i>nyanburr-</i> <i>nya:nburr-</i> (Capell and Coate 1984:233)
3pl	2pl	<i>gunda</i> ₂₋	<i>nyinbarr-</i> ({nyirr-n ^b warr})	<i>gunbirr-</i> <i>gunburr-</i> ('Wunambal north', per Capell and Coate 1984:233) <i>gund-</i> ('Wunambal south', per Capell and Coate 1984:233)

	Ngarinyin	Worrorra	Wunambal
3pl 3pl	<i>bunda</i> ₂ -	<i>gaanbarr-</i> ({gaarr-n- ^b warr})	<i>bunburr-</i> <i>banburr-</i> ('Wunambal north', per Capell and Coate 1984:233) <i>bund-</i> ('Wunambal south', per Capell and Coate 1984:233)

^a This form was incorrectly given as *wu-* in Rumsey (1982:85).

We do not propose to undertake a complete analysis of the transitive pronominal prefix complexes, but restrict ourselves to observations regarding some salient points.

First, the corresponding forms on each row of the table are sufficiently similar to allow us to conclude that in all likelihood the systems can be traced back to a system in Proto Worrorran that was somewhat more perspicuous, consisting of an accusative followed by a nominative pronominal prefix. The forms subsequently underwent some quite elaborate morphophonemic processes, as well as replacement of forms and systemic restructurings. Replacements almost always followed patterns we have encountered in the other pronoun systems, for example in the 1 2 forms the second person prefix was replaced in the Northern and Eastern groups as in the intransitive forms and pronoun prefixes to nouns.

Second, in the transitive prefixes cross-referencing a third person singular agent the contrast between genders is neutralised completely in Worrorra and Ngarinyin; by contrast, the gender contrast is consistently maintained in the accusative prefixes cross-referencing third person objects, as it is in the pronominals cross-referencing actors (notional intransitive subjects). In Wunambal, however, the innovated *b-* human class (labelled 3f in Table 22) is distinguished from all the other classes for third person singular agents. This holds true for other Northern Worrorran languages (see Capell and Coate 1984:229–237). There are a number of pertinent observations to be drawn out from the forms of the third person agent pronominal prefixes, many of which hold for the other Northern Worrorran languages. These are as follows.

- When the agent is of the non-human class the combined transitive prefix consists of an object prefix which is consistently followed by a final /n/. This final /n/ also occurs in certain other (combined) prefixes, e.g. 1 2 and 2 1, and has been interpreted by some as a type of inverse marker (e.g. Carr 2000 for Wunambal),⁴ employed when the agent is not higher on a person hierarchy than the patient. To make this analysis work, it must be presumed that first and second person occupy the same place on the hierarchy. Regardless of this interpretation, it seems to us that historically the /n/ is an accusative marker, which, through the operation of various historical processes, now remains only in situations where the agent does not outrank the patient in person and number.
- If we restrict attention to third person agents acting on first and second person patients, it is not difficult to develop a story for the modern forms. Observe first that those in which the agent is third person plural are quite perspicuously constructed from a first or second person accusative (inverse according to Carr's analysis) prefix followed by a third person plural agent form *burr-* ~ *birr-*, or *d-* in 'Wunambal south'. The otherwise

4 Heath (1976:182) argues that the Ngarinyin verb prefixation system 'approaches the structure' of a direct-inverse system, but Rumsey (1980:13–14) shows that Heath's argument is based on an incorrect representation of the morphophonemic composition of Ngarinyin object prefixes, and that when this is corrected, little or no evidence remains of even a tendency towards such a system.

corresponding forms in which the agent is third person singular lack this plural agent morpheme. For the non-human classes we could postulate a zero agent prefix; precisely this happens in Worrorra, albeit for all third person classes. For singular human class agents acting on first and second person objects a second position verb prefix *-du-* can be postulated for Wunambal (see the relevant forms in Table 22 with class *f* agents). Where did this innovation come from? One possibility is that it is a backformation from the third person human plural agent form *burr-*, with the omission of the number marker *rr-*, leaving *bu-*, which was reanalysed as a human class agent marker. This would follow the *-n-* accusative (inverse) marker, and progressive assimilation might have occurred, accounting for the occurring form *-du-*. The plausibility of this proposal is somewhat weakened by the fact that the initial bilabial stop of the corresponding third person plural form does not assimilate in place of articulation.

- Turning now to a third person agent acting on a third person patient, we see a related, though not identical story. Again the third person human class agent forms are related to the corresponding plural agent forms, the third person plural agent form *burr-* ~ *wurr-* being absent, and a zero in the matching position. This accounts for the otherwise surprising form *bun-* for 3f 3pl; the homophonous *bun-* 3f 3f remains exceptional, and we can only guess that the expected form *an-* does not occur in order to maintain a distinction from 3non-f 3a. The accusative/inverse marker does not show up in these forms. It does, however, appear in the non-human third person agent forms, which perhaps can be traced back directly to forms in Proto Worrوران.

A third salient point is that in the forms for first and second persons acting on third person singulars, Wunambal again seems to show the most restructuring. For second person subjects, there is no trace of a second person prefix; only the third person pronominal—almost identical in form to the corresponding intransitive prefix—is present. When the second person subject is plural, a plural marking /*rr*/ follows the third person pronoun. The same thing happens in the second person plural in Worrorra, but not in the singular. All traces of the number marker are lost in Ngarinyin, where /*n*/ appears instead of /*rr*/, perhaps an innovation of Eastern Worrوران. For first person plural subjects, the Wunambal forms are easily segmented into third person prefix followed by first person inclusive or exclusive prefix, all forms being very similar to the corresponding intransitives. These considerations are suggestive of a more recent origin for the third person singular object forms in Wunambal, with a radical restructuring of the system since Proto Worrوران.

Fourth, Ngarinyin in some places shows evidence of more radical morphophonemic processes than the other two languages, and if these are shared by other Eastern languages (as seems to be the case from data presented in Table 40 of Capell and Coate 1984:236) this would constitute additional evidence in favour of the Eastern languages as a genetic subgroup. In particular, we find in the forms for third person plural subject acting on a plural object the presence of /*d*/ or /*nd*/ where Worrorra and Wunambal show /*nb*/ or /*rrb*/, which almost certainly more closely match the Proto Worrوران forms. Similar correspondences are found in forms for first person acting on second and second acting on first, where at least one is plural.

Finally, another possible Eastern Worrوران innovation is a new second person plural transitive subject prefix *a₂-* (cf. *ja-* 2sg).

Much more remains to be said about the transitive pronominal prefix clusters, but to do so would require reconstruction of the system in Proto Worrوران, and ideally the inclusion of data from the poorer-described languages. The above remarks are, we believe, sufficient to indicate that a convincing case could be made.

8 *Subgrouping of the Worroran languages*

This chapter draws together evidence discussed in previous chapters for the viability of the three proposed groups—Eastern, Western, and Northern—as genetic units within the Worroran family. We began in Chapter 2 with a statistical analysis of the basic lexicon of the language, and showed that three groups can be distinguished on the basis of similar forms; although this is not compelling evidence for grouping, it is at least suggestive. In Chapters 3 to 7 we applied the comparative method to the Worroran languages, arguing that they do form a genetic family. On the basis of this and the data presented in Chapter 2, it is reasonable to expect that a rigorous application of the lexicostatistical method to just the Worroran languages would reveal a ternary grouping of the languages. Throughout Chapters 3 to 7 we identified a number of grammatical innovations characteristic of each of the three postulated groups, Northern, Eastern, and Western. These innovations are gathered together in Table 23.

This tabulation reveals that a number of innovations support the positing of Northern and Western groups, while support for the Eastern group is rather weaker. Nevertheless, we submit that the evidence is sufficient to justify the three primary groupings as genetic subgroups of Worroran.

Table 23: Probable shared innovations characteristic of each of the Worroran groups

Western	Eastern	Northern
Free pronominals		
innovation of new 2sg free pronoun * <i>ngunju</i> , possibly a borrowing from languages to the south	characteristic final /n/ monosyllabic 1sg form with long front vowel, perhaps deriving from protoform * <i>ngiyini</i> (which form is attested as a synchronic variant in Wurla)	harmonisation of final vowel of 1sg free pronoun with first vowel prefixation of <i>na</i> 2sg to 1pl inclusive pronoun innovation of 2pl <i>narra</i> from 2sg form + plural marker

Western	Eastern	Northern
Bound pronominals		
changes to forms of bound pronoun prefixes to nouns and intransitive verbs: loss of nasal quality of initial segment of 1pl exclusive replacement of 2sg pronominal prefix by a new form * <i>ngun-</i> new 2pl, innovated on basis of proto 2sg form + plural marker loss of initial <i>b</i> of 3pl form		development of new class marked forms in 3sg corresponding to restructuring of the noun class system innovation of new 2sg prefix, backformed from 2pl prefix
Noun classes		
nouns class endings (suffixes and final phonological segments) on Ns, developed from postposed gender-bearing anaphoric pronouns		restructuring of noun class system: development of a <i>b-</i> 'human' noun class from reanalysis of 3pl <i>birrV/ burrV</i> as <i>bi/bu</i> 'human' + <i>rrV</i> development of an <i>n-</i> inanimate class, possibly from previous FEM class loss of gender distinction in human Ns, with MAS class generalising to an animate class
Postpositions		
development of ablative postposition <i>-ngurru</i>	innovation of (general) locative postposition <i>-ra</i>	innovation of postpositions <i>-yanga</i> ABL and <i>-ngindalu</i> LOC

Western	Eastern	Northern
Inflecting verbs		
innovation of inflecting verb -YI 'say, do'	innovation of inflecting verb -YI 'be'	
	morphophonemic processes operating within transitive pronominal prefix clusters to inflecting verbs that reduce sequences of apical followed by bilabial to an apical stop or apical nasal-stop cluster	rise of a noun class-based distinction for agent pronominals in the transitive prefixes between <i>b</i> -class agents (derived from the erstwhile plural marker) and all other 3sg agent pronominals ^a
	innovation of second person plural transitive subject prefix <i>a</i> ₂ -	

^a For other Northern languages besides Wunambal in this respect, see Capell and Coate (1984:229–237).

9 *Conclusions*

In this volume we have presented evidence in favour of recognising the score of languages spoken in the mountainous Northern Kimberley region as a genetic group constituting a separate family that is at best very distantly related to other Australian families. We have reconstructed a small set of Proto Worrوران lexemes, and suggested historical phonological processes by which the forms in the modern languages may derive from the protoforms. Special attention was given in that discussion to correspondence sets in which the forms are not identical in all the languages, but differ systematically from each other in ways that can be accounted for by the posited protoforms and processes—that is the ones involving lamino-dental consonants and mid vowels.

The bulk of our evidence, however, comes from grammar rather than lexicon. Grammatical elements, in particular bound grammatical morphemes, are less prone to borrowing than are lexical elements, and fit into more or less idiosyncratic grammatical subsystems which are less likely to be borrowed in both form and substance than is any single lexical or grammatical element in them. Thus, for example, evidence from pronominal prefixes constitutes more reliable indication of old inherited material than evidence from free grammatical words (including free pronouns) and enclitics; and evidence from the shared patterning of prefixing vs non-prefixing body part possessive constructions provides even more powerful evidence of common retention. In the Worrوران case, grammatical material also provides the best evidence of grouping within the family: in particular, of innovations peculiar to each group involving restructuring of grammatical systems.

We believe it will be possible to extend the Proto Worrوران lexicon with further research, while acknowledging that we will always be hampered by extreme paucity of information on at least half of the languages. It should also be possible to establish lexical items peculiar to the protolanguages of each of the three subgroups, Eastern, Western, and Northern, though we have not yet begun this task. At present, lexical evidence in favour of the primary ternary grouping within the family is statistical in nature, and based on frequencies of shared comparable (potentially cognate) basic lexemes. It seems probable that if the statistics were redone in the standard lexicostatistical fashion the results would be in substantial agreement with those from the present statistical method.

To wind up the discussion it is worth remarking that it does indeed seem that at least in some parts of the Australian continent isoglosses do show significant clustering, in agreement with genetic groupings. In the Northern Kimberley region it seems that there are significant clusterings of lexical and grammatical features along the border with Nyulnyulan, Bunuban, and Jarrakan languages to the south, and within the Worrوران languages, along the

boundaries between the three groups. Interestingly, there are also correlations with clusters of typological features that distinguish the Worroran languages from their immediate non-Pama-Nyungan neighbours. The ternary subgrouping of the family also corresponds to more precise typological differences. The confluence of comparative and typological evidence, as well as lexical resemblance rates, adds to the case for Worroran as a genetic group.

Abbreviations used in the appendices

The abbreviations below are used to identify the sources of the lexical data shown in the appendices. For items which are not tagged with one of these abbreviations, unless an alternative default source is listed at the head of the appendix, the item has been taken from electronic lexical files compiled by William McGregor from various sources during 1985–1992.

- AC40 Capell, Arthur. 1940. ‘The classification of languages in north and north-west Australia’ (details in bibliography).
- AR84 Rumsey, Alan. Field notes on Unggumi, recorded in 1984 with Billy Monroe, Derby, W.A.
- AR90 Wurla-English Wordlist. Compiled in 1990 by Alan Rumsey with Tiger Moore and Tommy White.
- AR04 Rumsey, Alan. Field notes on Wurla, recorded in 2004 with Morton Moore and Chapman Alanbara, Mt. Barnett, W.A.
- BS&al Stokes, Bronwyn, et al. 1980. Nyigina-English: a first lexicon (details in bibliography).
- C&C Capell, Arthur and Howard Coate. 1984. *Comparative studies in Northern Kimberley languages* (details in bibliography).
- C&E Coate, Howard and Adolphus Elkin. 1974. *Ngarinjin-English dictionary* (details in bibliography).
- EV72 Vászolyi, Eric. 1972. Wunambal language data (details in bibliography).
- FM91 Worrorra vocabulary and verb paradigms elicited by Francesca Merlan from David Mowaljarlai in 1991.
- GA99 Aklif, Gedda. 1999. *Ardiyooloon Bardi ngaanka: One Arm Point Bardi dictionary* (details in bibliography).
- HC48 Coate, Howard. 1948. Wunambal-English Dictionary. In AIATSIS Library.

- JH84 Hudson, Joyce and Patrick McConvell. 1984. *Keeping language strong* (details in bibliography).
- JRBL Various writings by J. R. B. Love, chiefly Love (1934) and Love (1938).
- LK04 Notes on Wunambal language recorded by Alan Rumsey in 2004 with Louis Karadata at Mt. Barnett, W.A.
- MC00a Clendon, Mark. 2000a. *A grammar of Worrorra* (details in bibliography).
- MC00b Clendon, Mark. 2000b. Topics in Worora grammar (details in bibliography).
- MC&al Clendon, Mark, et al. 2000 *A provisional Worrorra dictionary* (details in bibliography).
- TC00 Carr, Thérèse L. 2000. Wunambal (details in bibliography).
- WD92 Douglas, Wilfrid. 1992. *Bardi language word-book* (details in bibliography).
- WM87 McGregor, William B. 1987. Field notebooks on Worrorra, Yawijibaya and Umida. In AIATSIS library.
- WM88 McGregor, William B. Field notes of Nyulnyul and Unggumi. In AIATSIS library.
- WM90 McGregor, William B. Field notebook entitled ‘Warwa, Unggumi and NyulNyul’. In AIATSIS Library.
- WM92 McGregor, William B. 1992. *Handbook of Kimberley languages*, Volume 2 (details in bibliography).
- WM93 McGregor, William B. 1993. *Gunin/Kwini* (details in bibliography).
- WMLF Willian B. McGregor’s lexical files, compiled from various sources during 1985–1992.

