Mirniny Phonology 2022

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Introduction

This phonology is based on recordings and research undertaken by the Goldfields Aboriginal Language Centre Aboriginal Corporation (GALCAC), linguist Jackie Coffin, with editing by Senior Linguist, Sue Hanson. It is compiled from historical documents, as well as recorded elicitation workshops with Mirniny speakers. Historical material used in this phonology includes work by; **Peter Gifford,** *Black and White and in Between*; **M Velichova-Rebelos**, *Wordlist of the Mirniny Language*; **Hale and O'Grady's** Mirniny recordings*;* **Dr J Ribi,** *Research Report on the Mirniny Language*; **Nicholas Thieberger,** *Handbook of Western Australian Aboriginal Languages,* and *Daisy Bates online resource.* For a complete list of these resources, see the reference listing at the end of this document.

A phonology is a document that catalogues the phonemes of a language, how these phonemes are produced in the mouth and the graphemes, or diagraphs, used to represent each phoneme. Letters of the Roman alphabet are used to represent the phoneme in this language. Some of the phonemes found in **Mirniny** language do not correspond to the English letter phonemes and therefore sometimes two letters are used to represent one phoneme such as 'ny' which represents the phoneme found in the English word, o**n**ion and the **Mirniny** word mirni**ny** – *man.* These are known as digraphs.

This phonology document explains phonological features found in words of the **Mirniny** language such as the vowels, consonants, consonant clusters, syllables and stress patterns.

The morphology, sentence structures, suffixes and adverbs will be addressed in a forthcoming sketch grammar of this language.

Location And Migration Of Speakers

Mirniny country occupies a long thin strip of land, east from Point Culver, along the south coast of Western Australia and South Australia to the head of the Great Australian Bight. The inhospitable nature of the Nullarbor to the north, meant the **Mirniny** stayed close to the coastline, never venturing more than 50 or 60 kilometres from the coast (Curr, 1886). Separate to non-Indigenous naming conventions, Aboriginal groups named themselves and their neighbours by differences in geography, cultural practices and rituals (or lack thereof). Considering this, it was not unusual for one language group to be known by many different names. Documents held in the GACLAC archives show the **Mirniny** were also known as: Meening; Minning; Jirkala; Wonunda; Julbara; Ba:duk, Ikala; Irkala; Ngandatha; Ngandada; Wanbiri; Warnabiri; Wonbil; Yirkala-Meening and Yirkla (Thieberger, 1993). **Mirniny** people are known to have lived in Balladonia, Eucla, Mundrabilla, Mundrabilla Station, Norseman and Esperance thus, further research around these areas will be undertaken.

'Consonant Phonetic Description' and 'Minimal Pair' sections of the paper contain sound files. To hear the pronunciations, push the control button and click the word at the same time.

This Phonology

1. Orthography

Linguists and language speakers jointly decide which letters best represent the phonemes in a language. This is done through both detailed phonemic analysis of each phoneme and discussion between and with speakers, before speakers make the decision on the orthography or alphabet to use for a language. The phoneme is then best-matched to the Roman alphabet or digraph such as '**ny**' in the word Mirni**ny** *man.* This document will explain the choices made and the reasons for making them.

One of the features of this language is that every phoneme is not found in every place in a word. Some phonemes are only found at the start of a word or middle of a word and some are only found in the middle or the end of a word.

Some phonemes are more voiced at the start of a word and less voiced in the middle or end of a word. The voiceless grapheme set /k/, /p/ and /t have been chosen to represent the phonemes that vary from the voiced /g/, /b/ and /d/, which are unused graphemes in this alphabet. In English, these phonemes are heard as a voiced and unvoiced phoneme pair, i.e. /p/ and /b/ and are expressed and heard as separate phonemes. However, in Mirniny they are heard and used as single phonemes with more or less voicing depending on the place in a word. The amount of voicing is, generally, stronger at the start of the word and therefore they are heard similar to the voiced English phonemes /g/, /b/ and /d/ whereas less voicing is used word central or word final and they are heard as the unvoiced English /k/, /p/ and /t/.

Voiced And Unvoiced Phonemes

This selection of words, collected from historical recordings held by GALCAC, have been used to calculate the percentage of voiced and unvoiced /**p**/, /**t**/, /**k**/ phonemes.

The percentage of voiced versus unvoiced phoneme use is detailed below.

Table 1: Example phonemes

1. **p**a**p**arnu *set alight* 2. ya**t**u *good* 3. ngarr**k**a *cliff* 4. **p**anyili *already* 5. yurl**k**a *grass* 6. **k**utjarra *two* 7. ma**k**a *no* 8. **p**uuna- *blow* 9. **p**uya *smoke* 10. **p**irlaya *the sea* 11. yarl**k**u *blood* 12. **p**urr**k**u *ash* 13. **p**utja *later*	29. **k**artaya *black* 30. **p**urn**t**angu *rock* 31. ngarn**t**uriny *what* 32. **p**akurri *where* 33. mu**t**i *small fish* 34. ngal**p**arrangu *died* 35. **p**anartu *that one* 36. tjurn**t**al *fog* 37. warn**t**i *small boy* 38. **p**urtu *small* 39. **k**ari *arm* 40. tjang**k**arn *mouth* 41. **k**uwarna *listen*	59. **p**ungu *hit* (PAST) 60. **p**uwa *hit!* (IMP) 61. **p**arl**k**a *head* 62. **k**urrima- *laugh, to* 63. yu**p**arla thigh 64. ngarl**t**i *liver* 65. kurn**t**u *breast* 66. ngal**k**un *eating* (PRES) 67. **p**iyurra *frighten* 68. wi**p**aru *snake* 69. **k**arla *fire* 70. yarru**k**u *left hand*

14. **p**arr**k**u *bark* 15. **k**atji *spear* 16. **k**u**k**url *throat* 17. **k**uya *no* 18. ngu**k**arra *armpit* 19. nyun**t**u *you* 20. ma**k**arlu *big* 21. **k**am**p**irti *stomach* 22. **p**ing**k**irli *skin* 23. **k**urila *south* 24. wina**k**a *wind* 25. **k**arli *boomerang* 26. **p**arran *light* 27. na**p**a ashes, *cold* 28. **p**aarti *grub*	42. **k**unminya *REFLEX* 43. **k**arlaru *fire+ERG* 44. **p**atja**k**u *use mouth* 45. yul**p**arra *south* 46. **k**urturtu *heart* 47. win**t**u *hair* 48. warl**p**i *water* 49. na**k**urtu *this one* 50. **p**u**p**arr *hungry* 51. **p**irri**k**u *nails+INSTR* 52. **y**a**k**in *moon* 53. **p**urra *scrub* 54. **k**aarl**t**a *west* 55. **k**a**k**arra *east* 56. **k**urrartu *short* 57. warl**k**u- *hail, to* 58. **k**amarna- *melt, to*	71. yurn**t**arn *nape of neck* 72. ngarn**t**any *sick* 73. **k**url**p**irr *kangaroo* 74. **k**uliya *ear* 75. **k**am**p**u *bone* 76. ngarn**k**urr *beard* 77. **p**irri *fingernail* 78. nan**k**a *neck* 79. **k**ularn *horn* 80. **p**irl**t**a *opossum* 81. **k**a**k**alangu *cockatoo* 82. **k**arlaya *emu* 83. **k**ararra *thin* 84. **p**in**k**irl *star* 85. **p**url**p**a *dust* 86. **p**uri *stone*

