

Holding the mirror up to converted languages: Two grammars, one lexicon

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journals.sagepub.com/home/ijb**Felicity Meakins**

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Abstract

Aims and objectives/purpose/research questions: This article describes an unusual result of language contact occurring in North-Central Australia, where extensive long-term contact between speakers of the genetically unrelated Jingulu and Mudburra has resulted in a high degree of lexical borrowing, with little if any change to syntactic or morphological structure in either language. What is particularly unusual about this borrowing is that it is bidirectional, with almost equal numbers of words being borrowed from Jingulu into Mudburra as vice versa. This situation mirrors that of converted languages, where two varieties have come to share a grammar through contact, but retain separate lexicons.

Design/methodology/approach: We use a comparative database to establish the direction of noun borrowings between these languages.

Data and analysis: The comparative database consists of 871 nouns shared by Jingulu and Mudburra and also includes 571 corresponding nouns from a number of geographically and phylogenetically neighbouring languages: Wambaya, Gurindji, Jaminjung, Jaru, Warlmanpa and Warumungu.

Findings/conclusions: We show that for nouns alone, Mudburra and Jingulu share 65% of their forms. What makes the Jingulu-Mudburra situation even more unusual is the relatively balanced bidirectional nature of borrowings, with 32% of shared nouns originating in Mudburra and 24.5% from Jingulu (for the remaining 43.5%, direction of borrowing could not be determined).

Originality: We suggest that this situation of bidirectional borrowing represents a hitherto unreported type of language hybridisation scenario, which we dub 'lexical convergence'.

Significance/implications: We claim that this unusual situation is the result of long-term cohabitation of the two groups, a shared cultural life and relative socio-political equality between the two groups. We venture that these may be requisite to the sort of extensive bidirectional borrowing and maintenance of individual grammatical systems found in lexical convergence more generally.

Keywords

Borrowing, mixed languages, Australian languages, converted languages, Jingulu, Mudburra

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Introduction

In this paper, we introduce an unusual situation of language contact in northern Australia between Jingulu (Mirndi, non-Pama-Nyungan) and Mudburra (Ngumpin-Yapa, Pama-Nyungan), which we claim represents a hitherto unidentified type of language hybridisation. In this situation, both Jingulu and Mudburra maintain their native morpho-syntax, with little influence from the other language, but borrow significant portions of the other language's lexicon, thereby creating a largely shared lexicon. We show that for nouns alone, Mudburra and Jingulu share 65% of their forms (*Establishing shared Mudburra and Jingulu forms* section). What makes the Jingulu-Mudburra situation even more unusual is the relatively balanced bidirectional nature of borrowings, with 32% of shared nouns originating in Mudburra and 24.5% from Jingulu (for the remaining 43.5%, direction of borrowing could not be determined) (*Summary for direction of borrowing* section). We speculate that the extent and nature of this transfer is the result of high levels of sustained and balanced bilingualism that must have stemmed from a social situation of mutual respect and undifferentiated levels of prestige between the groups and their languages (*Other cases of extreme borrowing* section).

The balanced bidirectional situation of contact described in this paper is unusual in comparison with other cases of extreme borrowing. High levels of noun borrowings have been described for other languages (Haspelmath & Tadmor, 2009b); however, these are unidirectional transfers of vocabulary. One other clearly documented case also comes from Australia. Heath (1981) describes similarly high levels of shared vocabulary between Ngandi (non-Pama-Nyungan) and Ritharrngu (Pama-Nyungan) in Arnhem Land, which share 47% of their nouns alone. He claims that borrowing went in both directions, but does not establish directionality for each noun due to the documentation requirement of neighbouring and related languages, which did not exist at the time of his work.

We cannot deal extensively with the question of directionality here, since we would need an extended philological discussion of each lexical set, as well as data from ten or so additional languages (most of which lack adequate dictionaries). (Heath, 1981, p. 365)

In this paper, we take up Heath's challenge, demonstrating that the direction of noun borrowing between Jingulu and Mudburra can be established through a careful comparison of surrounding languages. We introduce a comparative database of 871 nouns shared by Jingulu and Mudburra that also includes 571 corresponding nouns from a number of geographically and phylogenetically neighbouring languages: Wambaya (Mirndi, contiguous with Mudburra and Jingulu), Gurindji (Ngumpin, contiguous with Mudburra), Jaminjung (Mirndi, not contiguous with Mudburra and Jingulu), Jaru (Ngumpin, not contiguous with Mudburra and Jingulu), Warlmanpa (Yapa, contiguous with Mudburra and Jingulu) and Warumungu (Pama-Nyungan isolate, contiguous with Mudburra and Jingulu). We show that 32% of shared nouns were borrowed from Mudburra into Jingulu and 24.5% of shared nouns were borrowed from Jingulu into Mudburra (*Bidirectional noun borrowing in Mudburra and Jingulu* section). This high level of borrowing reflects Pensalfini's (2001, p. 391) early observation that the lexical verbs in Jingulu and Mudburra are 'almost entirely cognate across these two languages' although Meakins et al. (under review) quantify this number as nearly 40%.

This situation is also unusual in comparison with mixed languages, which are notorious for extreme levels and types of mixing. For example, L(exicon)-G(rammar) languages are the result of significant transfers of lexicon (Bakker, 2003). Nonetheless, lexical borrowing is unidirectional in these languages, which is unlike the Jingulu-Mudburra contact situation where borrowing is bidirectional. For example, Media Lengua replaced 90% of its Quechua lexical roots with Spanish stems (Muysken, 1981), and in Old Helsinki Slang, 80% of its vocabulary derives from Swedish

despite the Finnish grammatical base (Jarva, 2008). On the other hand, in structurally mixed languages, vocabularies converge to create a single system, for example in Gurindji Kriol, 36.6% of vocabulary is derived from Kriol, 35% from Gurindji and the remaining 28.4% contains synonymous forms from both languages (Meakins, 2011). The degree of vocabulary sharing is similar in the Jingulu-Mudburra contact situation; however, unlike in structurally mixed languages, little mutual grammatical transfer has occurred (*Other cases of extreme borrowing* section).

Instead, the Jingulu-Mudburra situation mirrors converted languages, which are a type of mixed language where bilingual speakers have a (largely) single lexicon, but separate grammars. For example, in converted mixed languages, such as Sri Lanka Malay (Nordhoff, 2009) and Takia (Ross, 1987), one language restructures its grammar on the pattern of the other in a process of metatypy, but the two languages maintain their own lexicons. We dub this new type of situation ‘lexical convergence’, claiming that Jingulu-Mudburra bilingual speakers essentially have (largely) one lexicon but two grammars in operation (*Other cases of extreme borrowing* section).

Background to Mudburra and Jingulu noun borrowings

Jingulu (Mirndi, non-Pama-Nyungan) and Mudburra (Ngumpin-Yapa, Pama-Nyungan) are Australian languages spoken around Elliott in northern Australia. Jingulu is the traditional language of this area, but around 200–500 years ago the Mudburra settled there and intermarried with Jingili¹ people, introducing Mudburra to the area. During this period, Jingili and Mudburra people formed one community for ceremonial and land ownership purposes, sharing a single kinship system (but maintaining distinct kin terms to a large extent). It was probably at this time that some divergence within Mudburra occurred, forming an eastern and western dialect. Western Mudburra (sometimes called Kuwirrinji) is closer to Gurindji, a neighbouring Ngumpin-Yapa language (see Figure 1), and Eastern Mudburra shows heavy influence from Jingulu, particularly in nouns, which is the topic of this paper.

Nowadays, very few people around Elliott describe themselves as solely Jingili, instead identifying as Jingili and Mudburra, or solely Mudburra. This close contact between Jingili and Mudburra people (and to a lesser extent with Warlmanpa and Wambaya people to the south, and to an even lesser extent with Warumungu people further south) has been a complex ecology of multilingualism and language mixing (see Figure 1). Since the colonisation of the area in the late 1800s, Kriol and English have been added to the mix (see Figure 2), impacting on the vitality of Jingulu and Mudburra. Today there are one or two fluent Jingulu speakers, and Jingulu is not in daily use. Mudburra also shows intergenerational differences indicative of language shift.

Jingulu and Mudburra are members of two unrelated language subgroups (Mirndi and Ngumpin-Yapa), perhaps ultimately related through proto-Australian; however, the existence of this proto language is controversial. Nonetheless, any shared forms are highly unlikely to have been inherited (very few proto-Australian forms have been identified) and much more likely to have been borrowed. Heavy borrowing between Jingulu and Mudburra was previously observed by Pensalfini (2001, p. 393), who found that Mudburra and Jingulu shared between 40% and 71% of items on a standard 200-item lexicostatistical list that includes both nouns and lexical verbs. This high level of shared vocabulary led Pensalfini to speculate about whether Jingulu might be a mixed language. Black (2007, p. 67) revised down that figure using 114 vocabulary items from Mudburra (Eastern and Western), Jingulu, Gurindji, Jaru, Ngamka, Wambaya and GudANJI. Black’s Jingulu data again includes nouns and verbs and is based on Chadwick’s (1975) documentation of Jingulu rather than Pensalfini’s (2001) work in an attempt to separate established Mudburra borrowings from more recent language obsolescence effects. Black finds 40–43% shared forms between Jingulu and Eastern Mudburra and 19–22% shared forms with Western Mudburra, which he suggests demonstrates the extent of borrowing from Jingulu into Mudburra (rather than a scenario