Appendix 1: Attested words with lamino-dental consonants in some Worroran languages and corresponding words in other Worroran languages

- 1 3sg applicative / kin propositus suffix: Ngarinyin *-nangga*; Unggumi *-nhingga*; Yawijibaya *-nhingi* (applicative) (WM87:10)
- 2 ‘alright, already’: Ngarinyin *beja*; Unggumi *batha*
- 3 ‘argue with, contradict’: Ngarinyin *dilaj*+MA (C&E:132), Unggumi *thilaj/thilaj*+YHI (WM88:134, 138)
- 4 ‘back(bone)’: Unggumi *-lathungga* (AR84:125,127), *-lathingga* (WM92); Worrorra *-rladu* (WM92), *-lardu* (MC&al); Yawijibaya *-ledu/-ladi* (WM92)
- 5 ‘barramundi’: Wurla *dewu*; Unggumi *thawurrmalye*
- 6 ‘be’: Wunambal *thanga* ‘let it be’ (root *thi~yhi?*); Ngarinyin *dang* ‘so’, ‘it is’ (C&E)
- 7 ‘beard, whiskers’: Wunambal *t(h)awurri* (sic); *tho:ru* (LK04), *dowaru* (HC48); Gunin/Kwini *dooru* (WM93:16), *rto:ru*; Ngarinyin *dawuru*; Wurla *thawulunggurr* (AR90), *thawaruma* (WM90:167), *dawuruma* (WM92)
- 8 ‘black cockatoo’: Wunambal *durramala* (HC48); *durramala* (LK04); Ngarinyin *durramala*; Wurla *thirren* (AR04); Unggumi *thurramala* (WM92); *tharramala* (WM90:227); Worrorra *durranma* (WM92), *darraanma* (MC&al)
- 9 ‘bloodwood tree’: Wunambal *bunda* (LK04); Ngarinyin *bunda?*; Wurla *bunda* (AR04); Unggumi *bunhtha* (WM90:230)
- 10 ‘break (e.g. rope)’: Wurla *thungirr*+A

- 11 ‘burst out’: Ngarinyin *dol*+A; Wurla *dol*+A (AR04); Unggumi *thal(-ba)* (WM90:298); Umiida *do:l* (WM87:122)
- 12 ‘bury’: Unggumi *thurrbul* (WM88:201)
- 13 ‘call name’: Wunambal *dali*+MA (LK04); Ngarinyin *dali*+MA; Wurla *dali*+MA (AR04); Unggumi *thali*:+MA; Worrorra *dali:(ba)* (WM92), *dali:ba* (MC&al)
- 14 ‘close’ (EV72): Wunambal *jiliburr* (LK04), *jilibid* (HC48:67); Ngarinyin *jilibirr*+MA(RA); Wurla *jiliburr*+MA(RA) (AR04); Unggumi *thilbirr*+MA (WM88:135, glossed as ‘open it up’); Worrorra *jilibi:rd* (MC&al)
- 15 ‘come, go’: Wunambal *bayanga* ‘Come!’ (LK04), *baianda* ‘Go!’ (HC48), *bayanda* ‘Go!’ (LK04); Ngarinyin *balu* ‘Come!’, *ba(nya)* ‘Go!’; Wurla *burralu* ‘Come!’, *ba:nya* ‘Go!’ (AR04); Unggumi *bayhal* ‘Come here!’ (WM88:57, 100) *baye/bayha* ‘Go!’ (WM88:100); Umiida *bayagalgo* ‘Come!’ (WM87:108, 131); Worrorra *bengkaal* ‘Come!’ (MC00b:127) *bayu* ‘Go!’; Yawijibaya *beyagal* ‘Come!’ (WM87:52)
- 16 ‘cough’: Ngarinyin *gunjurr*?; Wurla *gunthurr*+YI (AR90), *gundurrg*+MA (AR04)
- 17 ‘cut’: Wunambal *dir*, e.g. *tid ngindi* ‘I cut it’, *did* (LK04); Ngarinyin *durr* (C&E) [cf. *jirrang* ‘knife’]; Wurla *durr*+WU (AR04); Unggumi *thirr*; Worrorra *durr* (MC&al)
- 18 ‘defecate’: Unggumi *thithe* (WM90:173)
- 19 ‘die’: Wunambal *tabarr*, *debarr* (EV72), *debad* (HC48), *de:barr* (LK04); Gambera *debarr*; Gunin/Kwini *debarr*; Ngarinyin *debad*, also *debarr* (C&E), *uwerrare* (C&E); Wurla *debarr arrangga* (‘he died’) (AR90, AR04); Unggumi *thabad* (WM88:193), *thead* (WM90:147, 187, 188); Worrorra *debarr*, plural actor form *debad* (MC&al); Yawijibaya *rdebad*, *debad*
- 20 ‘digging stick’: Unggumi *thalye:ima* (WM88:112); Yawijibaya *jalu* (WM88:162)
- 21 ‘dog’ (variant 1): Wunambal *dila* (HC48); Ngarinyin *dila*; Wurla *thila* (AR90), *thila/dila* (AR04)
- 22 ‘dog’ (variant 2): Wunambal *gaia* (HC48); Unggumi *ka:yhe* (WM92), *gaye:a*
- 23 ‘down, below’: Unggumi *mathikiri/majikiri* (WM90:227)
- 24 DUal suffix: Unggumi *-nhtha*
- 25 ‘enter’: Unggumi *tha:ya* (WM90:195)
- 26 ‘faint’: Wunambal *thununba* (HC48:26); Ngarinyin *dunan(ba)+a* (C&E)
- 27 ‘fall’: Wurla *withirr arrwani* (‘it fell down’) (AR90)
- 28 ‘fart’: Ngarinyin *di:n+YI/MA* ‘defecate’; Wurla *thiny+YI* (AR90)
- 29 ‘father (my)’: Wunambal (EV72), *biija* (EV72), *bi:dja* (WMLF) (cf. *ji:yanu* ‘your father’ (LK04)); Ngarinyin *idja*; Wurla *idja* (AR04); Unggumi *irrathe* (AR84:31; WM88:63); Worrorra *irraaya* (MC00a)
- 30 ‘fill up’: Ngarinyin *dagi(wa)+YI*; Wurla *thagi+YI/MA*; Worrorra *dakidaki* ‘save, store up’ (MC00a)
- 31 ‘fire, firewood’: Wunambal *winjangum* (AC40), *winjangu* (LK04), *winthal* (HC48:28); Gambera *winjangun*; Ngarinyin *winjangun*; Wurla *winjangu* (AR90), *winyangu*

- (AR04); Unggumi *winthalingga*; Worrorra *wiyanu* (WM92, MC&al); Yawijibaya *wiya-nu*
- 32 ‘frilled lizard’: Wunambal *degulan* (HC48, LK04); Ngarinyin *degulan*; Wurla *degulan/thegulan* (AR04); Unggumi *thayikulanya* (WM88:185)
- 33 ‘good’: Wunambal *wunthaba* (HC48:33), cf. same word on p.16 as ‘convenient’, p.51 ‘nice’, ‘sweet’
- 34 ‘grow’: Wunambal *dalja*+MA (HC48, LK04); Ngarinyin *dalja*; Wurla *thalja*+MA (AR04); Unggumi *thalja* (WM88:96); Worrorra *dalja*+^BWARNGE (MC&al)
- 35 ‘hang’: Wunambal *yarrigaj* ‘hang down’; Ngarinyin *yad/yarr*+YI/ININGA; Wurla *yarr*+UNUNGA; Unggumi *thad*, e.g. *thad gawarri:la* ‘they hung it up’ (WM88:68); Worrorra *yarr+i:*, e.g. *yarr gawarri:rla* ‘They hung it down’ (MC00a:78)
- 36 ‘hit, kill’: Wunambal *nguyul* (LK04), *ngoiil* ‘hit with stick’ (HC48), *ngoiila* ‘hit in anger’ (HC48:38); Gunin *nguj/ngurd* (WM93:29); Ngarinyin *nguyul*; Unggumi *nguyhul*; Worrorra *nguyul* (WM92); Yawijibaya *nguyul* (WM87:7)
- 37 ‘hook up (spear)’: Wurla *thalg*+MA(RA) (AR90, AR04)
- 38 ‘huge’: Wunambal *thilirri* ‘too big’ (HC48:8), also *jaliri* (HC48:79); Ngarinyi *dalirri* ‘huge, clumsy, very heavy’ (C&E)
- 39 ‘hunt, go hunting’: Wunambal *yele*+WA (HC48), *ye:le*:+WA (LK04); Ngarinyin *yala(j)/yalej*+WA/MA/MINDA (C&E:284, 286); Unggumi *thali*:+MA (WM88:118, 120, 121, 124); Worrorra *yala*+^BWA, plural actor form: *yalabaa*+YI (MC00b)
- 40 ‘hurt, ache, throb’: Ngarinyin *dida*+WU; Wurla *thida*+WU (AR04); Unggumi *thidi*+MA (WM88:98), *thirra*+MA (AR84:127) (both in reference to ‘backbone’); Worrorra *jida*+YI (tr.) ‘poke’, ‘stab’
- 41 ‘ignore (be ignorant of)’: Wunambal *-mitha*, e.g. *ngamitha* ‘I don’t know’ (HC48:41) cf. *imitha*, *bumitha*, etc., ‘not seen before’; Ngarinyin *-mada* (C&E), *-amada*; cf. *amada* ‘dumb, enclosed’, (*~mamada*, etc.)
- 42 ‘kneel down’: Wunambal *lunggutha* (HC48:41) (NB: the Wunambal word listed by Coate for ‘knee’ is not *-lunggu*, but *djaruwal*); Ngarinyin *lunguda*+YI/WA (C&E)—cf. *-lunggu* ‘knee’, *lunggujad* ‘fat of the knee’ (C&E); Worrorra *rlungum* ‘knee’ (MC00a)
- 43 ‘last’ (adj.): Wunambal *gamantha-madangarri*
- 44 ‘lie, lay down’: Ngarinyin *dulu*; Unggumi *thulu*; Worrorra *durlu*: (MC&al)
- 45 ‘liver’: Ngarinyin *adi* ‘his liver’, *ngiyadi* ‘my liver’ (C&E; AR84:125), *ngadima* (WM92); Unggumi *yathima* ‘his liver’, *ngathima* ‘my liver’ (AR84:125)
- 46 ‘louse/lice’: Unggumi *thilye*
- 47 ‘make’: Wunambal *anathen*+WU (HC48:16)
- 48 MAS suffix: Ngarinyin cf. *j-* in *jirri*, *jinda*, etc.; Unggumi *-yha*; Worrorra *-ya* (MC&al, MC00a)
- 49 ‘meat’: Wunambal *i.rra*, *yirra* (EV72), *irra* (JH84); *yirra* (LK04); Gunin/Kwini *yirra*, also *yirra*, *yIrra*; Unggumi *thirri anggerrigirri*, *thirri*: (*-yhi?*), *thirrii*

- 50 ‘mend’: Wurla *thirrmil(-wa)+YI* (AR90)
- 51 ‘mouth’: Wunambal *kalama*, *-(a)lama* (EV72), *galama* (LK04); Unggumi *-nthilema ~ -y(h)ale:ma*, *nganhdhEll-ma*; Worrorra *-yalam* (MC&al); Yawijibaya *-yelem/-delem*
- 52 ‘navel’: Unggumi *thidma* (WM90:172)
- 53 ‘nearby, close’: Wunambal *wothulu*; Ngarinyin *wordulu* ‘close’ (C&E), *wardurlu* ‘be close to’ (C&E); Worrorra *wajulu* (MC&al)
- 54 ‘neck’: Ngarinyin *erru* ‘his neck’ (/a-yirru/), *ngiyerru* ‘my neck’ (/ngiya-yirru/); Wurla *ngiyurru* ‘my neck’ (AR90); Unggumi *-thurru (~-yhurru ?)* (AR84:124) *ngiyerrumam*; Worrorra *-yurrub* (MC&al); Yawijibaya *-yurrub/-jurru*
- 55 ‘one’: Wunambal *e.rringarn*, *ayarra*, *bumarege* (LK04; LK says *ayarra* is the word in Drysdale/Doongan area), *bi:erri*, *wuntharri*, *mi:arri* (HC48); Gunin/Kwini *amIrrigee*; Ngarinyin *erri* (/a-yirri/); Wurla *ayerri* (AR90), *ayerri/erri* (AR04); Unggumi *wintharri*, *winderri*, *yherre* (AR90); Worrorra *-yarrungu* (MC&al), 3sg MAS *iyarrungu*, 3sg FEM *nijarrungu(nya)*, 3sg W class *jarrungu* (MC00b:336)
- 56 ‘pain, be in’: Wunambal *lathowa*, *laja* (HC48); Ngarinyin *lada+MA* (C&E); *la+MA(RA)*
- 57 ‘paint up’: Wunambal *dinda+MA*; Ngarinyin *dinda+MA*; Wurla *dinda/thinda* (AR04); Unggumi *thinda+MA* (WM90:165); Worrorra *dinda+MA* (MC&al)
- 58 ‘paint, draw’: Wunambal *mathen* (HC84), cf. *mathamathen banggangarri* ‘scribe’, ‘drawing man’; Ngarinyin *maden+WU* (C&E), cf. *oden* ‘painting’
- 59 ‘paint, inscribe, make’: Wunambal *bathen* ‘make’ (HC48:47), cf. *bathenbaden* ‘to write’ (HC48:88); Ngarinyin *baden+WU*
- 60 ‘peck’ (V): Wurla *thida+WU*, *thida+MA* (AR04)
- 61 ‘perplexed, to be’: Wunambal *itheja*, e.g. *ni itheja manara* ‘I am perplexed’ (HC48:87); Ngarinyin *ideda+YI* (C&E), cf. *ijadi* ‘puzzle’
- 62 ‘pierce’: Wurla *tharrburd+MARA*
- 63 ‘plains kangaroo’: Unggumi *wan.galinha*; Worrorra *wan.gali:na* (MC&al)
- 64 plural suffix for personal pronouns: Unggumi *-thi/-tha*: *ngarrethi* ‘we’ pl.incl, *nyirethi* ‘we’ pl.excl, *gurra:tha* ‘you’ pl (WM90:234, WM92:158)
- 65 ‘raft (double)’: Wunambal *wunthala*
- 66 ‘sand, sandy ground’: Ngarinyin *djirrgali* (C&E); Unggumi *thirrgali:ma* (WM99:216); Worrorra *jirrkalima* (MC&al)
- 67 ‘scoop out’: Wurla *thagi* (*thangi?*)+YI
- 68 ‘short’: Unggumi *ngathaynga* (WM90:221)
- 69 ‘sit’: Wunambal *atha* (HC48), *ada* (LK04); Gambera *ada ngume*; Gunin/Kwini *ada*, also *aada*; Ngarinyin *ada*, also *adadowa*; Wurla *atha arra* ‘he’s sitting’ (AR90), *ada+MA* (AR04); Unggumi *atha*; Umiida *ban-a-wirree*, *aju*, *adja*, *yajo* (WM87:141); Worrorra *aja+NU^BWA* (MC&al); Yawijibaya *atha+MA* (WM87:29)

- 70 ‘skin’: Wunambal *waia* (HC48); Ngarinyin *waya*; Wurla *waya* (AR04); Unggumi *wayhai* (WM90:192); Worrorra *wayaama* (MC&al); Yawijibaya *wayaama* (WM92)
- 71 ‘snatch from’: Wurla *thungard+WU* (AR90), *thungard/dungarr* (AR04)
- 72 ‘spit’: Wunambal *jiba+MA/WU*; Ngarinyin *jiba+MA/WU*; Wurla *thibag+MA*; Worrorra *jibaa+WU/YI* (MC&al)
- 73 ‘split’: Ngarinyin *lajarrag* (C&E); Wurla *thirrbag+WU* (AR90), *thirrbag+MA/lajarr+MARA* (AR04)
- 74 ‘spotted nightjar’: Wurla *thin.gimarra-ngarri*
- 75 ‘stand up’: Wunambal *dad* (HC48), *tarr, dar-* (EV72); Gambera *gadhari*; Gunin/Kwini *darr, darr wirranggu, daarr*; Ngarinyin *darr*, also *dad* (C&E); Wurla *tharr arra* ‘he’s standing’ (AR90), *tharr/darr+RA* (AR04); Worrorra ^BWALKE ‘stand’, *darr+I^BWA* ‘occur or place in vertical or standing position’
- 76 ‘straight’: Wunambal *dja.dangari, djada(nari)* (HC48); Ngarinyin *jedan(ngarri)/jadan* (C&E); Wurla *jada* (AR04); Unggumi *thadangurru*; Worrorra *jadangurru/-yadangurru* (MC&al)
- 77 ‘tail’: Unggumi *thinguma* (WM92)
- 78 ‘throw spear, attack’: Wunambal *wurndij* (LK04); Ngarinyin *wurndij*; Wurla *wurndij+MA* (AR04); Unggumi *wuthij* (WM88:9), *wuthi(ba)* (WM88:117,123); Worrorra *wirndiy* (MC&al); Yawijibaya *wothiya/wojiya* (WM87:25)
- 79 ‘tight’: Wunambal *badathi* (HC84)
- 80 ‘tomorrow’: Unggumi *mangguthema* (WM88:59), *manggethima* (WM88:100)
- 81 ‘tongue’: Ngarinyin *anbula* (AC40), *ambula, arnbula*; Wurla *thilembura* (AR90), *anbula* (AR04); Unggumi *-nthalema, wanbulema* (AC40), *nganhdhEII-ma, thalanya* (AR84:124); Worrorra *anburla* (MC&al); Yawijibaya *-mbula*
- 82 ‘tooth’: Ngarinyin *-yirrkun*; Unggumi *nyarrgunh*
- 83 ‘tree, stick’: Unggumi *windthama*
- 84 ‘two’: Unggumi *wintharri- ngarndu, winhdharri-ngarndu*
- 85 ‘water lily species with yellow flowers’: Unggumi *thanggarinya* (WM88:115)

Appendix 2: Worrorran words with lamino-dental consonants and corresponding forms in other nearby languages

Note that Bunuba forms come from Rumsey (2000), Miriwung forms from Kofod (1976). Bunuba forms preceded by GG are in Gun.gunma, the mother-in-law register; those that are unspecified or preceded by JJ are in Jadajada or straight (everyday) Bunuba. (For details of the mother-in-law register, see Rumsey 2000:123–128.)