Table 2: Percentages of voiced versus unvoiced phoneme use in Mirniny

Bilabial Plosive (voiced b, unvoiced p)			**Dental Stop (voiced d, unvoiced t)**			**Velar-Plosive (voiced g, unvoiced k)**			**Total**	**%**
Syllable	**V+ /b/**	**V- /p/**	**Syllable**	**V+ /d/**	**V- /t/**	**Syllable**	**V+ /g/**	**V- /k/**		
Initial	28	0	**Initial**	0	0	**Initial**	26	1	V+ 54 V- 1	98.18% 1.82%
Medial	12	0	**Medial**	13	1	**Medial**	26		V+ 51 V- 1	98.08 1.92%
Final or more	0	0	**Final or more**	0	0	**Final or more**	0	0	V+0 V-0	0% 0%
Total	40	0	**Total**	13	1	**Total**	52	1	105 V+ 2 V- 107	98.13% 01.87%

The outcomes of the comparison of unvoiced and voiced phonemes use are:

1. Of the 86 lexemes analysed above, 28 have bilabial stop /**p**/ in initial position and 27 have the velar stop /**k**/ in initial position. All of these, with the exception of the initial /**k**/ in **k**urntu are voiced. Therefore, 98.08% of (eligible) initial phonemes are voiced (V+). While only 1.82% is unvoiced (V-). The alveolar stop /**t**/ does not appear in word-initial position.
2. Of the 86 lexemes analysed above, there are 12 bilabial stops in medial position, 14 alveolar stops in medial position and 26 velar stops in medial position. Of these, 98.08% are voiced and 1.92% are unvoiced.
3. Neither /p/, /t/, or /k/ are permitted to take final position in this language, therefore none of final phonemes are voiced.

4. Neither /p/, /t/, or /k/ are permitted to take final position in this language, therefore none of final phonemes are unvoiced.
5. Overall, 98.13% of all /p/, /t/ and /k/ phones in the above table are voiced, while 1.87% are unvoiced.

2. Vowels

This language has three short vowel phonemes /a/, /i/, /u/ and three long vowel phonemes /aa/, /ii/, /uu/. The vowels phonemes do not change place or manner of articulation and remain constant.

The language is rhotic and therefore vowels are rhotacized.

The phonemes represented by /y/ and /w/ are semi-vowels. These are pronounced the same as in English. However, in some circumstances the /y/ operates as a glide.

2.1 Vowel Table

/a/ as in English *c**u**t*
/aa/ as in English *f**a**ther*
/i/ as in English *p**i**n*
/ii/ as in English *b**ee**n*
/u/ as in English *p**u**t*
/uu/ as in English *b**oo**t*

Table 3: Mirniny vowel inventory

	front	**central**	**back**
high	i, ii	u, uu	
low			a, aa

2.2 Short Vowels

Short vowels may appear in any syllable of a word. Initial analysis indicates some restrictions on which vowels may appear next to which consonant. These restrictions are discussed below in section 3.2.

Mirniny has no rules preventing vowel-initial words. GALCAC linguists have noted examples of vowel-initial lexemes such as;

2.2.1 **a**linytjirra *north*

2.2.2 **a**lyirti *shrub, type of*

2.2.3 **a**ngapila *star*

2.2.4 **u**mpara *fly* (insect)

2.2.5 **i**rralu- *to pull*

2.2.6 **it**ja- *to void*

2.2.7 **i**karnu *wild dog*

2.2.8 **u**miya *nothing*

2.3 Long Vowels

A phonology must be based on recordings of speech produced in a natural setting however, the vowels analysed in this paper were recorded in an artificial setting. This is not ideal, but all that is currently available for this language.

Long vowels occur in seven of the 1595 headwords in the 2022 wordlist. All are positioned within the initial syllable.

As of December 2022, no audio recordings of long vowel /i:/ have been made. However, audio and written records indicate the use of /a:/ and /u:/. These are as follows:

2.3.1 p**uu**na *blow*

2.3.2 tj**aa**lany *tongue*

2.3.3 m**aa**tu *on top of*

2.3.4 m**aa**rra *cloud, type of*

2.3.5 k**aa**rlta *west*

2.3.6 p**aa**rti *grub*

2.3.7 m**ii**l *eye*

There is one written example of /i:/, m**ii**l *eye*. At first this lexeme was believed to be a borrowing from Noongar, but it has since been confirmed by a Mirniny elder as being from his language.

2.4 Vowel Harmony

Long vowels account for 0.44% of vowel use. All appear in the first syllable. In Australian Languages, stress falls on the first syllable (Dixon, 2002). Long vowels are distinguished from short vowels thanks to stress pattern rules (Sharp, 2004). These stress patterns rules are predictable, which allows us to disregard the occurrence of a long vowel in the second syllable, if presented in historical documentation.

In the GALCAC examples,

> 2.4.1 /a:/ appears in initial syllable position: after palatal stop /tj/; voiced labial stop /p/; bilabial nasal /m/ and voiced velar stop /k/. Long /a/ is followed by: retroflex stop /rt/; alveolar lateral /l/; alveolar stop /t/; retroflex lateral /rl/ and the alveolar rhotic /rr/.

2.4.2 In the first syllable /u:/ appears after voiced bilabial stop /p/ and before alveolar nasal /n/.
2.4.3 Long /i/appears in the first syllable after the bilabial nasal /m/ and before the alveolar lateral /l/.

3. Consonants

The graphemes of the English alphabet have been used to represent each consonant phoneme in this language. Digraphs are used to represent phonemes not found or, not found commonly, in Standard Australian English (SAE). For example, the retroflex lateral /rl/ found in the word ka**rl**a *fire* and the velar nasal /ng/ used in the word **ng**amu *food*.

These phonemes remain constant, as for the vowels.

Some consonant clusters can be found in these words and these are described in a later chapter in this phonology document.

This language has two rhotic or /r/ like sounds; a retroflex rhotic /r/ such as found in American English (AmE) /r/ and an alveolar rhotic /rr/ which is found in Scottish English.

The initial retroflex rhotic consonant /rl/, /rt/ and /rn/ is pronounced as rhotic, but not written this way, because speakers know to do this automatically. To write the consonants in this manner would only confuse readers and learners.

