

TOPICS IN  
URA PHONOLOGY AND MORPHOPHONOLOGY,  
WITH LEXICOGRAPHIC APPLICATION

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## List of abbreviations

-	morpheme boundary
#	word boundary
(D) through to (M)	interviewees, in Sociolinguistics chapter
(DICT)	item from partial dictionary, not elicited in the course of this research
(GRAM)	item from partial grammar, not elicited in the course of this research
.	syllable boundary, or inseparable meaning elements
+	morpheme boundary
1	first person
2	second person
3	third person
ADJ	adjective
C	consonant
DET	determiner
DL	dual
F	feminine
FORM	formal
GRPD	'grouped' size/shape modifier
INCL	inclusive
INFORM	informal
INTRANS	intransitive
IPA	International Phonetic Alphabet
M	masculine
N	noun
NEUT	neuter
p.c.	personal communication
PEJ	pejorative
PL	plural
POSS	possessive
PREP	preposition
RND.SIDED	'round-sided' size/shape modifier
SG	singular



SM	'small' size/shape modifier
TRANS	transitive
V	vowel, verb
ǃV	breve, indicating the least prominent element of a diphthong
∨V	tie bar, indicating a diphthong whose most prominent element is unknown

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## **Abstract**

Ura, a minority language spoken in Papua New Guinea, appears to be a candidate for eventual extinction, with an estimated 1,900 speakers, very few (if any) of them monolinguals. Any language is a unique vantage point from which to see humanity and our world in its various facets, and preserving endangered languages seems at least as worthy a pursuit as the many efforts globally at saving endangered species of flora and fauna. Also of great importance is the revitalisation (or first-time facilitation) of identity, esteem and dignity for speakers with regard to their language (and, inseparably, culture).

This thesis gives an overview of the sociolinguistic context of Ura, followed by a description and analysis of the phonology of Ura, and then addresses some of the morphophonology. Features explored include vowel centring and harmony, phonologically and morphophonologically conditioned epenthesis, and diachronic and synchronic alternations. The final chapter provides practical application of the issues discussed as they would relate to an Ura dictionary, and includes samples of the suggested wording and format of introductory notes and entries.

It is hoped that what is currently in progress or completed in the Ura language in terms of records, translation, literacy and linguistic analysis (of which this thesis is a part) will facilitate and support progress towards strength and vitality that will not perish.

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## **Abstract (Tok Pisin)**

Ura em i wanpela tokples bilong Papua New Guinea, na em i no bikpela tumas. Em tokples bilong 1,900 manmeri tasol, na i mas olgeta ol i save long Tok Pisin o Kuanua tu. Olgeta kainkain tokples bilong graun ol i gat we bilong ol yet long tingting na toktok long olgeta samting. I no gat tupela tokples i wankain olgeta. Olsem na strongim tokples em i bun tru long yumi olgeta, na dai long tokples em i wanpela hevi tru, sapos olgeta manmeri ol i kamap les long yusim tokples, o ol i dai pinis na ol i no skulim pikinini long tokples. Na tu, em i no gutpela samting sapos manmeri i sem long tokples.

Dispela pepa em i toktok long kainkain samting long tokples Ura. Namba wan, em i toktok long ol manmeri Ura ol i tingting wanem long tokples bilong ol – long ol senis i kamap, na kain samting olsem. Namba tu, em i toktok long ol haptok insait long tokples Ura – hau ol i save autim tokples, na ol hap insait long haptok, na hau ol i senis liklik, na tu hau sampela arapela tokples i wankain, o i narakain liklik. Na bihain, em i toktok long diksineri – hau bai yumi kisim dispela save na putim insait long wanpela buk i soim insait bilong toktok.

Bai yumi hop olsem ol kainkain wok long tokples Ura – ol samting ol i wokim pinis, na ol samting yumi stap yet long wokim nau – em bai strongim tokples na ol manmeri bilong tokples. Em bai gutpela stret sapos ol dispela kain samting em i kamapim laip tru insait long tupela.

## 1 Introduction

Ura is a language spoken in the East New Britain province of Papua New Guinea in Melanesia, and is one of seven languages in the Baining-Taulil family of the East Papuan branch of the ‘Papuan’, or non-Austronesian languages. As explained by Terrill (2003:6), the term refers to not an entirely familial grouping but rather a “negatively-defined areal grouping.” However as Foley (1986:3) notes, ‘Papuan’ is nevertheless the term widely used. Speakers seem to regard Taulil as a completely unrelated language. Intelligibility between the Baining languages is reportedly varied. In 1991 the estimated number of speakers of Ura was 1,900 (Ethnologue 2005, citing SIL).

The Ura speakers live in the Gazelle Peninsula of East New Britain, one of the islands of Papua New Guinea lying to the east of the mainland. My research was mainly with speakers in the Gaulim area, and the sociolinguistics section (chapter 3) must be taken to represent the speakers in this area only. There is also minor phonetic variation between Ura speakers in different areas and different generations.

This thesis aims to give a sketch of the phonology of Ura, and describe and explore some of the phonological and morphophonological points of interest. Attention will be paid mostly to points that would contribute to the production of an Ura dictionary, a project being worked on by the Ura Bible translation team at the time of fieldwork for the paper. This particularly includes issues that affect the spelling of a word in Ura orthography, and phonological patterns that have been thus far elusive and would have required the apparently arbitrary information to be recorded for every one of a large number of dictionary entries.

Because of the practical purpose of this thesis, and the necessity for it to be, as far as possible, relevant and accessible to linguists from a wide range of disciplines and to those involved in literacy and education, it will be informed by current theories but will not compromise its usefulness by being dedicated to proving or supporting any one theory.

The next two chapters address methodology for the fieldwork involved, and the sociolinguistic background of the Ura speakers; these are followed by chapters on phonology and points of interest in morphophonology, and finally by a chapter on application of some of the findings, in the form of suggestions regarding the details of an Ura dictionary.

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## **2 Methodology and notation**

From August 2004 to July 2005 I lived in Papua New Guinea to conduct fieldwork for this thesis under the auspices of SIL. The first five months were spent in orientation to Papua New Guinean life, culture and language, and also included wordlist elicitation with visiting Ura speakers and an introduction to Ura phonology. In January 2005 I moved to East New Britain and was based at the SIL Kokopo centre, making trips of usually at least a week in duration to live in the Ura community and gather data. Analysis and write-up took place during my time at SIL centres and continued once I returned to New Zealand at the end of July 2005.

### **2.1 Elicitation**

All Ura data shown in this thesis were recorded in phonetic transcription, except where marked as others' data; some were also recorded on cassette tape. Some uncertainties at the time of transcription have been checked and corrected based on review of the audio recordings, but no words have been transcribed from cassette only.

The majority of my data were elicited during interviews with individuals or small groups of Ura speakers, including a 600-item word and phrase list elicited from two Ura speakers separately. However some other data have come from monologues, conversation and brief exchanges between speakers, or impromptu language instruction during my time living in the language community. At this point I must acknowledge the patience and hospitality of Amen Ulaias and Elizabeth and Grace Amen, Gary and Peggy Rosensteel, Boas Denson and Margot Boas and the rest of the Gaulim community, and the SIL Kokopo centre staff, without whom this research could not have taken place.

The data come from adult male and female speakers between approximately 20 and 50 years of age, though one of the contributors in the sociolinguistics chapter was 12 at the time of recording.

Elicitation was done mainly in Tok Pisin, due to insufficient time being available for me to learn Ura to a useful level. On some occasions clarification was provided for speakers by Gary or Peggy Rosensteel, who are both very familiar with Ura. Although it is not ideal to elicit data using a second language, I do not consider this to have significantly compromised the validity of the data for phonological and morphophonological analysis, since Ura speakers seem aware of which words are borrowed in their language, and do not seem prone to imitating the sounds of Tok Pisin as they speak Ura in reply.

Where a phenomenon was unexpected or its incidence varied (either within a speaker's reporting, or as observed in general language use), data on it were elicited from multiple speakers. For example, the epenthetic [a] in some possessive pronouns (see section 5.1.2) was inconsistently reported by speakers, and results from up to nine different speakers were compared for particularly troublesome words. Many of the other non-problematic data have also been checked with at least one other speaker. Attention was also paid to the particular strengths and weaknesses of speakers. One woman proved to be fairly poor at discerning and accurately reporting the details of issues relating to vowels, and also seemed to be swayed by her familiarity with Ura orthography, sometimes reporting things as they are written, not as they are spoken. Her responses on such issues were accordingly used with caution, when they were used at all.

Care was taken to elicit data in conjunction with appropriate building of relationships, through conversation, visits, meals, chores and play. To have spent time with speakers only



for the purpose of acquiring language information would have been inappropriate and also short-sighted. Spending time with speakers and their families was not only an enjoyable and valuable experience, but discussion of their language would sometimes arise, providing unique and otherwise elusive insights. It was also an environment in which conversational Ura would occur, obviously valuable for contrast with the Ura of wordlists and interviews. Further to this, such time and participation in their activities seemed accepted as evidence for my intention of building relationships with them, not just extracting data. If their impression had been that the latter only was true, this would likely have meant reluctance to give their time and attention, and possibly disinclination to accommodate future linguist visitors. It was also a pleasure to share in their lives and be hosted by them.

### **2.1.1 Words elicited by others**

As marked in footnotes throughout the thesis, a few words have been taken from other Ura texts such as a partial Ura dictionary, a grammar, or portions of translated Scripture: all works in progress at the time of writing under Gary Rosensteel and the rest of the Ura translation team. Such words are included where my own data could not supply an important example. It should also be noted that where suffixes are glossed as FLAT/THIN.SG, ROUND-SIDED.PL, FLAT-SIDED.DL and the like, the labels for these suffixes were established by Rosensteel and are not my own work.

The Ura in such documents is mostly in orthography but I am familiar with Ura orthographic conventions and have converted examples back to the normalised phonetic transcription used for examples throughout the rest of the paper. However it must be noted that there can be ambiguity about the phonetic form of some graphemes in an orthographic Ura word (for example <ng> can be [ŋ] or [ng]). Where such ambiguity was related at all to the topic at hand, the word was disqualified as an example.

## 2.2 *Transcription and notation*

The Ura examples in this thesis are, unless otherwise marked, given in a normalised phonetic (not phonemic) transcription using the International Phonetic Alphabet (IPA). This is to provide clarity for the reader, and to make the most of this opportunity to contribute to the very small volume of phonetically-recorded data on this minority language. Where a particular part of the word is in focus, this is in **bold**.

Where examples are marked with brackets, [ura] indicates a word in its phonetic form; /ura/ indicates the phonemic form and <ura> indicates a word in orthography. The exception to this is names of people, places and languages, which are shown in orthography without brackets when not directly part of an example. For the purpose of reading these names, it should be noted that the Ura grapheme <ä> represents /ə/, and <q> represents [ɣ]. Qaqet (pronounced [ɣaɣət]) is a closely related language with a different orthography; in Qaqet, /ə/ has the grapheme <e>, not <ä>, and Qaqet names must be read accordingly. Some other ambiguous graphemes are discussed when they become relevant in chapter 6 on lexicographic application. Square brackets [] are additionally used in the sociolinguistics section to add important information to speakers' comments, such as gestures or clarification of intended meaning (provided by me). Where an Ura word occurs within normal text, it is underlined as well as being in IPA, to avoid confusion between text and examples.

Sometimes multiple suffixed forms are given for one stem, to exemplify stem or suffix alternation, or the absence of such. In these cases a comma separates the forms, and their respective glosses. Where the gloss for one form has multiple components, these components are separated by a slash /. A slash separating two Ura word forms indicates variation in reported pronunciation, which remained debated after further investigation.

Glosses in normal text are distinguishable by single quotation marks. Where there is grammatical category ambiguity in an English gloss, this is clarified; for example ‘light (ADJ; weight)’. Latinate names, where known, are shown italicised and in brackets. Those relating to flora and fauna were obtained from *The Jacaranda Dictionary and Grammar of Melanesian Pidgin* by Mihalic (1971). This dictionary was also consulted occasionally for refining English translations of some Tok Pisin words. Where the Tok Pisin is more specific or direct than the English, this is also given in the gloss for accuracy.

It is appropriate to also include here a note on the suffixes /-ka/ and /-ki/ (see 1 and 1 below) which will occur frequently in examples. Ura nouns are plural in their unsuffixed forms. /-ka/ and /-ki/ have a variety of meanings, depending on the stem. These meanings all include a ‘singular’ component; other meanings observed during the course of this research are masculine / feminine (respectively), bearer / thing borne (for example a tree and its fruit), and large / normal size. Still other stems occur with only one of the two suffixes (as the singular form); the other suffix attached to the same stem produces a meaningless word. Glosses shown for words with these /-ka/ or /-ki/ suffixes therefore vary. When the particular semantic realisation of such a suffix was not clarified in the course of this research, SG is used as a default gloss, or M.SG and F.SG where both /-ka/ and /-ki/ forms are given (or when glossing the suffixes themselves).