	Gloss	Unggumi	Wurla	Wunambal	Bunuba	Miriwoong	Kija
1	3sg applicative/kin propositus suffix	<i>-nhangga/</i> <i>-nhingga</i>			<i>-nhingi</i>		
2	‘alright, already’	<i>batha</i>			<i>yaninja</i>	<i>oranya</i>	
3	‘argue with, contradict’	<i>thilaj/thilaj+</i> YHI (WM88:134, 138)					
4	‘back (bone)’	<i>-lathungga</i> (AR84:125, 127); <i>-lathingga</i> (WM92)			<i>thanybarna</i>	<i>therlam</i>	<i>therlam</i>
5	‘barra-mundi’	<i>thawurrmal-ye dewul</i>			<i>balga</i>	<i>jaliwang</i>	<i>tayiwul</i>
6	‘be’			<i>thanga</i> ‘let it be’ (root <i>thi~yhi?</i>)	<i>way</i>		

Gloss	Unggumi	Wurla	Wunambal	Bunuba	Miriwoong	Kija
7 'beard, whiskers'	<i>thawaruma</i> (WM90:167)	<i>thawulung-gurr</i> (AR90)	<i>t(h)awurri</i> (sic); <i>tho:ru</i> (LK04), <i>dowaru</i> (HC48)	<i>thawuru</i>	<i>thawarung</i>	<i>towarum</i>
8 'black cockatoo'	<i>tharramala</i>	<i>thirren</i> (AR04)	<i>durramala</i> (LK04); <i>tharramala</i>	<i>dirrari</i>		
9 'blood-wood tree'	<i>buntha</i> (WM90:230)	<i>bunda</i> (AR04)		<i>muraga</i>		
10 'break (e.g. rope)'		<i>thungirr+A;</i> <i>bagud</i> (AR04)		<i>duwarr</i>	<i>dilb, bag</i>	<i>tipirr</i>
11 'burst out'	<i>thal(-ba)</i> (WM90:298)	<i>dol+A</i> (AR04)		<i>dungga</i>		
12 'bury'	<i>thurrbul</i> (WM88:201)			<i>rawuga/</i> <i>thuruga</i>		
13 'call name'	<i>thali:+MA</i>	<i>dalij+MA</i> (AR04)		<i>daliya</i>		
14 'close' (V)	<i>thilburr+MA</i> (WM88:135; glossed as 'open it up')	<i>jiliburr+MA(RA)</i> (AR04)				
15 'come/go'	<i>bayhal</i> 'Come here!' (WM88:57, 100) <i>baye/bayhe</i> 'Go!' (WM88:100)	<i>burralu</i> 'Come!' <i>ba:nya</i> 'Go!' (AR04)	<i>bayanga</i> (LK04) 'Come!' <i>baianda</i> 'Go!' (HC48) <i>bayanda</i> 'Go!' (LK04)	<i>ward buralu</i> 'Come!', <i>ward gelelib</i> , -RI, <i>ba</i> 'Go!'	<i>yitheb</i> 'Go!', <i>galiwany</i> 'Go!'	<i>warrak</i> 'Go!', <i>kirl(irl)ip</i> , -YI(N)~T~Y AN~-YA 'go'
16 'cough'		<i>gunthurr+YI</i> (AR90); <i>gundurr+MA</i> (AR04)				
17 'cut'	<i>thirr</i>	<i>durr+WU</i> (AR04)		<i>gayga</i>	<i>gad</i>	<i>pak-, katij</i>
18 'defecate'	<i>thithe</i> (WM90:173)					
19 'die'	<i>thabad</i> (WM88:205)	<i>debarr</i> <i>arrangga</i> 'he died' (AR04)		JJ: <i>duluga</i> GG: <i>debarra</i>	<i>juwarig</i>	<i>nang</i>
20 'digging stick'	<i>thalye:ima</i> (WM88:112)			<i>gananyi</i>		
21 'dog' (variant 1)		<i>thila</i> (AR90); <i>thila/dila</i> (AR04)		JJ: <i>tharra</i> GG: <i>jurrumbulu</i>	<i>jula</i>	<i>julany</i>
22 'dog' (variant 2)	<i>ka:yhe, gaye:a</i>					
23 'down, below'	<i>mathikiri/</i> <i>majikiri</i> (WM90:227)			<i>baburru</i>	<i>yilag</i>	<i>yilak</i>

Gloss	Unggumi	Wurla	Wunambal	Bunuba	Miriwoong	Kija
24 DUal suffix	<i>-nhtha</i>			<i>-ntha</i>	<i>-warriny</i>	
25 'enter'	<i>tha:ya</i> (WM90:195)			<i>wathayga</i>	<i>wutheb, wug</i>	<i>walik</i>
26 'faint'			<i>thununba</i> (HC48:26)			
27 'fall'		<i>withirr</i> <i>arrwani</i> 'it fell down' (AR90)		JJ: <i>jira</i> GG: <i>warrwala</i>	<i>jid, -WIN</i>	<i>pang, part,</i> <i>paljarr</i>
28 'fart'		<i>thiny+YI</i> (AR90)			<i>thinjbe</i>	
29 'father (my)'	<i>irrathe</i> (AR84:31; WM88:63)	<i>idja</i> (AR04)		<i>ngawungu</i>	<i>ngabang</i>	<i>nyakanji,</i> <i>ngapuny</i>
30 'fill up'		<i>thagi+YI/MA</i>				
31 'fire, firewood'	<i>wiyan.ga,</i> <i>winthalingga</i>	<i>winjangu</i> (AR90); <i>winyangu</i> (AR04)	<i>winjangum</i> (AC40); <i>winjangu</i> (LK04); <i>winthal</i> (HC48:28)	<i>winthali</i>	<i>gajawuleng</i>	<i>marnam,</i> <i>thunpam,</i> <i>marninh</i>
32 'frilled lizard'	<i>thayikulanya</i> (WM88:185)	<i>degulan/</i> <i>thegulan</i> (AR04)		<i>wawili</i>	<i>gedan</i>	
33 'good'			<i>wunthaba</i> (HC48:33), cf. same word on p. 16 as 'convenient', p. 51 'nice', 'sweet'	<i>jalungurru</i>	<i>ngundengi</i>	<i>minkawum</i>
34 'grow'	<i>thalja</i> (WM88:96)	<i>thalja+MA</i> (AR04)	<i>dalja+MA</i> (HC48, LK04)	<i>dalja</i>		
35 'hang'	<i>thad</i> (WM88:68)	<i>yarr+</i> UNUNGA	<i>yarrigaj</i> 'hang down'	<i>dadga+</i> NGARRI; 'hang up'		
36 'hit, kill'	<i>nguyhul</i>		<i>nguyul</i> (LK04); <i>ngoiil</i> 'hit with stick' (HC48); <i>ngoiila</i> 'hit in anger' (HC48:38)	<i>dangayga</i>	<i>theb, mad,</i> -IN(DA)	<i>thet, tawarr,</i> -YIT~-YIN~ -YI
37 'hook up (spear)'		<i>thalg+</i> MA(RA) (AR90, AR04)				
38 'huge'			<i>thalirri</i> 'too big' (HC48:8); also <i>jaliri</i> (HC48:79)			

Gloss	Unggumi	Wurla	Wunambal	Bunuba	Miriwoong	Kija
39 'hunt, go hunting'	<i>thali</i> +MA (WM88:118, 120, 121,124)		<i>yele</i> +WA (HC48) <i>ye:le</i> +WA (LK04)			
40 'hurt, ache, throb'	<i>thidi</i> +MA (WM88:98) <i>thirra</i> +MA (AR84:127, both in reference to 'backbone')	<i>thida</i> +WU (AR04)		<i>jirrbala</i>		
41 'ignore (be ignorant of)'			<i>-mitha</i> , e.g. <i>ngamitha</i> 'I don't know' (HC48:41) cf. <i>imitha</i> , <i>bumitha</i> , etc., 'not seen before'			
42 'kneel down'			<i>lunggutha</i> (HC48:41) (NB: the Wunambal word listed by Coate for 'knee' is not <i>-lunggu</i> , but <i>djaruwal</i>)	('knee' is <i>gumani</i>)		
43 'last' (adj.)			<i>gamantha-ma</i> <i>dangarri</i>	<i>baljuwa</i>		
44 'lie, lay down'	<i>thulu</i>			JJ: <i>baga</i> GG: <i>murrag</i> / <i>murraba</i>	<i>yug</i>	<i>paku</i>
45 'liver'	<i>yathima</i> ('his'), <i>ngathima</i> ('my') (AR84:125)			<i>mirliy</i>	<i>meling</i>	<i>mirlim</i>
46 'louse/lice'	<i>thilye</i>			<i>lun.ga</i>	<i>yalaleng</i>	
47 'make'			<i>anathen</i> +WU (HC48:16)	<i>manja</i> +MA ₂ / RA ₂	<i>birrgami</i>	<i>ngarak</i>
48 MAS suffix	<i>-yha</i>					
49 'meat'	<i>thirri</i> <i>anggerrigirri</i> , <i>thirri</i> : (- <i>yhi</i> ?), <i>thirrii</i>		<i>i.rra</i> , <i>yirra</i> (EV72), <i>irra</i> (JH84); <i>yirra</i> (LK04)	<i>miyha</i>	<i>majeng</i> , <i>ngarin</i>	<i>miyal</i> , <i>meyale</i>
50 'mend'		<i>thirrmil</i> (- <i>wa</i>) +YI (AR90)				
51 'mouth'	<i>-nthilema</i> ~ <i>-y(h)ale:ma</i> . <i>minjal</i> (AC40), <i>mugun</i>		<i>kalama</i> , <i>-(a)lama</i> (EV72); <i>galama</i> (LK04)	JJ: <i>thangarni</i> GG: <i>jayirriminyi</i>		<i>thuwundin</i> , <i>thewerndem</i>

Gloss	Unggumi	Wurla	Wunambal	Bunuba	Miriwoong	Kija
52 'navel'	<i>-thidma</i> (WM90:172)	<i>dinjil</i> (AR04)		JJ: <i>dinjili</i> GG: <i>yarlu</i>		
53 'nearby, close'			<i>wothulu</i>	<i>wathila</i>	<i>thumbugag</i>	
54 'neck'	<i>-yhurru/ -thurru</i> (AR84:124), <i>ngiyerrumam</i>	<i>ngiyurru</i> 'my neck' (AR90)		<i>winyi</i>	<i>thuweng</i>	
55 'one'	<i>wintharri,</i> <i>winderri,</i> <i>yherre</i> (AR84)	<i>ayerri</i> (AR90); <i>ayerri/erri</i> (AR04)	<i>ayarra;</i> <i>wuntharri,</i> <i>mi:arri</i> (HC48)	GG: <i>yuwarna</i> JJ: <i>yimanjarri</i>	<i>jerrawiyang</i>	
56 'pain, be in'			<i>lathowa, laja</i> (HC48)	<i>jirrbal+WU₂</i>		
57 'paint up'	<i>thinda+MA</i> (WM90:165)	<i>dinda/thinda</i> (AR04)	<i>dinda+MA</i>	<i>ba</i>		
58 'paint, draw'			<i>mathen</i> (HC84); cf. <i>mathamathen</i> <i>banggangarri</i> 'scribe', 'drawing man'	<i>manjimanji+</i> RA		
59 'paint, inscribe, make'			<i>bathen</i> 'make' (HC48:47); cf. <i>bathenbaden</i> 'to write' (HC48:88)	<i>nyunba+</i> YHA; 'paint' <i>ba+NI,</i> <i>manja+MA₂/</i> RA ₂ 'make'	<i>birrgami</i>	<i>ngarak</i>
60 'peck' (V)		<i>thida+WU;</i> <i>thida+MA</i> (AR04)				
61 'perplexed, to be'			<i>itheja</i> , e.g. <i>ni</i> <i>itheja manara</i> 'I am perplexed' (HC48:87)			
62 'pierce'		<i>tharrburd+</i> MA ₂		<i>janda+MA₂;</i> <i>dungga+MA₂</i>	<i>nganybun</i>	<i>tarrput,</i> <i>lunyarr</i>
63 'plain kangaroo'	<i>wan.galinha</i>			<i>walamba</i>		
64 plural suffix for personal pronouns	<i>-thi/-tha;</i> <i>ngarrethi</i> 'we' pl.incl; <i>nyirethi</i> 'we' pl.excl; <i>gurra:tha</i> 'you' pl (WM90:234; WM92:158)					
65 'raft (double)'			<i>wunthala</i>	<i>galwaya</i>		
66 'sand, sandy ground'	<i>thirrgali.ma</i> (WM99:216)			<i>walyarra</i>	<i>wurrjini</i>	

Gloss	Unggumi	Wurla	Wunambal	Bunuba	Miriwoong	Kija
67 'scoop out'		<i>thagi</i> (<i>thangi?</i>)+YI		<i>thada</i>		
68 'short'	<i>ngathaynga</i> (WM90:221)			<i>narda</i>		<i>kutunum</i>
69 'sit'	<i>atha</i>	<i>atha arra</i> (AR90) 'he's sitting'; <i>ada</i> +MA (AR04)	<i>atha</i> (HC48); <i>ada</i> (LK04)	<i>yatha</i>	<i>lulu</i> , -NI	<i>rut</i> , <i>rurt</i>
70 'skin'	<i>wayhai</i> (WM90:192)	<i>waya</i> (AR04)		<i>birlina</i>		
71 'snatch from'		<i>thungard</i> + WU (AR90); <i>thungard</i> / <i>dungarr</i> (AR04)				
72 'spit'		<i>thibag</i> +MA	<i>jiba</i> +MA/WU			
73 'split'		<i>thirrbag</i> +WU (AR90); <i>thirrbag</i> +MA <i>lajarr</i> +MA(RA) (AR04)			<i>lag</i> , <i>lagbany</i>	
74 'spotted nightjar'		<i>thin.gimarra</i> , <i>-ngarri</i>		<i>banangga</i> , <i>wadawiy</i>		
75 'stand up'		<i>tharr arra</i> (AR90) 'he's standing'; <i>tharr/darr</i> + RA (AR04)	<i>dad</i> (HC48); <i>tarr</i> , <i>dar-</i> (EV72)	<i>thatharra</i> / <i>wara</i>	<i>bare</i> , <i>darrb</i>	<i>that</i>
76 'straight'	<i>thadangurru</i>	<i>jada</i> (AR04)		<i>jada</i> (ngurru)		<i>jutu</i>
77 'tail'	<i>thingguma</i> (WM92)			<i>nyawa</i>		
78 'throw spear, attack'	<i>wuthij</i> (WM88:9); <i>wuthi(ba)</i> (WM88:117, 123)	<i>wurndij</i> +MA (AR04)	<i>wurndij</i> (LK04)	<i>wurdijga</i>	<i>wudij</i>	(cf. <i>withet-</i> 'throw')
79 'tight'			<i>badathi</i> (HC84)			
80 'tomorrow'	<i>mangguthema</i> (WM88:59); <i>manggethima</i> (WM88:100); <i>guminawan</i> , <i>wuguli</i> <i>mathikiri</i> / <i>majikiri</i> (WM90:227)			JJ: <i>maaningarri</i> GG: <i>gumbuninga-</i> <i>rri</i>	<i>nguburram</i>	<i>nyikawa</i>
81 'tongue'	<i>nyarrgunh</i> , <i>-rijingga</i> , <i>wun.ga</i> (ng)arduwiji			JJ: <i>minju</i> GG: <i>liji</i>	<i>jangejangedg-</i> <i>ang</i> , <i>therriny</i>	

Gloss	Unggumi	Wurla	Wunambal	Bunuba	Miriwoong	Kija
82 'tooth'	<i>-nthalema,</i> <i>wanbulema</i> (AC40), <i>nganhdhEll-</i> <i>ma</i>	<i>thilembura</i> (AR90); <i>anbula</i> (AR04)		<i>thalanyi</i>	<i>dalala</i>	<i>thalalam,</i> <i>thalalan</i>
83 'tree, stick'	<i>wumbangga,</i> <i>winthama</i> (<i>wun.ga</i>)	<i>wiran</i> (AR90)		JJ: <i>lurndu</i> GG: <i>girili</i>	<i>guleng</i>	<i>kunyjany,</i> <i>kuwuleny</i>
84 'two'	<i>winharringa-</i> <i>rndu,</i> <i>windhharri-</i> <i>ngarndu</i>	<i>mejerri(-wa);</i> <i>majarri</i> (AR04)		JJ: <i>thurranda</i> GG: <i>yimiyandi</i>	<i>ganggubeleng</i>	
85 'water lily species with yellow flowers'	<i>thanggarinya</i> (WM88:115)	<i>yarn.gun</i> (AR04)			<i>ganngubi</i> (<i>'waterlily'</i>)?	