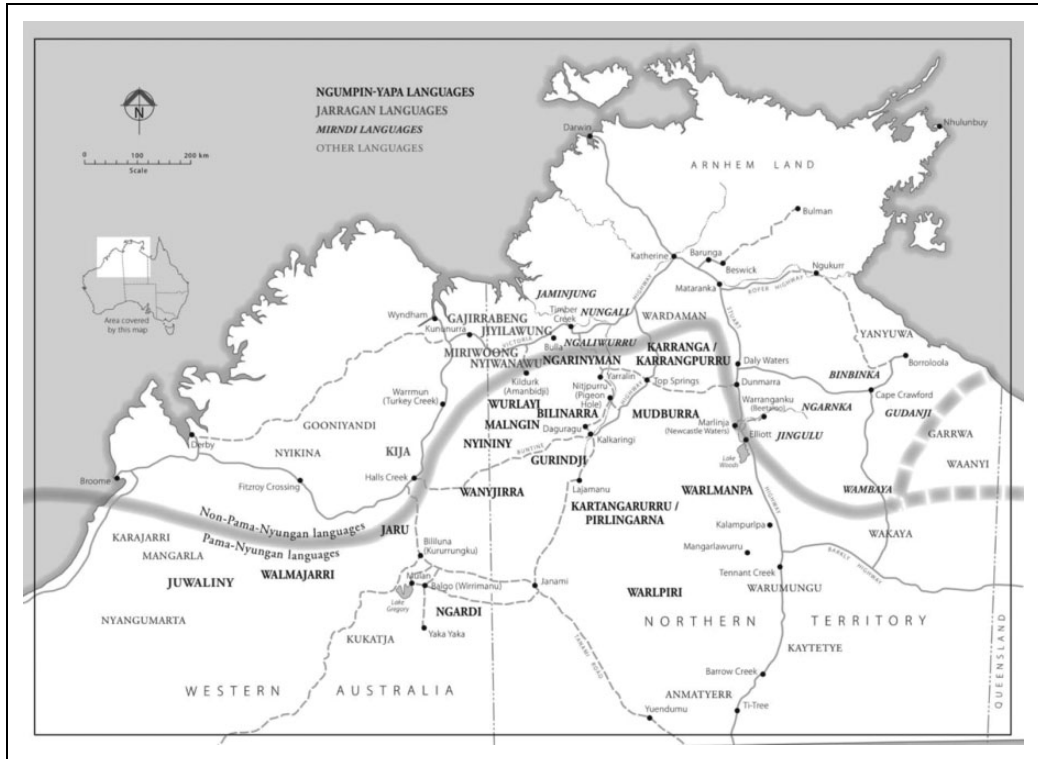


Figure 1. Ngumpin-Yapa and Mirndi languages, and surrounding unrelated languages (cartography Brenda Thornley, 2017).

of mutual influence, as previously suggested by Pensalfini (2001, p. 394), and the view we will argue for in this paper). Regardless of the actual numbers, both the Pensalfini (2001) and Black (2007) figures are very high in comparison with other case studies of borrowing (*Other cases of extreme borrowing* section). For example, 49% of nouns in Gurindji are borrowed from unrelated northern languages, such as Jaminjung, Wardaman and Mirawong, which is among the world's highest (McConvell, 2009, p. 795). In this paper, we extend these previous studies by examining the full set of nouns documented for Jingulu and Mudburra (*Establishing shared Mudburra and Jingulu forms* section) and establishing methods for determining the direction of borrowings (*Determining direction of borrowing between Mudburra and Jingulu* section).

Bidirectional noun borrowing in Mudburra and Jingulu

In this section, we detail the arguments for extensive bidirectional borrowing of nouns between Jingulu and Mudburra before placing this case study in the context of other instances of extreme lexical borrowing, including a number of mixed languages (*Other cases of extreme borrowing* section). We describe the construction of a comparative database of nouns from Jingulu and Mudburra to establish shared forms (*Establishing shared Mudburra and Jingulu forms* section). We then determine the direction of borrowing using three methods: (i) a comparison of the shared Jingulu and Mudburra nouns with corresponding nouns from a number of dictionaries, databases and ethnobiologies of neighbouring and related languages in the comparative database (*Method 1: Correspondence sets with neighbouring languages* section); (ii) environmental knowledge of the



Figure 2. Main languages in contact in the Elliott area (Meakins & Pensalfini, 2016, p. 430).

local region (*Method 2: Biological information* section); and (iii) an examination of the behaviour of the borrowed nouns with respect to the Jingulu gender system (*Method 3: Gender behaviour of nouns* section).

Establishing shared Mudburra and Jingulu forms

In order to determine the extent of noun sharing between Jingulu and Mudburra, we compiled a comparative database of 871 nouns that are recorded for both Jingulu and Mudburra. The nouns were extracted from the Jingulu dictionary (Pensalfini, 2011), the Mudburra dictionary (Green et al., 2019) and the ethnobiological volume *Jingulu and Mudburra Plants and Animals* (Raymond et al., 2018). The comparative database shows that 571 (66%) of the nouns are shared between Jingulu and Mudburra. Nine are recent Kriol borrowings, which are not considered in this paper, leaving a set of 562 (65%) shared Mudburra and Jingulu nouns for analysis. This figure falls within the Pensalfini (2001) range of 40–71%, and is higher than the Black (2007) range of 40–43%.

Note that the nouns did not have to be identical in form in order for the two languages to be considered to share the word. Some of the 562 shared forms are match completely, but some have minor stem changes. These changes relate to (i) phonological processes, (ii) the presence or absence of derivational morphology or (iii) differences related to the presence or lack of a gender

system in the source language. In other words, these changes result from the process of morpho-phonological integration, or adaptation.

Firstly, there are minor phonological differences between Mudburra and Jingulu nouns in some cases. For example, there are some clear cases where initial lenition has resulted in different surface forms, such as the word for ‘corkwood tree’, which is *kulunjurru* in Jingulu and *wulunjurru* in Mudburra. For ‘louse’, Jingulu has *mukunjirni* whereas the Mudburra word is *mubunjini*. It seems reasonable to assume that one peripheral stop has been replaced by another ([b] <-> [k]) in or after the borrowing process. In these cases, we consider Jingulu and Mudburra to have shared words.

There are also differences that may result from the differing morphological systems of the languages in question. For example, Jingulu adds an animate plural suffix *-wala* to the word for *dardu* ‘many’ in order to derive the word *darduwala* ‘group’, whereas the word for ‘group’ in Mudburra is simply *dardu*. Similarly, the word for ‘jealous’ is *nguwajkarra* in Mudburra and *nguardjarrajkala* in Jingulu. The Jingulu word ends in the productive comitative morpheme *-jkala*, which regularly appears in words denoting psychological or character traits. In examples such as these, where the roots of the words are clearly shared, we also consider the Jingulu and Mudburra nouns to be shared.

However, by far the most common reason for differences in form between Jingulu and Mudburra nouns is gender morphology. Jingulu, like most Mirndi languages, has a four-class gender system for nominals, with each class having a characteristic ending: *-a* or *-ji* for masculine, *-(r)ni* or *-(r)di* for feminine, *-u* for neuter and *-mi* or *-bi* for vegetable (Pensalfini, 2003). In cases where the Jingulu and Mudburra words differ only in their endings, we consider the words to be shared. For example, the word for a wattle species in Jingulu is *barlungbarlungmi*, but in Mudburra it is *barlungbarlung*. More discussion of Jingulu gender and its effect on Jingulu and Mudburra nouns can be found in the *Method 3: Gender behaviour of nouns* section and Pensalfini and Meakins (2019). We next turn our attention to determining the direction of noun borrowings.

Determining direction of borrowing between Mudburra and Jingulu

Method 1: Correspondence sets with neighbouring languages. The first method involved extending the comparative dataset of nouns to surrounding and related languages. The two main languages added to the comparative dataset were Gurindji (Ngumpin, closely related to Mudburra, contiguous with Mudburra, but not in contact with Jingulu) (Meakins et al., 2013) and Wambaya (the only other Mirndi language contiguous with Jingulu for which a sizeable vocabulary is documented, also in contact with Mudburra) (Nordlinger, 1998a).² Four other languages were also added for additional comparisons when the Gurindji and Wambaya comparisons were not sufficient to come to conclusions about direction of borrowing: Jaminjung (a Mirndi language separated from Jingulu by unrelated languages, not in contact with Mudburra) (Jones et al., 2011; Schultze-Berndt & Simard, 2015), Warlmanpa (Yapa, distantly related to Mudburra, contiguous with Jingulu and Mudburra) (Nash, 2003), Jaru (Ngumpin, in contact with neither Jingulu nor Mudburra) (Blythe, 1992; Deegan et al., 2010) and Warumungu (Pama-Nyungan isolate, contiguous with Warlmanpa and Wambaya, having had limited contact with Jingulu and none with Mudburra) (Simpson, 2014). Note that full correspondences were not found for all 562 shared Mudburra and Jingulu nouns, depending on the comprehensiveness of the lexical databases and dictionaries. The relative position of these languages is shown in the map in Figure 1.

The comparative database provides us with a method for determining the linguistic origin of nouns and therefore the direction of borrowing. For example, if a noun is shared by Mudburra (Ngumpin), Jingulu (Mirndi) and Gurindji (Ngumpin), but not by Wambaya (Mirndi), we conclude that it is a Mudburra word that was borrowed into Jingulu (PATTERN 1 in Table 1). Conversely, if a noun is shared by Mudburra (Ngumpin), Jingulu (Mirndi) and Wambaya (Mirndi), but not by

Table 1. Hypotheses based on shared forms in Jingulu, Mudburra and their closest relatives.

Jingulu MIRNDI	Mudburra NGUMPIN	Gurindji NGUMPIN	Wambaya MIRNDI
PATTERN 1:			
✓	✓	✓	x
➤ Borrowed from Mudburra into Jingulu			
PATTERN 2:			
✓	✓	x	✓
➤ Borrowed from Jingulu into Mudburra			
PATTERN 3:			
✓	✓	x	x
➤ Not clear therefore more data is required (see Table 2)			
PATTERN 4:			
✓	✓	x	x
➤ Not clear therefore more data is required (see Table 2)			

Gurindji (Ngumpin), we conclude that it is a Jingulu word that was borrowed into Mudburra (PATTERN 2). Where the shared Jingulu-Mudburra nouns are (i) not found in either Gurindji or Wambaya (PATTERN 3) or are (ii) found in both Gurindji and Wambaya (PATTERN 4), directionality of borrowing cannot be established through this four-way comparison alone.

Of the 562 nouns shared by Mudburra and Jingulu, 214 (38%) are also shared in either Gurindji (PATTERN 1, *PATTERN 1: Clear Mudburra borrowings into Jingulu* section) or Wambaya (PATTERN 2, *PATTERN 2: Clear Jingulu borrowings into Mudburra* section). For another 196 (35%) shared Mudburra-Jingulu nouns, where Gurindji and Wambaya nouns did not help determine the direction of borrowing, information from the other related and neighbouring languages (Jaminjung, Warlmanpa, Jaru and Warumungu) gave some clues in a number of these cases, as shown in Table 2 (PATTERNS 3A–D, discussed in the *PATTERN 3: Unclear directions of borrowing* section and 4A–D, discussed in the *PATTERN 4: Unclear directions of borrowing* section).