1	bi.as- <b>ka</b>
	sores/cuts/wounds-M.SG
	blood

2	bi.as- <b>ki</b>
	sores/cuts/wounds-F.SG
	sore/cut/wound

A further note on suffixes is that some nouns are marked for size or shape, for example ‘gums’: ɟan-it ‘gums-FLAT/THIN.SG’, ɟan-itnək ‘gums-FLAT/THIN.PL’. For these stems, the singular, dual and plural forms are all marked with suffixes specific to things of that size or shape. (The plural is suffixed for such words, though the unsuffixed form can sometimes still be used as a plural also.) Other nouns also can take some of these size/shape-specific suffixes, which in such cases depict (say) a particularly flat/thin specimen of that item, for example sdəm ‘ears’, sdəm-gi ‘ears-SG’, sdəb-it ‘dog’s ear’. (The final /m/ - /b/ alternation on the stem in these words will be discussed later in 5.5.)

As observable above, morpheme boundaries are marked in Ura words throughout this thesis by using a hyphen -. Where they have been not marked for some reason, this is noted in the text. However after only one year of fieldwork, even with good advisors, it is all but certain that some morpheme boundaries have been unnoticed by me. The absence of a hyphen, therefore, should not be taken as a guarantee of monomorphemicity, particularly over more than three syllables. Most morphemes in Ura are monosyllabic or disyllabic. Syllable boundaries are not marked except in section 4.4 on syllable structure, as well as occasionally in other examples where particularly relevant. These include instances of two consecutive vowels, where it is reasonably certain that these represent a sequence, not a diphthong. Those which are reported and observed reliably as diphthongs are marked as  $\check{V}V$  or  $V\check{V}$ , as in 3 and 4 below. However, due to difficulty in reliably establishing whether consecutive vowels were a sequence or diphthong, the distinction is not always marked.

A sample from section 4.4.1 concludes this section, illustrating some of the different kinds of transcription and notation mentioned.

### CVV

3	ɣaě.βeš	wingbeans
4	ɣəĩ	bush rope PL

CVV syllables tend to be questionable; the first example listed above has two CVV syllables but both end in [e] or [ɔ], which as discussed in 4.3.1.4.2 and 4.3.1.6.2 are often related to /l/ or other vowels either cross-linguistically or within Ura. The second example is ɣəĩ ‘bush rope PL’; the word for ‘piece of bush rope’ is ɣaul-it.

### 3 Sociolinguistic background

#### 3.1 *Neighbouring languages and language contact*

The vast majority of Ura speakers, in the Gaulim area at least, have Tok Pisin as a second language. English is also taught in schools. Kuanua is a neighbouring unrelated (Austronesian) language with significantly greater prestige and population than Ura. The Ethnologue (2005) indicates 61,000 Kuanua speakers, which is the seventh biggest (by number of speakers) of Papua New Guinea's 820 living languages (Ethnologue 2005), as compared with Ura's 1,900 (Ethnologue 2005<sup>1</sup>), or even compared with the whole Baining-Taulil language family at approximately 12,400 speakers. The composition of the Baining-Taulil family as per the Ethnologue (2005) is shown below.

Language	Number of speakers	
Kairak	750	(1988, SIL)
Makolkol	7	(1988, SIL)
Mali	2,200	(1988, SIL)
Qaqet	6,350	(1988, SIL)
Simbali	387	(2004, SIL)
Taulil	800	(2000, Wurm)
Ura	1,900	(1991, SIL)

In the Gaulim area, Ura speakers have Kuanua speakers in adjacent houses at some points. There is also a teachers' college (tertiary) along the main road that draws students and staff from various language backgrounds. English is the language of instruction at the college.

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<sup>1</sup> The Ethnologue attributes the Kuanua and Ura speaker population figures to SIL (1991).

Some of these non-local students board on campus, further increasing the presence of other languages in the general Ura-speaking community.

As far as I have observed, most dialogue between Ura speakers and others happens in Tok Pisin. Tok Pisin is “the variety of Melanesian Pidgin English spoken in Papua New Guinea,” (Smith, 2002:3) and is one of the three official languages of Papua New Guinea (the others being English and Hiri Motu). It is the only language of 50,000 Papua New Guineans (Ethnologue 2005) and used very widely for contact between people who do not speak the same language. Some outsiders living long-term in the predominantly Ura area have learned some basic Ura words and phrases, however efforts to learn Ura as a second language are generally rare.

Also of significance for language contact is intermarriage. In learning about people’s family language background, discovering a solely Ura heritage was the exception rather than the rule. Many had a mother, father or grandparent who came from another Baining language group or, less commonly, an unrelated language like Kuanua. Some implications of intermarriage and close-proximity habitation language contact are discussed in the rest of this chapter.

When Ura is being learnt (or imitated), whether by outsiders or in the context of child language acquisition, mispronunciations occur, as one would expect. Below are some Ura speakers’ specific observations of mispronounced Ura words. Mispronounced elements are in **bold**.

	Ura word	Gloss	Mispronunciation	Group attributed to, if any
5	ɣale	stop it	<b>k</b> ale	Highlanders, Kuanua speakers, children
6	ɣaku	no, not	<b>k</b> aku	Highlanders, Kuanua speakers, children
7	ɣayak	uncle	<b>k</b> akak	children
8	liɣər	money	li <b>g</b> ər	-
9	laβuyi	mercy	lavu <b>g</b> i	-
10	ɾaŋam	bananas	<b>r</b> aŋam	-
11	naŋ	come	<b>n</b> aŋ	Kuanua speakers
12	rigi	river, water SG	li <b>g</b> i	children

Kuanua speakers also reportedly “can’t pronounce” [ə]. Similarly, [ɟ] is “hard for outsiders to pronounce.”

### 3.2 *Perceived causes of language change*

All the informants I asked shared thoughts on language change, or volunteered information of their own accord. The main causes of language change in Ura, according to their comments, are summarised and/or translated in italics below in general order of frequency or perceived significance. See Appendix I for speakers’ comments in the original Tok Pisin. Speakers are referred to with letters (D) to preserve anonymity. Comments are listed below in sequences that made natural progressions, but should not be taken to represent a conversation between the parties referred to. Each different letter represents a separate interview occasion and interviewees were generally not aware of what had been said in previous interviews with other speakers. Most letters represent one interviewee; (E) and (F) represent groups of



speakers interviewed, and quotes show the consensus, normally summarised by one spokesperson.

### 3.2.1 Mixed marriages

*When Ura speakers marry non-Ura speakers, their children will have mixed language. (L)*

*If you were to hear the Ura of the people over there [gestures to nearby houses], you would see it was not quite right. Women are married to Kuanua speakers, and they don't teach their children Ura properly. (D)*

*Now the language is getting messed up. Why? Because many Kuanua speakers have come in, and because many Bainings are married to outsiders. This is why the changes are happening, and they weren't happening before. (K)*

*When Ura speakers marry people from the Sepik and places like that, they tend to use lots of Tok Pisin. They completely forget Ura; they put huge amounts of Tok Pisin into it. (G)*

There is possible evidence for people in mixed marriages feeling shame about the resulting language implications. One speaker, usually thorough and straightforward in his answers, left mixed marriages completely out of his reasons for language change, even when I recapitulated his points at the end and asked if he could think of anything else to add. He himself is married to a non-Ura-speaker.

### 3.2.2 Living near or teaching speakers of other languages

*When Ura speakers live with/near speakers of other languages, they absorb some of those other languages. (L)*

*This change is also from making it easy for outsiders. We change it to teach them our language, and it has stuck. There's no reason why this change has hung on. (F)*

*The old men from before said liyər [for ligər]. But all sorts of languages have come in now – Tok Pisin and Kuanua – and it brought about change in the languages here. Some letters [sounds] were lost. Kuanua doesn't have ɣ. When the young men heard us Bainings [speakers of Ura and the other Baining languages] saying yaku ['no'], they said, 'what sort of a language is that? You should say kaku.' ... Now the language is getting messed up. Why? Because many Kuanua speakers have come in, and because many Bainings are married to outsiders. This is why the changes are happening, and they weren't happening before. (K)*

### 3.2.3 Education in other languages

*The generation of speakers who are now grandparents or great-grandparents were schooled in Kuanua, and Ura was mixed with Kuanua. (L)*

*Also, the elders from before were schooled in Kuanua. (K)*

*From a 50-year-old speaker: Before, our fathers didn't know how to mix with the other languages. They (our fathers) were taught Kuanua, but it was our generation that started to adopt it. I was taught English, and don't know Kuanua... For the young ones who go to school, it's especially hard to turn English into Ura; English is strong. When they come*

*home, they've learned names for everything in English before learning them in Ura, and then they can't be bothered learning the Ura ones. (M)*

*kaku is something the children say – a recent development. Before, everyone said yaku. This change started happening about ten years ago. Children start off saying yaku, before they go to school. (K)*

### **3.2.4 Poor instruction in Ura at home**

*Mothers use kale and kaku to their babies and then they don't correct them later. We get a bit cross, or say 'don't do that,' when we hear a mother starting teaching them that baby talk. We don't want the babies to grow up and still speak like babies. (L)*

*Some fathers only teach their children Tok Pisin. Later, it's hard for them to come down to Ura. Or parents don't educate their children well in Ura, so Tok Pisin and English seep into Ura; Kuanua, and the other Baining languages do too. (M)*

*A group of mothers commented as follows: We correct the children occasionally, but some have already learned kaku, and when they're grown up they retain it. kakak ['uncle'] is the same. This change has happened recently; it hasn't been around for a long time. It's happened because of how parents teach their children. If you go to the more isolated Ura speakers, you hear that they speak clearly/properly.*

*Children hear their parents say kaku occasionally and they copy it, and they like kaku more than yaku; it's easier. And the parents are embarrassed to correct them. The same goes for yale ['stop it'], yayak ['uncle'] and yɔkɔk ['baby']. (E)*

### 3.2.5 Difficulty in pronunciation (children)

The following is from a 12-year-old speaker: *Children say kaku and not yaku, and they say yale as ‘kale’. It’s hard for the small children to pronounce y – they call it k. Now I only say yaku and yale. (G) (The last statement is definitely not factual.)*

The last paragraph under 3.2.4 above contains a similar claim.

### 3.2.6 Contact with new items

*New items that are introduced are being called by their English or Tok Pisin names. (L)*

### 3.2.7 Lack of corresponding graphemes in Ura orthography

*kale isn’t right. It’s yale. Before, we didn’t have this letter ‘q’. Now Gary [expatriate Bible translator for Ura] has come up with ‘q’ [to represent the sound [ɣ]] and we’re pleased. We often followed the Kuanua alphabet. This change isn’t from speaking quickly; it’s from following the Kuanua alphabet. (F)*

If this is a cause, it cannot be a very strong one, as the Ethnologue (2005) lists a literacy rate of 15-25% in Ura.

It is interesting that borrowing of words was not mentioned often. New items are rarely given Ura names; the only one I am aware of is ɟɟɟɟmətki, meaning literally ‘they go fast in it’ (Rosensteel, p.c.), for the Tok Pisin words ‘ka’ and ‘bas’, which refer to vehicles. The main themes in people’s comments, then, are phoneme pronunciation change, and Ura mixing with or being replaced by other languages, particularly in children’s language learning.

### 3.2.8 Responses to language change

One speaker remarks, “*We think about the issue of keeping to the way things were before. Our children must learn our language well. These days, some young people, if you were to ask them the name of that tree there, wouldn’t know what it was called... Later, this child will marry an outsider, and won’t be able to [or won’t] use the language of us Ura speakers.*” (D)

Another says, “*We [his generation – he is 50] can speak purely; later, when we’ve died, I think Ura will be all mixed [with other languages]. [But] we’re still here, and you [linguists and Bible translators] are fortifying Ura by putting it on paper and in books.*” (M)

The group of mothers said, “*We don’t want to keep these new changes. We like how our predecessors used to speak. Their way is better than how things are done now...*” (E)

*Now Ura is getting messed up.* (K)

*Now people are absorbing bits of Tok Pisin. I don’t think it’s very good.* (G)

The response to change is all negative. It is noteworthy that while people clearly recognised negative results of mixed marriages, no one made comments that mixed marriages were bad, or that people shouldn’t marry non-Ura-speakers.