Appendix 3: Widest-attested Worroran lamino-dental correspondences and posited protoforms

- 1 ‘beard, whiskers’ **thawuru*: Wunambal *t(h)awurri* (sic); *tho:ru*, *dowaru* (HC48); Gunin/Kwini *dooru* (WM93:16), *rto:ru*; Ngarinyin *dawuru*; Wurla *thawulunggurr* (AR90), *thawaruma* (WM90:167), *dawuruma* (WM92)
- 2 ‘black cockatoo’ **thurran(ma)*: Wunambal *durramala* (HC48); *durramala*; Ngarinyin *durramala*; Wurla *thirren* (AR04); Unggumi *thurramala* (WM92); *tharramala* (WM90:227); Worrorra *durranma* (WM92), *darraanma* (MC&al)
- 3 ‘bloodwood tree’ **bunhtha*: Wunambal *bunda*; Ngarinyin *bunda?*; Wurla *bunda* (AR04); Unggumi *bunhtha* (WM90:230)
- 4 ‘call name’ **thalij*: Wunambal *dali+MA*; Ngarinyin *dalij+MA*; Wurla *dalij+MA* (AR04); Unggumi *thali:+MA*; Worrorra *dali:(ba)* (WM92), *dali:ba* (MC&al)
- 5 ‘close’ (V) **thil(i)birr*: Wunambal *jiliburr*, *jilibid* (HC48:67); Ngarinyin *jilibirr+MA(RA)*; Wurla *jiliburr+MA(RA)* (AR04); Unggumi *thilbirr+MA* (WM88:135, glossed as ‘open it up’); Worrorra *jilibi:rd* (MC&al)
- 6 ‘come, go’ **-yha*: Wunambal *bayanga* ‘Come!’ (LK04), *baianda* ‘Go!’ (HC48), *bayanda* ‘Go!’; Ngarinyin *balu* ‘Come!’, *ba(nya)* ‘Go!’; Wurla *burralu* ‘Come!’, *ba:nya* ‘Go!’ (AR04); Unggumi *bayhal* ‘Come here!’ (WM88:57, 100), *baye/bayha* ‘Go!’ (WM88:100); Umiida *bayagalgo* ‘Come!’ (WM87:108, 131); Worrorra *bengkaal* ‘Come!’ (MC00b:127) *bayu* ‘Go!’; Yawijibaya *beyagal* ‘Come!’ (WM87:52)
- 7 ‘cut’ **thirr/thurr*: Wunambal *dir*, e.g. *tid ngindi* ‘I cut it’, *did* (LK04); Ngarinyin *durr* (C&E) [cf. *jirrangu* ‘knife’]; Wurla *durr+WU* (AR04); Unggumi *thirr*; Worrorra *durr* (MC&al)
- 8 ‘die’ **thabarr*: Wunambal *tabarr*, *debarr* (EV72), *debad* (HC48), *de:barr* (LK04); Gambera *debarr*; Gunin/Kwini *debarr*; Ngarinyin *debad*, also *debarr*, *uwerrare*; Wurla *debarr arrangga* ‘he died’ (AR90, AR04); Unggumi *thabad* (WM88:193),

- thebad* (WM90:147, 187, 188); Worrora *debarr*, plural actor form *debadi* (MC&al); Yawijibaya *rdebad*, *debad*
- 9 ‘fire, firewood’ **winthalngi*: Wunambal *winjangum* (AC40), *winjangu* (LK04), *winthal* (HC48:28); Gambera *winjangun*; Ngarinyin *winjangun*; Wurla *winjangu* (AR90), *winyangu* (AR04); Unggumi *winthalingga*; Worrora *wiyanu* (WM92, MC&al); Yawijibaya *wiya-nu*
- 10 ‘frilled lizard’ **thayigulan*: Wunambal *degulan* (HC48, LK04); Ngarinyin *degulan*; Wurla *degulan/thegulan* (AR04); Unggumi *thayikulanya* (WM88:185)
- 11 ‘grow’ **thalja*: Wunambal *dalja*+MA (HC48, LK04); Ngarinyin *dalja*; Wurla *thalja*+MA (AR04); Unggumi *thalja* (WM88:96); Worrora *dalja*+^BWARNGE (MC&al)
- 12 ‘hang’ **yharr/tharr*: Wunambal *yarrigaj* ‘hang down’; Ngarinyin *yad/yarr*+YI/ININGA; Wurla *yarr*+UNUNGA; Unggumi *thad*, e.g. *thad gawarri:la* ‘They hung it up’ (WM88:68); Worrora *yarr*+I:, e.g. *yarr gawarri:rla* ‘They hung it down’ (MC00a:78)
- 13 ‘hit, kill’ **nguyhul*: Wunambal *nguyul* (LK04), *ngoiil* ‘hit with stick’ (HC48), *ngoiila* ‘hit in anger’ (HC48:38); Gunin/Kwini *nguj/ngurd* (WM93:29); Ngarinyin *nguyul*; Unggumi *nguyhul*; Worrora *nguyul* (WM92, MC&al); Yawijibaya *nguyul* (WM87:7)
- 14 ‘hunt, go hunting’ **yhalaj/thalaj*: Wunambal *yele*+WA (HC48), *ye:le*+WA (LK04); Ngarinyin *yala(j)/yalej*+WA/MA/MINDA (C&E:284, 286); Unggumi *thali*:+MA (WM88:118, 120, 121, 124); Worrora *yala*+^BWA, plural actor form *yalabaa*+YI (MC&al)
- 15 ‘mouth’ **yhalama*: Wunambal *kalama*, *-(a)lama* (EV72), *galama* (LK04); Unggumi *-nthilema* ~ *-y(h)ale:ma*, *nganhdhEll-ma*; Worrora *-yalam* (MC&al); Yawijibaya *-yelem/-delem*
- 16 ‘nearby, close’ **wathulu*: Wunambal *wothulu*; Ngarinyin *wordulu* ‘close’ (C&E), *wardurlu* ‘be close to’ (C&E); Worrora *wajulu* (MC&al)
- 17 ‘one’ **-yharri*: Wunambal *e.rringarn*, *ayarra*, *bumarege* (LK04; LK says *ayarra* is the word in Drysdale/Doongan area), *bi:erri*, *wuntharri*, *mi:arri* (HC48); Gunin/Kwini *amIrrigee*; Ngarinyin *erri* (/a-yirri/); Wurla *ayerri* (AR90), *ayerri/erri* (AR04); Unggumi *wintharri*, *winderri*, *yherre* (AR84); Worrora *-yarrungu* (MC&al), 3sg MAS *iyarrungu*, 3sg FEM *nijarrungu(nya)*, 3sg W class *jarrungu* (MC00b:336)
- 18 ‘paint up’ **thinda*: Wunambal *dinda*+MA; Ngarinyin *dinda*+MA; Wurla *dinda/thinda* (AR04); Unggumi *thinda*+MA (WM90:165); Worrora *dinda*+MA (MC&al)
- 19 ‘sit’ **atha*: Wunambal *atha* (HC48), *ada* (LK04); Gambera *ada ngume*; Gunin/Kwini *ada*, also *aada*; Ngarinyin *ada*, also *adadowa*; Wurla *atha arra* (AR90) ‘he’s sitting’, *ada*+MA (AR04); Unggumi *atha*; Umiida *ban-a-wirree*, *aju*, *adja*, *yajo* (WM87:141); Worrora *aja*+NU/^BWA (MC&al); Yawijibaya *atha*+MA (WM87:29)
- 20 ‘skin’ **wayha*: Wunambal *waia* (HC48); Ngarinyin *waya*; Wurla *waya* (AR04); Unggumi *wayhai* (WM90:192); Worrora *wayaama* (MC&al); Yawijibaya *wayaama* (WM92)
- 21 ‘spit’ **thiba*: Wunambal *jiba*+MA/WU; Ngarinyin *jiba*+MA/WU; Wurla *thibag*+MA; Worrora *jibaa*+WU/YI (MC&al)

- 22 ‘stand up’ **tharr*: Wunambal *dad* (HC48), *tarr*, *dar-* (EV72); Gambera *gadhari*; Gunin/Kwini *darr*, *darr wirranggu*; Ngarinyin *darr*, also *dad*; Wurla *tharr arra* (AR90) ‘he’s standing’, *tharr/darr*+RA (AR04); Worrorra -^BWALKE ‘stand’, *darr*+I/^BWA ‘occur or place in vertical or standing position’
- 23 ‘straight’ **thada*: Wunambal *dja.dangari*, *djada(nari)* (HC48); Ngarinyin *jedan(ngarri)/jadan* (C&E); Wurla *jada* (AR04); Unggumi *thadangurru*; Worrorra *jadangurru/-yadangurru* (MC&al)
- 24 ‘throw spear, attack’ **wuthij/wurndij*: Wunambal *wurndij* (LK04); Ngarinyin *wurndij*; Wurla *wurndij*+MA (AR04); Unggumi *wuthij* (WM88:9), *wuthi(ba)* (WM88: 117, 123); Worrorra *wirndiy* (MC&al); Yawijibaya *wothiya/wojiya* (WM87:25)

Appendix 4: Basic vocabulary from eight Worroran languages

Unless otherwise indicated, Ngarinyin forms are from Coate and Elkin (1974) and Wurla forms from Rumsey (1990). Note that due to the disparate sources for the lexical information shown there are inconsistencies in the range of details provided; for instance, sometimes inflecting verbs are cited in root form, sometimes in an inflected form.

Gloss	Wunambal	Gambera	Gunin/Kwini	Ngarinyin	Wurla	Unggumi	Umiida	Worrora
'arm'	-nunggu (EV72)		-nunggu (-nunggu)	nunggu, munonggu	burrunda	nungguma (manma)		^b wardu (lower), -aarlum (upper) (MC&al), nunggum
'armpit'	manambarr (EV72), ma.la.mbarr		malambarr	marlambarr, -andarga	wandarga	malambarrma, malambarr-ma		marlambadba (MC&al), marlambard, ngali:djariga
'ashes (cold)'	wa.gu	jeiala		bunalgara, gona, gorno, wagu		karningga, wabara		bimbirnal, bimbi'nalba (FM91), bimbinulb (JRBL), binalu (MC&al)

Gloss	Wunambal	Gambera	Gunin/Kwini	Ngarinyin	Wurla	Unggumi	Umiida	Worrorra
'back'	<i>ka:jila, gayla</i> (EV72), <i>ngowarrga</i>	<i>gaiila</i>	<i>kayila</i>	<i>gayilan, anggan</i>	<i>bada</i>	<i>-lathungga</i> (AR84) <i>-lathingga</i> (WM) <i>-lardingga, ko:rrngi</i>		<i>-larđu</i> (MC&al), <i>-rladu</i>
'bad'	<i>ba:ri, a:riiwa, -aariwa</i> (EV72)	<i>wunggari</i>	<i>ba:riiwa</i>	<i>-alwa</i>	<i>gulanggu</i>	<i>-ngilyerr, ungilyerr</i>	<i>whop-parria</i>	<i>arrwarri, iwarri</i> (FM91); <i>-warr</i> (MC&al) <i>-warri, waru</i>
'be burning'	<i>marra</i>		<i>malamala wirranggu</i>	<i>wari, duld</i>	<i>wari winyangga</i>	<i>kalanggala</i>		<i>wari, wariwari, -NINJAWA</i> (MC&al), <i>mara</i>
'be sitting'	<i>a.da</i> (HC48)	<i>ada ngume</i>	<i>ada, also aada</i>	<i>ada, also adadowa</i>	<i>ada</i> (AR04), <i>atha arra</i> ('he's sitting')	<i>atha</i>	<i>yajo</i> (WM87:141), <i>ban-a-wirree, aju, adja</i>	<i>aja</i>
'be standing'	<i>tarr, dar-</i> (EV72) <i>dad</i> (HC48)	<i>gadhari</i>	<i>darr, darr wirranggu</i>	<i>darr, dad</i>	<i>tharr/darr</i> (AR04), <i>tharr arra</i> ('he's standing')	<i>-YANGGAY</i>		<i>-WALGEE ~ -MBALGEE, -A WELGENGU</i> (C&C), <i>-^BWALKE</i> (MC&al)
'big'	<i>b(a)rrarra, benewurr, -newurr</i> (EV72)		<i>wunangay</i>	<i>jonggarri, -aned, jonggaridi</i>	<i>arda, 'big one (male)'</i>	<i>jawingarringga</i>	<i>air-down-gee</i>	<i>-raarveya</i> (MC&al), <i>inayirri</i>
'bite'	<i>ngirij</i>	<i>gundurr</i>	<i>gEndurr</i> (C&C), <i>gaarndIrr</i>	<i>go:d</i> (C&C), <i>-aningga-, gadur</i>	<i>warrga anjilan</i> ('you bit him')	<i>bada, parda</i>		<i>-ANINGGA</i> (C&C), <i>-NINGGA, kardurr</i> (MC&al)
'black'	<i>ji.ngarri, gurImbarr</i> (EV72)		<i>juwangay</i>	<i>gulaba, gulijba, gunbarra, awungun</i>	<i>gun-ngarri</i>	<i>kulibanggarri, kurnbanggarri, wagumade</i>		<i>wakumaada</i> (MC&al), <i>waguma:da</i>

Gloss	Wunambal	Gambera	Gunin/Kwini	Ngarinyin	Wurla	Unggumi	Umiida	Worrora
'bone'	<i>unarr, bunar</i> (AC40), <i>-rnar</i> (EV72), <i>nganard</i>	<i>awurr, nganalala</i>	<i>burnarr</i>	<i>-wurnarr, anorr/anod, onarr</i>	<i>awurr</i>	<i>-(wi)na:riya, inari</i> (AC40), <i>yIna:ri-ya</i>		<i>ina:ri, -rnaariya</i> (FM91), <i>-maarri</i> (MC&al), <i>nganari</i>
'breast, milk'	<i>-manda</i> (EV72), <i>ngamu, ngamarngala</i>	<i>darlbarn</i>	<i>nga:mu</i>	<i>ngamun</i>	<i>ngamu</i>	<i>ngamungga</i> (<i>wun:ga</i>), <i>ngamUngga, ngamungga</i>		<i>ngamuku</i> (MC&al), <i>ngamugu</i>
'camp, place'	<i>kEra:; gEra</i> (EV72)		<i>gIrang, gura, gIra:</i>	<i>-alu, dambun</i>	<i>dambu</i>	<i>dambima, tambi-ma, tambi:ma, dambi:ma</i>	<i>tapima, dabima, dabi</i>	<i>tambi:ma, dambima</i> (FM91), <i>dambeem</i> (MC&al)
'carry'	<i>wurray, mardug, -YANGGE</i> (EV72)		<i>jagurr, marnu</i>	<i>munomunawu, dandij</i>	<i>marnu angamanga</i> 'I carried it'	<i>-NE</i>		<i>marnowa, -AANGURRU, jujurr</i> (MC&al)
'climb up'	<i>baj, ben nganga</i>		<i>be:n, been, bee</i>	<i>bad, badj</i>	<i>baj-ba arrangga</i> 'he climbed'	<i>baj ~ bay</i>	<i>bai</i>	<i>baay, bern, wurndak</i> (MC&al), <i>bayi</i>
'cry, weep'	<i>wala</i>	<i>wala</i>	<i>warla, wala</i>	<i>wada</i>	<i>warda-wa errinyi</i> 'he cried'	<i>wara, wala(wa)</i>		<i>wala</i> (MC&al)
'cut it'	<i>tid, mali</i> (EV72), <i>did</i> (LK 04)		<i>Irr</i>	<i>did, durr, dir, darn, dud</i>	<i>durr</i> (AR04), <i>gardug-ba ngirrenyi</i> ('I cut it up')	<i>thirr</i>		<i>durr</i> (MC&al)
'die'	<i>tabarr, debarr</i> (EV72); <i>debad</i> (HC48); <i>de:barr</i> (LK04)	<i>debarr</i>	<i>debarr</i>	<i>debad, also debarr, uwerrare</i> ('he died')	<i>debarr arrangga</i>	<i>thabad</i> (WM88:193); <i>thebad</i> (WM90:147, 187, 188)		<i>rdiabarr, debad</i> (FM91), <i>debarri, beruk, debadi</i> (MC&al)
'dig'	<i>jarri</i>	<i>warug mangi</i>	<i>ja:rii wungana ngawagu, jaarri</i>	<i>djari, djariwa, waruba, warug</i>	<i>jarri wungoni</i> 'I dug it (hole)'	<i>jarri</i>	<i>jarri</i>	<i>jarri</i> (MC&al)