In the case of PATTERN 3D, 107 words were only found in Jingulu and Mudburra and not in any of the other languages examined, giving the appearance of local innovations. These are set aside in the first part of this study and revisited in the *Method 3: Gender behaviour of nouns* section. An examination of borrowing patterns of nouns in relation to Jingulu gender helps resolve these cases. Direction of borrowing for other nouns can also be resolved with a knowledge of endemic plant and animal species in the Elliott region (*Method 2: Biological information* section).

PATTERN 1: Clear Mudburra borrowings into Jingulu. The clearest way of determining if a Mudburra noun has been borrowed into Jingulu is whether the noun exists in Gurindji, but not Wambaya (PATTERN 1). Of the 562 Jingulu-Mudburra shared nouns in the comparative dataset, 134 forms (24%) show correspondences between Jingulu, Mudburra and Gurindji, with a different form in Wambaya. Ten examples are given in Table 3; the first five examples show one-to-one matches in form between the three languages, whereas the second five examples show differences in form that relate to borrowing Mudburra nouns into the gender system of Jingulu.^{3–5}

Subsection terms (known colloquially as ‘skin names’), which are an important part of the kinship system for both Mudburra and Jingili people, can be established as a borrowing from Mudburra to Jingulu. While Wambaya utilises the same eight-term subsection system as Jingulu, Gurindji and Mudburra (Nordlinger, 1998b), the Jingulu subsection terms are based on the

Table 2. Hypotheses based on shared forms in Jingulu, Mudburra and other related and neighbouring languages.

Jingulu MIRNDI	Mudburra NGUMPIN	Gurindji NGUMPIN	Wambaya MIRNDI	Jaminjung MIRNDI	Jaru NGUMPIN	Warlmanpa YAPA	Warumungu ISOLATE
PATTERN 3A:							
✓	✓	x	x	x	✓	~	~
➤ Borrowed from Mudburra into Jingulu							
PATTERN 3B:							
✓	✓	x	x	✓	x	~	~
➤ Borrowed from Jingulu into Mudburra							
PATTERN 3C:							
✓	✓	x	x	x	x	✓	✓
➤ Impossible to determine the direction of borrowing between Jingulu and Mudburra							
PATTERN 3D:							
✓	✓	x	x	x	x	x	x
➤ Local innovation between Jingulu and Mudburra							
PATTERN 4A:							
✓	✓	✓	✓	x	✓	✓	✓
➤ Borrowed from Mudburra into Jingulu and Wambaya							
PATTERN 4B:							
✓	✓	✓	✓	✓	✓	✓	~
➤ Impossible to determine the direction of borrowing between Jingulu and Mudburra							
PATTERN 4C:							
✓	✓	✓	✓	✓	x	~	~
➤ Impossible to determine the direction of borrowing between Jingulu and Mudburra							
PATTERN 4D:							
✓	✓	✓	✓	x	x	x	x
➤ Impossible to determine the direction of borrowing between Jingulu and Mudburra							

Mudburra ones, not cognate with the Wambaya ones. Mudburra and Gurindji, like other Ngumpin-Yapa languages, have different initial consonants for the male versus female names in each subsection, with male subsection terms beginning in [j] and female terms in [n]. This is also the case in Jingulu (which has also suffixed *-nginja* to male skin names and *-nginju* to female ones – possibly related to the word *nginja* ‘seed’ in Jingulu). Of the other Mirndi languages, Jaminjung also has this *j/n* alternation, but Wambaya does not have it systematically. The Jingulu forms are clearly closer to the Mudburra forms than to the Jaminjung forms, as shown in Table 4. We can conclude that Jingulu borrowed its 16 subsection terms from Mudburra, and Jaminjung from Gurindji. (The Wambaya terms appear to be a combination of Ngumpin and Garrwa forms, although discussion of that is outside the scope of this paper. In general, we are also not making claims about deeper historical relationships or earlier cognate forms e.g. ‘Nangari’ and ‘Napan-gardi’ (see McConvell, 1985 for a discussion).)

PATTERN 2: Clear Jingulu borrowings into Mudburra. The most robust way to determine whether a Jingulu noun has been borrowed into Mudburra is whether it also exists in Wambaya, but not in

Table 3. Mudburra noun borrowings into Jingulu (PATTERN 1 – shading shows correspondences).

English	Jingulu (Mirndi)	Mudburra (Ngumpin)	Gurindji (Ngumpin)	Wambaya (Mirndi)	Jaminjung (Mirndi)	Warlmanpa (Yapa)	Warumungu (isolate)	Jaru (Ngumpin)
Chest	mangarli	mangarli, mandangali	Mangarli	linka	manarrang	mangarli	lappi	madangali dugudugu giningi
Red ochre	kalnga	kalnga	kalnga	girrina	gidbi gurrmi murdu	yurlpu	–	murдумardarr
Cheek, jaw	kangarnda	kangarnda	kangarnta	garnmanka	jaguwi, walany	karlikarli	karlikarli	limimi, ngan.kurr, ngalya, jamiy, linga
Egg	kidba	kidba	kirtpa	marrgulu	buluwuj, gardawarlng	ngarlupurru, nginyingiyi, kumpumpu	kumpumpu	gambin (y)
Charcoal	linyarda	linyarda	linyart	janyala wugulaji	miwiny	pirriyiyi	–	gunyini, lardi
Tomahawk	mayingkirni	mayingka	mayingka lampura	ganybalinya nyinggarna	lamburra	mayingka	warnanja	mayingga
Tawny frogmouth	jurdiyini	jurdiyina	jutyiyina	gulugulinya	jalarrarr, jumujumuj, nyurrunyurru	–	kurrkurr	wirmanuwaji, diliyigi
Bush passionfruit	babingi	babingi	bambilyi	minggilyanuma	warrabala	papingi	–	bambilyi
Eye	ngabanju	ngabanyji mila	ngapanji mila	murlu	juwud	milpa	miyil	milba, milwa
Lower back	nyinjimi	nyinyji	nyinyji	banduma	buliyag, warrawa	lampu	–	winggi, ngirndi

Gurindji (PATTERN 2). Of the 562 shared Jingulu and Mudburra noun forms, 80 forms (14%) show correspondences between Jingulu, Mudburra and Wambaya. Table 5 provides some examples of Jingulu nouns borrowed into Mudburra. The first four examples show one-to-one correspondences between Jingulu and Mudburra and the second set of five examples show differences, most of which can be explained by the Jingulu gender system (Pensalfini & Meakins, 2019).

If the form also exists in Jaminjung, but not in Jaru, this direction of borrowing is strongly confirmed (the form may well exist in Warlmanpa and Warumungu too, as they have had extensive contact with Jingulu). For example, the appearance of the word ‘kestrel’ in Warumungu in Table 5 may give pause because Warumungu is a Pama-Nyungan isolate (therefore distantly related to Mudburra). However, as it has been in contact with Wambaya, which shares the same form, it stands to reason that it has borrowed the Wambaya form.

PATTERN 3: Unclear directions of borrowing. Of the 562 nominals shared between Mudburra and Jingulu for which Gurindji and Wambaya data is also available, 134 (24%) fall into PATTERN 3, that

Table 4. Subsection terms in Jingulu, Mudburra and their related and neighbouring languages.

Jingulu (Mirndi)	Mudburra (Ngumpin)	Gurindji (Ngumpin)	Wambaya (Mirndi)	Jaminjung (Mirndi)	Warlmanpa (Yapa)	Warumungu (isolate)	Jaru (Ngumpin)
Jaaninginja	Janama	Janama	Jiyinama	Janama	Japanangka	Jappanangka	Jawan
Naaninginju	Nanaku	Nanaku	Niyinama	Nanagu	Napanangka	Nappanangka	Nyawana
Jabijinninginja	Jambijina Jamiljina Jampiyin	Jampin Jampijina Jampijinpa	Yagamarri	Jabija	Jampijinpa	Jampin	Jambiyin
Nabijinninginju	Nambijina Nambiyin	Nampin Nampijina	Yagamarrirna	Nambijin	Nampijinpa	Nampin Ngampija	Nambiyin
Jalyirringinja	Jalyirri	Japalyi Jalyirri Japanyi	Balyarrinji	Jalyarri	Japaja	Jappaljarri	Jawalyi
Nalyirringinju	Nalyirri	Nalyirri	Balyarrinya	Nalyarri	Napaja	Naljarri, Nalyirri (Nappaljarri)	Nyawajarri
Jamirringinja	Jimarra Jabarda	Japarta	Jyamarrama	Jabarda	Jakama	Jakkamarra	Jagarra
Namirringinju	Nimarra	Nimarra	Niyamarrama Niyamarragurna	Namirra	Nakama	Nakkamarra	Nagarra
Jangalinginja	Jangala	Jangala	Jangalama	Jangala	Jangala	Jangali	Jangala
Nangalinginju	Nangala	Nangala	Nangalama	Nangarla	Nangala	Nangali	Nangala
Jangaringinja	Jangari	Jangari	Bangarinji	Jangari	Japangarti	Jappangarti	Jangari
Nangaringinju	Nangari	Nangari	Bangarinya Nungarima	Nangari	Napangarti	Nappangarti	Nangari
Jiminginja	Jimija	Jimija Jukurtayi Jungurra	Jurlanyma	Jimij	Jungurra	Jungarrayi	Jungurra
Nimingjinu	Namija	Namija	Nurlanyma (Ngabida)	Namij	Namurlpa	Namikili [Nungarrayi]	Nyanyjili
Jurlinginja	Jurlama	Jurlama	Jurrulama	Julama	Jupula	Juppurla	Juwurru
Naalinginju	Nawurla	Nawurla	Nurrulama	Nawurla	Napula	Narrurlu	Nyawurru

is, words that appeared in neither Wambaya nor Gurindji. Once we take into account data from Jaminjung, Wambaya, Warlmanpa and Warumungu, four sub-patterns emerge, which are outlined in Table 2.

PATTERN 3A shows nouns also found in Jaru or Warlmanpa, but not Jaminjung. On the basis of this pattern, we hypothesise that the noun is borrowed from Mudburra into Jingulu because Jaru

Table 5. Jingulu and Mudburra shared forms with Wambaya (PATTERN2 – shading shows correspondences).