Allophones of /t/: /th/ and /tj/, appear to be in free variation in a number of morphemes. Handwritten wordlists, found in historical documents, contain multiple examples of the dental stop /th/ where we might expect to find the palatal stop /tj/. Naessan (2013), goes so far as to list both phonemes in variations of the same lexeme (i.e. **th**uwi and **tj**uwi *meat*) However, analysis of elicited language recordings have revealed the use of the lamino stop /tj/ by speakers.

See the following examples:

Table 4: /th/ or /tj/

Written Record	Audio Record	Gloss	GALCAC Orthography
thaalany (Velichova-Rebelos, 2005). **th**alany (Curr & O'Grady, 1886)	**tj**aalany (Schultz, 1960)	*tongue*	**tj**aalany
tharrjin (Curr & O'Grady, 1886) **th**arrtjin (Naessan, 2013)	**tj**arrtjin (Schultz, 1960)	*ankle*	**tj**arrtjin
thu**th**u (Velichova-Rebelos, 2005).; Naessan, 2013). **tj**u**tj**u (Naessan, 2013)	**tj**u**tj**u (Schultz, 1960)	*dog*	**tj**u**tj**u

thuwi (Naessan, 2013; Curr & O'Grady, 1886)	**tj**uwi (Schultz, 1960)	*meat*	**tj**uwi
nga**th**u (Velichova-Rebelos, 2005).	nga**tj**u (Schultz, 1960)	*I* *1SG*	nga**tj**u
thartu (Naessan, 2013).	**tj**artu	*towards/ that way*	**tj**artu
thukapu (Velichova-Rebelos, 2005).	**t**ukapu (Carlisle, 1993)	*woman*	**tj**ukapu

Looking at the data supplied in the above table, it would appear /th/ has been used in written records to represent a palatal stop where speakers are heard to use /tj/. Across the border of Mirniny country, western neighbours the Ngadju, used /dj/ in the spelling of 'man' in historical material but contemporary analysis discounts the phoneme in the language.

One example in a recording of /t/ in place of /th/, that being **t**ukapu/**th**ukapu. In this recording, the non-Aboriginal speaker has used an alveolar stop and not the palatal, in place of the suggested dental stop.

Field linguists have used a variety of symbols to represent this diagraph, including: /d^{y}/, /t^{y}/ /dh/ and /dj/ (Dixon, 2011). As stated above, /d/, /b/ and /g/ are not used in GALCAC orthographies, and so /tj/ will be used to represent the lamino-dental stop.

In a similar manner, O'Grady & O'Grady (in Velichova-Rebelos, 2005) have used /c/ to represent /tj/ in their Mirniny Language Wordlist.

Table 5: /c/ or /tj/

Written Record	**Audio Record**	**Gloss**	**GALCACAC Orthography**
cina (Velichova-Rebelos, 2005).	**tj**ina (Carlisle, 1993)	*foot*	**tj**ina
cirntu (Velichova-Rebelos, 2005).	**tj**intu (Carlisle, 1993)	*sun*	**tj**irntu
cirra (Velichova-Rebelos, 2005).	**tj**irra (Schultz, 1960)	*thigh or leg*	**tj**irra

It would appear that O'Grady & O'Grady used the /**c**/ grapheme to differentiate between the palatal stop and the dental stop in their notes. The GALCAC orthography will use /**tj**/ to represent the palatal stop.

3.1 Consonants Table

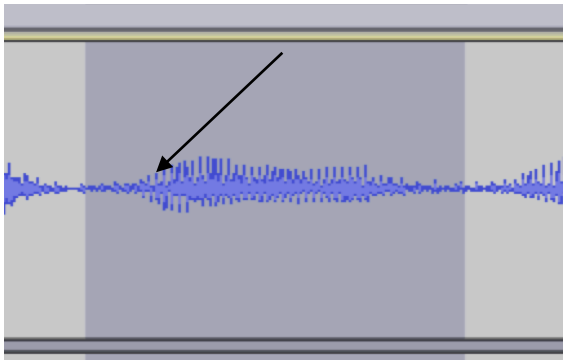
Table 6: Mirniny consonant chart

		Non-peripheral				
		Apical		Lamino	Peripheral	
		Alveolar	Retroflex	Palatal	Velar	Bilabial
Stops		t	rt	tj	k	p
Nasals		n	rn	ny	ng	m
Laterals		l	rl	ly		
Rhotics		rr	r			
Semi-vowels	Glides			y		
	Approximants					w

3.2 Consonant Phonemic Description

3.2.1 Bilabial Stop *p*

Bilabial stop /p/ as in Standard Australian English (SAE) ***p**in*. The bilabial stop may appear word-initially or medially but not finally. This phoneme is more voiced in word initial position, and may be voiced or unvoiced in word medial. Within a consonant cluster (CC) it takes the second position only (C2).



pungu *hit* (PAST).

Concerning consonant vowel restrictions (as mentioned in section 2.2) the GALCAC toolbox has examples of all three short vowels following the bilabial stop. This means there are no restrictions on vocalic environments for word-initial /p/.

3.2.1.1 patja *use mouth*

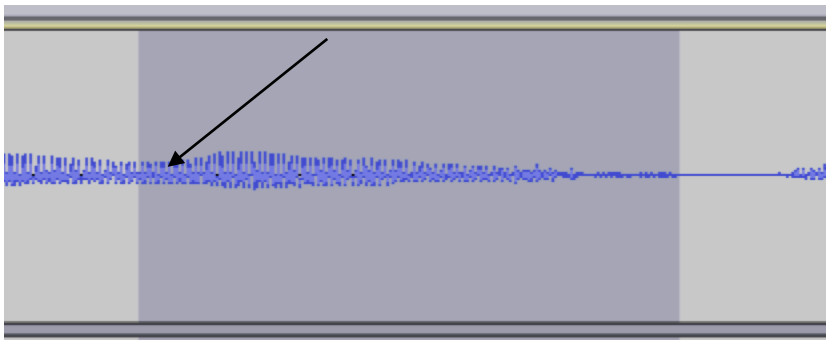
3.2.1.2 pirri *fingernail*

3.2.1.3 puparr *hungry*

3.2.2 Bilabial Nasal *m*

Bilabial nasal /m/ as in SAE ***m****ouse*.

This consonant appears in first and medial word positioning. Within a CC it may appear in either C1 or C2.



muni *lip*

Concerning consonant vowel restrictions (as mentioned in section 2.2) the GALCAC toolbox has examples of all three short vowels following the bilabial nasal. This means there are no restrictions on vocalic environments for word-initial /m/.