Gloss	Wunambal	Gambera	Gunin/Kwini	Ngarinyin	Wurla	Unggumi	Umiida	Wororra
'dog'	<i>lewa, le:wa</i> (EV72), <i>dila, gaia</i> (HC48)		<i>liwa, leewa, lewa</i> <i>dela</i>	<i>gananggurd, dila,</i> <i>dila</i> (AR04), <i>tEla</i>	<i>thila, dila</i> (AR04), <i>tEla</i>	<i>ka:ye,</i> <i>kananggurr,</i> <i>gaye:a</i>	<i>karnongkurri</i>	<i>karnanggurri,</i> <i>garnan ggurra</i> (FM91), <i>kanangkurri</i> (MC&al)
'down, below'			<i>duurr</i>	<i>alyi, alje, alja</i>	<i>alya</i>	<i>mo:rrga,</i> <i>madhikiri,</i> <i>mathikiril,</i> <i>majikiri</i> (WM90:227)		<i>wayur(r)u,</i> <i>wayurru</i> (FM91)
'ear'	<i>wuyu, wuyu, wuyu</i> (EV72)		<i>wuyu</i>	<i>oru, -ORRU,</i> <i>nyowuru</i>	<i>peraro</i> (WMLF) <i>ngiyoru</i> 'my ear' (AR90),	-RNEMA		<i>-niima, -niima</i> (FM91), <i>-neem</i> (MC&al)
'east'	<i>yamamara</i>		<i>marangu</i> <i>birdipirdi,</i> <i>bIrdibIrdi</i>	<i>waringarri,</i> <i>warringerrri</i>	<i>ngulamu</i>	<i>wurrngana</i>		<i>warangarri,</i> <i>waringarrima</i> (FM91)
'eat, consume'	<i>minyjal, mindja</i>	<i>minjal, nguduba,</i> <i>ngangia</i>	<i>minyjal nglrmdi</i>	<i>minjarl</i>	<i>minjarl ngirrinyi,</i> 'I ate'	<i>minyjal</i>		<i>minyjal, minyjarl</i> (FM91, MC&al)
'egg'	<i>kumbe:</i>		<i>yulumban,</i> <i>yilumban</i>	<i>gambi, jinoran</i>	<i>gumbayi,</i> <i>gumbulirr</i>	<i>gambi:ngga,</i> <i>kambi-ngga,</i> <i>kambi:ngga</i>		<i>warnawi,</i> <i>i'norunu</i> (FM91), <i>wonau</i> (JRBL), <i>ambi</i>
'eye'	<i>umbul, wumbul</i>	<i>wumbul, gulungu</i>	<i>wumbul</i>	<i>-ambul, amen</i>	<i>aiambul</i> (WMLF)	<i>-nggubulngga ~</i> <i>-mbul, jumbul</i> (AC40), <i>nga:mbilnga</i>	<i>airgo-bil-in-ee,</i> <i>-biilu</i>	<i>-(a)mbulu ~</i> <i>-gubulu</i> (FM91), <i>ombula</i> (AC40), <i>-aambulu</i> (MC&al)
'face'	<i>-ngirri</i> (EV72), <i>-ngiri</i>		<i>muru, also murru</i>			<i>-ngirringga</i>		<i>-bingum</i> (FM91), <i>-mingum</i> (MC&al)
'fall, downwards motion'	<i>bakarla, -WA(N)</i> (TC00:185)		<i>barda, baarda</i>	<i>-W₁A, ngarrwa,</i> <i>ngara</i>	<i>withirr arrwani</i> 'it fell down'	<i>bugir'la</i>		<i>-^BWA, ngaarrwa</i> (MC&al)

Gloss	Wunambal	Gambera	Gumin/Kwini	Ngarinyin	Wurla	Unggumi	Umiida	Worrora
'fat'	<i>bo.rra</i>			<i>bowarra, borra, mowarlawa</i>	<i>marraj-nungga</i>			<i>bawarra</i> (MC&al), <i>burugu</i>
'fat'	<i>wajingal, -raarra</i> (EV72), <i>djangulun</i>	<i>wudjangarl</i>	<i>wurringun</i>	<i>dala, wuringun</i>	<i>mulunggu</i>	<i>mirn.gangga, winyjei, mIn.ga-ngga</i>		<i>wirringi.wa, wurngiwa</i>
'fingemail'	<i>na.rriun, geengga</i>		<i>rirrimlrl</i>	<i>baradarl</i>	<i>rerrmendel</i> (WMLF), <i>rirrimil</i>	<i>wirringga, miyan (inya), ridmindil-ma</i>		<i>ke.ngga, geengga</i> (FM91) <i>keingka</i> (MC&al)
'fire'	<i>wunarr, winjangum</i> (AC40), <i>bu:</i> (AC40) <i>winjangu</i> (LK 04); <i>winthal</i> (HC48:28)	<i>winjangun, gurimaru</i>	<i>buwu, wunarr</i> (AC40), <i>boo, buu</i>	<i>winjangun</i>	<i>winyangu</i> (AR04), <i>wonyangon</i> (WMLF), <i>winjangu</i>	<i>wiyan.ga, winthalingga</i>	<i>ou-yun</i>	<i>wiyanu</i> (MC&al)
'foot'	<i>wu.rra, anggarra, jo.rlu, wurdmaru</i> (EV72)		<i>anggarra, anggarra</i>	<i>-yimbularru, adjuma, ambularu</i>	<i>jolu, ambulara</i> (WMLF), <i>jowulu</i>	<i>-ijardingga ~ -yambllarrungga</i>		<i>-jerdu</i> (JRBL), <i>-yardu ~ -jardu</i>
'forehead'	<i>durlu</i> (EV72), <i>-malad</i> (HC48), <i>mu.ru, dulu</i>	<i>durlu</i>	<i>tulu</i>	<i>-murlarr, jumulaj, amurlarr amalad</i>	<i>ngilmirlarrma, -mitadma</i> (<i>manma</i>)			<i>-malarru, -mirlarru</i> (FM91), <i>-mlarru</i> (MC&al), <i>ngamlaru</i>
'give it'	<i>gorl nguma</i> (EV72), <i>bungal</i>	<i>-ALNGA</i>	<i>-ANGA</i> (C&C), <i>gungur!</i>	<i>-NGURLU, -NGULI~ -NGULU</i>	<i>angangur!ini, 'I gave to him'</i>	<i>-NGUL</i>	<i>ganganuno:n</i>	<i>-ANO</i> (C&C), <i>-RNO, -RNA, -YAARIWU</i> (MC&al)
'go, walk'	<i>wurray, mardug</i> (EV72), <i>-YANGGE</i> (EV72), <i>baianda</i> (HC48), <i>bayanda</i> (LK04)	<i>madewa baianga</i>	<i>-A</i>	<i>-A</i>	<i>gure burra 'Go!'</i>	<i>-NE, bayhal 'Come here!'</i> (WM88) <i>baye/bayha 'Go!'</i> (WM88)	<i>bayagalgo 'Come!'</i> (WM87) <i>mung-er-nio</i>	<i>-NGA, -(N)GA</i> (JRBL), <i>-YA 'go',</i> (MC&al)

Gloss	Wunambal	Gambera	Gunin/Kwini	Ngarinyin	Wurla	Unggumi	Umiida	Wororra
'good'	<i>manambarra</i> , <i>-yaba</i> (EV72), <i>wundaba</i>	<i>wundabangari</i>	<i>wanyilme</i> , <i>wanyji</i>	<i>-aniya</i> , <i>-anija-</i> , <i>amaren</i>	<i>ayiba</i> 'good (male)'	<i>yimaja</i> , <i>yi.maja</i>	<i>arr-goul-an</i>	<i>ardiyei</i> , <i>i'niyangarra</i> (FM91), <i>-niya</i> (MC&al), <i>winia</i>
'ground, dirt'	<i>bunumburr</i> , <i>burra</i>			<i>ngura</i> , <i>gabarl</i>	<i>ngurra</i> (WMLF)	<i>jila:ma</i> (<i>manma</i>), <i>thirrgali:ma</i>		<i>tabalba</i> , <i>gabarlba</i> (FM91), <i>kabalba</i> (MC&al)
'hair of head'	<i>yambarra</i> , <i>jagarra -o:ja</i> (EV72)	<i>walan</i>	<i>jagarra</i>	<i>djagaran (di)</i> , <i>djagarandi</i>	<i>alangurr</i> (WMLF), <i>yambarra</i>	<i>wirriye:ya</i> , <i>warndirrye</i> , <i>wirriye-yha</i>		<i>ngawayarra ~</i> <i>ngawayarru</i> , <i>jagarra</i> (FM91)
'hand'	<i>miyal</i> , <i>wiri</i> (EV72), <i>-mi:arl</i>	<i>wiri</i>	<i>miyal</i> , also <i>miyarl</i>	<i>-rnamala</i> , <i>ama</i> <i>mind</i>	<i>nyingiyal</i> , <i>birinanggo</i> (WMLF)	<i>-rnanangga</i>	<i>air-dun-ee</i>	<i>-rnurnu</i> , <i>-nori</i> (JRBL), <i>-rnurnu</i> , <i>-rnorri</i> (MC&al)
'hard'			<i>gardagardaj</i>	<i>dar.ud</i> , <i>burudu</i> , <i>elguri</i>	<i>tanjege</i> , <i>ka:mburrige</i>		<i>burrundu</i> (FM91)	
'head'	<i>baandi</i> , <i>ware-</i>	<i>ba:ndi</i>	<i>ba:ndi</i>	<i>-rlangun</i> , <i>mambagun</i>	<i>alangurr</i> (WMLF)	<i>-nggubama</i> , <i>-bama</i> (AC40)	<i>-marre</i>	<i>-miri</i> , <i>-mirige</i> (FM91), <i>-bri</i> (AC40), <i>-mri</i> (MC&al)
'hear, listen'	<i>nuruk</i> , <i>nguru</i> (EV72), <i>ngur.u</i> <i>nganga</i>	<i>nguru</i> , <i>bururo</i> <i>ngama</i>	<i>ngana</i> , <i>ngarna</i>	<i>nguru</i> , <i>ngur.u</i>	<i>winyi nyinindani</i> 'I heard you'; <i>nguru nyarriyenyi</i> 'we listened'	<i>ngarwe</i>		<i>nguru</i> , <i>-bri</i> (JRBL), <i>-bri</i> (AC40), <i>nguru</i> (MC&al)
'heart'	<i>kanyakanyia</i> , <i>rangu</i>	<i>durlwa</i>	<i>dili:</i>	<i>rangu</i>	<i>rangu</i>	<i>durlwayha ~</i> <i>turlwe</i> , <i>rdulwe:</i> , <i>turlwa-yha</i>	<i>rangu</i>	
'here'			<i>winyjagu</i>	<i>ganda</i>	<i>manggerrima</i> , <i>manma</i> , <i>marn.girrima</i>			<i>ngurru</i> (FM91, MC&al); <i>-aal</i> , <i>mana</i> , <i>ngurru</i> (MC&al)

Gloss	Wunambal	Gambera	Gumin/Kwini	Ngarinyin	Wurla	Unggumi	Umiida	Worrora
'hit, kill'	wut, -NBUN (EV72); <i>nguyul</i> (LK04); <i>ngoiil</i> 'hit with stick' (HC48); <i>ngoiila</i> 'hit in anger' (HC48:38)	<i>parda</i>	<i>bumarmung</i> , <i>ngawurd</i> , <i>ngud</i>	<i>bada</i>	<i>ngurr nyilani</i> ('he was hitting her')	<i>ngurr nyilani</i> ('he daj(ba) was hitting her')	<i>pada</i>	^B WU, ^B WEE (MC&al), <i>nguyul</i>
'hungry'	<i>ngurrimal</i> , <i>nguya</i> , <i>ngiye</i> , <i>ngaya</i> (EV72), <i>mewurr</i>	<i>ngure</i> ; also <i>ngurre</i>	<i>ngure</i> ; also <i>ngurre</i>	<i>nguyen</i> +WU 'be hungry', <i>ngujen</i> 'hunger'	<i>nguyan</i>	<i>bara:ngga</i> , <i>bara</i> , <i>barangga</i> , <i>pEra:-ngga</i>	<i>bri-ella</i>	<i>bayaa</i> (MC&al), <i>baya</i>
'I, me'	<i>ngay(a)</i>	<i>ngaaya</i>	<i>ngayu</i> , <i>ngaya</i>	<i>ngin</i> , <i>ngen</i>	<i>ngeen</i> (C&C), <i>ngiyini</i>	<i>ngayingga</i>	<i>ngayu</i> , <i>ngaajy</i> (C&C), <i>noi(c?)-ka</i>	<i>ngayu</i> , <i>ngaya</i> (MC&al), <i>ngayu</i>
'kangaroo (generic)'	<i>a.mba</i>	<i>amba</i>	<i>amba</i>	<i>yali</i>	<i>wandiwurr</i> , <i>yali</i> (AR90)	<i>wareyha</i> , <i>ware</i> (AC40), <i>waraya</i> , <i>ware-yha</i> , <i>ware</i>	<i>wara</i>	<i>wara</i>
'knee'	<i>jarawal</i> , <i>jurruwal</i> (EV72), <i>lenggal</i>	<i>wandjuru</i>	<i>wanyjuru</i>	<i>ajrgu</i> , <i>alunggu</i>	<i>-lhinggingga</i> , <i>jEruwal</i> , <i>jerruwal</i>	<i>wareyha</i> , <i>ware</i> (AC40), <i>waraya</i> , <i>ware-yha</i> , <i>ware</i>	<i>aira-look-ee</i>	<i>-lungkum</i> , <i>-yoorrkum</i> (MC&al)
'later on, soon'	<i>gadeji</i> (EV72)	<i>winjeriwara</i>	<i>wanggun di</i> , <i>wanggun</i>	<i>wanggun di</i> , <i>wanggun</i>	<i>wali.ya</i>	<i>wali.ya</i>	<i>winma:nbali</i> , <i>bija</i> (FM91), <i>ngamba</i> (MC&al)	<i>winma:nbali</i> , <i>bija</i> (FM91), <i>ngamba</i> (MC&al)
'laugh'	<i>yey</i>	<i>jedj nganga</i>	<i>yey</i> , <i>yeej</i>	<i>gan.garl</i> , <i>yey</i> , <i>ajeron</i>	<i>garn.gal</i> , <i>birrimara</i> 'they laughed'	<i>juray</i>	<i>argo-bull-ee</i> , <i>jirrai</i> , <i>djirai</i>	<i>juraii</i> (MC&al), <i>juray</i>
'leave it'	<i>turra</i>		<i>jarri</i> , <i>jari</i>	<i>jarri</i> , <i>jari</i>	<i>durru biyanganya</i> 'I left it'			
'lip'	<i>kalama</i> , <i>mindja-</i>	<i>mindja</i>	<i>memindjarl</i>	<i>memindjarl</i>	<i>-manduma</i>			<i>minyarib</i> , <i>arjalim</i> (JRBL), <i>-yalam</i> (MC&al; same as 'mouth')