English	Jingulu (Mirndi)	Mudburra (Ngumpin)	Gurindji (Ngumpin)	Wambaya (Mirndi)	Jaminjung (Mirndi)	Warlmanpa (Yapa)	Warumungu (isolate)	Jaru (Ngumpin)
Smoke tree	Bularraku	bularraku yarakara	jarndji yanjurru	buyarragu	jarndjiny yarrirra	walanja	–	waram
Grass (generic)	Bikirra	bikirra yuka	yuka	bigirra	warnda	wanpaka	karlkkurr	yuga
Baby	Manjala	manyjala	wunyu	manjala	bardarda wirrinygirri yibilingman	–	pululu, purlungu	lumburrugarra yabaji jingga yidagina
Spangled perch, generic	Kakuyi	kakuwi kakuyi kakuyu yawu	tanyan tawujan yawu	gaguwi	yaag	kakayu	liwanja	murnmurd muwalanga
Turtle (short neck)	kulamandarrimi	kulamandarri	kuwarlamparla	gulamandarrina	guwarlamparla	–	–	balarn
Diver duck (small)	birridini	birrida, birridini birriwidi	karrangkarrang	birrida	barragbarrag karrangkarrang	tarlwarrañji	ipilyaku	burruwi burrgaji
Itchy caterpillar	buruburrudi	buruburrurda	warikarang karang wanpura	buruburrurna	–	–	–	maramara nyinggi
Turtle (short neck)	kulamandarrimi	kulamandarri	kuwarlamparla	gulamandarrina	guwarlamparla	–	–	balarn
Kestrel	waruburluburla	waruburluburlu	jinparlpalinypaliny	warabulubulu	barlinybarliny	warawurlu	warupulupulu	garrgany

and Warlmanpa are related to Mudburra, and Jaminjung is related to Jingulu. Of the 134 nominals in PATTERN 3, 12 fall into this category. Some examples are given in Table 6.

In some of these cases, there were forms where full datasets for the four languages were not available, but comparisons with Jaminjung, Warlmanpa, Warumungu and/or Jaru words show that the direction of borrowing was almost certainly from Mudburra into Jingulu, that is, the forms were also found in one of the more distant Ngumpin-Yapa languages, but not Jaminjung. A total of 20 such forms were found, a sample of which is given in Table 7.

PATTERN 3B consists of nouns also found in Jaminjung, but not Warlmanpa or Jaru. In these cases, we hypothesise that the noun is borrowed from Jingulu into Mudburra. Only six of the 134 forms in PATTERN 3 fall into PATTERN 3B, some of which are given in Table 8.

In the case of ‘wild cucumber’, it seems most likely that the Jingulu form *warnburrkbi*, cognate with Jaminjung *wanbud*, was borrowed into Mudburra. Note the appearance of the vegetable gender suffix *-bi* (an allomorph of *-mi*).

PATTERN 3C consists of nouns found in Warlmanpa (and in some cases also Warumungu), but neither Jaru nor Jaminjung. Only nine such examples were found in PATTERN 3, with five given in Table 9.

In these cases, it appears that some sort of borrowing has taken place, but it is impossible to tell the direction. Words from Jingulu may have been borrowed into Mudburra and thence to Warlmanpa, or from Jingulu to both Mudburra and Warlmanpa. Some may then have gone into Warumungu from Warlmanpa. On the other hand, a word from Warlmanpa may have been borrowed into Mudburra and Jingulu (directly or indirectly via Mudburra).

PATTERN 3D represents the overwhelming majority of PATTERN 3 nouns, with 107 (80%) of the 134 nominals not found in any other languages, and appearing to be local innovations in Jingulu and Mudburra. Some examples are given in Table 10.

In these cases, to err on the side of conservatism, we have stated that it is not possible to determine whether Mudburra or Jingulu innovated the form. It is, of course, possible that the innovation arose in *both* languages simultaneously, following the union of Jingili and Mudburra communities. Given that the two languages were spoken in what constitutes a single set of speech communities, the word would have entered the *community* rather than the language, and thus could be said to be a simultaneous innovation. The form could also have arisen in Jingulu or Mudburra and spread to the other language, or the form could have been borrowed into either or both of those languages from a neighbouring language (Gurindji, Jaminjung, Wambaya, Warlmanpa), and later have fallen out of use in the original source language. The direction of transfer for many of these shared forms can be determined with reference to the behaviour of nouns and the Jingulu gender system. More will be said about some of these examples in the *Method 3: Gender behaviour of nouns* section.

PATTERN 4: Unclear directions of borrowing. In PATTERN 4, the noun form is shared in Jingulu, Mudburra, Gurindji and Wambaya, again making it difficult to determine direction of borrowing. Of the 562 words where the Mudburra and Jingulu forms are shared, 62 (11%) fit this pattern. In these cases, examination of the other languages considered here also reveals four sub-patterns, which are outlined in Table 2.

PATTERN 4A consists of nouns also found in Jaru, Warlmanpa or Warumungu, but not in Jaminjung. In these cases, we hypothesise that the form is of Ngumpin, or at least Pama-Nyungan, origin, and is borrowed from Mudburra into Jingulu and Wambaya. Ten of the 62 forms in PATTERN 4 fall into this category. Some examples are given in Table 11.

PATTERN 4B consists of nouns that occur in all of the languages investigated, or with the exception of Warumungu (which is a Pama-Nyungan isolate). Fourteen such forms were found, some examples of which are given in Table 12. In the case of the words for birds, ‘galah’ and ‘finch’

Table 6. PATTERN 3A, which shows shared forms in Jingulu, Mudburra and Jaru, Warlmanpa or Warlmanpa.

English	Jingulu (Mirndi)	Mudburra (Ngumpin)	Gurindji (Ngumpin)	Wambaya (Mirndi)	Jaminjung (Mirndi)	Warlmanpa (Yapa)	Warumungu (isolate)	Jaru (Ngumpin)
River red gum	Bilirna	Bilina Dimalarn kunjimarra	Marlarn timarlarn	galabirra	dimalan	jilwirli kunjumarra kurraramara	kunjumarra	bilirn dimalarn malarn
Feather, wing	Liyimbu limbu	Limbu Bijinka marramarra diyardiya	Marirrij pinkirr Puntal Tiyatiya marramarra	mardaja	bardang diyardiya marrabarra wirra	pinkirrrpa limpi	limpi	bin.girr
Black plum	Kiyandinmi	Kiyandinmi	Muying	darimabigigi	burrgal	marrkirti	marrkirti	girndiyi
Blue tongue lizard	Jurlurlurra	Jurlurra lungkura ngabalya	Jiwili	gulangunya milirrgbarna	luma lunggura	palyupalyu luma	palyupalyu	lunggurra giringgaji luma jiwili
Yellow goanna	Walanja	Walanya	Wartapa	mayinanji	–	–	–	wilinyi
Nail-tail kangaroo	Jurnma	Jurnma	Kakuya kururrungku	ngulungulu wankarri	dugurlgurl gururrunguny	jurnma	jurnma	gururrunggu
Fat, marrow	Dika	Dika	Jira Wararr Yara	guriya	guriy	tikawara	tikapinjili	guri

onomatopoeia may explain the correspondences rather than borrowing. Some terms such as *ngabuja* ‘grandmother’ and *lambarra* ‘father-in-law’ are also found throughout the region beyond the languages studied (McConvell, 2016), while others are found more locally distributed or are even unique to some languages. It is, of course, possible that these represent some inherited form from proto-Australian.

PATTERN 4C consists of nouns common to Mudburra, Jingulu, Gurindji, Jaminjung and Wambaya, but not Jaru. We suggest that these nouns could have been borrowed into Gurindji and then Mudburra, or into Gurindji from Jaminjung and into Mudburra from Jingulu. Therefore, it is impossible to determine whether they were borrowed between Jingulu and Mudburra. Twenty-two such forms were found. Some examples are given Table 13.

Very little can be concluded from the examples in Table 13, with the possible exception of the word for ‘bird’. All forms, arguably with the exception of Jaru, are based on a stem *ju(r)lak*, with Wambaya and Jingulu both having replaced the final /k/ with /ji/. The suffix *-ji* is an old Eastern Mirndi marker of masculine gender, and it remains so to this day in Wambaya. In Jingulu, the masculine ending is now usually *-a*, but some masculine nouns retain the older *-ji*, as in this case. It therefore seems likely that the word is not of Jingulu origin, and was likely borrowed from Wambaya, which borrowed it from a Ngumpin-Yapa language (possibly Warlmanpa), while Jaminjung borrowed it from Gurindji. Had Jingulu borrowed the word from Mudburra, it would

Table 7. Mudburra noun borrowings into Jingulu (shading shows correspondences).

English	Jingulu (Mirndi)	Mudburra (Ngumpin)	Gurindji (Ngumpin)	Wambaya (Mirndi)	Jaminjung (Mirndi)	Warlmanpa (Yapa)	Warumungu (isolate)	Jaru (Ngumpin)
Shell, shell plate	binjayinja	binyjayinya	–	rawuwanggu	–	–	–	binyjawinya
Spinifex hopping mouse	(w)ijibarda	wijibardu	–	–	–	wijipartu	wijipartu	–
Wild curry kurradjong	miyikimi	miyaka	miyaka kinyjirrka	–	–	–	–	mararljaru, miyaga
Hat	murrkardi	murrkardi	murrkartu walyawalya	–	gulagagina gurunyunggina waljawalja	mukarti	mukkarti	magarda walyawalya
Tree lizard	buburlu	bubulu	pupulu	–	–	–	–	buwulu buwurli babulu, baburlu
Things, stuff	nyambanyamba	nyamba	nyampakayi rnikayirni	–	numali	nyayikanikani	–	nyamba

Table 8. PATTERN 3B shared forms in Jingulu, Mudburra and Jaminjung.