### 3.3 #[ɣ] → #[k]

The change speakers seem most aware of is a somewhat recent [ɣ] → [k] change word-initially. [ɣ] is an allophone of /k/ and normally occurs intervocalically, following liquids and sometimes utterance-initially (as do the other plosive phonemes). This is discussed further in

4.2.2.2.1.6 and 4.2.2.2.1.7. In discussions about language change, the pronunciation of the words yaku ‘no’ and yale ‘stop it! / don’t!’ almost always featured. More often than not I heard these pronounced kaku and kale in daily use and yet across the board, people perceive this to be not correct speech. People finish explaining how kaku is what only small children and foreigners say, only to almost in the same breath use kaku to correct a child or respond in the negative to a question. The following two quotes are a representative summary of people’s comments:

L: *The real way to say it is ya-, but because we rush, we say ka-. To my ears, kale and kaku aren’t quite right.*

Lee: Is this a new change?

L: *It’s been around for a while. It’s not something just in our children; it’s from our fathers [that is, those approximately age 60]. I think it’s from starting to speak quite quickly.*

Lee: I’ve heard some adults saying kale and kaku, though.

D: *Well, we do know that the Ura is really yale and yaku.*

It is interesting to note the differences in how recent people think the change is. The last comment from ‘L’ above is one claim about this; two others follow:

*kaku is something the children say – a recent development. Before, everyone said [yaku].*

*This change started happening about ten years ago. (K)*

*This change has happened recently; it hasn’t been around for a long time. (E)*

In contrast, the other plosive phonemes /p/, /t/ and /c/ – are realised as plosives less frequently than /k/ when word-initial, and are apparently not ‘simplified’ (as in 3.2.4) for children (based on conversation with L). G says [ɟ] is easy for children to say.

Although /k/ often occurs as [k] initially in many words, yaku and yale were consistently the words mentioned as illustrative. It could be that the semantics of yaku and yale have been part of the motivation for the change. A preference for a ‘stronger’ sound beginning the words for ‘no’ and ‘stop it!’ would be understandable. However these words also could have been repeatedly volunteered simply because they are used frequently and so catch speakers’ attention.

### **3.4 Summary**

Ura speakers have had significant language contact with Kuanua, Tok Pisin and English, and speakers clearly have intuitions about the effects of this. They believe that contact with other languages – from schooling to neighbours to intermarriage – and poor instruction in Ura at home are the main causes for the changes they see today, and they view these changes negatively. There is a gap between their awareness of these changes and their own self-awareness in terms of speech, as many have adopted these changes themselves more than they realise.

## 4 Phonology

### 4.1 Phonology introduction

In this chapter we will look at the phones present within Ura and their distribution, vowel harmony, syllable structure and stress. Tone is not contrastive in Ura.

Some phonological processes occurring within Ura words occur also across word boundaries. A major example is voicing and spirantisation of plosives. The first table below illustrates this within words, showing different alternants of the /-ki/ suffix; the second table containing two-word examples illustrates corresponding alternants of /t/ in *tet* ‘go’, whose distribution is governed not lexically but by the phonological properties of the previous word.

13	et- <b>ki</b>	gardens-SG
14	un- <b>gi</b>	shade-SG
15	si- <b>ɣi</b>	red cedars-SG

16	ut <b>tet</b>	we (INCL) are going
17	un <b>det</b>	we (DL.INCL) are going
18	ŋüa <b>ɟet</b>	I will go

This is useful information because it permits us to use multiple-word examples where one-word illustrations are scarce for a particular phenomenon.



## 4.2 Consonants

### 4.2.1 Consonant inventory

Below are the consonant phonemes of Ura.

	bilabial		dental		alveolar		palatal		velar	
<b>plosive</b>	p	b	t	d			c	ɟ	k	g
<b>nasal</b>		m		n				ɲ		ŋ
<b>tap</b>						r				
<b>fricative</b>					s					
<b>lateral approximant</b>						l				

### 4.2.2 Plosives

The plosive phonemes are /p/, /b/, /t/, /d/, /c/, /ɟ/, /k/ and /g/. Their articulation and distribution (with more accurate labelling for /p, t, c, k/, given in 4.2.2.2) are discussed in this section.

#### 4.2.2.1 Place of articulation

/p/, /b/, /k/ and /g/ are unexceptional in terms of place of articulation, being consistently bilabial and velar respectively.

/t/ and /d/ are often dental but can be alveolar; one alternant of /t/ (discussed further under 4.2.2.2.1.6) is the retroflex [ɖ].

/c/ and /ɟ/ are pronounced with the tongue making contact from the palate right through to the teeth, with the tongue visible particularly in careful articulation. In reproducing the palatals to

Ura speakers, this visible dental contact was an important prerequisite for their endorsement of one's pronunciation.

The palatals are certainly contrastive independent phonemes synchronically, but there is evidence that they may have previously been allophones of other phonemes, perhaps the corresponding velar or anterior coronal stops. They have noticeably limited frequency compared with the other stops, and occur more often following /ə/ than the other vowels. This limited distribution is particularly noticeable in connection with [a]-epenthesis later, in that epenthesis occurs in almost all contexts except following palatals (5.1.1).

#### 4.2.2.2 Allophonically variable obstruent phonemes /p, t, c, k/

##### 4.2.2.2.1 Manner of articulation in various phonological environments

It should be noted that where spirantisation or fricatives are mentioned in connection with realisations of these phonemes, it is also possible to observe approximants of the same place of articulation; namely [β, ɹ, j, w] respectively.

##### 4.2.2.2.1.1 Finally

Before a pause these plosives are realised phonetically as voiceless plosives. They may be optionally aspirated or unreleased, with no apparent phonological motivation or semantic implications.

19	marap	vertical house posts
20	mət	inside
21	sləc	bones
22	yek	caves (N)

#### 4.2.2.2.1.2 Following other obstruents

Following plosives and the fricative /s/, one observes voiceless plosives, as follows. Each phoneme is illustrated in bold, first following a voiceless plosive and then following /s/.

23	γutpət	middle finger
24	βaspasiɬɔc	much later

25	ɬəp-təp-ka	fire (flaming)
26	βəs-təm-ne	gather <sup>2</sup>

27	γət-car	scratch (V)
----	---------	-------------

There were no examples of /c/ following /s/ discovered in the course of this research. This may or may not be the result of phonotactic constraints; /c/ is after all a rarer phoneme than the other allophonically variable obstruents, as was explained at the end of 4.2.2.1.

28	eγɔc-ka	weak
29	iŋas-ki	thin (ADJ)

#### 4.2.2.2.1.3 Preceding other obstruents and nasals

Parallel to the previous section, one observes voiceless plosives preceding obstruents and nasals. Examples follow, with one example (where available) before voiceless and voiced plosives, the fricative /s/ and a nasal.

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<sup>2</sup> Data from Rosensteel et al (Scripture) (nd.)

30	u <b>p</b> -ka	valleys-SG
31	sə <b>p</b> -bəŋaŋ	afternoon
32	ɣit kə <b>p</b> sa ama ɣaul-it	she is tying the bush rope-SG
33	bi <b>p</b> mət-ki	blunt

34	βə <b>t</b> -ka	houses-SG
35	ka <b>t</b> dərəm	he knows
36	tsə <b>m</b> -tsəm	writing
37	-it <b>nək</b>	flat/thin.PL

38	ji <b>c</b> pəm-gi	wet (ADJ)
39	ɣanlə <b>c</b> dama ŋəmuŋ	he split the wood
40	rə <b>c</b> -ŋət	right/correct

No examples of /c/ preceding /s/ were found.

41	gə <b>k</b> -pəɽ-ayən	he burped
42	βu <b>k</b> dur	explosion
43	sak-sak-pə <b>m</b> -ga	light (ADJ, weight)
44	rə <b>k</b> nan-gi	green tree frogs-SG

#### 4.2.2.2.1.4 Adjacent homorganic voiceless plosives

Since no change in voicing or manner of articulation is observed when these allophonically variable obstruent phonemes precede or follow other obstruents, we might expect to similarly observe no change when morpheme boundaries bring homorganic ones together. In practice,

however, we observe a few different realisations for such occurrences. Below are the few noted in the course of this research that are realised as expected. The ‘exceptional’ realisations (which are in the majority) are discussed in 5.3.

45	/mi.ɔk-ka/
	papaya-SG
	[mi.ɔka]
	papaya ( <i>Carica papaya</i> ) SG

46	/ka.ira <b>k</b> -ka/
	Kairak-SG
	[ka.ira <b>k</b> a]
	Kairak man

47	/kɔ <b>k</b> -kɔ <b>k</b> -ka/
	babies-M.SG
	[ɣɔ <b>k</b> ɔ <b>k</b> a]
	baby boy

The stem above is reduplicated; more examples of reduplication are found in 4.3.3.3.

48	/kit-tɔr/
	F.SG.CONTINUOUS.ASPECT-wash/pour <sup>3</sup>
	[ɣitɔr]
	rain (V)

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<sup>3</sup> Gloss from Rosensteel et al (Grammar) (nd.)

#### 4.2.2.2.1.5 Following nasals

Following nasals these phonemes are realised as voiced stops, as follows. The reader will also notice voicing and spirantisation on the initial phoneme in 49 below; this is discussed just below in 4.2.2.2.1.6.

/p/ following a nasal	49	/prən- <b>pr</b> ən/	
		[βrən- <b>b</b> rən]	
		shake, shiver	
/t/ following a nasal	50	/in- <b>t</b> et/	
		[in- <b>d</b> et]	
		you (DL) are going	
/k/ following a nasal	51	/un- <b>k</b> i/	
		[un- <b>g</b> i]	
		shade-SG	
		umbrella	

There were no occurrences of /c/ following a nasal discovered in the course of this research, but this may be due to /c/'s limited distribution.

#### 4.2.2.2.1.6 Preceded and followed by a vowel or liquid

When preceded and followed by a vowel or liquid, we observe voiced, spirantised alternants of allophonically variable obstruent phonemes; this means intervocalically, before a liquid (when following a vowel) or after a liquid (when preceding a vowel). None were observed between liquids in the course of this research. /t/ in this context is occasionally pronounced as the voiced retroflex fricative [z], perhaps only in deliberate, emphatic speech, but is normally the voiced retroflex approximant [ɹ]. The approximant symbol, rather than the fricative

symbol, is accordingly used in examples throughout this thesis. For /p/, /c/ and /k/ the realisation is more often fricative, but approximant realisations are also common.

Also in contrast to the other allophonically variable obstruent phonemes, the anterior coronal is realised as a plosive following liquids. This is likely to reflect an avoidance of clusters containing components that are too similar: both liquids in Ura are alveolar, and a [rɿ] or [lɿ] cluster could violate phonotactic constraints.

Three examples of each phoneme in these environments are shown below. Often phonemes were not observed following [l] in the course of this research. Many /l/s in Ura are realised as vowels or Ø (see section 5.4 for discussion) which is likely to be the reason for this gap.

/p/ intervocalically	52	/mənəp-itnəm /	The [a] – [ə] alternation above is discussed in section 4.3.3.1.
		[mənəβ-itnəm]	
		(gloss uncertain, possibly ‘tiredness’)-FLAT/THIN.DL	
		eyelids (DL)	
/p/ following a liquid, preceding a vowel	53	/pur-pur/	
		[βur-βur]	
		rub in (ointment)	
/p/ following a vowel, preceding a liquid	54	/upraŋ-ka/	
		[uβraŋ-a-ɣa]	
		fog SG	

The pre-suffixal [a]s in 54, and 55 below, are epenthetic and will be discussed in 5.1.1.

/t/ intervocalically	55	/it-it/	
		[iɾ-a-it]	
		lice-[a]-FLAT/THIN.SG	
		louse	
/t/ following a liquid, preceding a vowel	56	/artən-ki/	
		[artən-gi]	
		jaws/cheeks-SG	
		chin, jaw, cheek	
/t/ following a vowel, preceding a liquid	57	/ɲit lir/	
		[ɲit lir]	
		come here	

/t/ following either of the two liquids is realised as [t], as explained nearer the start of

4.2.2.2.1.6.



/c/ intervocalically	58	/slæc-ige/	
		[sləj-ige]	
		bodies-FLAT.SIDED.SG	
		body	
/c/ following a liquid, preceding a vowel	59	/təkɔrcia/	
		[tɔɣɔrɟia]	
		like.this	

No examples were found of /c/ preceding a liquid.

/k/ intervocalically	60	/raɔ-ki/	
		[raɔ-ɣi]	
		walnuts-F.SG	
		walnut	
/k/ following a liquid, preceding a vowel	61	/ʔar-ka/	
		[ʔar-ɣa]	
		life-SG	
		young	

No examples of /k/ following a vowel, preceding a liquid were found.