Gloss	Wunambal	Gambera	Gunin/Kwini	Ngarinyin	Wurla	Unggumi	Umiida	Wororra
'liver'	<i>ka:ri, garri</i> (EV72), <i>garin</i>	<i>gari</i>	<i>ka:ri</i>	<i>garrin, adi</i> 'his liver', <i>ngjadi</i> 'my liver'	<i>gari</i>	<i>nga:dima, karriny</i> (<i>manma</i>), <i>yathima</i> ('his'), <i>ngathima</i> ('my') (AR84)	<i>u-an-die</i>	^k <i>wulam</i> (MC&al), <i>karrimi, garima</i>
'long'	<i>-wande</i> (EV72)		<i>worndade, bo:rndade</i>	<i>-anana</i> , also <i>ana</i> , <i>garangen</i>	<i>arna</i> 'long, tall (male)'	<i>-na:na, karren.gen.gaya-ngga</i>	<i>carron-can-yar</i>	<i>karanken</i> (MC&al), <i>karranggeinu, karranggeinyia</i>
'many'	<i>balanggarra, jama</i> (EV72)		<i>ja:ma, balanggarra, jamu</i>	<i>balanggarra, -rdanggarri</i>	<i>balanggarra</i>	<i>balanggarri, karndiwangurru</i>	<i>bal-un-gurree</i>	<i>-raarrawa</i> (MC&al), <i>ardarruwa</i>
'meat'	<i>i.rra, yirra</i> (EV72), <i>irra</i>		<i>yirra</i> , also <i>yirra, yIrra</i>	<i>ngala</i>	<i>ngaala</i> (WMLF), <i>ngula</i>	<i>thirri, anggerrigirri, thirri: (-yhi?), thirrii</i>	<i>parnarri, bunirra, bunira</i>	<i>birnarra, bunarra</i> (FM91), <i>bunmarri, kubadinya</i> (MC&al)
'moon'	<i>ka.gri, gunyili</i> (AC40), <i>gan.gi</i> (EV72)		<i>gagarri</i> (AC40)	<i>garn.gi, gunyili</i>	<i>kan.gi</i> (WMLF), <i>garn.gi</i>	<i>kunyi.li, ginvila</i> (AC40), <i>kilimanya, kirlima-nya</i>	<i>goun-ee-la</i>	<i>ja.rna, gu'nyerla</i> (FM91), <i>kunyila</i> (MC&al), <i>ginjila</i>
'morning'	<i>juwun.gi</i>			<i>uguli, moren</i>	<i>mabirri, moringgarri</i>	<i>kuminawan, wugili:</i>	<i>mamungkun</i>	<i>manggunu, mamanggunu</i>
'mouth'	<i>kalama, minjal, -(a)lama</i> (EV72)	<i>minjal, ngalama, galama, balama</i> (AC40)	<i>-lama, moga</i> (AC40)	<i>emandu, minjal</i> (AC40), <i>amugul emugu</i>	<i>muga</i>	<i>-nthalema ~ -y(h)ale:ma, nganhdhEil-ma, minjal</i> (AC40), <i>mugun</i>		<i>-yarlam, -yamunggu</i> (FM91), <i>-yamundu</i> (JRBL), <i>-yalam</i> (MC&al; same as 'lips')
'nape of neck'	<i>ma.yil, go:-</i>	<i>maiiil-ra, maillnu, manaiil-ngu</i>		<i>nijeru, r.ugunjan</i>		<i>ngathurrama, -yurrama</i>		<i>ngayurruwu, rugunjan</i>
'near, close by'	<i>winyga, wuron</i> (EV72), <i>wothulu</i> (HC48)			<i>wardulu, wordulu, -ananganganed</i>			<i>igeri</i>	<i>wajulu</i> (MC&al), <i>wajumu</i>

Gloss	Wunambal	Gambera	Gunin/Kwini	Ngarinyin	Wurla	Unggumi	Umiida	Worrora
'neck (exterior)'	<i>-mairl</i>		<i>mayil</i>	<i>erru</i> 'his neck' (<i>{a-yirru}</i>), <i>ngiyerru</i> 'my neck' (<i>{ngiya-yirru}</i>)	<i>ngiyurru</i> 'my neck'	<i>manma</i> <i>ngiyerrumamba-</i> <i>ma</i> , <i>-thurru</i> (<i>{-yhurru}</i> ?) (AR84)		<i>mayerralba</i> (FM91), <i>-yurrub</i> 'neck' (MC&al)
'north'	<i>ngurrambul</i>		<i>marrungu</i>	<i>ngu'larr</i> , <i>buru</i> , <i>buwurru</i>	<i>buwurru</i>	<i>wilanguwa</i>		<i>kama:li</i> , <i>beem badma</i> (FM91)
'nose'	<i>nunjuuru</i> , <i>winji</i> (AC40), <i>winyji</i>	<i>winji</i>	<i>winyji</i>	<i>-atil</i> (AC40), <i>ajil</i> <i>ninjiri</i> (WMLF)	<i>ninjiri</i> (WMLF)	<i>-ngirringga</i> , <i>jininde</i> (AC40)		<i>-minguma</i> , <i>-mingum</i> (FM91), (MC&al), <i>arbingum</i> (JRBL)
'one'	<i>e.rringarn</i> , <i>ayarra</i> , <i>bi:erri</i> , <i>wuntharri</i> , <i>mi:arri</i> (HC48)		<i>amIrrigee</i>	<i>-yirri</i>	<i>ayerri/erri</i> (AR04), <i>ayerri</i>	<i>wintharri</i> , <i>winderri</i> , <i>yherre</i> (AR84), <i>wintharringga</i> , <i>winderri</i>		<i>-yarrungu</i> (MC&al) <i>iyarrungu</i> , <i>jarrungu</i>
'person, Aboriginal person'	<i>bErranyjin</i> , <i>barrinyji</i> , <i>barindj</i>	<i>buminjini</i>	<i>-(V)mrrigem</i>	<i>brr.ru</i> (pl), <i>ari</i> '(Aboriginal) man'	<i>burrenu</i> , <i>pururu</i> (WMLF), <i>ari</i>	<i>yerrdherriya</i>		<i>aarrinja</i> (MC&al), <i>i.ja</i> , <i>arindja</i>
'river'	<i>mararran</i> , <i>maror:lale</i>	<i>maro:lale</i>	<i>marnanggal</i>	<i>marolale</i>	<i>modo:rE</i> (WMLF)	<i>yawuluma</i> (<i>manma</i>), <i>warnduma</i>		<i>marurarlim</i> , <i>morolalam</i> (FM91) <i>marolalem</i> , <i>molnganem</i> (MC&al)
'rock, stone'	<i>a.rru</i> , <i>aru</i> (EV72)	<i>arrgun</i>	<i>a.rru</i>	<i>manjan</i> , <i>argun</i> , <i>rargi</i>	<i>manjEn</i> (WMLF), <i>manja</i>	<i>minangga</i> (<i>wun.ga</i>), <i>mirnangga</i>		<i>kayugu</i> , <i>karrku</i> (MC&al)
'run, go quickly'	<i>balja</i> , <i>jarrij</i> (EV72)	<i>djaridj wumminga</i>	<i>ka:di</i>	<i>wo:; wari</i>	<i>nyonyo errinyi</i> 'he ran'	<i>jarriba</i>		<i>jarriba</i> , <i>jarrij</i> (MC&al), <i>jarrij</i> , <i>djari marl</i>

Gloss	Wunambal	Gambera	Gunin/Kwini	Ngarinyin	Wurla	Unggumi	Umiida	Wororra
'sand'	<i>kur'ur'lu, bera</i> (EV72)		<i>birra, burra</i>	<i>jilambundi, meridji, ngadju, djirrgali</i> 'soft sand, sandy ground'	<i>ngayawarl</i> 'river sand'	<i>walyarra, walyarra-ma, walyarrema</i>		<i>kabar'ba, mirijim</i> (FM91) <i>mirijim, jirrkalima</i> (MC&al)
'see, look'	<i>liny, mara, lii</i> (EV72)	<i>mara, ungawia</i>	<i>mara</i> (C&C)	<i>mara, li, liny</i>	<i>mara angoni</i> 'I saw him'	-MINDEI		<i>mara, murrnungo:</i> <i>-warleiga</i>
'shin'	<i>kurrow</i>			<i>bando:gun</i> (<i>di</i>)				
'short'	<i>-dugur</i> (EV72)			<i>-adjaw, -adjow, danggaran</i>	<i>gibili(-ngarri)</i>	<i>nardangga, rnirdage</i>		<i>i.awu, iyow</i> (FM91), <i>yawyawu, -yawu</i> (MC&al)
'shoulder'	<i>lawarra, marnu, -marnu</i> (EV72)	<i>ngaiamandi, gaiamandi, biamandi</i>	<i>-rlmallm</i>	<i>gului, emendi, emandi</i>	<i>angudu</i> 'his shoulder' (WMLF)	<i>ngamarduma, -marnuduma, ngamarnu-ma</i>		<i>manduma, ngame.lgam, marnuma</i> (FM91), <i>mundum</i> (JRBL), <i>-marnudum</i> (MC&al)
'small'	<i>bardade:</i>		<i>blde:ni</i>	<i>burdu, budu, bidibidi</i> (C&E)	<i>walyayi</i>	<i>burdungga, birdima</i>		<i>birdinya, birdeen</i> (MC&al)
'smoke'	<i>binjagun</i> (AC40), <i>mawarr, binjan</i> (EV72)	<i>ngunjur, bindjan</i>	<i>nginyjerr, malgarra, malgarra(wa)</i>	<i>binjan</i> (AC40)	<i>ngulmaru</i>	<i>binjangga</i>		<i>ma.lgarram, bi'jagu</i> (FM91), <i>pichuggu</i> (JRBL), <i>bijaku</i> (MC&al)
'south'			<i>mayinggi</i>	<i>arawadi</i>	<i>arawadi</i>	<i>yalmban, arrwarri:</i>		<i>yarlmbarrbarri, ara 'warrima</i> (FM91)
'speak'	<i>yey</i>		<i>ba:rra, barrawu, baarra</i>	<i>wurla+MA/WU, wula</i>	<i>wurla angoni</i> 'I talked to him'	<i>barrabarra, barrabarra</i>		-JU (JRBL), -RLOO (MC&al)

Gloss	Wunambal	Gambera	Gunin/Kwini	Ngarinyin	Wurla	Unggumi	Umiida	Worrora
'star'	<i>kandarr</i>			<i>jada</i> (C&E)	<i>wajila</i> (WMLF)	<i>warndanya</i> , <i>windinya</i>	<i>bar-dee</i>	<i>yamgandam</i> , ' <i>nyan.garn</i> ' <i>dama</i> (FM91), <i>yankarndam</i> (MC&al)
'stomach (external)'	<i>me:wur</i> (AC40) <i>mala-</i> (HC48)	<i>mala</i> , <i>nguyyu</i>	<i>mala</i> (AC40)	<i>marndu</i> 'belly', <i>nguyen</i> , <i>djagu/djagurr</i> , <i>mandu</i>	<i>marndu</i>	<i>-gulum</i> (AC40)		<i>marnduma</i> , <i>marndum</i> , <i>-ngulum</i> (MC&al) (both simply 'stomach')
'stomach (internal)'	<i>-tamburr</i>			<i>marndu</i> , <i>mandu</i> , <i>angijad</i>		<i>nga:dima</i>		<i>-gulum</i> (AC40)
'sun'	<i>murung</i> , <i>marangi</i> , <i>marango</i> , <i>miri</i>	<i>marangi</i> , <i>marango</i> , <i>marimbi</i>	<i>marangu</i> , <i>morong</i> (AC40)	<i>marangi</i> , <i>merrangi</i>	<i>marangi</i> (WMLF)	<i>maranginya</i> , <i>maranginye</i> , <i>windinya</i>	<i>mir-rage</i>	<i>maranguny(a)</i> , <i>marangunya</i> (FM91, MC&al)
'tail'	<i>muyun</i>		<i>mo:yun</i>	<i>-langga</i> , <i>alangga</i> , <i>nyawayn</i> <i>gulmed</i> (C&E)		<i>yulanggamu</i> , <i>thingguma</i>		<i>kulmeidba</i> , <i>gul'meedba</i> (FM91), <i>kunmedba</i> (JRBL), <i>kulmerr</i> , <i>-aanu</i> (MC&al)

Appendix 5: Body part terms in the basic wordlists for eight Worrorran languages, with posited protoforms

Where a given protoform is attested in all three Worrorran subgroups in the list below, this is shown with three stars before the posited protoform. Where attested in two of the subgroups it is marked by two stars. Where attested in only one group, a hypothetical protoform is presented, marked with one star, only if the form is reflected in two or more languages within the group. ‘+P’ designates ‘prefix taking’ and ‘-P’ non-prefix taking. Using these abbreviations, summary information is presented about the extent of agreement among the languages as to which forms take prefixes and which do not. So for example under the first entry ‘arm’, ‘****nunggu* (+P in Northern, -P in Eastern and Western)’ means ‘The posited protoform *nunggu* is attested in all three subgroups of Worrorran; it is prefix taking in the Northern group and non-prefix taking in the Eastern and Western groups’.

- 1 ‘arm’ ***-*nunggu* (+P in Northern, -P in Eastern and Western): Wunambal -*nunggu* (EV72), -*waiel* (HC48); Gunin/Kwini -*nanggu* (-*nunggu*); Ngarinyin *nunggu* (‘upper arm’), *munonggu*; Wurla *burrunda* (AR90); Unggumi *nungguma* (*manma*), *manma nungguma*; Worrorra *nunggum*, -^b*warndu* (‘lower arm’), -*aarlum* (‘upper arm’) (MC&al)
- 2 ‘armpit’ ****manambarr* (-P in 5 languages in all 3 subgroups): Wunambal *manambarr* (EV72), *ma.la.mbarr*; Gunin/Kwini *malambarr*; Ngarinyin *marlambarr*, -*andarga*; Wurla *wandarrga* (AR90); Unggumi *malambarrma*, *malambarr-ma*; Worrorra *marlambard*, *ngali:djariga*
- 3 ‘back’ ***kayila* (-P in Northern and Eastern), *-*l(r)adu* (+P in Western): Wunambal *ka:jila*, *gayla* (EV72), -*wadga* (HC48), *ngowarrga*; Gambera *gaiila*; Gunin/Kwini *kayila*; Ngarinyin *gayilan*, *anggan*; Wurla *bada* (AR90); Unggumi -*lardingga*, *ko:rrngi*; Worrorra -*rladu* (WM92) -*lardu* (MC00b)
- 4 ‘bone’ ***-(V)*rnarr* (+P in all 3 subgroups): Wunambal *unarr*, *bunar* (AC40), -*rnar* (EV72), *nganard*, *nganad*, *ganarr*, etc. (HC48); Gambera *awurr*, *nganalala*; Gunin/Kwini *burnarr*; Ngarinyin {-*wurnarr*}, *anorr/anod*, *onarr*; Wurla *awurr* (AR90);

- Unggumi *-(wi)na:rriya, inari* (AC40), *yIna:rri-ya*; Worrorra *ina:rri, -rnaarriya* (FM91), *-rnaarri* (MC&al), *nganari*
- 5 ‘breast, milk’ *****ngamu** (–P in all 3 subgroups): Wunambal *ngamu, ngamarnngala* (JH84), *-manda* (EV72); Gambera *darlbarn*; Gunin/Kwini *nga:mu*; Ngarinyin *ngamun*; Wurla *ngaamoo* (JH84), *ngamu* (AR90); Unggumi *ngamungga (wun.ga), ngamUngga, ngamungga*; Umiida *ngamugu*
- 6 ‘ear’ ***wuyu** (–P in Northern): Wunambal *uyu, wuyu* (JH84), *wuyu* (EV72) *-manga* (HC48); Gunin/Kwini *wuyu*; Ngarinyin *-orru, nyowuru* (JH84), *oru*; Wurla *peraro; ngiyoru* ‘my ear’ (AR90); Unggumi *-rnema*; Worrorra *-niima, -rnima* (FM91) *-neem* (MC&al)
- 7 ‘eye’ *****(a)mbul** (–P in Northern, +P in Eastern and Western.): Wunambal *umbul, wumbul* (JH84) *wumbulu-* (HC48); Gambera *wumbul, gulungu*; Gunin/Kwini *wumbul*; Ngarinyin *-ambul, nyaman* (JH84), *amen*; Wurla *aiambul*; Unggumi *-nggubulngga ~ -mbul, jumbul* (AC40), *nga:mbilnga*; Umiida *airgo-bil-in-ee, -biilu* (HC48); Worrorra *-(a)mbulu ~ -gubulu* (FM91), *ombula* (AC40), *-aambulu* (MC&al)
- 8 ‘face’ ****-ngirri** (+P in Northern and Western): Wunambal *-ngirri* (EV72, HC48), *ngiri*; Gunin/Kwini *murru*, also *murru*; Unggumi *-ngirringga*; Worrorra *-bingum* (FM91) *-mingum* (MC&al)
- 9 ‘fingernail’ *****rirmi(ndi)l** (–P in Northern, Eastern and Western), ****geengga** (–P in Northern and Western): Wunambal *na:rrmun, geengga* (JH84), *gein.ga* (HC48); Gunin/Kwini *rirmIrl*; Ngarinyin *baradarl*; Wurla *rerrmendel* (JH84), *rirmil*; Unggumi *wirrilngga, milyan(inya), ridmindil-ma*; Worrorra *ke.ngga, geengga* (FM91)
- 10 ‘foot’ ****jo(:)(r)lu** (–P in Northern and Eastern), ***angga** (–P in Northern): Wunambal *wu.rra, anggarru* (JH84), *-njal* (EV72) *angga-* (HC48), *wura-/bura-* (HC48); Gambera *jo:rlu, wurdmaru*; Gunin/Kwini *angarra, anggarra*; Ngarinyin *-yimbularru, adjuma, ambularu*; Wurla *jolu* (JH84), *ambulara, jowulu* (AR90); Unggumi *-njardingga ~ -yamblarrungga*; Umiida *arr-jetty*; Worrorra *-yardu ~ -jardu, -jerdu* (JRBL)
- 11 ‘forehead’ *****-mularr** (+P in all 3 subgroups), ***du(r)lu** (–P in Northern): Wunambal *mu:ru, dulu* (JH84), *durlu* (EV72) *-malad*; Gambera *durlu*; Gunin/Kwini *tulu*; Ngarinyin *-murlarr, jumulaj* (JH84), *amalad*; Wurla *-murlarr* (AR90); Unggumi *ngilmirlarrma, -miladma (manma)*; Worrorra *-malarru, -mirlarru* (FM91), *-mlarru* (MC&al), *ngamlaru*
- 12 ‘hair of head’ *****jagarra** (–P in all 3 subgroups), ****yambarra** (–P in Northern and Eastern): Wunambal *yambarra, jagarra* (EV72), *-o:ja* (EV72) *wondud* (HC48); Gambera *walan*; Gunin/Kwini *jagarra*; Ngarinyin *djagaran (di), djagarandi*; Wurla *alanggurr, yambarra* (AR90); Unggumi *wirrilye:ya, warndirrye, wirrilye-yha*; Worrorra *ngawayarra ~ ngawayarru, jagarra* (FM91)
- 13 ‘hand’ ***(-)miya(r)l, wiri** (sources disagree on whether Wunambal *miya(r)l* is prefixing): Wunambal *miyal, wiri* (EV72), *-mi:arl*; Gambera *wiri*; Gunin/Kwini *miyal*, also *miyarl*; Ngarinyin *-rnamala, ama mindi*; Wurla *nyingiyal* (JH84), *birinanggo*; Unggumi *-rnanangga*; Umiida *air-dun-ee*; Worrorra *-nori* (JRBL), *-rnurnu, -rnorri* (MC&al)