English	Jingulu (Mirndi)	Mudburra (Ngumpin)	Gurindji (Ngumpin)	Wambaya (Mirndi)	Jaminjung (Mirndi)	Warlmanpa (Yapa)	Warumungu (isolate)	Jaru (Ngumpin)
Wild cucumber	warnburrkbi	warnburrbi	kaaril kawujin martawuk	murulama	wanbud	ngalparanpa	–	ngawuraka
Shade	ngarluba	ngaluba ngandayi ngandawi	ngantawi yarti	manjungu	ngarlu murag	yama	marla	ngandawu ngandawi
Younger brother	bardarda	bardarda	karlaj	gagulu	bardarda garlaj	kukurninyina palinjawangu	kukkaji	ngajayi
Dream	bankaja	bankaja buwarraja kurni	kinimamarri yawar yungkaj	buwarraja	bankiyaj	puwarijpa	–	guni marnan win.girr
Poison	marringilija	manngilija, lungkarda	mawuya yarrwal	lunggarra	marring mawiyamayili	–	–	mawuya

Table 9. PATTERN 3C, which shows shared forms in Jingulu, Mudburra and Warlmanpa.

English	Jingulu (Mirndi)	Mudburra (Ngumpin)	Gurindji (Ngumpin)	Wambaya (Mirndi)	Jaminjung (Mirndi)	Warlmanpa (Yapa)	Warumungu (isolate)	Jaru (Ngumpin)
Bread, damper	kandirri	kandirri mangarri	mangarri mayingany	bulyuluma	mangarra	kandirri	kandirri nyurlu munta	mangarri
Clapstick	kundalnga	kurndarnga	karnpak karnpij kilkilpkaji	danmuga	garnbij	kuntara	–	garnbag
Digging stick Yam stick	kabila	kabilikiyarri	kiyarri	maganja	jurna nyanya	kanakapirli	kana	garna
Many, much, a lot, lots	dardu	dardu	jarwa	garnguja, garngunya	banbiya bardawurru ganjalubayi	tartu	wakkapi julali	nguyurru waringarri
Good, well	bardakurra	bardakurru	punyu	guriiji	jarlag	partakurru	–	gidayurayuralu

Table 10. PATTERN 3D, which shows shared forms in Jingulu, Mudburra and no other related or neighbouring languages.

English	Jingulu (Mirndi)	Mudburra (Ngumpin)	Gurindji (Ngumpin)	Wambaya (Mirndi)	Jaminjung (Mirndi)	Warlmanpa (Yapa)	Warumungu (isolate)	Jaru (Ngumpin)
Diver duck	narli	narli	karrangkarrang	dalwarranji	barragbarrag garranggarrang	tarlwarranji	jipilyaku	garranggarrang
Coolibah tree	bidbidarra	bidbidarra	wurlwaji	murrinja	gininggi	tinjirla, karrowari	pururutu	waram
Nest	janbara	janbara	ju ru	jalyu	ju ru	-	pirntitnurru	bija
Heart	jingirdi	jingirdi, jangardka, dulang	tulang	gurdurlu, marala	durlu	manturlka	marnturlka	dulbu, girningi
Knee (cap)	mingkirridbi	mingkirridbi	tingarri	banggirra gandaniyama	dingarri jurluwal wajibard	pirinpiripa, tingarri	mirtinpi	jungari dingarri gimarni

have done so after the masculine ending had been established as *-a*, and we would expect the word to be *ju(r)laka*.

PATTERN 4D consists of nouns common to all of Jingulu, Mudburra, Gurindji and Wambaya, but not found in any of the other four languages. In this pattern, there is really no way to tell where a form originated. There are 16 such cases, although it should be noted that for about half of these

Table 11. PATTERN 4A, which shows shared forms in Jingulu and Mudburra, and Jaru, Warlmanpa or Warumungu.

English	Jingulu (Mirndi)	Mudburra (Ngumpin)	Gurindji (Ngumpin)	Wambaya (Mirndi)	Jaminjung (Mirndi)	Warlmanpa (Yapa)	Warumungu (isolate)	Jaru (Ngumpin)
Elder brother	baba	babangaba	papangapa	baba	ngapa	palinjawung kupaparti	papa	babayi
Two	kujkarrani	kujarra	kujarra	gujarra(wulu)	jirrama	jirrama	kujjarra	gujarra
Crab	ngargarda	ngardarda marndababuni	kapirtik karlarr murlkurriny	majigina wurrayalyi wagina	jilin murrada nyamurra walmu	ngartarta	ngartarta	galarr murlgurru marlajilawuja murlgurr
Fat, marrow	dika	dika	jira, wararr, yara	gurija	gurij	tika, wara	tika, pinjili	guri
River red gum	kunjimarra	kunyimarra bilinadimalarn	marlarn timarlarn	galabirra	dimalan	kunjumarra kurramara	kunjumarra	bilim dimalarn malarn

Table 12. PATTERN 4B shared forms all languages (although only sometimes in Warumungu).

English	Jingulu (Mirndi)	Mudburra (Ngumpin)	Gurindji (Ngumpin)	Wambaya (Mirndi)	Jaminjung (Mirndi)	Warlmanpa (Yapa)	Warumungu (isolate)	Jaru (Ngumpin)
Breast, milk	ngabulu	ngabulu, jumurdku	ngapulu	ngaburlu	ngabulu	ngapurlu	ngamuna	ngabulu, ngawuni
Finch	nyiyinyiyi	nyiyinyi nyunumi	niinii	nyinimirri	niininini	–	nyinngirri	nyinyi
Galah	kilikilidi	kilikilika wajilan	kilinykiliny wajilan	gilyinkilyida	giliggilig	–	kirikirli	gilinygiliny
Paternal grandmother's brother	ngabuja	ngabuju	ngapuju	ngabuju	ngabuju	ngapuju	tapu-tapu apurtu	ngawuju
Father-in-law	lambarra	lambarra	lamparra	lambarra gardunganji	lambarra garnji	lampanu	–	lambarra

cases, the reason they fell into this group is that there was no data available for the word in most or all of the other four languages. Some examples are given in Table 14.

Method 2: Biological information. Other cases of Jingulu borrowings into Mudburra can be determined even when the comparative dataset is not complete. For example, missing Gurindji data in the ethnobiological domain is indicative of the lack of a species in the area west of Elliott.

Table 13. PATTERN 4C, which shows shared forms in Mudburra, Jingulu, Gurindji and Wambaya, but not Jaru.

English	Jingulu (Mirndi)	Mudburra (Ngumpin)	Gurindji (Ngumpin)	Wambaya (Mirndi)	Jaminjung (Mirndi)	Warlmanpa (Yapa)	Warumungu (isolate)	Jaru (Ngumpin)
Plains goanna	jurrkubadi	jurrkubarri	jurrkupati	jurrqubarri	jurrqubarri	nyinyirri	mangirriji	barany
White-breasted woodswallow	janba	janba	janparriman	janbalari janbalyi	jarnbarrimany	–	–	jirringali binbinilayirri
Bird	jurliji	julaka	julaka	julaji, julanga	jurlag	jurlaka	julaka	jirika
Foreigner, stranger	warnayaka	warnayaka	wanayak	wanayagi wanayagirna	warnayag	warnayaka, yajka	–	garigari
Bauhinia	wanyarri jingi	wanyarri jingi banyjibanyji	wanyarri jiingi	wajarra	wanyarri wayili	wanyarri	–	gunji

Table 14. PATTERN 4C shared forms in Mudburra, Jingulu, Gurindji and Wambaya, but not Jaminjung, Warlmanpa, Warumungu or Jaru.

English	Jingulu (Mirndi)	Mudburra (Ngumpin)	Gurindji (Ngumpin)	Wambaya (Mirndi)	Jaminjung (Mirndi)	Warlmanpa (Yapa)	Warumungu (isolate)	Jaru (Ngumpin)
Soap tree	bilangbilangmi	bulangbulang	pilangpilang	barlangguba rlangu bulunbulunji	barrawi marnkilg	pingkurla	kalkarti	barrabi barrawi
Tobacco	warnu	warnu, warlayarra	warnu, warlayarra ngunyju janyungu	warnu	walayarra, malmalmaj nguru	janyungu	janyungu	ngunyju janyungu
Billycan	jawaranya	jawaranya	jawaranya kartak	jawaranya	birrigud gardag yibumbu	parakujpa	parrakul parrakurn	diba
Spit	banga	banga jalkirra	panga jawuljupak	banga	ganggung jarrawul	nyuyu	nyuyu	jalurununju
Thirsty Dry Shallow	kurranja	kurranyku	kurranyku	gurranja	galbalba larrman	pirrakuliji	warrinji	marangabawinja marda bulbarra marrga balinya barndig

Table 15. Mudburra shared ethnobiological forms with Mirndi languages.

English	Jingulu (Mirndi)	Mudburra (Ngumpin)	Gurindji (Ngumpin)	Wambaya (Mirndi)	Jaminjung (Mirndi)	Warlmanpa (Yapa)	Warumungu (isolate)	Jaru (Ngumpin)
Wild rice	kingkirra	kingkirra	–	ginggirra	barnkal, ngarruyu	karnkurr	–	–
Magpie goose	warlidaji	warlidaji	–	warlidaji	jamajban, marnawirri	walutaji	–	wulujurnjurn
Mulgara	kudingi	kurdingi	–	gudingi	jijigurr	–	–	lilgurn
Blue wiregrass	mawurumi	mawurumi	–	mawuruma	–	–	–	–
Western brown	ngayiliji	ngayiliji	–	ngayilaji	–	–	–	dambul

Table 16. Phonology and semantics of genders in Jingulu (Pensalfini, 2003, pp. 160–164; cf. Chadwick, 1975).

Gender	Suffix	Semantics
Masculine	-a (sometimes -ji)	Male higher animates, most mammals, raptors, some fish and insects, flat rounded objects. Default animate class.
Feminine	-ni (allomorph -rdi)	Female higher animates, song birds, atypical animals, some fish and insects, axes.
Vegetable	-mi (allomorph -bi)	Long and thin or pointy items of all sorts (includes most edible vegetables).
Neuter	-u (or C-final)	Default inanimate class (includes spherical edible plants, and body parts that are not pointy or long and thin).

Combining this evidence with the presence of a similar form from Wambaya suggests that Mudburra has borrowed the noun from Jingulu. Five examples of this kind are found in the data and are given in Table 15.

Method 3: Gender behaviour of nouns. The third method for determining the direction of noun borrowings between Jingulu and Mudburra uses the behaviour of borrowed nouns in relation to the Jingulu gender system. Jingulu has four genders, unlike Mudburra which has no grammatical gender. Jingulu nouns belong to one of four genders – masculine, feminine, neuter and vegetable – robustly identified by concord with adjectives and demonstratives. There is also a broad semantic classification (with exceptions), with a phonological reflex, summarised in Table 16.