An intervocalic environment is the only one in which vowels affect which alternant occurs. A vowel only before or after the allophonically variable obstruent phoneme will not motivate

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<sup>4</sup> Data from Rosensteel et al (Scripture) (nd.)

voicing and spirantisation. Evidence for this is found in many examples, including 38 and 51 above.

It should be noted that there are some words that do not show voicing or spirantisation in this intervocalic environment; these are discussed in 5.3.

#### 4.2.2.2.1.7 Initially

As seen in examples 49, 53 and 59 above, voiced spirantised alternants also occur in initial position – that is, after a pause (for example when elicited in the context of a word list) one observes both plosives and fricatives/approximants.

The majority of nouns and adjectives must be preceded either by a determiner (ama) or possessive (such as a) – that is, a vowel-final word. (The determiner is more prevalent than English *the/a* and occurs before both plural and singular nouns.) The phonemes which begin such words are consequently never in genuine initial position, since word boundaries are no barrier to processes such as spirantisation and voicing in Ura (see 4.1). Two examples of this obligatory precedence follow.

62	/ <b>ama</b> ɣar-ka <b>ama</b> pət-ka/
	[ <b>ama</b> ɣar-ɣa <b>ama</b> βət-ka]
	<b>DET</b> young-SG <b>DET</b> house-SG
	new house

63	/a pəs-ki/
	[a βəs-ki]
	<b>DET</b> head-SG
	his head

(There are, however, some nouns (there may also be adjectives, though none were identified in the course of this research) which are not preceded by ama; four examples are found in 4.2.2.3 below. There is no apparent motivation for this: the exceptional nouns are not all mass nouns, nor obviously borrowed, nor seemingly related in any other way.)

A general survey of the 600-item word and phrase list mentioned in 2.1 of the methodology section indicates a trend for /p/ to be [β] and /k/ to be [k]; the instances of initial /t/ are insufficient to be conclusive. /c/ was not observed in utterance-initial position. As was the case in 4.2.2.2.1.6, approximant realisations instead of fricatives are common. One example of each is shown below.

64	<b>β</b> anaia	day after tomorrow
65	<b>t</b> əc	here/now
66	<b>k</b> atet	he is going

The question does arise as to whether the underlying forms of the phonemes discussed in this section 4.2.2.2 are best symbolised by fricatives rather than plosives, especially given their varying realisations following a pause. However, this would make for a phonemic inventory with no voiceless plosives, which is not a thing expected in terms of universals. Maddieson (1984:27) reports that the UCLA Phonological Segment Inventory Database (UPSID) shows

only eight percent of languages (from a survey of 317<sup>5</sup>) do not have a “plain voiceless plosive series.” It would also be strange that the other fricative, /s/ (found under 4.2.3), does not alternate with plosive counterparts in what would be the expected environments (as described in 4.2.2.2.1.1-4.2.2.2.1.5 above).

There may be a current (phonetic) change in pronunciation from fricative allophones in initial position to plosive allophones, if the reported trend in the sociolinguistics section 3.3 applies not only to [k] / [ɣ] but to the other phonemes also.

In summary, allophonically variable obstruent phonemes show manner and voicing assimilation. Their realisation is mostly determined by the preceding (not following) sound except in the case of vowels, where a specifically intervocalic environment is what determines the realisation (that is, voiced and spirantised alternants). They occur voiced following nasals, voiced and spirantised when preceded and followed by vowels or liquids, and voiceless elsewhere. Exceptional realisations of these phonemes are found in the morphophonology section under 5.3.

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<sup>5</sup> Laver (1994:577), commenting on UPSID, explains that “an effort was made to cover the principal language families of the world.” Comrie (1989:11) comments that such surveys fall short of being truly representative simply because of the enduring gaps and over-representations due to availability of speakers of languages from different parts of the geographical and social world. Even so, there seems no need to propose that Ura belongs to this phonological minority when the /p, t, c, k/ analysis suffices.

### 4.2.2.3 Voiced plosive phonemes /b, d, ʃ, g/

In addition to the voiced plosives mentioned above which are post-nasal alternants of allophonically variable obstruent phonemes, there are also phonemes consistently realised as voiced, and furthermore never spirantised. Examples are shown for each place of articulation below with two initial occurrences followed by two intervocalic occurrences. Note the contrast for both environments with the way in which the voiceless plosives would be realised – that is, by [β], [ɮ], [j] and [ɣ]. Only one example was found for /ʃ/ in initial position.

67	<b>b</b> əɬəɣʒan	beach, shore
68	<b>b</b> əʃəmsəɣa	disintegrating
69	<b>e</b> banan-gi	reddish ground frogs-SG
70	a <b>b</b> i.as-ka	his sores/cuts/wounds-M.SG (his blood)
71	<b>d</b> uguska	little/last finger
72	<b>d</b> ur	deep
73	<b>i</b> dan-gi	freshwater eels-SG
74	a <b>d</b> u.im-ga	his elbows-SG
75	<b>ʃ</b> əm	prune a tree completely <sup>6</sup>
76	<b>b</b> əʃəmsəɣa	disintegrating
77	<b>n</b> iʃil-əs	livers-SG
78	<b>g</b> arəs-ka	sea
79	<b>g</b> laŋ	chinks in knife or spade blade

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<sup>6</sup> Data from Rosensteel et al (Grammar) (nd.)

80	-ige	flat-sided.SG
81	snagǔ aŋ-gi	bladders-SG

67, 71, 78 and 79 occur without the normal preceding ama and so are definitely examples of their respective voiced plosives utterance-initial position (not influenced by a preceding nasal).

The question then arises as to whether such voiced plosive phonemes ever occur following nasals. Examples are rare, but one is shown below.

82	daŋ-ɖəm-ga saβɔŋɔ	go up (top, onto) <sup>7</sup>
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One is tempted to guess that historically these voiced plosives were post-nasal alternants of voiceless plosives, and the motivating nasal environment has since been lost. However no evidence for this was found either synchronically in Ura or when comparing Ura with other Baining languages. Morpheme breaks are marked only in Ura words.

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<sup>7</sup> Gloss supplied by Rosensteel, p.c.

	Ura	Gloss	Kairak	Mali	Qaqet
83	<b>baes</b>	type of tree PL	<b>b</b> erəs	<b>b</b> aləs	<b>b</b> aɾəs
84	<b>ɗui</b>	stones	<b>ɗ</b> ul	<b>ɗ</b> ul	<b>ɗ</b> ul
85	<b>ɗ-ige</b>	taro-FLAT.SIDED.SG (piece of taro)	<b>ɗ</b> om	<b>ɗ</b> igəl	<b>ɗ</b> itnək
86	<b>g</b> æp-ki	black palm (species of <i>Caryota</i> )-SG	<b>g</b> aləpki	<b>g</b> aləpki	<b>g</b> aləpki
87	<b>eg</b> ūin	necks	l <b>g</b> ɔin	l <b>g</b> ɔin	ɣənap <sup>8</sup>

There was some prenasalisation of voiced plosives observed; however due to time constraints this was not investigated in detail during the course of this research. Prenasalisation is not consistent between speakers or even within one speaker's utterances of the same word. It would make a good topic for further research.

In light of this apparent prenasalisation, we could instead propose that what appear to be unalternating voiced plosive phonemes are in fact just the post-nasal alternants of allophonically variable obstruent phonemes. This is an attractive analysis, since it removes the puzzling contrast between these two otherwise very similar sets of phonemes. We would then have to say that these nasals preceding [b, d, ɟ, g] are phonetically present very seldom indeed. However, this analysis encounters a problem with a pronoun set in Ura whose form alternates depending on (among other things) whether the noun being possessed begins with a consonant cluster. These possessive pronouns are discussed more fully in 5.1.2, and are sensitive to the phonemic (not just phonetic) form of a noun. The pronoun form expected before a CVC syllable is gūa; the form expected before a CCVC syllable is gū. The following

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<sup>8</sup> ɣənap appears to be not a real cognate for egūin.

examples therefore suggest that there is no underlying consonant cluster – no /nt/ or /ŋk/ – word-initially.

88	gǔa dam	my mountains
89	gǔa gəs	my kagua (edible plant of fig family; English equivalent unknown) PL
90	gǔa gət	my big bamboo for splitting into walls

### 4.2.3 Fricatives

/s/ is the only fricative in Ura aside from those alternating with the voiceless plosives. /s/ occurs in all positions, as follows:

91	sen	knives
92	snaŋ	belts (N)
93	yəsəŋ	hair/fur PL
94	nes	birds' tails

### 4.2.4 Nasals

Ura has four nasal stops: /m/, /n/, /ɲ/ and /ŋ/. These also occur in all positions, as follows.

initial		medial		final	
mes	grasshoppers	ama	DET	βlam	pigs
nes	birds' tails	ana	give it here	sen	knives
ɲaŋ	come here	dəŋ-it	woodchips-SG	ilaŋ	charcoal PL
ŋǔa	I	bəŋaŋ	night PL	sayəŋ	eyes



#### 4.2.4.1 Place of articulation

As with the plosives, the bilabial and velar /m/ and /ŋ/ are unexceptional in terms of place of articulation. The anterior coronal /n/ is often dental but can be alveolar, and the palatal /ɲ/ is pronounced with the tongue making contact from the palate right through to the teeth.

#### 4.2.4.2 No place assimilation for nasals

Nasals never assimilate in place of articulation, whether adjacent to stops or other nasals.

Some examples are shown below, with adjacent nasals first, followed by nasals adjacent to heterorganic plosives.

95	ama isəm ɲənək	the birds sang out
96	kət bənɲɔ ɹəmɲət	he gives it to me
97	ɲūaləɲ-ɲūaləɲ	flowers (of bush or tree)
98	ɲnaska	corner (of road)
99	ɹinəmga	fish (N)
100	idan-gi	freshwater eels-SG
101	rəɲga	long grass
102	ɲbranaski	whirlpool

Recall again that word boundaries are no obstacle to assimilation of voicing or to spirantisation. One might therefore expect this to hold for place assimilation for nasals also.

However no assimilation is observed in this environment in 95-102 above.

## 4.2.5 Liquids

### 4.2.5.1 /r/

#### 4.2.5.1.1 *Place of articulation*

/r/ is unexceptional in terms of place of articulation, being consistently alveolar. The reader will recall that the retroflex [ɻ] previously mentioned is an alternant of /t/, not /r/.

#### 4.2.5.1.2 *Manner of articulation*

Both [r] and [ɹ] occur for this phoneme and it is difficult to ascertain which is its more common or primary form. Table 1 in the Appendix shows a customised wordlist elicited from three male speakers. The results from this below indicate trends in some environments, while in others there is no clear favouring of either phone, suggesting either true free variation or the need for more research.

Phonological environment	Phone
#_	more commonly [r]
V_C	more commonly [r]
V_V	most commonly [r]
C_V	most commonly [r]
_#	unclear

In this thesis for both the phoneme and its realisations, the tap symbol is used; the occurrence of [r] for /r/ is not noted, due to the variation clearly apparent in Table 1.

## 4.2.5.2 /l/

### 4.2.5.2.1 *Place of articulation*

/l/ is unexceptional in terms of place articulation, being consistently alveolar.

### 4.2.5.2.2 *Manner of articulation*

/l/ occurring as a consonant is unexceptional, but as mentioned in 4.2.2.2.1.6, morpheme-final

/l/ is often realised as a vowel or Ø. This is discussed further under section 5.4.

## 4.2.6 Consonantal phonotactics

Consonant clusters occur only in onsets or across syllable boundaries. That is, codas that do exist always consist of a single consonant. The table below indicates the observed monomorphemic consonant clusters; all consonants are listed on the vertical axis, to clearly display which consonants are never part of a cluster. One example of each cluster is shown following the table. Where there are very few examples known for a cluster, or where it is possible that a morpheme boundary intervenes between the two consonants, this is marked with an asterisk \*.

	<b>d</b>	<b>n</b>	<b>r</b>	<b>s</b>	<b>l</b>
<b>p</b>		pn*	pr		pl
<b>t</b>				ts*	
<b>c</b>					
<b>k</b>		kn*	kr		kl
<b>b</b>			br		bl*
<b>ɖ</b>			dr*		
<b>ɟ</b>					
<b>g</b>			gr		
<b>m</b>			mr		ml*
<b>n</b>					
<b>ɲ</b>					
<b>ŋ</b>					ŋl*
<b>r</b>					
<b>s</b>	sd*	sn	sr*		sl
<b>l</b>					

It is noticeable that only alveolar consonants can occur as the second element of a cluster.