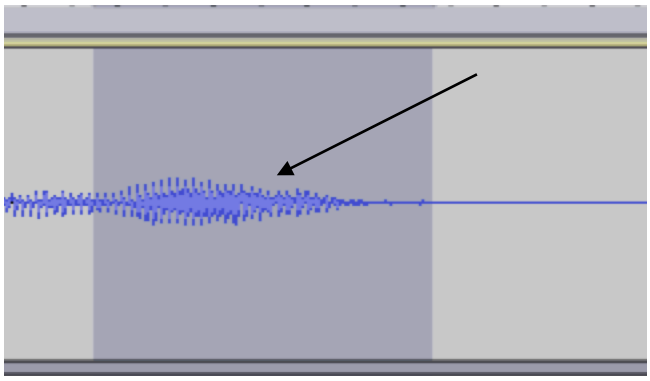
3.2.2.1 makuru *wind*

3.2.2.2 minya *DEM*

3.2.2.3 muni *lip*

3.2.3 Bilabial Approximate *w*

Bilabial approximate /w/ as in SAE ***w****on*. These glides or semivowels are phonetically similar to vowels, but function as consonants. The bilabial approximate appears word-initially or medially, but not in word-final position. It does not appear within a CC.



pu**w**a *hit!* (IMP)

Concerning consonant vowel restrictions (as mentioned in section 2.2) the GALCAC toolbox has examples of all three short vowels following the bilabial approximate. This means there are no restrictions on vocalic environments for word-initial /w/.

3.2.3.1 walyi *bad*

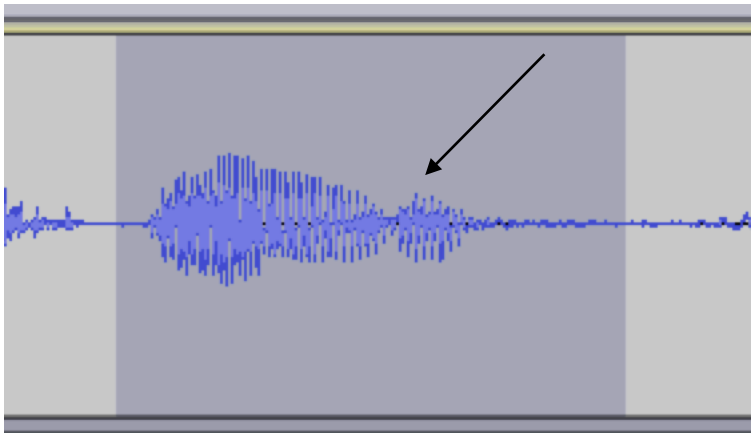
3.2.3.2 wintu *hair*

3.2.3.3 wula- *to cry*

3.2.4 Alveolar Stop *t*

Alveolar stop /t/ as in SAE ***t****op*. This phoneme does not appear in word-initial or word-final positions. Where it occurs medially, it may be voiced or unvoiced.

Within the CC, the alveolar stop takes C2.



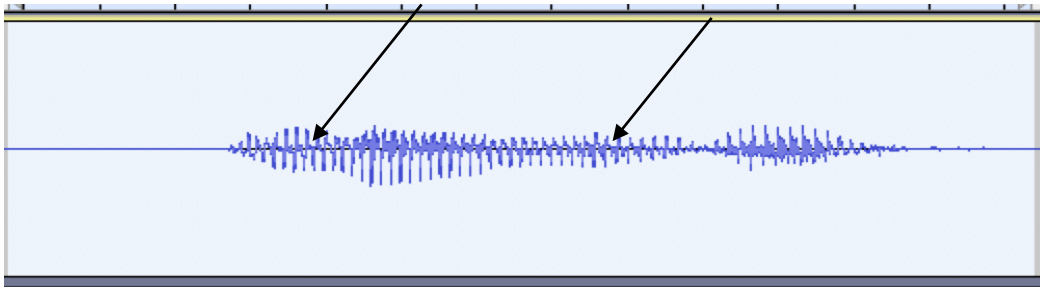
win**t**u *hair*

Concerning consonant vowel restrictions (as mentioned in section 2.2), this phoneme is not permitted to take word-initial position. This means there are no examples of vocalic environments in word-initial position to share here.

3.2.5 Alveolar Nasal *n*

Alveolar nasal /n/ as in SAE ***n****et*.

The alveolar nasal is quite productive and appears in word initial, medial and final position. Within the CC it takes C1 position.



nanka *neck*

Concerning consonant vowel restrictions (as mentioned in section 2.2) the GALCAC toolbox has examples of short /a/ and /u/ following the alveolar nasal. This vocalic environments for word-initial /n/ are restricted to /a/ and /u/ only.

3.2.5.1 nanka *neck*

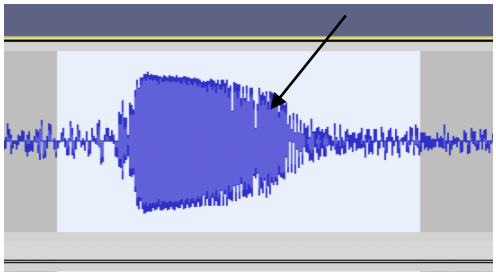
3.2.5.2 nurrku *face*

3.2.6 Alveolar Lateral *l*

Alveolar lateral /l/ as in SAE ***l****ight*.

The alveolar lateral may appear word-initially, medially or finally. Within the CC it takes C1.

There is only one example of this phone in word-initial position, **l**arra *really*? All other examples are as suffixes.



kuri**l**a *south*

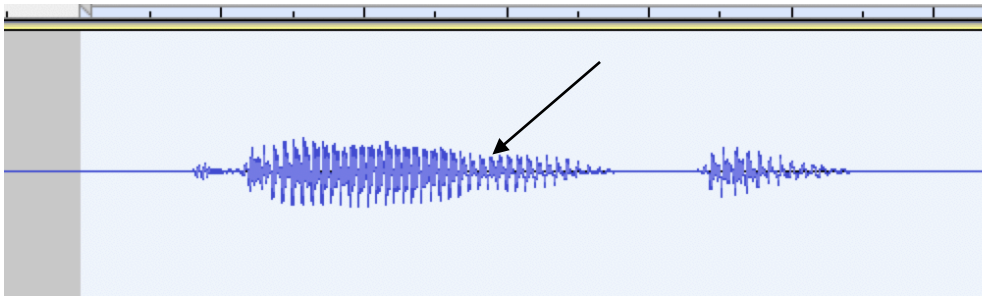
Concerning consonant vowel restrictions (as mentioned in section 2.2) the GALCAC toolbox does not have examples of short /i/ or short /u/ following the alveolar lateral. This means vocalic environments for word-initial /l/ is restricted to /a/ only.