Pensalfini and Meakins (2019) use 167 Jingulu nouns,⁶ which are confirmed as having been borrowed from Mudburra, and 92 Mudburra nouns, which are established as Jingulu borrowings using Methods 1 and 2 to determine (i) how Mudburra nouns are allocated gender when they are borrowed into Jingulu and (ii) what happens to the gender of Jingulu nouns when they are borrowed in Mudburra. They find that Mudburra nouns are allocated to Jingulu genders largely on the basis of semantics, but also phonology. Where Mudburra nouns end in -a or -u and match the semantics of Jingulu masculine or neuter genders, they are allocated to these genders and do not

change form. On the other hand, when Mudburra borrows Jingulu nouns, it generally borrows them with the gender marker frozen to the stem.

Given these observations, we identify four strategies regarding nouns and gender for determining the direction of noun borrowings between Jingulu and Mudburra:

- a. a word that ends in *-ji* in both languages, and is in masculine gender in Jingulu, is almost certainly of Eastern Mirndi origin (Jingulu or Wambaya), and is therefore borrowed into Mudburra from Jingulu;
- b. a word that ends in *-rni* or *-rdi* in both languages, and is in feminine gender in Jingulu, is almost certainly of Jingulu origin;
- c. a word that ends in *-mi* or *-bi* in both languages, and is in vegetable gender in Jingulu, is almost certainly of Jingulu origin;
- d. a word that differs only in the presence of a feminine or vegetable gender marker in Jingulu and its absence in Mudburra is far more likely than not to be of Mudburra origin.

We can now apply these observations of the patterns of gender and noun borrowing to the 254 nouns with undetermined provenance. Eighty-one of these undetermined cases come from PATTERN 3D (PATTERN 3: *Unclear directions of borrowing* section, Table 10) where Jingulu and Mudburra share forms that are unique to these languages and not found in related or neighbouring languages (making it impossible to use the comparative dataset to determined provenance). Of these as yet undetermined forms, nine fall under clause (a) above (shown in Table 17), 20 fall under clause (b) (Table 18) and 17 fall under clause (c) (Table 19).

In the case of ‘oriole’, both the Jingulu and Mudburra words end in *-ji*, while the Gurindji and Jaminjung words do not, which strengthens the conclusion that the word is likely to have been borrowed into Mudburra from Jingulu. This pattern (although admittedly in the absence of data from any of the other languages) appears to be of Mirndi origin, with the Jingulu word bearing the older Eastern Mirndi masculine *-ji*, having been borrowed into Mudburra, while Gurindji borrowed the unsuffixed (and consonant-final) Jaminjung form.

With three exceptions (‘heart’, ‘stinking turtle’ and ‘crab’), all examples are bird names. Most of the other languages studied have a form that is clearly cognate, and this seems to be a property of onomatopoeic bird names – they spread across language boundaries. However, the key point is that the Mudburra and Jingulu forms are differentiated from the others by the presence of *-rni* and the raising of all the vowels to /i/. This is a result of vowel harmony in Jingulu, which applies when feminine or vegetable gender suffixes are added to words: all adjacent low vowels raise to /i/ (Pensalfini, 2002). This does not happen in any other languages, and therefore the Mudburra form must have come from Jingulu.

There are 25 nominals that fall under clause (d), examples of which are given in Table 20. Of these, 11 are vegetable gender in Jingulu and 13 feminine.

All of these examples, as Table 20 shows, involve the addition of the Jingulu feminine suffix *-rni* or vegetable *-mi* to the Mudburra form, triggering regressive height harmony in the Jingulu stem. The first example, in particular, shows how harmony operates. Both Gurindji and Mudburra have *wangkar-ranga* for this kind of goanna. Once the feminine suffix is added to this, all adjacent low vowels raise to /i/, producing *wingkirringirni* in Jingulu. Contrast this with *mayibi* ‘pollen balls’ in Mudburra. The existence of the underlying high vowels /i/ in the Mudburra form prevents harmony from spreading any further leftward in the Jingulu word, so that the initial low /a/ is preserved in the Jingulu *mayibimi*.

Summary for direction of borrowing. Of the 871 nouns recorded for Mudburra and Jingulu, 571 (66%) are shared forms. Nine are recent Kriol borrowings and are not considered here. The break-down of the remaining 562 (65%) shared noun forms based on Methods 1–3 is shown in Table 21.

Table 17. Masculine Jingulu words likely to have been borrowed into Mudburra.

English	Jingulu (Mirndi)	Mudburra (Ngumpin)	Gurindji (Ngumpin)	Wambaya (Mirndi)	Jaminjung (Mirndi)	Warlmanpa (Yapa)	Warumungu (isolate)	Jaru (Ngumpin)
Witchetty grub	janbakurduminiji	janbakuduminiji laju lamawurd lamawuda	laju lamawurt walmakuny	buringi	laju lamawud murluny	lajju	wirilki	lajubungal
Shufflewing, cuckoo-shrike	juruwuji	juruwuji	janparriman pinpanajarra	janbalarri jirrbilijirrbili	janbarrimany	–	–	–
Butcherbird	kurrbalawuji	kurrbulawuji	kumurlawurru kumurlawurta	–	garbugardburr gumalajburru	kumulajpurru	kumulajpurru	gumurlawurru
Oriole, rufous whistler	nyurijimiji nyurinyimiji	nyurujimiji nyurijingarna yurijimiji	nyurijpan	–	nyurijban	–	–	–
Boil	(w)ukurliji	wukurliji karlaba	karlapa	garrurdarna ngundurrina	darru	–	–	muyuru ngundagurra

Table 18. Feminine jingulu words likely to have been borrowed into Mudburra.

English	Jingulu (Mirndi)	Mudburra (Ngumpin)	Gurindji (Ngumpin)	Wambaya (Mirndi)	Jaminjung (Mirndi)	Warlmanpa (Yapa)	Warumungu (isolate)	Jaru (Ngumpin)
Heart	jingirdi	jingirdi dulang jangardka	tulang	gurdurlu, marala	durlu	manturika	manturika	dulbu, girningi
Spinifex pigeon, rock pigeon	kilwilwirni	kilwilwirni	karlawarr	galwalwana	gala wadbad marrawung	–	kurruny kurruny	garlawarrgarlawar galawirri
Crab	marnababurni	marnababuni ngardarda	karlarr kapirtij murkurriny	majgina majgayi wurrayalyiwagina	murrada nyamurra walmu	ngartarta	ngartarta	galarr murlgurru marlajilawuja murlgur
Black diver duck	nardburrijimi	nardburrijini	karrangkarrang	Dalwarranji	barragbarrag garranggarrang	tarlwarraji	jipilyaku	garranggarrang
Budgerigar	(w)ujuwujuurni	wujuwujuurni nguruwaji	kulyuyurra kulyuyu kumuyurra	Ngadijirri	gumulyurran	ngurrawaji	ngartajarngi	gulyuyu ngardijirri gumuyurru

Table 19. Vegetable Jingulu words likely to have been borrowed into Mudburra.

English	Jingulu (Mirndi)	Mudburra (Ngumpin)	Gurindji (Ngumpin)	Wambaya (Mirndi)	Jaminjung (Mirndi)	Warlmanpa (Yapa)	Warumungu (isolate)	Jaru (Ngumpin)
White stone, white body paint	bilirdbi	bilidbiyadu	kalji makirra yatu	Magirra	galji	kartji	–	mawundi yalga garrigu ngunyungunyu
Yellow water lily	kaminarrinyi	kaminarrinmi	jikamuru pinanyi	Barranama	dagud, garrngurni, nardi	–	–	binanyi, garrja; garringarri
Knee, kneecap	mingkirridbi	mingirridbi mangarrad kurlijidingarri	tingarri karlingarrngkurliji	banggirra gandaniyama	dingarri jurluwal wajibard	pirinpiripa tingarri	mirtinpi	jungari dingarri gimarni
Edible gum (of trees)	miringmi	miringmi kuramana	martiya	-	guramana yirriwij	ngartulpa	–	gumi, mardiya, marduwa
Throat	ngujbi	ngujbingilkirri	ngirkirri	Birnmanma gurranganyma	barrangardba gulumbung, nawij	walapanpa	wanykkurr	gulyurr wirri garrawari garndarr garndarr

Table 20. Feminine and vegetable words likely to have been borrowed into Jingulu.

English	Jingulu (Mirndi)	Mudburra (Ngumpin)	Gurindji (Ngumpin)	Wambaya (Mirndi)	Jaminjung (Mirndi)	Warlmanpa (Yapa)	Warumungu (isolate)	Jaru (Ngumpin)
Goanna sp.	wimkirringirni	wankarranga	wankarranga	–	larraja marlajagu malbardajagu	karlawurru	warlkan	jarrambayi labardany labarajlabardaj
Mother	jakardirni	jakardi	ngamanti ngamayi	gujunganjarda, gujinya	gujarding, gujang	ngarti-	karnantimamam	wingamayingama
Ground Sugarbag	wangkurriirni	wangkurra	nangkalij nangkalinyarlukura	wawuna	namawurru	ngarlu	kurlppu	ngarlugirringa
Potato sp.	babirdimi	babirda	pikurta	–	bigurda	papirta	manaji	buwurabiyurabigurda ngawiya
Pollen balls from sugarbag	mayibimi	mayibi	kumpayingkuntarri ngunyuwulij	–	darni gudiyari gundarr igundarrng gunyuma	–	–	ngunyuwulij

Table 21. Summary of borrowing direction for nouns in Mudburra and Jingulu.

		Number	Direction of borrowing
Method 1	PATTERN 1	134	M → J
	PATTERN 2	80	J → M
	PATTERN 3A	32	M → J
	PATTERN 3B	6	J → M
	PATTERN 3C	9	Indeterminate
	PATTERN 3D	107	Indeterminate
	PATTERN 4A	10	M → J ^a
	PATTERN 4B	14	Indeterminate
	PATTERN 4C	22	Indeterminate
	PATTERN 4D	16	Indeterminate
Method 2 (applied to 'can't tell' from Method 1)	Environment	5	J → M
Method 3 (applied to 'can't tell' from Method 1)	Gender	25	M → J
		46	J → M

^aThis scenario seems likely; however, the existence of the examined items in both Ngumpin and Mirndi languages as well as in the isolate Warumungu may also be regarded as evidence of an areal effect. Hence, it well may be that Jingulu and/or Mudburra borrowed these items from the other languages in contact, and not directly from each other.