Apparently no clusters begin with liquids; this is unsurprising given the sonority sequencing principle. We see no clusters involving palatals, although their scarcity means this is not necessarily a significant absence. No obstruent clusters are observed except [sd] and [ts]; the other plosive columns have accordingly been omitted from the table.

With a significant number of these consonant clusters, there is differing opinion among Ura speakers as to whether there should in fact be a vowel (usually /ə/) between the consonants.

Where a vowel other than /ə/ is claimed, it is the vowel in the following syllable. This is the case for most or all /pn/, /pl/, /kr/, /kl/, and /ml/, and some /gl/ and /sr/. It is not so for /pr/, /ts/, /bl/, /br/, /gr/, /sn/ /sl/ and most /mr/.

#### 4.2.6.1 Examples for consonant cluster table

Clusters of the shape CCC in these examples reflect C.CC, that is, a consonant in the coda of the previous syllable.

103	<b>βnək-pnək</b>	whimper (V)
-----	------------------	-------------

There are few, if any, other /pn/ examples within a syllable.

104	<b>βrəc-prəc</b>	squash (V)
-----	------------------	------------

There are few other /pr/ examples within a syllable.

105	<b>βluc-pluc</b>	be becoming loose
-----	------------------	-------------------

106	<b>tsəm-tsəm</b>	writing
-----	------------------	---------

There are few, if any, other /ts/ examples within a syllable.

107	<b>ɣnəs-knəs</b>	worry, be frustrated
-----	------------------	----------------------

There are few, if any, other /kn/ examples within a syllable.

108	<b>ʔrəs-krəs</b>	rustle
-----	------------------	--------

109	<b>ʔlək</b>	(gloss unknown <sup>9</sup> )
-----	-------------	-------------------------------

There are few other /kl/ examples within a syllable.

110	<b>brəŋ</b>	mud / soft ground
-----	-------------	-------------------

111	<b>bləŋ</b>	(gloss unknown)
-----	-------------	-----------------

112	<b>drəm</b>	know
-----	-------------	------

There is evidence that this example and the others for /dr/ may not be monomorphemic; /d/ may be a (rare) prefix. The example above is the word for ‘know’; the word for ‘think’ is rəm.

113	<b>grəŋ-grəŋ</b>	tree beetles
-----	------------------	--------------

There are few other /gr/ examples within a syllable.

114	<b>mrən-ga</b>	worry, burden (N)
-----	----------------	-------------------

There are few other /mr/ examples within a syllable.

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<sup>9</sup> Data from Rosensteel et al (Scripture) (nd.)

115	<b>m</b> lʊŋ	dogs (PEJ)
-----	--------------	------------

There are few other /ml/ examples within a syllable.

116	<b>ŋ</b> lɔŋ	fern shoots
-----	--------------	-------------

There are few, if any, other /ŋl/ examples within a syllable.

117	<b>s</b> dəm	ears
-----	--------------	------

There are few, if any, other /sd/ examples within a syllable.

118	<b>s</b> nəŋ	hips
-----	--------------	------

119	<b>s</b> rʊ	old
-----	-------------	-----

There are few other /sr/ examples within a syllable.

120	<b>s</b> ləp	bones
-----	--------------	-------

### 4.3 Vowels

#### 4.3.1 Monophthongs

##### 4.3.1.1 Monophthong vowel phoneme inventory

Below are the monophthong vowel phonemes of Ura in their approximate phonetic positions.

	Front	Central	Back
Close	i		u
Close-mid	e		
Mid		ə	
Open-mid			ɔ
Open		a	

Vowel phonemes contrast in height, backness and rounding, as shown below.

	[- back]	[+ back], [- round]	[+ back], [+ round]
[+ high]	i		u
[- high], [- low]	e	ə	ɔ
[+ low]		a	

Diphthongs and vowel sequences will also be discussed later in section 4.3.2.2.

##### 4.3.1.2 General processes involving morphophonological change

All vowels alternate with [ə] in some reduplicated forms and suffixed nouns (although any such alternation will be vacuous in the case of /ə/ itself); however, these alternations are not



related to stress or syllable structure (open versus closed syllables). A discussion of these phenomena follows in section 4.3.3 on vowel centring.

Some occurrences of /e/ alternate with /i/ in environments conducive to vowel harmony, as explained further in 4.3.4.1.

/a/ sometimes alternates with /ə/ in closed syllables; further discussion of this is found in 4.3.3.2.

### **4.3.1.3 /i/**

#### ***4.3.1.3.1 Phonetic realisations***

In most cases /i/ is realised as [i] or is slightly centred to [i], but not as far as [ɪ].

In addition to this, in at least three cases /i/ occurs in an onset. The evidence for this is found in 5.1.2.1, but a provisional outline is that the possessive pronoun variant occurring before /iaũŋ/ ‘tree seedlings’, /iaüs/ ‘evil spirits’ and /ʔɔ.e/ ‘small bamboo for woven walls’ is the one which does not occur before vowels. This indicates the presence of an initial consonant; that is, they are [jaũŋ], [jaüs] and [jɔ.e] respectively. In normalised phonetic transcription (mentioned in 2.2), the latter is the way the words will be represented.

This evidence of an initial consonant is insufficient motivation for positing a distinct /j/ phoneme, because the only other potential support for /j/ elsewhere in Ura arises in the context of diphthongs in 4.3.2.2, where the issue arises of whether to analyse some elements as vowels or glides. There is significant disincentive for proposing a /j/ phoneme simply as an

alternative to some diphthongs or to account for the three words above, since neither of these contexts is without alternative analysis. It is more consistent to analyse these as above; that is, with [j] as an onset variant of /i/ found in [jaʊŋ], [jaʊs] and [jɔ.e] and potentially elsewhere.

The first two of these three words are monosyllabic, so it may well be that Ura does not (normally – see 4.3.2.2 under ‘/ie/’) allow triphthongs – the initial /i/ is ‘forced’ into onset position. However it is interesting that disyllabic /ɔ.e/ is also realised with an onset. This will feature in the discussion of diphthongs later in 4.3.2.2.

This proposal of a phoneme with both vocalic and consonantal realisations is amply paralleled. For example, in many varieties of English liquids and nasals can occupy syllable nuclei as well as margins.

#### **4.3.1.3.2 *Distribution in syllables***

/i/ occurs in initial, medial and final position, as follows.

121	i s-ka	paths/roads-SG
122	si l	weed (V)
123	si	red cedars

### 4.3.1.4 /e/

#### 4.3.1.4.1 *Phonetic realisations*

In all cases /e/ is realised as [e].

#### 4.3.1.4.2 *Distribution in syllables*

/e/ occurs in initial, medial and final position, as follows.

124	<b>em</b>	mushrooms
125	<b>βem-ga</b>	pigs-M.SG
126	<b>ɟaŋe</b>	flesh

It should be noted that syllable-final [e] is rare and many occurrences can be shown either cross-linguistically or within Ura to be (or have historically been) /VI/. This alternation of /l/ with vowels is discussed in section 5.4; a sample of Table 18 from the Appendix is shown below.

	<b>Ura</b>	<b>Gloss</b>	<b>Kairak</b>	<b>Mali</b>	<b>Qaqet</b>
127	<b>sage</b>	go to someone <sup>10</sup>	sagəl	sagəl	sagəl
128	<b>ɟae</b>	small men's string bags	ɾalaŋ	ɟal	səgən
129	<b>βlam, βem-ga</b>	pigs PL, M.SG	βle, βləmga	βlam, βləmga	βələm

Also noteworthy for /e/ is its scarcity. In three Ura texts with a total of over 130,000 words, [e] made up only six percent of vowel occurrences (compared to [a] (45.5%), [ə] (22%), [i]

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<sup>10</sup> Gloss supplied by Rosensteel, p.c.

(13.5%), [u] (7.5%) and [ɔ] (6.5%)). This, combined with the connection with /l/, leads one to suspect that although [e] is now a contrastive phoneme, having minimal pairs with other vowel phonemes, it may have not always been so, having entered Ura (and other Baining languages) initially via vowel harmony and/or as an allophone of /Vl/.

#### 4.3.1.5 /a/

##### 4.3.1.5.1 *Phonetic realisations*

In all cases /a/ is realised as [a]. The occurrence of an epenthetic [a] is discussed in section 5.1.

##### 4.3.1.5.2 *Distribution in syllables*

/a/ occurs in initial, medial and final position, as follows.

130	<b>a</b> t	her (POSS)
131	r <b>a</b> t	molars
132	a <b>ɣ</b> a	their

Despite stem-final [a] being common in determiners and pronouns, it is not common in nouns and verbs, and most (if not all) instances have final [al] cognates in other Baining languages. This is illustrated in the table below, and is also discussed later in 5.4.2, where /l/ will be examined cross-linguistically.

	Ura	Gloss	Kairak	Mali	Qaqet
133	ɟa	take, bear	ral	ɟal	ral
134	i.a, ila-ɣi	mangoes PL, SG	il, ila-ɣa	βiyual, βiyua-ɣi	ial, iala-ɣa
135	sa	bear, give birth. Archaic Ura: <u>sai</u> <sup>11</sup>	sal		sal

#### 4.3.1.6 /ɔ/

##### 4.3.1.6.1 *Phonetic realisations*

The phoneme /ɔ/ is generally realised as [ɔ] (somewhat lower than [ɔ]) and is sometimes as low as [ɒ]. However as mentioned below in 4.3.1.6.2, its distribution is similar to that of /e/, so it seems appropriate to classify it phonologically in parallel fashion as a mid vowel.

When /ɔ/ is the beginning of a diphthong or vowel sequence and follows a consonant, it is often realised as labialisation on the consonant, with the second part of the diphthong or sequence then following. Some examples are given below.

	Phonemic form	Gloss	Phonetic form, normal speech
136	/kɔ̃ar/	to say	[ɣ <sup>w</sup> ar]
137	/ekɔ̃e-ki/	clouds-SG	[eɣ <sup>w</sup> e-ɣi]

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<sup>11</sup> Information supplied by Rosensteel, p.c.

### 4.3.1.6.2 *Distribution in syllables*

/ɔ/ occurs in initial, medial and final position, as follows.

138	ɔrən	smell (V TRANS)
139	mɔr	big
140	ŋɔ	me

It is just as scarce as /e/ with only approximately 7% of all vowel occurrences (see aforementioned details in 4.3.1.4.2) and we may wonder whether it too entered Ura (and other Baining languages) originally as a variant of another phoneme. There are no clear indications of its origins, as compared with /e/. A more extensive cross-linguistic comparison of both /e/ and /ɔ/ would be a worthwhile topic for further research.

### 4.3.1.7 /u/

#### 4.3.1.7.1 *Phonetic realisations*

In most cases /u/ is realised as [u] or is slightly centralised (not simply fronted) to [ü], though not as far as [ʊ].

One is prompted to wonder, on recalling the discussion of /i/ and [j] in 4.3.1.3.1, whether /u/ patterns similarly, with [w] in syllable onsets. As it happens, /u/ was not observed in an onset context.

It cannot be claimed, however, that /u/ is never realised in a consonantal fashion. As with /ɔ/ in 4.3.1.6.1, /u/ at the beginning of a diphthong and following a consonant is often realised as

labialisation on the consonant, with the second part of the diphthong then following. Two examples are given below.

	Phonemic form	Gloss	Phonetic form, normal speech
141	/gũ a/	my	[g <sup>w</sup> a]
142	/pəpũ e/	sweet potato, species of <i>Ipomea</i>	[[βəβ <sup>w</sup> e]

One might wonder whether the absence of [w] in onsets is due to avoidance of overlap in phonetic realisations of different phonemes. In 4.2.2.2.1.7 it was mentioned that initial allophonically variable obstruent phonemes are sometimes realised as approximants. Of particular relevance here is that for /p/ and /k/, this means [β] and [ɰ], bilabial and velar approximants respectively. However it cannot be that the labial-velar approximant [w] as a realisation of /u/ would make for unacceptable overlap under Ura phonotactic constraints: one does observe phonemic overlap in Ura with a phonetically voiced plosive, which can be either a realisation of a voiced plosive phoneme or the post-nasal realisation of an allophonically variable obstruent phoneme. So Ura does tolerate some ambiguity in this area. We may judge, then, that the apparent absence of syllable-initial /u/ as [w] is inconsequential.

#### 4.3.1.7.2 *Distribution in syllables*

/u/ occurs in initial, medial and final position, as follows.

143	un-gi	shade-SG (umbrella)
144	yur	to be angry
145	βu	bad

### 4.3.1.8 /ə/

#### 4.3.1.8.1 *Phonetic realisations*

In all cases /ə/ is realised as [ə]. The occurrence of an epenthetic [ə] is discussed in 4.3.3.3.