3.2.6.1 larra *really*

3.2.7 Alveolar Rhotic *rr*

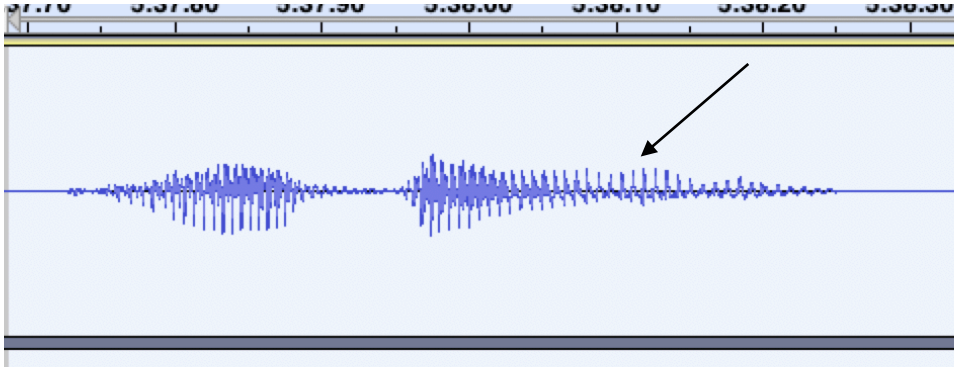
Alveolar rhotic /rr/ as in Scottish English *bai**rn***.

This phone has two allophones, depending on whether it appears in word-medial or word-final position. Where it appears medially, speakers produce a tap. In word-final position this phone becomes a trill. Within the CC this phone takes C1.



ya**rr**uku *left hand.*

As seen above, ya**rr**uku *left hand* the /rr/ is articulated as a tap



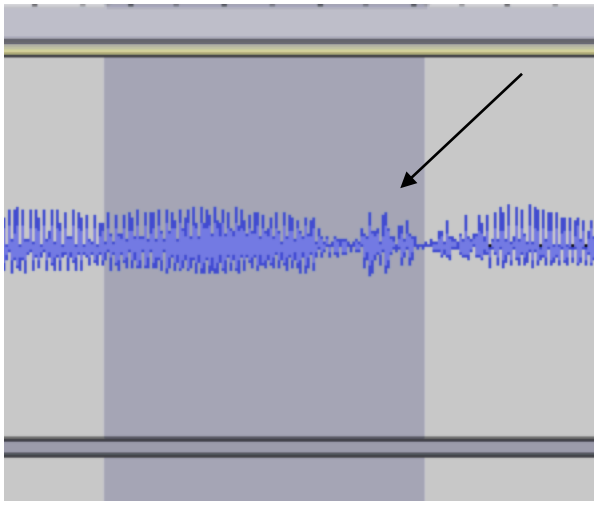
nguka**rr**a, *armpit*

A trill in word final position, nguka**rr**a *armpit*

As mentioned above, the alveolar rhotic does not appear in word-initial position. This precludes it from any discussion regarding vocalic environments in word-initial position.

3.2.8 Retroflex Stop *rt*

The retroflex stop /rt/ sounds like American English ***cart***. This phone appears in word-medial position only. Where it appears within the CC the retroflex stop takes C2 only.

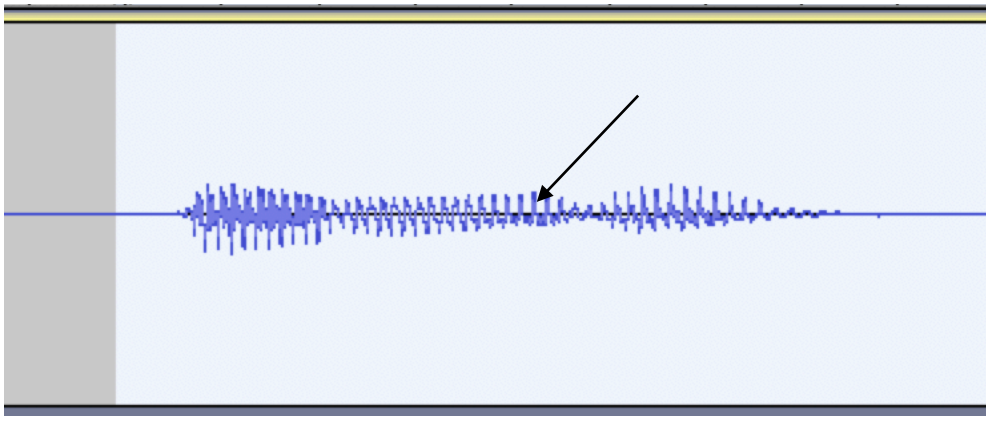


wa**rt**u *eye*

As mentioned above, the retroflex stop does not appear in word-initial position. This precludes it from any discussion regarding vocalic environments in word-initial position.

3.2.9 Retroflex Nasal *rn*

Retroflex nasal /rn/as in American English *ba**rn***. This phoneme appears word-medially or word-finally. Within the CC, the retroflex nasal takes C1.



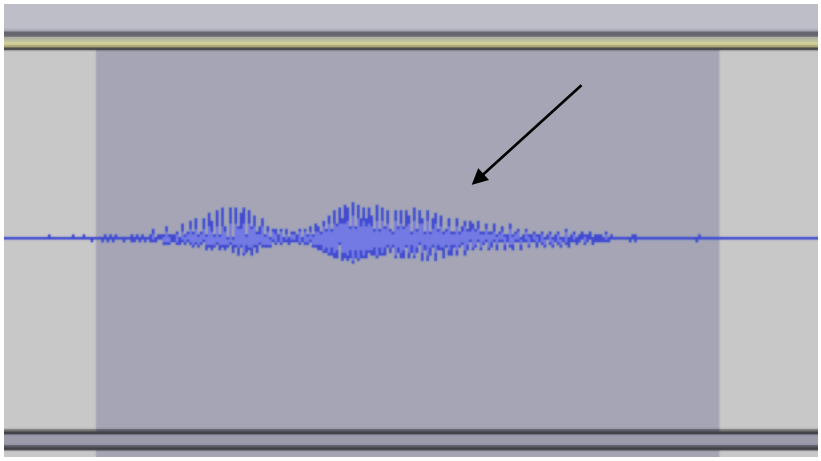
ku**rn**tu *breast.*

In this example, the speaker has pronounced the initial velar stop so softly as to be almost imperceptible.

As mentioned above, the retroflex nasal does not appear in word-initial position. This precludes it from any discussion regarding vocalic environments in word-initial position.

3.2.10 Retroflex Lateral *rl*

Retroflex lateral /rl/, as heard in American English *curl*. This phoneme appears word-medially and finally.