- 14 ‘head’ ***-marre/-miri** (+P in Western), ***bandi** (–P in Northern): Wunambal *baandi*, *ware-*; Gambera *ba:ndi*; Gunin/Kwini *ba:ndi*; Ngarinyin *-rlangun*, *mambagun*; Wurla *alanggurr*; Unggumi *-nggubama*, *-bama* (AC40); Umiida *-marre* (HC48); Worrorra *-miri*, *-miri ge* (FM91), *-bri* (AC40)
- 15 ‘heart’ *****ranggu** (–P in all 3 subgroups), ****durlwa** (–P in Northern and Western): Wunambal *kanyjakanyja*, *ranggu* (HC48); Gambera *durlwa*; Gunin/Kwini *dili-*; Ngarinyin *ranggu*; Wurla *ranggu* (AR90); Unggumi *durlwayha* ~ *turlwe*, *rdulwe-*, *turlwa-yha*; Worrorra *ranggu*
- 16 ‘knee’ ****lunggu** (–P in Eastern and Western): Wunambal *jarawal*, *jurruwal* (EV72), *jurawal-* (HC48), *lenggal*; Gambera *wandjuru*; Gunin/Kwini *wanyjurru*; Ngarinyin *ai urga*, *ajrgu*, *alunggu*, *-lunggu*; Unggumi *-lhinggingga*, *jEruwal*, *jeruwal*; Umiida *aira-look-ee*; Worrorra *ngalunggun*, *-lunggun* (MC&al), *-yoorkum* (MC&al)
- 17 ‘lip’ *****minja** (–P in all 3 subgroups): Wunambal *kalama*, *mindja-*; Gambera *mindja*; Ngarinyin *memindjal*; Unggumi *-manduma*; Worrorra *minyjarlb*, *arjalim* (JRBL), *-yalam* (MC&al; same as ‘mouth’)
- 18 ‘liver’ *****garri** (–P in all 3 subgroups): Wunambal *ka:rri*, *garri* (EV72), *gari-* (HC48); Gambera *gari*; Gunin/Kwini *ka:rri*; Ngarinyin *garrin*, *adi* ‘his liver’, *ngijadi* ‘my liver’; Wurla *garri* (AR90); Unggumi *nga:dima*, *karriny* (*manma*); Umiida *u-an-die*; Worrorra *karrimi*, *garima*, *-^kwulam* (MC&al)
- 19 ‘mouth’ *****-yhalam** (+P in all 3 subgroups) *****minja** (–P in all 3 subgroups): Wunambal *kalama*, *minjal* (EV72), *-(a)lama* (EV72), *minja-* (HC48); Gambera *minjal*, *ngalama*, *galama*, *balama*; Gunin/Kwini *-lama*, *moga* (AC40); Ngarinyin *emandu*, *minjal* (AC40), *amugu/emugu*; Wurla *muga* (AR90); Unggumi *-nthalema* ~ *-y(h)ale:ma* (AR84), *minjal* (AC40), *mugun*; Worrorra *-yarlam*, *-yamunggu* (FM91), *-yamundu* (JRBL), *-yalam* (MC&al; same as ‘lips’)
- 20 ‘nape of neck’ ****yhurru** (+P in Western and Eastern; see Wurla item for ‘neck (exterior)’), ***mayil** (–P for Northern): Wunambal *ma.yil*, *go:-*; Gambera *maiili-ra*, *maiilnu*, *manaiil-ngu*; Ngarinyin *nijeru*, *rugunjan*; Unggumi *ngathurruma*, *-yurruma*; Worrorra *ngayurru*, *rugunjan*
- 21 ‘neck (exterior)’ ****mayil** (–P for Northern and Eastern; Wunambal): *-maiirl* (HC48); Gunin/Kwini *mayil*; Ngarinyin *eru*, *erun*, *langgan*, *majil*, *majirul*; Wurla *ngiyurru* ‘my neck’ (AR90); Unggumi *manma*, *ngiyerrumambama*; Worrorra *mayerrolba* (FM91), *-yurru* (MC&al)
- 22 ‘nose’ ***winji** for Northern (sources disagree on whether the Wunambal form is prefixing); Wunambal *nunjurru*, *winji* (AC40), *winyji* (JH84), *-windji* (HC48); Gambera *winji*; Gunin/Kwini *winyji*; Ngarinyin *-aiil* (AC40), *nyayal* (JH84), *ajil*; Wurla *ninjiri*; Unggumi *-ngirringga*, *jininde* (AC40); Worrorra *-minguma*, *-mingum* (FM91, MC&al), *arbingum* (JRBL)
- 23 ‘shin’ (no attested correspondences across Worrوران languages): Wunambal *kurrow*; Ngarinyin *bando:gun* (*di*); Worrorra *-warleiga*
- 24 ‘shoulder’ *****(-)marn(d)u/i** (sources disagree on whether the Wunambal and Worrorra forms are prefixing): Wunambal *lawarra*, *marnu*, *-marnu* (EV72); Gambera *ngaiamandi*, *gaiamandi*, *biamandi*; Gunin/Kwini *-rllmallm*; Ngarinyin *gulili*, *emendi*, *emandi*; Wurla *angudu* ‘his shoulder’; Unggumi *ngamarduma*, *-marnduma*,

- ngamarndU-ma*; Worrorra *manduma*, *ngame.lgam*, *marnuma* (FM91), *-mandum* (JRBL), *-marndum* (MC&al)
- 25 ‘stomach (external)’ ***marndu* (–P in Eastern and Western), **mala* (–P in Northern): Wunambal *me:wur* (AC40); *mala-* (HC48); Gambera *mala*, *nguyu*; Gunin/Kwini *mala* (AC40); Ngarinyin *nguyen*, *djagu*, *djagurr*, *mandu* ‘belly’, *marndu* ‘belly’; Wurla *marndu* (AR90); Unggumi *-gulum* (AC40); Worrorra *marnduma*, *marndum*, *-ngulum* (MC&al)
- 26 ‘stomach (internal)’ *-*gulum/-ngulum* (+P in Western; see Unggumi and Worrorra ‘stomach (external)’): Wunambal *-iamburr*; Ngarinyin *mandu*, *angijad*; Unggumi *nga:dima*; Worrorra *-gulum* (AC40)
- 27 ‘tail’ ****gulmed* (–P in Northern, Eastern and Western): Wunambal *muyun*, *gulmed* (HC48); Gunin/Kwini *mo:yun*; Ngarinyin *-langga*, *alangga*, *gulmed*; Wurla *nyawayn* (AR90); Unggumi *yulanggamu*, *thingguma*; Worrorra *kulmeidba*, *gul'meedba* (FM91), *kunmedba* (JRBL), *kulnmerr* (MC&al), *-aanu* (MC&al)
- 28 ‘thigh’ (no attested correspondences across Worroran languages): Wunambal *kanbala*; Ngarinyin *odarn*, *wandjari*; Wurla *uda* (JH84), *bajbala* (AR90); Unggumi *bararr(ye)* (*inye*), *inye burarrye*; Worrorra *jambi:na*
- 29 ‘tongue’ ****anbula* (–P in Northern, Eastern and Western): Wunambal *mu.gu*, *anbule* (AC40), *arnberla* (EV72), *anbul* (HC48); Gambera *minjal*; Gunin/Kwini *mIga*, *moga* (AC40); Ngarinyin *anbula* (AC40), *ambula*, *arnbula*; Wurla *thilembura* (AR90); Unggumi *-nthalema*, *wanbulema* (AC40), *nganhdhEll-ma*; Worrorra *anbula*, *an'birla* (FM91)
- 30 ‘tooth’ ***lina* (–P in Northern and Eastern): Wunambal *li.na*, *lEna* (EV72), *line-* (HC48), *lirnera*; Gambera *lirnera*, *line-nu*, *line-ngu*; Gunin/Kwini *lIna*; Ngarinyin *lina*, {-yirrgun}; Wurla *me:njo*; Unggumi *nyarrgunh*, *-rijingga*, *wun.ga* (ng)arduwiji; Worrorra *ngawiyagu*, *i'wiyagu* (FM91), *-wiuk* (JRBL)

Appendix 6: Basic body part words from neighbouring non-Worrorran languages

Gloss	Miriwung	Kija	Bunuba	Nyikina	Warrwa	Bardi
‘arm’			<i>barndiy</i>	<i>nimarra- ngka</i>	<i>milgu, namala</i>	<i>-marl(a)</i>
‘armpit’			<i>garri</i>	<i>kalngoony</i>	<i>nimbarrma</i>	<i>-nganyboo, ninganyburr, ninganyboo</i>
‘back’		<i>therlam</i>	<i>nyiyidi</i>	<i>ninyji, balarr(ja), niyal (BS&al)</i>	<i>ninyji, niinji ‘backbone’</i>	<i>-ya, ninga</i>
‘bone’	<i>ya:rring</i>	<i>kujim, gwiji</i>	<i>guju</i>	<i>kamarri, kanyji, kamari</i>	<i>kanyji</i>	<i>kanji, gaanyji</i>
‘breast’	<i>ngaberleng</i>	<i>kamu, gamum</i>	<i>ngamu</i>	<i>ngamarna</i>	<i>ngamarna</i>	<i>ngamarna, nimara, ngamana</i>
‘ear’	<i>nganderrang, yardem ngarderrang (JH84)</i>		<i>bina</i>	<i>nilaba(ba)</i>	<i>nilawa</i>	<i>nilemar, nilamarr (WD92, GA99), -lamarr</i>
‘eye’	<i>mulng, mo:l (AC84)</i>	<i>murlu, murlum, muulu</i>	<i>murlu</i>	<i>nimilgarr (JH84)</i>	<i>ngaada, nimelgarr (AC40)</i>	<i>nim, niimi ‘his eye’ (WD92, GA99)</i>
‘face’			<i>mirrngi</i>	<i>nimilgarr</i>	<i>maalamala</i>	<i>nankarr(a) (GA99), -nkarr(a)</i>
‘finger- nail’	<i>yanderrng, randerrng</i>	<i>yarnderre</i>	<i>miljarni</i>	<i>miljan, miljarn, kirrimal</i>	<i>miljan</i>	<i>wawa nimarla, oorool, nimarl-oorool</i>

Gloss	Miriwung	Kija	Bunuba	Nyikina	Warrwa	Bardi
‘foot’	<i>yambalng</i>	<i>thamparlam,</i> <i>thengam</i>	<i>thinga</i>	<i>niyambalu,</i> <i>gardijina</i> (JH84)	<i>niyambala,</i> <i>-yambala</i>	<i>nimbal,</i> <i>niimbala</i> (WD92), <i>niimbal(a)</i> (GA99), <i>-janbala</i>
‘forehead’	<i>muweleng</i> (JH84)	<i>muwulu,</i> <i>muwelem</i>	<i>jawiy</i>	<i>jirrbal</i>	<i>jirrwarl,</i> <i>jiirrwal</i>	<i>nan.karra,</i> <i>nankarra</i> (WD92), <i>nankarr(a)</i> (GA99), <i>-angarra</i>
‘hair of head’	<i>yambarrang</i>	<i>yamparra</i>	<i>wirrili</i>	<i>yambarra,</i> <i>jakarra</i> (BS&al)	<i>jagarra,</i> <i>ma:rru</i>	<i>mawarn,</i> <i>moowarn</i> (WD92, GA99), <i>mowan</i>
‘hand’	<i>malang,</i> <i>mayinggul</i> (ng)	<i>marlam</i>	<i>mingali</i>	<i>nimarra-</i> <i>ngka</i>	<i>nimala</i>	<i>nimarl</i> ‘his hand’, <i>niimarla</i> (WD92), <i>niimarl(a)</i> (GA99), <i>-marl(a)</i>
‘head’		<i>gunggulin</i>	<i>gungurlu</i>	<i>nalma,</i> <i>marroo</i> (BS&al)	<i>nalma</i>	<i>na:lma,</i> <i>naalma</i> (WD92), <i>nalma</i> (GA99), <i>-lma, gordi</i>
‘heart’			<i>durlu</i>	<i>durlb,</i> <i>doorlboo</i>	<i>turlbu, turlu</i>	<i>gurdurdu,</i> <i>liyan</i>
‘knee’			<i>gumani</i>	<i>nimidi</i>		<i>nimid, mulgu,</i> <i>nimidii,</i> <i>nimiid(i),</i> <i>nimirdi, -midi</i>
‘lip’	<i>thalala</i>	<i>thuwundin,</i> (mouth), <i>therwerndem</i> (mouth)	<i>maluwa</i> (lip), <i>thangarni</i> (mouth)	<i>jabi</i> (lip), <i>nilirr</i> (mouth)	<i>nilerr,</i> <i>nilirr</i>	<i>nilirr, -lirr</i>
‘liver’	<i>meling</i>	<i>mirlim</i>	<i>mirliy</i>	<i>yukula</i>	<i>kawiri, kabir</i>	<i>kawir, gawirr,</i> <i>gawoo</i>
‘mouth’	<i>thalala</i> (AC40), <i>thuwerndeng</i> (JH84)		<i>thangarni</i>	<i>nilirr</i>	<i>nilirr</i>	<i>nilirr</i> (GA99), <i>-lirr</i>
‘nape of neck’	<i>thuwend</i>			<i>burda</i>	<i>buda, burda</i>	<i>boda</i> (WD92), <i>bood(da)</i> (GA99)
‘neck (exterior)’			<i>winyi</i>			

Gloss	Miriwung	Kija	Bunuba	Nyikina	Warrwa	Bardi
'nose'	<i>nyumburr</i>	<i>manil,</i> <i>nyigernem,</i> <i>nyumburru</i>	<i>wura</i>	<i>ngunijina</i>	<i>ngunina,</i> <i>ngunijina,</i> <i>ngunijina</i>	<i>niimal</i> (GA99), <i>-mal</i>
'shin'			<i>garrawu</i>	<i>jangkala</i> 'lower leg' (BS&al)	<i>nimidi:</i>	<i>janggal(a)</i> (GA99)
'shoulder'	<i>lawada,</i> <i>berrmanda</i>		<i>birrindi</i>	<i>gurntijina,</i> <i>koorndjina</i> (BS&al)	<i>gundi:na,</i> <i>gunina,</i> <i>kiliwili, kunina</i>	<i>langan,</i> <i>langana</i> (WD92), <i>langan(a)</i> (GA99)
'stomach (external)'	<i>galjan</i> (AC40)	<i>jaam</i>	<i>gurda</i>	<i>nungu</i>	<i>nungu, -ngu</i>	<i>noongoo</i> 'his stomach' (WD92, GA99), <i>-ngoo</i>
'stomach (internal)'	<i>raring</i>		<i>gurda</i>	<i>nungu</i>	<i>kaaburra</i>	<i>nungu,</i> <i>noongoo</i> (GA99), <i>-ngoo, ilbid</i>
'tail'			<i>nyawa</i>			
'thigh'	<i>baliyarrem</i>		<i>birdi</i>	<i>balngany- jina,</i> <i>ganganjina</i> (JH84)	<i>balngarnjina,</i> <i>balnganjina</i>	<i>nanmurr,</i> <i>narnmurru</i> (JH84), <i>nanmoorr(oo)</i> (GA99), <i>-anmurru,</i> <i>ilarra</i>
'tongue'	<i>dalala,</i> <i>thalala</i> (AC84), <i>dalala</i>	<i>thalalam,</i> <i>thalalan</i>	<i>thalanyi</i>	<i>niyanga- lany, jalany</i>	<i>niyangarlany,</i> <i>jalan,</i> <i>niyangalany</i>	<i>niyangarra,</i> <i>niyangala,</i> <i>niyangal(a),</i> <i>-jangala,</i> <i>ningangala</i>
'tooth'	<i>jangejanged- gang,</i> <i>therriny</i>		<i>minju</i>	<i>nilirr</i> (also 'mouth')	<i>jangguliny,</i> <i>ganyji nilirr</i>	<i>jarrunggu,</i> <i>jarranggoo</i> (WD92), <i>jarrangg(oo)</i> (GA99)