#### 4.3.1.8.2 *Distribution in syllables*

/ə/ occurs only medially.

146	məɾ	good
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There is one instance of a possibly initial /ə/ in əc ‘near’ but this would be an exception, if it is in fact a word (and not a suffix).

### 4.3.1.9 Further research opportunities

In addition to the minor phonetic variation in realisations of /i/ and /u/, there may also be similar variation in realisations of /e/, /a/ and /ɔ/. Investigation into this, and also into whether there is phonological conditioning for such variation for any of the five aforementioned vowel phonemes, would be good topics for further research.

### 4.3.2 Interpretation of adjacent vowel sounds

Ura has occurrences of adjacent vowel sounds. The question arises as to whether these should be interpreted as either a) long vowels (where the adjacent vowels are identical) or diphthongs, or b) as or sequences of two vowels. The term ‘vowel combinations’ will be used to denote adjacent heterorganic vowel sounds not yet specified as diphthongs or sequences.



### 4.3.2.1 Long vowels

Long vowels are scarce in Ura; in fact only three words contain relatively undisputed<sup>12</sup> long vowels. They are shown below; minimal pairs are given where available.

	Word with reported long vowel	Gloss	Contrasting word, if any	Gloss
147	i:ar	cucumbers	ǎar	life
148	yu:m	knees	yum	cough/mucus
149	la:r	sugarcane ( <i>Saccharum officinarum</i> ) PL	-	-

One speaker disputed la:r but there was general agreement among others that it contained a long vowel.

We observed in 4.3.1.3.1 that /i/ is occasionally realised as [j]. It was difficult to determine whether there was an instance of this in 147, i.e. whether the word was phonetically [i:ar] or instead [i.jar]. My judgement is that it is phonetically [i.jar], that is, phonemically /i.ǎar/ (and so not a long vowel at all), with /i/ realised as [j] when preceded by /i/.

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<sup>12</sup> Undisputed among speakers; see discussion.

Other long vowels proposed (by speakers) but disputed are as follows:

150	βa:s-it	breadfruit ( <i>Artocarpus incisa</i> ) leaves-SG
151	a:s-it	grass skirt belts-SG
152	ra:s-it	fingernails-SG
153	a:	his

There is an epenthetic [a] pattern discussed more fully in 5.1.2 that gives some valuable insight into confirming the presence of long vowels. We find an epenthetic [a] in possessive pronouns when they precede noun stems of the form CV(C) – that is, monosyllabic consonant-initial noun stems (as in 156-157, in contrast with 154-155). Of importance to our current topic is that noun stems of the form CVVC (as are proposed in 148, 149, 150 and 152) do not motivate an epenthetic [a]. Some unambiguous examples follow, first showing the regular possessive pronoun with CVVC noun stems and then the epenthetic [a] with CVC stems.

154	gu raup	my pig fleas
155	gu laĩt-ki	my navels-SG
156	gũa dam	my mountains
157	gũa sek	my stories

Bearing this in mind, if the words in 148-153 take gu and not gũa as a possessive pronoun, this will be very good evidence for the existence of genuine long vowels – CVVC – in those words. And one does indeed see good evidence of this sort with consonant-initial nouns.

158	gu la:r	my sugarcane ( <i>Saccharum officinarum</i> ) PL
159	gu yu:m-gi	my knees-SG
160	gǔa ras-it	my fingernails-SG
161	gǔa βas-it	my breadfruit ( <i>Artocarpus incisa</i> ) leaves-SG

This suggests that there are long vowels in la:r and yu:m but not in rasit and βasit.

It must be acknowledged that there may be other long vowels, or other examples of the ones shown above. (That said, the general relative scarcity and possibly only recent emergence of /e/ and /ɔ/ in particular make the absence of /e:/ and /ɔ:/ not surprising.) Long vowels in general were a point of uncertainty, with potential for over-emphasis (and therefore sometimes lengthening) by speakers during single-word elicitation, and a demonstrable lack of objectivity or reliability in reporting of long vowels, at least from some speakers. The long vowel in yu:m is the only one completely agreed upon by the speakers I asked; also, asking one speaker about a list of words which definitely could not have contained long vowels (because of their taking a particular possessive pronoun as discussed in 5.1.2.1, for example) produced claims that some of them did contain long vowels.

#### 4.3.2.2 Diphthongs and vowel sequences

Having addressed long vowels, we turn now to interpretation of combinations of dissimilar adjacent vowels. Some of these occur across morpheme boundaries; these are disregarded as candidates for diphthongs.

Many vowel combinations that are often pronounced as diphthongs in normal speech were shown to be sequences – with each vowel the nucleus of a different syllable – by eliciting

careful, deliberate speech. This was done by asking speakers to say a word very slowly. Meter in indigenous song proved inconclusive as a definitive indicator of diphthongs and sequences, as the vowel combination in question could, even for occurrences the same word, occur as one syllable or two in different songs or parts thereof.

Some vowel combinations are consistently pronounced as diphthongs. The following two have been reported as diphthongs throughout the course of this research.

162	γᵛᵛ	bush rope
163	γᵛar	say

A third, /eə/, may also be always a diphthong in Ura, but because only one example γaěβeě ‘wingbeans’ has been properly investigated (and found to contain the diphthong [eě]), this cannot be claimed conclusively.

For other vowel combinations, the difference seems to be distributional. An /iə/ in particular was consistently pronounced as one syllable when word-initial, and two syllables elsewhere, as illustrated below.

164	ᵛᵛ	yes INFORM
165	ᵛᵛp-mət-ki	sunken mouthed woman
166	mi.ək	papaya ( <i>Carica papaya</i> ) PL
167	ud-i.əm	two

However, the variation we observe above could reflect /i/ filling the onset of the syllable when word-initial, realised as [j]. This would give [jɔ] (as for jɔ.e in 4.3.1.3.1) and [jɔp.mət.ki] for 164 and 165 above respectively. This is discussed further following the vowel combination inventory below.

So far we have addressed five of the thirty possible vowel combinations (that is, excluding long vowels) for Ura's six-vowel system. /ə/ never occurs adjacent to other vowels, which eliminates a further ten combinations. For the sake of the table below, let us assume that it also never occurs as a long vowel; its limited distribution plus the very rare nature of long vowels makes this not an unreasonable assumption. In fact twenty of the possible thirty combinations were observed in the course of this research. The table below displays all possibilities (and also long vowels) excluding those involving /ə/ and a discussion follows. As stated in 2.2, diphthongs are marked as  $\check{V}V$  or  $V\check{V}$  diphthongs as appropriate, and sequences as  $V.V$ . Where there is a diphthong but its most prominent element is uncertain, this is marked with a tie bar  $\widehat{V}V$ . Grey indicates an absence of the combination in the data.

	<b>i</b>	<b>e</b>	<b>a</b>	<b>ɔ</b>	<b>u</b>
<b>i</b>		ie, i.e	ia, i.a	io, i.ɔ	iu (?), i.u
<b>e</b>			ea	eɔ	
<b>a</b>	aĩ, a.i	$\widehat{ae}$ , a.e (?)	a:	aɔ, a.ɔ	aũ, a.u
<b>ɔ</b>	ɔĩ	ɔe, ɔ.e	ɔa		
<b>u</b>	ũi, u.i	ue, u.e	ua, u.a		u:

(/ea/ is marked neither as a diphthong nor sequence because this information is unknown; an explanation follows presently, just before example 177.)

An initial overview of the table highlights again the limited distribution of /e/ and /ɔ/, with almost all absent combinations containing either /e/ or /ɔ/.

Also noticeable is that most combinations have both sequential and diphthongal realisations. In some words these combinations were consistently pronounced as diphthongs, while in others they were consistently sequences. In yet other words, reporting and production by speakers was varied.

Below are brief comments where applicable and examples for each of the combinations illustrated in the table.

/ie/ is rare, and only two examples (one diphthongal and one sequential) were found in the course of this research (though the stem containing the second occurs with several different affixes).

168	ĩe	plant with edible leaves ( <i>Abelmoschus manihot</i> ) (Tok Pisin ‘aibika’) PL
169	li.eɫ-a-it	rooster sg-SG

The /ie/ combination also occurs in a triphthong, whose first two components are realised as [je], as shown.

170	ʔieĩ/
	[jeĩ]
	yes INFORM

This word also contains an /ei/ combination, which is otherwise unobserved in these data.

This can however be excluded as exceptional because for a word such as ‘yes INFORMAL’ to be phonologically unusual would not be surprising.

/ia/ has both diphthongal and sequential realisations:

171	i.ɨ.aɾ	green
172	ɨaɾ	life

/io/ has both diphthongal and sequential realisations:

173	mi.ɔk	papaya ( <i>Carica papaya</i> ) PL
174	ɨɔ	yes INFORM

/iu/ has both diphthongal and sequential realisations:

175	si.u	wrinkles (N)
176	u.ɨu-ɣa	long

siu and other potentially /i.u/ words were reported variably; none were consistently reported as sequences.

/ea/ is rare, and the only example discovered in the course of this research is from an Ura text, so no information is available about its pronunciation.

177	ɨumeaɾ	(gloss uncertain; possibly ‘rescue’ <sup>13</sup> .)
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<sup>13</sup> Data from Rosensteel et al (Scripture) (nd.)

/eɔ/ apparently has only diphthongal realisations:

178	yaě.βeɔ̃	wingbeans
-----	----------	-----------

However, its rarity means it is unwise to draw conclusions.

/ai/ has both diphthongal and sequential realisations:

179	laĩt-ki	navels-SG
180	ka.i.rak	(name of people group)

kairak was pronounced both with a sequence and a diphthong at various times. No

morphological complexity is apparent but it could conceivably be polymorphemic.

/ae/ has both diphthongal and sequential realisations:

181	sāel-ya	left-M.SG (left-handed male)
182	le.βa.et	four

Although 182 was definitely trisyllabic, the five other investigated occurrences of ae combinations were quite clearly diphthongs. It is possible that le.βa.et has a morpheme break between [a] and [e], though there is no evidence for this from its form (at least from the familiarity developed with Ura morphemes over the course of this research). If so, all monomorphemic ae combinations may be diphthongs.

/a:/ has been mentioned in 4.3.2.1 as a long vowel. No evidence was found for a disyllabic

/a.a/.



/aɔ/ has both diphthongal and sequential realisations:

183	βaɔ̃-yi	grandmothers-SG
184	ya.ɔs	lungs

yaɔs was reported and produced variably, not consistently as a sequence.

/au/ has both diphthongal and sequential realisations:

185	jaũs	evil spirits
186	sa.un.ga	belt (N)

/ɔi/ apparently has only diphthongal realisations:

187	ɔĩ	bush rope PL
-----	----	--------------

/œ/ has both diphthongal and sequential realisations:

188	ɔ̃œp	tears
189	mœ.e	all

mœe was reported and produced variably, not consistently as a sequence.

/ɔa/ apparently has only diphthongal realisations:

190	ɔ̃ar	say
-----	------	-----

/ui/ has both diphthongal and sequential realisations:

191	sũ i-gi	rain-SG (rain shower)
192	du.i m-ga	elbows-SG

duim-ga was reported and produced variably, not consistently as a sequence.

/ue/ has both diphthongal and sequential realisations:

193	βə.βũ e	sweet potato, species of <i>Ipomea</i> PL
194	ɹu.e r	first (gloss uncertain)

/ua/ has both diphthongal and sequential realisations:

195	gũ a	my
196	su. a	steal

It is interesting to note that although no examples of unambiguous  $\widehat{iV}$ / diphthongs were found (no/C $\widehat{iV}$ (C)/ syllables, only /# $\widehat{iV}$ .../ or / $\widehat{iV}$ .../), this is not the case for  $\widehat{uV}$ /. All diphthongal  $\widehat{uV}$ /s occurred following an onset, not syllable-initially.

/u:/ has been mentioned in 4.3.2.1 as a long vowel. No evidence was found for a disyllabic

/u.u/.

### 4.3.2.2.1 Diphthong element prominence

Ura has both falling and rising diphthongs. Rising diphthongs (in which the second element is more prominent than the first) account for the majority. In the table below, grey indicates combinations that were not observed as diphthongs in the course of this research.

	<b>i</b>	<b>e</b>	<b>a</b>	<b>ɔ</b>	<b>u</b>
<b>i</b>		ǐe	ǐa	ǐɔ	ǐu
<b>e</b>					
<b>a</b>					
<b>ɔ</b>		ǒe	ǒa		
<b>u</b>	ǔi	ǔe	ǔa		

The following are falling diphthongs; that is, the first element is more prominent than the second.