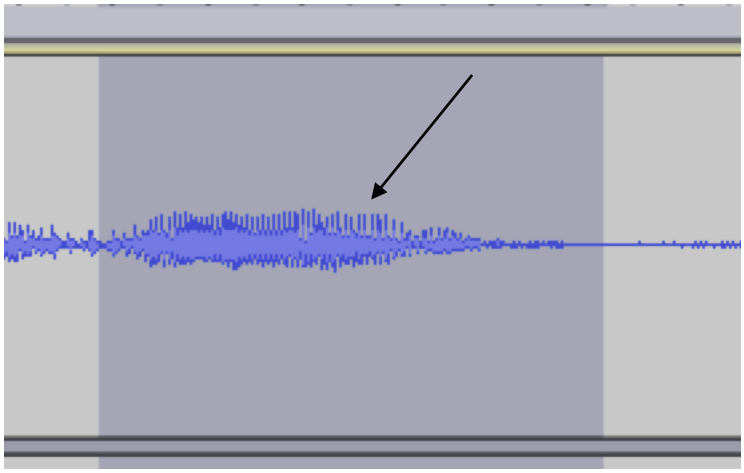
maku**rl**u *big*

When it appears in a CC, the retroflex lateral takes C1.

As mentioned above, the retroflex lateral does not appear in word-initial position. This precludes it from any discussion regarding vocalic environments in word-initial position.

3.2.11 Retroflex Rhotic *r*

Retroflex rhotic /r/ as in American English *car*. This phoneme is always rhoticised.



wa**r**any *long*

The retroflex rhotic is the most restricted in terms of where it may appear. This phone can appear word-initially or word-medially, but not word-finally. In word-medial position the retroflex rhotic must appear intervocalically. The retroflex rhotic does not appear in a consonant cluster.

There is only one example of the retroflex rhotic appearing in word-initial position. In this example the vowel immediately following it is /a/. This suggests the retroflex rhotic is restricted to /a/ in word-initial vocalic environments.

3.2.11.1 **r**a- *throw, project or aim*

There is very little information on this morpheme, other than to suggest it is a verb root that is associated with throwing, aiming or projecting an item towards an object. It appears to be associated with hunting or fighting, being that it is used with other words like *spear* and *stone*. Unfortunately this is only a written example, so GALCAC linguists cannot analyse recorded audio.

3.2.12 Palatal Nasal *ny*

As in SAE *o**ni**on*. The palatal nasal is very productive, appearing in word initial, medial and final positions. The palatal nasal can appear in C1 in the CC.

tjaala**ny** *tongue.*

Concerning consonant vowel restrictions (as mentioned in section 2.2) the GALCAC toolbox has examples of all three short vowels following the palatal nasal. This means there are no restrictions on vocalic environments for word-initial /ny/.

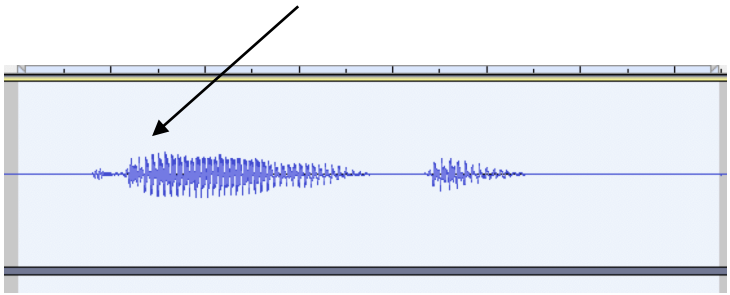
3.2.12.1 nyanytju *horse*

3.2.12.2 nyina- *to sit*

3.2.12.3 nyuntu *2SG*

3.2.13 Palatal Glide *y*

As in SAE ***y****ellow*. This phoneme may be found word-initially or word-medially. It does not appear in the word-final position, nor does it appear in the consonant cluster.



yarruku *left hand*

Concerning consonant vowel restrictions (as mentioned in section 2.2) the GALCAC toolbox has examples of all three short vowels following the palatal glide. This means there are no restrictions on vocalic environments for word-initial /y/.

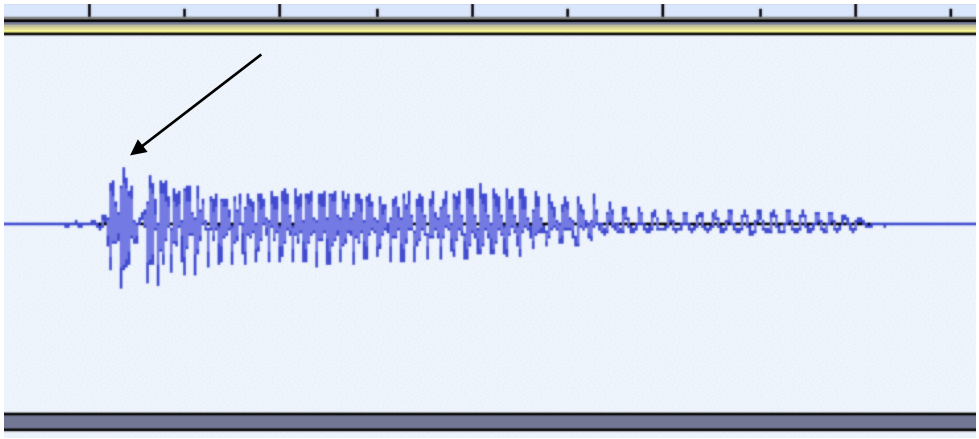
3.2.13.1 yarruku *left hand*

3.2.13.2 yilirri *creek*

3.2.13.3 yulparra *south*

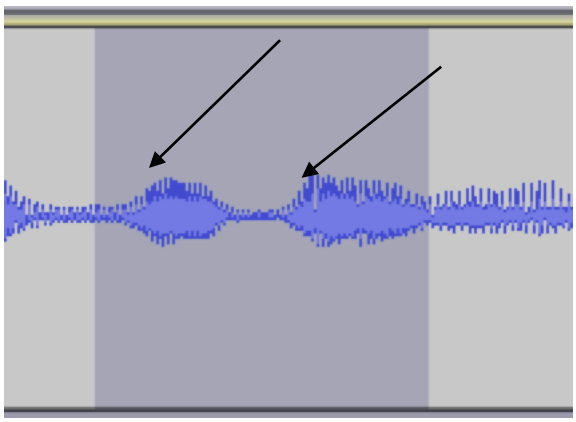
3.2.14 Velar Stop *k*

Velar stop /k/, as in SAE ***g****et*. The velar stop may appear in word-initial or word-medial position. In the CC it is restricted to C2. This phoneme is voiced in both first and medial positions. The first example demonstrates first syllable production.



kurntu *breast*

This example shows voiced in initial and medial production.