Using the comparative dataset (Method 1), we can conclude that 176 (31.5%) nouns are confirmed as having been borrowed from Mudburra into Jingulu and 86 (15.5%) nouns are Jingulu to Mudburra borrowings. However, this still leaves some 300 (53%) nouns for which the direction of borrowing cannot be determined using the comparative database.

With the extra knowledge of the local environment (Method 2) and the Jingulu gender system (Method 3), we can conclude that 181 (32%) nouns of the 562 shared Jingulu and Mudburra nouns are confirmed as having been borrowed from Mudburra into Jingulu and 137 (24.5%) nouns are Jingulu to Mudburra borrowings. This still leaves some 224 (43.5%) nouns for which the direction of borrowing cannot be determined. Nonetheless, these methods have established that, in addition to the high number of shared nouns between Jingulu and Mudburra (65%), the borrowing was not unidirectional, but was bidirectional in nature. This situation will be put in context in the following section.

Other cases of extreme borrowing

There are two reasons this case study of noun borrowing warrants closer examination. Firstly, the amount of shared vocabulary is very high and, secondly, the relatively balanced bidirectional nature of the borrowing is rarely reported in the literature. This section places both of these observations in the context of other case studies of noun borrowings. We argue that the Jingulu-Mudburra situation is the opposite of converted languages. Instead of a (largely) single lexicon but separate grammars, as is the case with converted languages, we show that the Jingulu-Mudburra situation represents a largely single lexicon with separate grammars. We dub this 'lexical convergence', a hitherto undescribed type of language hybridisation scenario.

Firstly, the rates of noun borrowing between Jingulu and Mudburra are reasonably high. A total of 32% of the shared nouns represent Mudburra → Jingulu borrowings, and 24.5% are Jingulu → Mudburra borrowings. These figures put the Jingulu-Mudburra situation in the mid-range of noun borrowings in the languages examined in the Leipzig Loanword Typology project (Haspelmath & Tadmor, 2009a). This wide-scale study of borrowing used 1460 lexical items in 41 languages to measure rates of transfer along a number of semantic and word class dimensions (Haspelmath &

Tadmor, 2009a). They found that nouns were by far the most borrowed word class, which provides extensive empirical evidence to support previous claims (Aikhenvald & Dixon, 2007; Haugen, 1950; Muysken, 1981; Singh, 1982; Thomason & Kaufman, 1988; Whitney, 1881). Nouns made up 31.2% of total loanwords, compared with 15.2% adjectives and adverbs, and 14% verbs. Languages such as Zinacantán Tzotzil, Iraqw, Wichi, Hausa, Dutch and Saramaccan are in the same range as Jingulu-Mudburra noun borrowings (Tadmor, 2009, pp. 61-62). Nonetheless, five languages have borrowed over 45% of their nouns, namely Romanian, English, Tarifiyt Berber, Selice Romani and Gurindji (Tadmor, 2009, p. 61-62). In the case of Selice Romani, 75.6% of nouns are borrowed from various sources (Elšik, 2009). Closer to home, Gurindji, related to Mudburra, has borrowed 49% of its nouns, mostly from its northern neighbours, including Jaminjung, which is related to Jingulu (McConvell, 2009).

Note that this is not the only word class where Jingulu and Mudburra show extensive borrowing. Meakins et al. (under review) show that Jingulu and Mudburra share nearly 40% of their verbs, with 33% of these borrowed from Mudburra to Jingulu, and 18% from Jingulu to Mudburra. (The direction of borrowing for the remaining 48.7% of shared forms could not be established.) Thus there is a 2:1 ratio (Mudburra:Jingulu) for verbs and a 4:3 ratio for nouns. Again the picture for verbs emerges of bidirectional borrowing.

Such high percentages of borrowing are indeed observed in L(exicon)-G(rammar) mixed languages (Bakker, 2003, p. 125). This type of mixed language exhibits a split between the lexicon and grammar. Some examples include Angloromani (English grammar, Romani words), Ma'á (Bantu grammar, Cushitic core vocabulary), Bilingual Navajo (Navajo grammar, English vocabulary), Media Lengua (Quechua grammar, Spanish lexicon) and Old Helsinki Slang (Finnish grammar, Swedish lexicon) (Meakins, 2013). At the extreme of the L-G mixed languages, Media Lengua derives 90% of its vocabulary from Spanish (Muysken, 1981). The percentages for most L-G mixed languages are lower, but the operation of two parallel lexicons distinguishes some languages, such as Angloromani and Ma'á, from normal borrowing scenarios, such as those described above (Matras et al., 2007; Mous, 2000).

Although the extent of borrowing between Jingulu and Mudburra is not necessarily in the high range of languages in the Loanword Typology project or in comparison with some L-G mixed languages, the relatively balanced bidirectional nature of the noun transfers is less usual. Bidirectionality is largely unreported in the borrowing literature; however, Australia again provides some exceptions (Dixon, 2002, pp. 40–44). For example, Ngandi (non-Pama-Nyungan) and Ritharrngu (Pama-Nyungan) share 47% of their nouns (Heath, 1981, p. 355). Although Heath does not examine the issue of directionality in detail, he concludes that nouns transfers between Ngandi and Ritharrngu have occurred in relatively equal quantities.

(P)reliminary study suggests that asymmetries in the direction of diffusion are small (Al [Ngandi, non-Pama-Nyungan] has borrowed from Y1 [Ritharrngu, Pama-Nyungan] more than vice versa, but this probably results from the greater of the latter EG [ethno-linguistic group], rather than from cultural prestige factors). (Heath, 1981, p. 365)

A number of structurally mixed languages also combine vocabulary from two languages, which is perhaps not bidirectional borrowing as such, but a convergence of lexicons. These mixed languages have a composite morpho-syntactic frame that tends to exhibit noun phrase (NP) and verb phrase (VP) splits according to different source languages. In some cases, the lexicon also is stratified according to nouns and verbs. For example, the grammar and lexicon of Michif (Canada) is split according to source language. French provides the NP structure and 83–94% of nouns, and Cree contributes the verb phrase (V) structure and 88–99% of verbs (Bakker, 1994). Other structural mixes show source languages contributing to both the noun and verb inventories. For example,

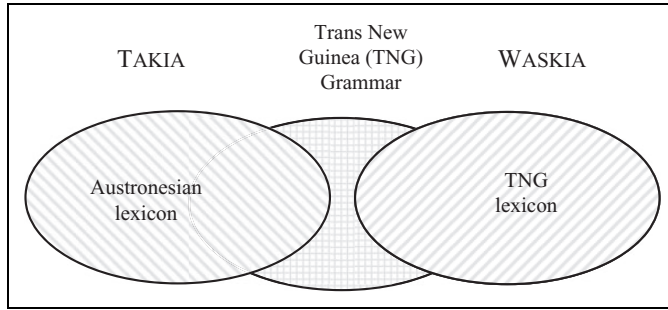


Figure 3. Takia, a converted language.

Mednyj Aleut (Bering Strait) combines the morpho-syntactic elements from Russian and Aleut, and this mix is also reflected in the lexicon, with Aleut contributing 61.5% of nouns and 94% of verb stems, and Russian the remaining vocabulary (Thomason, 1997). Back in Australia, Gurindji Kriol combines the NP structure of Gurindji with the VP structure of Kriol, but also shows relatively equal contributions from both languages to the noun and verb inventories. Based on a 200-word Swadesh list, 36.6% of vocabulary is derived from Kriol, 35% from Gurindji and the remaining 28.4% contains synonymous forms from both languages (Meakins, 2011).

The situation of bidirectional noun borrowing in Jingulu-Mudburra is not unlike Ngandi and Ritharrngu or structurally mixed languages, such as Gurindji Kriol, in terms of the extent of shared vocabulary. Where it differs is in the lack of structural influence. While 65% of the lexicon is shared, the grammars of Mudburra and Jingulu remain largely unaffected by the other language. This pattern of mixing is the mirror opposite of converted languages. Converted languages develop when the ancestral language maintains its lexicon, but undergoes restructuring of its morpho-syntax on the basis of an introduced language through a process of metatypy (Ross, 2006). For example, Sri Lanka Malay is a Malay/Indonesian (Austronesian) variety heavily restructured under the influence of Tamil (Dravidian). All of Sri Lanka Malay's surface forms, including lexicon and morphology, are Austronesian; however, it developed from an isolating language to an agglutinating language under the influence of Tamil. It has also acquired subject–object–verb (SOV) word order, postpositions and pre-nominal determiners and adjectives due to this contact (see papers and references therein from Nordhoff, 2012). Similarly, the lexicon of Takia (Karkar Island, Papua New Guinea (PNG)) is Austronesian; however, the grammar has undergone extensive restructuring on the model of Waskia (Trans New Guinea). For example, Takia has developed a SOV word order, tense–aspect–mood (TAM) marking using enclitics and noun-determiner order under the influence of Waskia (Ross, 2001, 2006). The one-grammar, two-lexicon end result is shown in Figure 3 (although note that Ross (2009) also observes that Takia has borrowed 25.9% of its vocabulary so the split is not straightforwardly form–structure).

The Jingulu-Mudburra contact situation is the opposite of converted languages. Where converted languages share a single grammar and maintain separate lexicons, the Jingulu-Mudburra situation may be conceptualised as sharing a (largely) single vocabulary, while maintaining two separate grammars, as shown in Figure 4.¹

We argue that this 'one lexicon–two grammars' conceptualisation of the contact situation between Jingulu-Mudburra is a new type of mixing, 'lexical convergence'. In essence, for bilingual Jingulu-Mudburra speakers, two mixed languages operate in parallel. Bilingual speakers claim to be speaking either 'Jingulu' or 'Mudburra' at any moment based largely in the use of morpho-syntax, not vocabulary.