	<b>i</b>	<b>e</b>	<b>a</b>	<b>ɔ</b>	<b>u</b>
<b>i</b>					
<b>e</b>				eǒ	
<b>a</b>	aǐ	aǐ		aǒ	aǔ
<b>ɔ</b>	ǒǐ				
<b>u</b>					

In summary, a ban on tautosyllabic [+high] sequences generally governs which of a diphthong's elements will be most prominent; any /iV/ or /uV/ diphthong will be rising, and

any /aV/ falling. When /e/ and /ɔ/ are adjacent to each other, /e/ is most prominent, and when /i/ and /u/ are adjacent, the second of the pair is most prominent.

#### 4.3.2.2.2 *Diphthong origins*

There is reasonable evidence that consecutive vowels within a morpheme may exist because of historical elision of a consonant. The following table shows some [æ] occurrences and the corresponding words in other Baining languages. Most of them appear to be cognates, though a few seem to be instead synonyms, probably indicating the absence of a cognate. It is not clear from this research whether baes and ɹæe contain diphthongs or sequences.

	Ura	Gloss	Kairak	Mali	Qaqet
197	baes, baes-ka	type of tree PL, SG	berəs, berəs- ka	baləs, baləs- ka	baɽəs, baɽəs- ka
198	ɹæe, ɹæe-ɣa	small men's string bags PL, SG	ralaŋ, raləŋait	ɹal, ɹal-ka	səgən, səgənəet
199	ɹaēŋ, ɹaē-ga	ditches PL, SG	ɣ <sup>w</sup> er, ɣ <sup>w</sup> er-ka	ɹaēŋ, ɹaē-ga	ravuiŋ, ravuiŋ-ga
200	ɣaēŋ, ɣaē-ga	stars PL, SG	eldaŋ	ɣaēŋ, ɣaē-ga	waldaŋ, waldaŋ-a-ɣa
201	gaēp, gaēp- ki	bush palm trees PL, SG	galəp-ki	galəp, galəp- ki	galəp, galəp- ki

### 4.3.3 Vowel centring

Vowel centring is commonly seen in three circumstances, which are explained below.

#### 4.3.3.1 Suffixed forms

/a/ in the unsuffixed form of some nouns is realised as [ə] in suffixed forms, when /a/ is in the final syllable of the stem. The following are a few examples; a larger example set is found in the Appendix within Table 11.

202	ɟap, ɟəp-ki	traditional stone axes PL, SG
203	ɣʒebap, ɣʒebəp-ga	tongues PL, SG
204	ɟaŋam, ɟaŋəm-gi, ɟaŋəm-ga	bananas PL, SG, rope of bananas
205	mənap, mənəβ-it, mənəβ-itnəm	(gloss uncertain, possibly ‘tiredness’) PL, FLAT/THIN.SG (eyelid), FLAT/THIN.DL (eyelids DL)

It can be seen in examples 202-205 that centring is observed in both monosyllabic and polysyllabic stems. It does not happen for /a/s in a non-final syllable in the stem (204) and occurs regardless of the length or phonological content of the suffix.

However, there are also many examples where /a/ occurs consistently as [a]. No phonological factors seem to determine this. As above, a larger example set is found within Table 11 of the Appendix; a sample follows below.

206	sap, sap-ki	traditional bludgeons PL, SG
207	bəŋaŋ, bəŋaŋ-əs	night PL, GRPD <sup>14</sup>
208	ulan, ulan-gi	snakes PL, SG
209	bulap, bulap-ka	housebroken/tame animals PL, SG

Centring also does not occur when /a/ is part of a diphthong or vowel sequence; this follows from the fact that [ə] does not occur in diphthongs (see 4.3.2.2). A few examples are shown below; more are given in Table 2 of the Appendix.

210	bi.as, bi.as-ka	sores/cuts/wounds, blood
211	ɟae, ɟae-ɣa	small men's string bags PL, SG
212	raɔ, raɔ-ɣi	walnut (trees) PL, SG

Note that it is unlikely that we in fact have an /ə/ phoneme with an [a] alternant occurring in the final syllable of unsuffixed forms, since the /ə/ phonemes in the words below show no alternation. A further seven examples occur in Table 10 alone of the Appendix.

213	ɟəc, ɟəj-et	hand and arm PL, SG
214	artən, artən-gi	jaws/cheeks, jaw/cheek/chin
215	βəm, βəm-gi, βəb-it	mouths PL, SG, FLAT/THIN.SG (lip)

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<sup>14</sup> Gloss supplied by Rosensteel, p.c.

### 4.3.3.2 Alternation in /sa/

Illustrating superficially the same phenomenon but with more obvious phonological motivation is preposition sa ‘to’<sup>15</sup>. Similar variation is observable in a small number of other Ura words; centring in this context would be a good topic for further research. The table below shows /a/-/ə/ alternation and cognates in two other Baining languages; a discussion follows.

	[sa]	gloss	[sə]	Kairak	Qaqet
216	sa ama	to DET	-	sa ama	sa ama
217	sa gem	to with	-	sa gələm	sa gəl
218	sa e	to at	-	(set)	(sa βət ma) <sup>16</sup>
219	sa i βuk	to thus on.top	-	si βuk	sa i βuk
220	-	to on	sə ɽəm	sə rəm	sa rəm
221	-	to on	sə βət	sə βət	sa βət
222	-	to inside	sə mət	sə mət	sa mət
223	-	to inside	sə βəm	sə βəm	sa βəm
224	-	to middle.of	sə məni	sə məni	sa məna
225	-	to beside	sə ɽage	sə ragəl	sa rəmit
226	-	to inside	sə βa	sə βa	sa βa
227	-	to on	sə ɽa	sə ra	sa ra

<sup>15</sup> Glosses and list of constructions for investigation supplied by Rosensteel, p.c.

<sup>16</sup> set and sa βət ma appear to be not real cognates for sa e.

We observe that /sa/ is [sə] before consonants and [sa] before vowels, except for sa gem. We must assume that this context for [a]-[ə] alternation is separate from the others in 4.3.3.1 and 4.3.3.3, as it behaves in an almost entirely predictable manner.

As regards the cognates, the unvarying Qaqet prepositions indicate Ura sə is an alternant of sa, not the other way round. The Kairak prepositions, in contrast, are very similar to Ura. At the time of eliciting the cognates it was hoped that some more enlightening phonological background would be revealed, particularly for sa gem, but no other motivating factors are obvious.

#### 4.3.3.3 Reduplicated forms

The third context for vowel centring in Ura is reduplication. Reduplication seems somewhat associated semantically with movement (perhaps loosely iterative) and/or onomatopoeia. The base is reduplicated in its entirety; this reduplicant precedes the base, and sometimes its vowel is centred to [ə]. The reader will note that in some forms shown in the table below there is a suffix, which is not part of the base, and therefore not reduplicated. Our sole example of a polysyllabic base shows centring occurring on the stressed syllable, not the unstressed, showing that this alternation is centring rather than weakening.

	<b>Reduplication with /V/ → [ə]</b>	
228	kət-kut	chop (wood)
229	βlək-plək	of various colours: striped, spotted
230	ŋʉaləŋ-ŋʉaləŋ	flowers (of bush or tree)
231	nəs-nəs-ki	sharp
232	rəβ-ə-rip	swell up



All vowels undergo centring, though curiously /i/-centring is accompanied by an epenthetic [ə] between the base and reduplicant (232). The only two instances of /i/ centring in reduplicants found during this research contain this epenthetic [ə]. (The other instance is found in Table 3 of the Appendix.)

In other forms, however, no vowel centring is observed. No phonological conditioning is apparent regarding whether centring occurs; no semantic theme is obvious in either group, and both groups contain nouns, verbs and adjectives, ruling out the significance of grammatical category. Some examples follow.

<b>Reduplication with no vowel change</b>		
233	βluc-pluc	be becoming loose
234	γəŋ-gəŋ-gi	butterflies-SG
235	sak-sak-pəm-ga	light (ADJ; weight)
236	er-er	crickets
237	ir-ir	hiccups (N)

Naturally, there are also examples where no centring is apparent because the base itself contains /ə/. A few examples follow. More examples of reduplication for all three types are found in Table 3-Table 5 of the Appendix.

Reduplication with /ə/		
238	gər-gər	thorns
239	yrəŋ-grəŋ	crack, pop (of bones)
240	ɹən-dən-ga	sturdy/stable

#### 4.3.3.4 Further research opportunities

In addition to the centring described above, there is also centring of vowels in an utterance to /ə/ in a small number of usage contexts, for example when speakers call short greetings to each other across medium distance: e.g. səp-bəŋaŋ becomes səp-bəŋəŋ. Though examples of this were only available sporadically and therefore were not abundant, it would be very interesting to collect more and see under what circumstances (spatial, environmental or social) these occur.

#### 4.3.4 Vowel Harmony

Vowel harmony is a feature in Ura, but is neither pervasive nor very phonologically predictable. In the data gathered it only happens with [e] or diphthongs containing [e], when in vowel sequences or close proximity to harmony-inducing vowels. Other vowels will be discussed in terms of harmony in 4.3.4.2.

##### 4.3.4.1 /e/ and /i/

This occurs in around half of cases when a suffix with the high front vowel /i/ in its first syllable is added to a stem with /e/ in its final syllable. An informal representation of this alternation is as follows:

/e/ → [i] / \_(C)+(C)i

Harmony is observed in diphthongs, as the following examples illustrate.

Examples of /e/ → [i]			
241	laet	laĩt-ki	navels PL, SG
242	em-ga	im-gi	boy, girl
243	yæseŋ	yæsiŋ-ini	hair/fur PL, SM.SG
244	nes	niis-ki	birds' tails PL, F.SG
245	enep	eniβ-i.ɔŋ	tribes/generations PL, SM.PL
246	ɟɛm-ga	ɟĩim-gi	boy, girl <sup>17</sup>

Although laet was not specifically investigated regarding whether it contained a diphthong, it could reasonably be assumed to, since as mentioned in 4.3.2.2, the large majority of [ae]s are diphthongs, and since laĩt-ki is diphthongal also. The existence of harmony in diphthongs is not in question, however, as it is illustrated in 246. We observe in 245 that either the process is not recursive, or it only occurs across a morpheme boundary.

A full list of vowel harmony examples discovered during the course of this research is found in Table 6 of the Appendix.

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<sup>17</sup> The difference in meaning between 242 and 246 was unclear.

Vowel harmony is leftward-spreading only; /e/ with a preceding /i/ remains unchanged.

247	-ige	FLAT.SIDED.SG
248	-isem	LONG/THICK DL
249	məyiɛ	yesterday

#### 4.3.4.1.1 Exceptions

As mentioned under 4.3.4, there are some of the instances of vowel harmony not occurring.

Examples follow; a few more are found in Table 7 of the Appendix. The number of exceptions – almost the same as the number that do show harmony – raises the question of which is actually exceptional.

	Examples of /e/ as [e]		Possible explanation, if any (discussion below)
250	manɛŋ-a-ɣi	foreheads-[a]-SG	epenthetic [a]
251	er-er-ɣi	crickets-SG	reduplication
252	βem-ini, βem-gi	small pig; female pig	morphophonology affecting stem

	Examples of /e/ as [e]		Possible explanation, if any (discussion below)
253	et-ki	large gardens-SG	morphophonology affecting stem
254	gaep-ki	black palm trees-SG	?
255	ɣɔep-ki	tears-SG (small puddle)	?
256	səɣɔe-ɣi	forked posts/branches-SG	?

<sup>18</sup> Data from Rosensteel et al (Dictionary Notes) (nd.)

257	ɣek, ɣe-ɣi	caves PL, SG	?
258	es-iɣɔm	small hawks' nests-DL	?

**Epenthetic [a] (250):** It seems very plausible that the epenthetic [a] could block vowel

harmony. At least three more words illustrate this. There were no instances found where the epenthetic [a] does not block vowel harmony. See section 5.1.1 for discussion of this epenthetic [a].

**Reduplication (251):** This example (with at least one other form like it, in Table 7 of the Appendix) suggests that reduplicated stems resist vowel harmony. There were no examples found of reduplicated forms undergoing harmony. However it is not uncommon for reduplicated forms to be resistant to phonological processes. Wilbur's "Identity Constraint" (1973:58) states that "There is a tendency to preserve the identity of R<sub>0</sub> [base] and R<sub>r</sub> [reduplicant] in reduplicated forms." Since there is no distinction made in this tendency, we have no clues as to which of the morphemes is the base and which is the reduplicant in these completely reduplicated forms.

**Morphophonology affecting stem (252-253):** This might be explained if harmony is affected by the fact that in these forms [e] alternates with [a] in other forms of the stem; compare the plurals βlam 'pigs' and lat 'gardens' respectively.