References

- Aikhenvald, Alexandra Y. and Robert M.W. Dixon. 2001. Introduction. In Alexandra Y. Aikhenvald and Robert M.W. Dixon, eds, *Areal diffusion and genetic inheritance: problems in comparative linguistics*, 1–26. Oxford: Oxford University Press.
- Aklif, Gedda. 1999. *Ardiyooloon Bardi ngaanka: One Arm Point Bardi dictionary*. Halls Creek, Western Australia: Kimberley Language Resource Centre.
- Alpher, Barry J. and David G. Nash. 1999. Lexical replacement and cognate equilibrium in Australia. *Australian Journal of Linguistics* 19. 5–56.
- Bergsland, Knut and Hans Vogt. 1962. On the reliability of glottochronology. *Current Anthropology* 3. 115–153.
- Berndt, Ronald M. 1959. The concept of ‘the tribe’ in the Western Desert of Australia. *Oceania* 30. 81–107.
- Black, Paul. 1997. Lexicostatistics and Australian languages: problems and prospects. In Darrell T. Tryon and Michael Walsh, eds, *Boundary rider: essays in honour of Geoffrey O’Grady*, 51–69. Canberra: Pacific Linguistics.
- Blake, Barry. 1988. Redefining Pama-Nyungan: towards the prehistory of Australian languages. *Aboriginal Linguistics* 1. 1–90.
- Bowern, Claire L. 2004a. Diagnostic similarities and differences between the Nyulnyulan and neighbouring languages. In Claire L. Bowern and Harold Koch, eds, *Australian languages: classification and the comparative method*, 269–290. Amsterdam and Philadelphia: John Benjamins.
- 2004b. Bardi verb morphology in historical perspective. PhD thesis, Harvard University.
- Bowern, Claire L. and Harold Koch. 2004. Introduction: subgrouping methodology in historical linguistics. In Claire L. Bowern and Harold Koch, eds, *Australian languages: classification and the comparative method*, 1–15. Amsterdam and Philadelphia: John Benjamins.
- Breen, Gavan, J.G. 1990. *Salvage studies of western Queensland Aboriginal languages*. Canberra: Pacific Linguistics.

- Brown, Cecil H., Eric W. Holman, Søren Wichmann, and Viveka Vilupillai. forthcoming. Automated classification of the world's languages: a description of the method and preliminary results. To appear in *Sprachtypologie und Universalienforschung*.
- Capell, Arthur. 1940. The classification of languages in north and north-west Australia. *Oceania* 10. 241–272, 404–433.
- 1941. Notes on the Wunambal language. *Oceania* 11. 295–308.
- 1956. *A new approach to Australian linguistics*. Handbook of Australian Languages, Part 1. Sydney: Oceania Publications.
- 1972. The languages of the northern Kimberley, W.A.: some structural principles. *Oceania* 43. 54–65.
- Capell, Arthur and Howard H.J. Coate. 1984. *Comparative studies in Northern Kimberley languages*. Canberra: Pacific Linguistics.
- Carr, Thérèse L. 2000. Wunambal: a language of the North-West Kimberley region, Western Australia. MA thesis, University of New England.
- Chrétien, C. Douglas. 1962. The mathematical models of glottochronology. *Language* 38. 11–37.
- Clendon, Mark. 1999. Worora gender metaphors and Australian prehistory. *Anthropological Linguistics* 41. 308–355.
- 2000a. *A grammar of Worrorra*. Halls Creek: Kimberley Language Resource Centre.
- 2000b. Topics in Worora grammar. PhD thesis, Adelaide University.
- Clendon, Mark, Patsy Lalbanda, Amy Peters and Daisy Utemorrhah. 2000. *A provisional Worrorra dictionary*. Halls Creek: Kimberley Language Resource Centre.
- Coate, Howard H.J. 1948. English-Wunambal dictionary. Unpublished typescript held in AIATSIS Library.
- n.d.a. Umida. Manuscript.
- n.d.b. Umida language: Sam Wulugudja. Manuscript.
- n.d.c. Ungumi vocabulary. Manuscript.
- Coate, Howard H.J. and Adolphus P. Elkin. 1974. *Ngarinjin-English dictionary*. Volumes 1 and 2. Sydney: Oceania.
- Coate, Howard H.J. and Lynette Oates. 1970. *A grammar of Ngarinjin, Western Australia*. Canberra: Australian Institute of Aboriginal Studies.
- Corbett, Greville. 1991. *Gender*. Cambridge: Cambridge University Press.
- Crawford, Ian. 1982. *Traditional Aboriginal plant resources in the Kalumburu area: aspects in ethno-economics*. Perth: Western Australian Museum.
- Dench, Alan C. 1995. *Martuthunira: a language of the Pilbara region of Western Australia*. Canberra: Pacific Linguistics.
- 2001. Descent and diffusion: the complexity of the Pilbara situation. In Alexandra Y. Aikhenvald and Robert M.W. Dixon, eds, *Areal diffusion and genetic inheritance: problems in comparative linguistics*, 105–133. Oxford: Oxford University Press.

- Dixon, Robert M.W. 1970. Proto-Australian laminals. *Oceanic Linguistics* 9. 79–103.
- 1980. *The languages of Australia*. Cambridge: Cambridge University Press.
- 1990. The origin of ‘mother-in-law vocabulary’ in two Australian languages. *Anthropological Linguistics* 32. 1–56.
- 1997. *The rise and fall of languages*. Cambridge: Cambridge University Press.
- 2001. The Australian linguistic area. In Aikhenvald, Alexandra Y. and Robert M.W. Dixon, eds, *Areal diffusion and genetic inheritance: problems in comparative linguistics*. Oxford: Oxford University Press. 64–104.
- 2002. *Australian languages: their nature and development*. Cambridge: Cambridge University Press.
- Dobson, Annette J., J.B. Kruskal, D. Sankoff, and L.J. Savage. 1972. The mathematics of glottochronology revisited. *Anthropological Linguistics* 14. 205–212.
- Douglas, Wilfrid. 1992. *Bardi language word-book: a revision of “Word gems from Iwanya—Sunday Island [Bardi/English]”*. Broome: Jawa Publications.
- Embleton, Sheila M. 1982. Lexicostatistical tree reconstruction incorporating borrowing. *Eighth Lacus Forum*, 265–272. Columbia: Hornbeam Press.
- 2000. Lexicostatistics/glottochronology: from Swadesh to Sankoff to Starostin to future horizons. In Colin Renfrew, April McMahon and Larry Trask, eds, *Time depth in historical linguistics*. Volume 1. 143–165. Cambridge: The McDonald Institute for Archaeological Research.
- Evans, Nicholas 2005. Australian languages reconsidered: a review of Dixon (2002) *Australian languages: their nature and development*. *Oceanic Linguistics* 44. 242–286.
- Gray, Russell D. and Fiona M. Jordan. 2000. Language trees support the express-train sequence of Austronesian expansion. *Nature* 405. 1052–1055.
- Greenberg, Joseph. 1988. The first person inclusive dual as an ambiguous category. *Studies in Language* 12. 1–18.
- Heath, Jeffrey. 1976. Substantival hierarchies: addendum to Silverstein. In Robert M. W. Dixon, ed., *Grammatical categories in Australian languages*, 172–190. Canberra: Australian Institute of Aboriginal Studies.
- 1978. *Linguistic diffusion in Arnhem Land*. Canberra: Australian Institute of Aboriginal Studies.
- 1987. The story of *-n-: *CV- vs. *CV-n- noun-class prefixes in Australian languages. In Donald C. Laycock and Werner Winter, eds, *A world of language: papers presented to Professor S.A. Wurm on his 65th birthday*, 233–243. Canberra: Pacific Linguistics.
- Hosokawa, Komei. 1988. Classified Yawuru dictionary. Unpublished manuscript held in AIATSIS library.
- Hudson, D.H. and D. Bryant. 2006. Application of phylogenetic networks in evolutionary studies. *Molecular Biology and Evolution* 23. 254–267. Software available from www.splitstree.org.

- Hudson, Joyce and Patrick McConvell. 1984. *Keeping language strong*. Broome: Kimberley Language Resource Centre.
- Koch, Harold. 1995. The creation of morphological zeroes. In Geert Booij and Jaap van Marle, eds, *Yearbook of Morphology 1994*, 31–71. Dordrecht: Kluwer Academic.
- 2004. A methodological history of Australian linguistic classification. In Claire L. Bowerman and Harold Koch, eds, *Australian languages: classification and the comparative method*, 17–60. Amsterdam and Philadelphia: John Benjamins.
- Kofod, Frances M. 1976. Miriwung-English [Word list]. Unpublished manuscript held in AIATSIS library.
- 1978. The Miriwung language (East Kimberley): a phonological and morphological study. MA thesis, University of New England.
- n.d. Introduction to Kija grammar. Unpublished manuscript.
- Kuryłowicz, Jerzy. 1964. *The inflectional categories of Indo-European*. Heidelberg: Carl Winter.
- 1995 [1945/9]. The nature of so-called analogical processes. *Diachronica* 12. 113–45.
- Love, James R.B. 1931–2. Introduction to the Worora language. *Journal of the Royal Society of Western Australia* 17. 53–69, and 18. 13–22.
- 1934. Grammatical structure of the Worora language of north-western Australia. MA thesis, University of Adelaide.
- 1936. *Stone age bushmen of today*. London: Blackie.
- 1938. An outline of Worora grammar. In Adolphus P. Elkin, ed., *Studies in Australian linguistics*, 112–124. Sydney: University of Sydney.
- 1941. A view of the Worora language. *Mankind* 2. 33–34.
- 2000. *The grammatical structure of the Worora language of north-western Australia*. Edited by Robert M.W. Dixon. München and Newcastle: Lincom Europa.
- McGregor, William B. 1988. *Handbook of Kimberley languages, Volume 1: general information*. Canberra: Pacific Linguistics.
- 1990. *A functional grammar of Gooniyandi*. Amsterdam: John Benjamins.
- 1992. Handbook of Kimberley languages, Volume 2: the languages of the Kimberley, Western Australia. Unpublished manuscript.
- 1993. *Gunin/Kwini*. München and Newcastle: Lincom Europa.
- 1994. *Warrwa*. München and Newcastle: Lincom Europa.
- 1995. Nominal prefixing in Nyulnyul. In Hilary Chappell and William B. McGregor, eds, *The grammar of inalienability: a typological perspective on body part terms and the part-whole relation*, 251–292. Berlin and New York: Mouton de Gruyter.
- 1996. The pronominal system of Gooniyandi and Bunuba. In William B. McGregor, ed., *Studies in Kimberley languages in honour of Howard Coate*, 159–173. München and Newcastle: Lincom Europa.

- McGregor, William B. 2002. *Verb classification in Australian languages*. Berlin and New York: Mouton de Gruyter.
- 2003a. Verbal uses of comitative markers in Australian languages. Paper given to workshop on comitatives, held in Linguistics Department, Aarhus University.
- 2003b. Aspect, time, and associative relations in some Australian languages. *Tidsskrift for Sprogforskning* 1. 151–175.
- 2004. *The languages of the Kimberley, Western Australia*. London: RoutledgeCurzon.
- 2008. The origin of noun classes in Worroran languages. In Claire Bower, Bethwyn Evans, and Luisa Miceli, eds, *Morphology and language history: in honour of Harold Koch*, 185–200. Amsterdam and Philadelphia: John Benjamins.
- Miller, Wik R. 1971. Dialect differentiation in the Western Desert language. *Anthropological Forum* 3. 61–78.
- Munro, Morndi. 1996. *Emerarra: a man from Merarra*. Edited by Mary Anne Jebb. Broome: Magabala Books.
- O'Grady, Geoffrey N., Stephen A. Wurm and Kenneth L. Hale. 1966. Aboriginal languages of Australia (a preliminary classification). Unpublished manuscript, Victoria, B.C: Department of Linguistics, University of Victoria.
- O'Grady, Geoffrey N., Carl F. Voegelin, and Frances M. Voegelin. 1966. Languages of the world: Indo-Pacific fascicle 6. *Anthropological Linguistics* 8. 1–197.
- Rankin, Robert L. 2003. The comparative method. In Brian Joseph and Richard D. Janda, eds, *The handbook of historical linguistics*, 183–212. London: Routledge.
- Rumsey, Alan L. 1980. Prolegomena to a theory of Australian grammatical case systems. In Bruce Rigsby and Peter Sutton, eds, *Papers in Australian Linguistics No. 13: Contributions to Australian Linguistics*, 1–29. Canberra: Pacific Linguistics.
- 1982. *An intra-sentence grammar of Ungarinjin, north-western Australia*. Canberra: Pacific Linguistics. (A corrected electronic version is available at http://pacling.anu.edu.au/catalogue/Catalogue_OOP_Books.pdf.)
- 1984. Field notes on Unggumi, recorded with Billy Monroe, Derby, W.A.
- 1990. English-Wurla word book. Manuscript and computer file.
- 2000. Bunuba. In Barry Blake and Robert M.W. Dixon, eds, *The handbook of Australian languages*. Volume 5, 34–152. Oxford and Melbourne: Oxford University Press.
- Schmidt, Wilhelm. 1919. *Die Gliederung der Australischen Sprachen: geographische, bibliographische, linguistische Grundzüge der erforschung der australschen Sprachen*. Vienna: Mechitharisten-Buchdruckerei.
- Stokes, Bronwyn. 1982. A description of Nyigina: a language of the West Kimberley, Western Australia. PhD thesis, Australian National University.
- Stokes, Bronwyn, Gladys Johnston, and Lucy Marshall. 1980. Nyigina-English: a first lexicon [Nyikina/English]. Unpublished manuscript held in AIATSIS Library.

- Stokes, Bronwyn and William B. McGregor. 2003. Classification and subclassification of the Nyulnyulan languages. In Nicholas Evans, ed., *The non-Pama-Nyungan languages of northern Australia: comparative studies of the continent's most linguistically complex region*, 29–74. Canberra: Pacific Linguistics.
- Sutton, Peter and Harold Koch. 2008. Australian languages: a singular vision (Review article of R.M.W. Dixon 2002 *Australian languages: their nature and development*. Cambridge: Cambridge University Press, 2002. Pp. xlii+734). *Journal of Linguistics* 44. 471–504.
- Taylor, Peter. 1967. Kitja materials. Manuscript held in AIATSIS Library.
- Taylor, Peter and Joyce Hudson. 1976. Metamorphosis and process in Kija. *Talanya* 3. 25–36.
- Vasse, Eric. 1991. Nouns and nominals in Wunambal. In Ian G. Malcolm, ed., *Linguistics in the service of society: essays in honour of Susan Kaldor*, 25–34. Perth: Institute of Applied Language Studies, Edith Cowan University.
- Vászolyi, Eric. 1972. Wunambal language data. Unpublished manuscript held in AIATSIS Library.
- 1976a. Wunambal [Paper 80, Topic E: Simple and compound verbs: conjugation by auxiliaries in Australian verbal systems]. In Robert M.W. Dixon, ed., *Grammatical categories in Australian languages*, 629–646. Canberra: Australian Institute of Aboriginal Studies.
- 1976b. Wunambal [Paper 26, Topic A: The derivational affix 'having']. In Robert M. W. Dixon, ed., *Grammatical categories in Australian languages*, 282–285. Canberra: Australian Institute of Aboriginal Studies.
- Watkins, Calvert. 2001. An Indo-European linguistic area and its characteristics: ancient Anatolia. Areal diffusion as a challenge to the comparative method? In Alexandra Y. Aikhenvald and Robert M.W. Dixon, eds, *Areal diffusion and genetic inheritance: problems in comparative linguistics*, 44–63. Oxford: Oxford University Press.
- Wurm, Stephen A. 1972. *Languages of Australia and Tasmania*. The Hague: Mouton.