kukurl *throat*

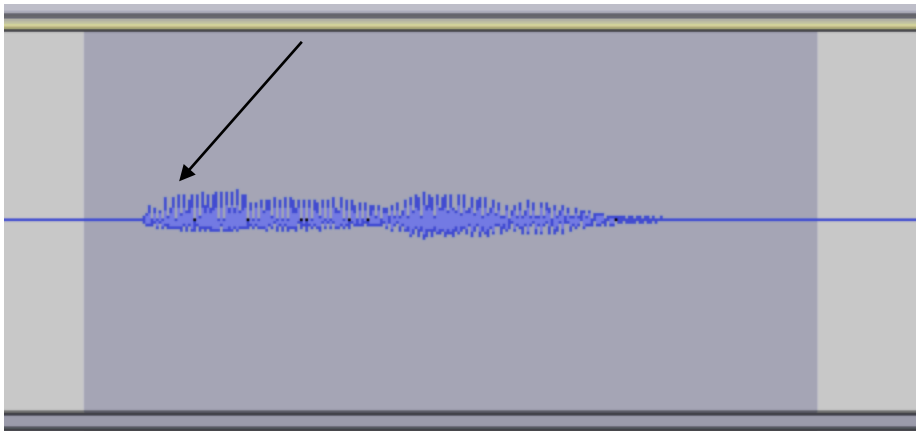
Concerning consonant vowel restrictions (as mentioned in section 2.2) the GALCAC toolbox has examples of /a/ and /u/ following the velar stop, but not /i/. This means /k/ is restricted to /a/ and /u/ vocalic environments in word-initial position.

3.2.14.1 kakalangu *cockatoo*

3.2.14.2 kukurl *throat*

3.2.15 Velar Nasal *ng*

Velar nasal /ng/, as in SAE s***ong***. This phoneme appears in word initial and medial positions, but not word-final position. In a CC this phone may occur in either C1 or C2.



ngarnkurr *beard*

Concerning consonant vowel restrictions (as mentioned in section 2.2) the GALCAC toolbox has examples of all three short vowels following the velar nasal. This means there are no restrictions on vocalic environments for word-initial /ng/.

3.2.15.1 ngarrka *cliff*

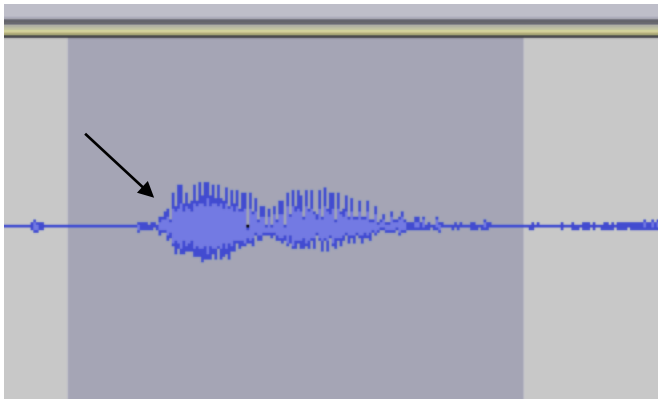
3.2.15.2 nginpin *eyebrow*

3.2.15.3 ngunya- *to laugh*

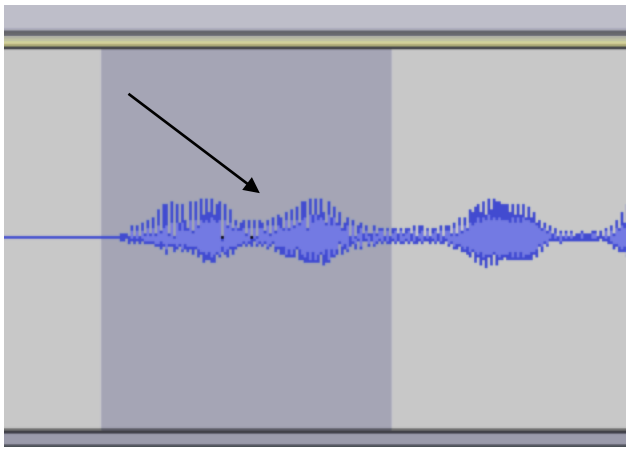
3.2.16 Palatal Stop *tj*

Palatal stop /tj/ similar to SAE ***j**une* or ***j**udge*. This sound does not exist in Mirniny as it does in SAE, but can be heard in other Australian languages in words like Pi**tj**an**tj**a**tj**arra and **Tj**un**tj**un**tj**arra. The palatal stop occurs in word-initial and word-final position, and may take C2 in the CC.

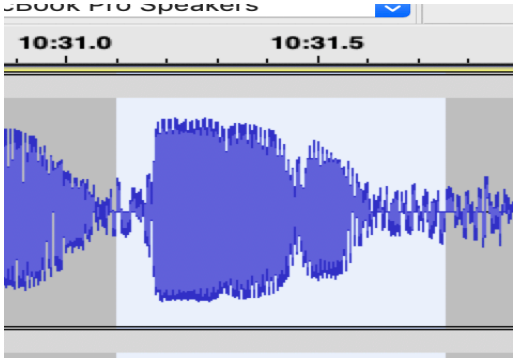
This phone is produced differently depending on its phonemic environment. Preceding /a/ and /u/, it is a clear stop, however when it comes before /i/, this phone is produced with more friction and is closer to the SAE /j/. This is because the vocal apparatus is positioned differently at the end of the consonant and going into the production of the open, fronted vowel immediately following it, which results in a different sound.



tjartu *that way*



nga**tj**u *I*



tjirriny *sandhill*

Concerning consonant vowel restrictions (as mentioned in section 2.2) the GALCAC toolbox has examples of all three short vowels following the palatal stop. This means there are no restrictions on vocalic environments for word-initial /tj/.

3.2.16.1 tjartu *that way*

3.2.16.2 tjirriny *sandhill*

3.2.16.3 tjutju *dog*

4. Word Structure

4.1 Syllable Structure

The minimum morpheme structure is CV, e.g.

4.1.1	ma-	*get*	m/a	C/V
4.1.2	yu-	*give*	y/u	C/V

The most common minimum word pattern is CVCV, e.g.

4.1.3	warta	*wood*	wa/rta	CV/CV
4.1.4	tjutju	*dog*	tju/tju	CV/CV

GALCAC records show one example of an extremely rare VCCV being,

4.1.5	irltu	*blood*	irl/tu	VC/ CV

Other examples of word structure, different to the CVCV are shown below, note these are from historical written records.

4.1.6	umpara	*fly*	um/pa/ra	VC/CV/CV
4.1.7	umiya	*nothing*	u/mi/ya	V/CV/CV

These structures may be the result of an initial consonant drop. Changes to stress patterns, i.e. from first to second syllable, can result in the initial consonant drop over time (Dixon, 2011).

This would account for the distinctive pattern. In any case, it is clear that Mirniny does not have a rule preventing vowel initial lexemes.

4.2 Word Initial Phonemes

Mirniny does not appear to have a rule preventing word-initial vowels.

The historical data has several written records of vowel initial words. Historical documents analysed by GALCAC reveal V/CV syllable structure.