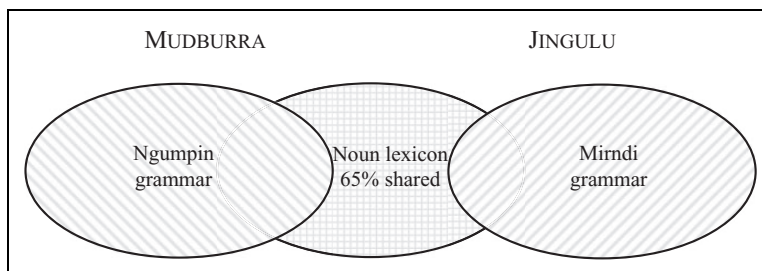


Figure 4. The Jingulu-Mudburra contact situation.

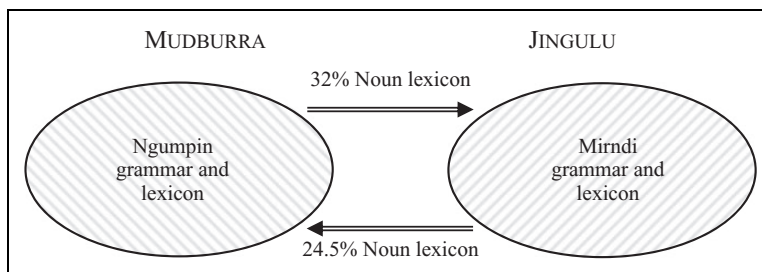


Figure 5. Jingulu-Mudburra noun transfer.

Of course, it is possible that the situation actually represents a case of two synchronically autonomous language systems, with separate but overlapping lexicons that is the result of large-scale bidirectional borrowing. Thus, Mudburra would be said to have a Ngumpin grammar and lexicon with 24.5% of its lexicon deriving from Jingulu; Jingulu would be said to have a Mirndi grammar and lexicon with 32% of its lexicon deriving from Mudburra, as represented in Figure 5.

Some evidence for this approach would be the existence of forms in both languages that have different meanings. The sort of evidence for this approach would be shared forms, which show shifted semantics in one language and not the other. This would indicate that the lexicons are separated. We have no evidence to this effect.

Just how such a situation has come about is somewhat puzzling. In most intense contact situations, grammatical convergence is not uncommon, but separate lexicons are maintained. It makes sense for speakers to maintain separate lexicons, as the lexicon is generally thought of as more integral to ethnic identity than grammar. In this respect, grammatical structure tends to fly under the radar in intense contact situations where bilingual speakers are negotiating newly transformed social boundaries. For example, Aikhenvald (2008) describes a contact situation along the Sepik River (PNG) where Manambu (Ndu) underwent many grammatical changes under the influence of Kwoma (Kwoma-Nukuma) and Yessan-Mayo (Tama), but largely maintained its lexicon. She considers this tendency a kind of ‘schismogenesis’, defined by Bateson (1958, p. 175) as ‘a process of differentiation in the norms of individual behaviour resulting from cumulative interaction between individuals’. Aikhenvald (2008, p. 46) suggests that the Manambu, who are multilingual, ‘maintain a separate linguistic identity by keeping the lexicons separate’. Indeed, vocabulary is also important for maintaining social identity in situations of divergence, not just convergence. For example, in a study of 17 Oceanic languages spoken on the northernmost islands of Vanuatu, François (2011) notes that languages tend to diverge in vocabulary, to create new dialects and languages, but largely maintain structural homogeneity across the languages. He attributes this to the emblematic nature of vocabulary in differentiating social groups.

Of course, lexical diffusion does occur, as discussed above, and indeed this usually relates to shifting identities. For example, 90% of *Media Lengua*'s vocabulary is Spanish, which Muysken attributes to young Quechua men starting work in the construction industry in nearby provincial towns, learning Spanish and getting to a point where they 'could not completely identify with the traditional Quechua culture or the urban Spanish culture' (Muysken, 1997, p. 376).

Given the identity-marking functions of lexicon, bidirectional borrowing is less straightforward to understand. Vocabulary is usually maintained to reinforce an identity or borrowed to mark out new (sometimes mixed) identities. In the case of bidirectional borrowing between Ngandi and Ritharrngu, Heath offers a plethora of functions for the mutuality of this type of diffusion.

(S)table, long-term maintenance of language boundaries, separating EG's [ethno-linguistic groups] typically with fewer than 300 persons each; frequent intrafamilial bilingualism, with the Fa(ther) (and most other persons in subsistence unit) speaking one primary language, and the Mo(ther) being a native of a different language; EG's each having a territorial base, with boundaries sometimes fuzzy, and with social and marital relations radiating outward in several directions (not always of equal importance); and particular bilingual or multilingual capabilities of individuals, varying even within small groups according to particular kinship relations and personal residential histories. Other important features are the virtual absence of asymmetrical functional or prestige differentiation of the languages, and the tendency for cultural centripetalism to operate on speech only in terms of language boundaries, while not blocking diffusion of individual words. (Heath, 1981, p. 363)

Thus, Heath attributes bidirectional borrowing situations to small groups with little hierarchical difference and with high rates of social exchange, such as marriage and ceremony. This is the likely scenario for Mudburra and Jingili people. Somewhere between 200 and 500 years ago, Mudburra people entered Jingili country, which may have been a part of the larger northern shift of Ngumpin-Yapa peoples and languages. The current linguistic situation suggests that this potential encroachment on Jingili people was handled with diplomacy. Indeed, Mudburra and Jingili peoples' accounts of historical relations between groups, although a number of generations removed from the initial contact, tell of peaceful cohabitation and exchanges in marriage from the start. This differs with folklore around contact with other neighbouring people (Pensalfini, 2011). There is some linguistic evidence in the noun borrowings to support this view. For example, the large presence of Mudburra subsection terms in Jingulu, which are inherited matrilineally, suggests that Mudburra women were a part of the mechanism by which Jingili people negotiated their land and its resources. Unfortunately, beyond these subsection terms, the noun borrowings do not show other clear patterns in semantic domains, which might reveal more of this process (e.g. in gendered domains, such as tools and food production). Nonetheless, the relatively even nature of the bidirectional borrowing is suggestive of a lack of prestige differentiation and a high level of mutual respect between the groups. This is despite the fact that Mudburra people were moving onto Jingili land, a situation where Mudburra people could have been characterised as 'refugees' or 'colonisers', if power differences were salient. The end result has been a large shared lexicon, which shows the extent to which Jingili and Mudburra identities merged over the last 200–500 years. Thus, if having separate lexicons signals otherness, as discussed above, developing a shared lexicon signals sameness. Given this, perhaps the real puzzle is why the different grammars are maintained. The answer to this may lie in the fact that multilingualism is the norm in this society (and more generally across Australia) (Heath, 1978, 1981).

Conclusion

The contact-induced vocabulary change found in Jingulu and Mudburra does not appear to have a precedent in the language contact or historical linguistics literature. Over some centuries of

cohabitation, the two languages have borrowed extensively from one another, to the extent that they now share of 50% of their vocabulary. Moreover, other than the presumable borrowing of a nominal plural suffix from Jingulu into Mudburra, the genetically unrelated languages have not influenced one another morphologically or syntactically. Through careful examination of the shared nominal forms between the two languages, we have determined that the rates of borrowing have been almost the same from Mudburra into Jingulu, as from Jingulu into Mudburra. Nouns provide a good basis for this exploration for two reasons. Jingulu nominals inflect by suffixation for one of four genders, while Mudburra lacks grammatical gender entirely. Furthermore, nouns have been shown to be the class most likely to be borrowed (Haspelmath & Tadmor, 2009a).

In order to determine direction of borrowing based solely on synchronic descriptions, we applied three sets of criteria. Firstly, we compared shared noun forms to the forms attested in the languages most closely related to each of Jingulu and Mudburra, and to other neighbouring languages. Secondly, specific biological and environmental knowledge allowed some forms to be identified as coming from the historical territory of either Mudburra or Jingulu. Finally, the determinations made using these two methods allowed us to identify patterns of behaviour with respect to gender morphology. Generally speaking, Mudburra did not remove the masculine and neuter endings when borrowing a Jingulu word, and Jingulu did not add masculine or neuter morphology in borrowing Mudburra words. On the other hand, Jingulu did add feminine and vegetable gender endings when borrowing Mudburra words into those genders, while Mudburra often removed those gender endings from words of Jingulu origin. This knowledge allowed us to revisit the hitherto undetermined cases and assign source languages to many of those cases.

We contrast this situation with a number of well-attested cases in the contact literature. Instances of extensive lexical borrowing are well attested, as in L-G mixed languages, although these tend to be overwhelmingly in one direction (for example, the borrowing into local languages of massive amounts of vocabulary from a colonising language). In contrast, Jingulu and Mudburra have contributed so much to one another's lexicon that they share much of their lexicon, despite maintaining distinct morphology and syntax. This pattern mirrors that of converted languages, wherein two languages share a single grammar but retain separate lexicons, such that one language can be translated more or less morpheme-by-morpheme into the other.

What seems to distinguish these languages from the Jingulu-Mudburra situation is that in both kinds of scenario described above, one of the languages is associated with a prestige group, a group with greater economic and political power. The history of Jingulu and Mudburra contact is, by contrast, one of shared resources, according to folk history a peaceful one and one in which neither group has dominated the other. While this is the first time that such a situation has been given this sort of detailed linguistic attention, it does not appear to be unique, as evidenced by the situation of Ngandi and Ritharrngu in Arnhem Land, as described by Heath (1981). The methodology outlined in this article may prove useful in examining this and other potential cases of lexical convergence in greater detail, making it possible to determine direction of borrowing in such cases.

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Notes

1. *Jingili* is the name of the people and *Jingulu* is the name of the language.
2. Ngarnka, Binbinka and Gudanji are also related to Jingulu but are not well enough documented for the purposes of this paper.
3. Note that only relevant forms are given, that is, not all synonymous forms within a language are provided (although they are recorded in the comparative database).
4. Note that where correspondences of animals or plants are found, we have based this on scientific names rather than common names. In the tables, we provide the common names for the reader's benefit.
5. Note that orthographic differences 'b-p', 't-d' and 'k-g' are not meaningful as these languages do not have a voicing distinction in stops.
6. Only nouns with gender independently determined by cross-referencing on adjectives or demonstratives were used to avoid circularity of argumentation, that is, we do not use phonological sequences in a Mudburra noun that are interpretable as gender suffixes as evidence for the direction of transfer from Jingulu into Mudburra.

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