4.2.1 ini *name*

4.2.2 imi *lower lip*

4.2.3 irralu *pull*

Mirniny has restrictions as to which consonants may appear at the beginning of a word.

Word initial consonants:

k, m, n, ng, ny, p, tj, w, y

In a database with over 1500 entries, there was only one example of lexeme beginning with the retroflexed rhotic /r/, this being the verb root, ***r****a- throw, aim, project*

4.2.4 ***r****arnu* past tense form of *throw, aim, project*

The phoneme rr does not occur in the initial position.

When they occur in the initial position, /n/, /t/ and /l/ are retroflexed, even though they are not written as /rn/, /rt/ and /rl/. To write word-initial retroflex consonants as they are pronounced would confuse learners. First language speakers intuitively know to pronounce the phones in this retroflexed manner.

4.3 Word Final Phonemes

In a database of over 1000 lexemes, consonant-final examples were rare. Below is a list of some of the consonant-final lexemes.

4.3.1 tjungin *night*

4.3.2 tjarltarr *to split*

4.3.3 nginpin *eyebrow*

4.3.4 tjilkarl *root*

4.3.5 tjupin *smooth*

4.3.6 ngarnkurr *beard*

Most words in the GALCAC database are vowel-final.

4.4 Consonant Clusters

The most common consonant clusters found in a sample of 500 morphemes are listed below. The syllable pattern for each morpheme are either consonant+vowel , or consonant+vowel+consonant. In the instances where a syllable is a CVC pattern, the subsequent syllable will commence with a C and a consonant cluster will occur. For example, tjir**nt**u tjir**n**/**t**u, the consonant cluster /**rnt**/ is formed due to the syllable pattern. However, the phonemes are not pronounced together as in the English word *ant* but are pronounced according to the syllable to which they belong.

Table 7: Consonant clusters

rltj	ku**rltj**irrka	ku**rl**/**tj**irrka	*grass seed*
lyk	karra**lyk**a	karra**ly**/**k**a	*bark of a tree*
ngk	karla**ngk**a	karla**ng**/**k**a	*by the fire*
rnt	nga**rnt**atja	nga**rn**/**t**atja	*we, you and I*
rlk	pa**rlk**a	pa**rl**/**k**a	*head*

nasal stop	***n+t***	tjirntu = tji**rn**/**t**u *sun*
	m+p	kampu = ka**m**/**p**u *bone*
	ny+tj	panytjala = pa**ny**/**tj**ala *old*
	n+p	nanpa = na**n**/**p**a *string*
lateral stop	***l+p***	ngalpa = nga**l**/**p**a *many*
	l+k	mulku = mu**l**/**k**u *cat*
	rl+k	yurlka = yu**rl**/**k**a *grass*
	rl+tj	kurltjirrka = ku**rl**/**tj**irrka *grass seed*
rhotic stop	***rr+k***	purrku = pu**rr**/**k**u *ashes*
		ngarrka = nga**rr**/**k**a *cliff*
	rl+k	parlka = pa**rl**/**k**a *head*
	rn+t	ngarntany = nga**rn**/**t**any *sick*
	rl+p	warlpi = wa**rl**/**p**i *water*
rhotic nasal	***rr+m***	tjarltarrma = tjarl/ta**rr**/**m**a *split, to*

4.5 Geminate

GALCAC research has not yielded any geminates at this time.

5. Minimal Pairs

Table 8: Minimal pairs

m - n	tjamu *grandfather*	tjanu *lightning*
m – y	mayi *food*	yayi *now*
ng – y	ngalpa *dead*	yalpa *thumb*
k – l	maka *no*	mala *truly*
a - u	warta *tree*	wartu *eye*
r– n	paru *burn*	pana *that one*
a – u	mara *hand*	maru *black*
l - lk	yurla *ground*	yurlka *grass*
tj - w	putja *later*	puwa *hit!*
a – u	wila *stomach*	wilu *hot wind*
a-i	inyara *flower, type of*	inyira *seed, type of*
k – y	puka *rotten*	puya *smoke*
tj – y	patja *use mouth*	paya *dig*
i - u	purti *girl*	purtu *small*

6. Homophones

Within a sample of 600 words, linguists uncovered the following list of homophones:

6.1 marna *many* and *older brother*

6.2 minya *gum tree, species of* and *that one* (demonstrative).

6.3 ngalpa *dead* and *many*

6.4 yalpa *thumb* and *woman*

6.5 yatu *ok* and *right hand*

6.7 kampu *bone, throwing stick* and *back* (body part)

6.8 pirri *fingernail* and *claw* (of a bird)

6.9 purtu *first toe* and *small*

6.10 kaltu *ant* and *penis*

7. Stress

As per Goedeman's 2010 a survey of stress in Australian languages, in an overwhelming majority of Aboriginal languages main stress appears somewhere at the beginning of the word.

> *'The prototypical stress pattern for these languages places main stress on the first syllable and secondary stress on alternate syllable thereafter.'*

Mirniny shares the most common pattern, with initial main stress, and occasional secondary stress on the penultimate syllable, in words with three or more syllables.

8. Reduplication

Reduplication is used functionally, to indicate an increase or decrease in state, or prosodically.

For example, the Mirniny lexeme kutjarra-kutjarra *four* is created by repeating the lexeme kutjarra *two.*

In this example the root word is compounded to create a new word, with a semantic relationship to the original root word.

E.g.:

Table 9: Semantic reduplication

Reduplication	**Root Word**	**Gloss**
kutjarra-kutjarra	kutjarra *two*	*four* repeated to indicate double that number.

9. Reduplication in compound words.

In these examples the phonological process of reduplication focusses on prosodic morphology.

Table 10: Phonological reduplication

Reduplication	**Gloss**
mimi	*breast*
tjutju	*dog*
witji-witji	*boomerang*
muru-muru	*fly, species*
kalu-kalu	*fibre, balls of, from the sea*
kalta-kalta	*shark, species of*
kuntji-kuntji	*march fly*

It should be noted that the reduplications in the above table represent both reduplicated morphemes and reduplicated lexemes. Examples like tjutju and mimi are reduplicated morphemes, whereas witji-witji, muru-muru, kalu-kalu, kalta-kalta and kuntji-kuntji are

reduplicated lexemes. Reduplicated lexemes are indicated by a hyphen between the constituent elements. Reduplicated morphemes are written without a hyphen, to indicate they are comprised of reduplicated *phonemes,* and not a reduplicated *lexeme.*

10. Onomatopoeic

Onomatopoeic morphemes collected represent bodily sounds or functions, and animal sounds.

10.1 ngurrkiyan	*snoring*
10.2 kurrku	*mopoke, species of bird*
10.3 parrku	*bark, of a dog*
10.4 purnitjarrtjarr	*plover, species of bird*
10.5 kaku	*crow*

11. Haplology

No examples of haplology as yet.

12. Elision

No elision discovered as yet.

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