**gaep-ki, ɣɔep-ki (254-255):** We cannot claim that the stem-final /p/ in particular blocks harmony (see enep, eniβ-iɣɔŋ at 245), nor would it be a particularly natural explanation. The occurrence of harmony in 246 means that their diphthongal status cannot be the reason either.

**səyǝe-yi (256):** It cannot be that a vowel would not harmonise merely because the potentially harmonising vowel is in an open syllable; the tables in 4.3.4.1.2 show proof of this. However, there remain at least four vowel-final stems including səyǝe in which harmony does not take place (see the Appendix, Table 7).

**ye-yi (257):** There seems no good explanation for this. The plural form is yek, and we observe a parallel situation below in which harmony does occur.

259	lek, li-yi	hole in the side of something PL, SG
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**es-iɔm (258):** This too seem inexplicable. Again there are near-minimal pairs displaying vowel harmony as shown below.

260	em-ga, im-gi	boy; girl
261	nes, nis-ki	birds' tails PL, SG

#### 4.3.4.1.2 Harmony from both [-back] and [+back] high vowels

The following table showing forms of the phrase meaning ‘stay there’ displays clear harmony also, and now we see that high vowels in general, not just high front vowels, produce harmony, as in yali lun, yali lut.

[e]		[i]	
yale len	2/3 DL	yali lun	1 DL
yale lem	3 F DL	yali liom	3 M DL
yale let	3 LONG/THICK SG	yali lit	3 FLAT/THIN SG
yale ya	3 M SG	yali yi	3 F SG

[e]		[i]	
ɣale ləm	3 RND.SIDED	ɣali lut	1 PL
ɣale ləs	3 GRPD SG	ɣali lini	3 SM SG
ɣale ler	3 VERY LARGE SG	ɣali lige	3 FLAT.SIDED SG
ɣale ɲət	3 NEUT	ɣali lisem	3 LONG/THICK DL
ɣale ɲɔ	1 SG	ɣali limem	3 GRPD DL

The same happens with at least two other verb forms as shown below:

[e]		[i]	
sayule lem	work hard 3.F.DL	sayuli liəm	work hard 3.M.DL
dayule ɟa	leave 3.PL	dayuli liəm	leave 3.M.DL

All the initial [l]s on the pronouns appear to be epenthetic. This phenomenon was not conclusively investigated in the course of this research, and would be a good topic for further research.

#### 4.3.4.2 /ɔ/ → [u] harmony

The subsequent question is, after observing vowel harmony in height from /e/ to [i]: is /ɔ/ realised as [u], given the right phonological environment?

One obstacle to answering this is simple statistics. As mentioned in 4.3.1.4.2, /ɔ/ makes up only 6.5% of the vowel occurrences. If one combines this with the fact that /u/ makes up only seven percent, and needs to occur **following** /ɔ/ to be a trigger for vowel harmony, we see

why it is difficult to find opportunities for harmony. This is compounded by a lack of suffixes containing /u/. In fact no instances of /ɔ/ before /u/ were identified.

However it was shown in the examples of ɣale/ɣali above that the backness of the harmony candidate and the harmony-inducing vowel need not be the same (with a back /u/ motivating harmony for a front /e/), so we can also check whether /ɔ/ raises before /i/. We find that it does not, except for one example where [ɔ] is a constituent of a diphthong.

262	mɔr-ɣi	big
263	eβɔp-ki	female humans-SG
264	t-pɔt-ki	hammocks/slings for babies-SG
265	ɟɛm-ga, ɟɛim-gi	boy, girl

In summary, vowel height harmony is observed with /e/ being realised as [i] in environments conducive to harmony for some words; /ɛ/ is also realised as [ɛi] in favourable environments, but /ɔ/ is generally not realised as [u] in similar circumstances.

#### **4.4 Structure of the Ura syllable**

The possible Ura syllable types can be represented as follows:

$$((C)C) (V)V (C)$$

Onsets are optional and can consist of one or two consonants. Nuclei can be monophthongs or diphthongs. Codas always consist of a single consonant, as mentioned in 4.2.6. They are also optional. This gives twelve possible combinations, all but two of which are illustrated below.



Two examples are given for each type. Where there are polysyllabic words, the example syllable is in **bold**. Syllable boundaries have been marked in this section for clarity. They can also be assumed to be present at morpheme boundaries, in this section only. Some comments are made regarding syllables' frequency of occurrence; these comments are made only for rare types. Those not commented on are in fact also not all equally common, but a proper statistical comparison of the frequency of various types was beyond the scope of this research, so only rarity of unquestionable significance has been noted.

#### 4.4.1 Examples of possible syllable types

##### V

266	<b>i.səm</b>	birds
267	<b>a</b>	his

##### ǃV

268	<b>ǃe</b>	plant with edible leaves ( <i>Abelmoschus manihot</i> ) (Tok Pisin 'aibika') PL
269	<b>u.ǃu-ya</b>	long (ADJ)

Ura has many occurrences of vowels in hiatus (V.V); however diphthongs usually occur in a CVVC context. In fact, the only apparent VV syllables are iV, which as we saw in 4.3.2.2 can be analysed as [jV].

##### CV

270	<b>si</b>	red cedars
271	<b>-ka</b>	M.SG

## CVV

272	yaě.βeǰ	wingbeans
273	ɣɔĩ	bush rope PL

CVV syllables tend to be questionable; the first example listed above has two CVV syllables but both end in [e] or [ɔ], which have similar distribution and (for /e/ at least) there is often a relationship to /l/ or other vowels either cross-linguistically or within Ura (see 4.3.1.4.2). The second example is ɣɔĩ ‘bush rope’; the word for ‘piece of bush rope’ is yaũl-it. One can observe similar variation cross-linguistically in another CVV syllable below. Syllable and morpheme boundaries have not been marked in the Kairak and Mali words due to insufficient data being obtained in the course of this research to mark such distinctions.

Ura	Gloss	Kairak	Mali
ɟa e-ɣa	type of small string bag-SG	ralaŋ (PL) raləŋait (SG)	ɟal (PL), ɟalka (SG)

## CCV

274	iŋ.bra.nas.ki	whirlpool
275	sru	old

This syllable type is rare.

(Morpheme breaks are not shown in 274, as they were not ascertained during the course of this research; one could reasonably guess however that the final [ki] would be a F SG suffix, at least.)

**CCVV**

No syllables of this type were observed in the course of this research.

**VC**

276	<b>is-ka</b>	roads/paths-SG
277	<b>em</b>	mushrooms

**VVC**

278	<b>ĩɔp-mət-ki</b>	sunken-mouthed woman-SG
279	<b>ĩar</b>	life

This syllable type is also rare. Glosses for the first two morphemes in 278 were not pursued in the course of this research, though the [ki] is undoubtedly a F.SG suffix.

**CVC**

280	<b>βəm</b>	mouths
281	<b>ɣep</b>	spears

**CVVC**

282	<b>laĩt</b>	navels
283	<b>sāel</b>	left (direction)

Although other syllable types containing VVs are either questionable, rare or apparently non-existent, CVVC syllables are relatively plentiful. This is unexpected, since one would expect scarcity of a less complex syllable type (VV, CVV etc) to predict scarcity or absence of a

more complex type (CVVC). One may guess that the VV diphthongs now observable are (or were) at some level CV.VC, now pronounced C<sup>̣</sup>VVC or CV<sup>̣</sup>C. This would be a worthy topic for future investigation.

### CCVC

284	<b>sləp</b>	bones
285	<b>brəŋ</b>	mud / soft ground

### CCVVC

No syllables of this type were observed in the course of this research.

## 4.4.2 Further comments on contiguous vowels and consonants

### VVV

A VVV syllable is not possible based on the representation at the beginning of 4.4; it should be addressed however because in 4.3.1.3.1 there was mention of three words /iaũŋ/, /iaũs/ and /jɔ.e/. These should be analysed as having initial consonants; that is, [jaũŋ], [jaũs] and [jɔ.e] respectively, for reasons discussed in that section.

As regards the current topic, [jɔ.e] can be ignored as it is polysyllabic and so does not present a VVV syllable type possibility. For the remaining two, the analysis suggests the syllable pattern schema relates to the surface [j...] form rather than the more abstract [i...] form.

There was one exceptional example of a triphthong in 4.3.2.2 under ‘/ie/’.

**CCC**

Although CCC is not possible within a syllable, one may wonder whether it is ever found across a syllable boundary. For Ura, this could only be manifest as C.CC; codas are never complex, so CC.C would be impossible.

One does in fact observe C.CC, as follows. As in 274, morpheme breaks are not shown in 286 below.

286	iŋ.bra.nas.ki	whirlpool
287	βrən-brən	shake, shiver

**4.4.3 Summary**

Ura allows both onsets and codas, and complex nuclei. Onsets can be complex, consisting of up to two consonants, but codas cannot. Most syllable types possible within Ura's syllable structure parameters are in fact found in the language, but there are rather surprising and as yet not well-understood idiosyncrasies related to sequences currently pronounced as diphthongs.

**4.5 Stress**

For most examples through this thesis stress is not marked, both because it is not relevant to the issue being discussed and because it was sometimes difficult to confirm, or to confirm consistently from multiple sources. Reasonably clearly and consistently stressed words were chosen for the examples in this chapter. It should be noted that decisions on consonant syllabification have been made not after consultation with speakers but purely on the basis of onset maximisation while bearing in mind the known acceptable word-initial consonant clusters as detailed in 4.2.6, so as to not assign more to an onset than is allowable in Ura.

Stress is not contrastive in Ura; rather it appears to be basically penultimate but affected by syllable weight. Primary stress must be on one of the last two syllables. It will be on the first heavy one; or if neither is heavy, on the penultimate syllable. A heavy syllable in Ura is one with a heavy rhyme, either containing a branching nucleus or a coda. Examples for various word lengths and syllable types are shown below, with discussion.

#### 4.5.1 Disyllabic words

Disyllabic words follow the stress pattern described above regardless of whether they are monomorphemic or polymorphemic. In the first table below, stress occurs on the penultimate syllable in 288-290, and on the final (heavy) syllable in 291-293.

<b>Disyllabic monomorphemic words</b>		
288	'ɣaku	no
289	'məni	middle
290	'snənbət	question
291	sə'gək	one
292	du'rac	fowls
293	ɣu'sem	intestines

It is worth checking for any discrepancies between stress in monomorphemic and polymorphemic words, since there certainly is some morphophonological variation elsewhere in Ura. Polymorphemic words display the same pattern, as follows.

<b>Disyllabic polymorphemic words</b>		
294	'ri-gi	river/water-SG
295	'sru-γi	old woman-SG
296	'mər-ŋət	big
297	ɲa-'tet	you SG are going
298	du'l-am	stones-DL
299	βə'b-it	mouths-FLAT/THIN.SG (lip)

#### 4.5.2 Trisyllabic words

Stress in trisyllabic words also conforms to this pattern. The table below shows monomorphemic examples. Again, three examples are given showing penultimate stress, followed by three with final stress in the presence of a heavy final syllable.

<b>Trisyllabic monomorphemic words</b>		
300	də'dən-ga	wrong
301	γǝ'e'bəŋ-ga	tongues-SG
302	slə'j-ige	bodies-FLAT.SIDED.SG
303	ᵛiǝ'β-it	taro ( <i>Colocasia antiquorum</i> ) leaves uncooked-SG
304	ᵛβəgə'l-it	coconut ( <i>Kokos nucifera</i> ) fronds-SG
305	ᵛbəɹǝ'γǝn	beach/shore

We observe in 301 that stress occurs on the penultimate syllable despite the presence of a heavy initial syllable.

Monomorphemic trisyllabic words are much more rare in Ura. Some trisyllabic stems can be seen below under 4.5.3 in examples 307-309 in the singular (suffixed) form. For those that were elicited also in the plural (unsuffixed) form at some point during the course of this research, stress was not the focus of attention at the time and was consequently not consistently noted. Trisyllabic loanwords are found later in examples 324-326 of section 4.5.6.

### 4.5.3 Quadrisyllabic words

Quadrisyllabic words (all polymorphemic)		
306	ˌmər-mər-ˈtəge	(hamlet name)
307	ˌmasiˈɬəm-gi	dreams-SG
308	ˌŋəɬaˈlɔm-gi	medium-sized brown bats with face marking-SG
309	ˌebaˈnan-gi	reddish ground frogs-SG

We observe secondary stress emerging in quadrisyllabic words, on the initial syllable.

### 4.5.4 Exceptions

Stress does not always occur on the heavier of the two last syllables (or otherwise the penultimate syllable). There are a variety of possible explanations for this. Perhaps stress has a basic position in each word (according to the rule established in this section) but actual utterances can deviate from this. Alternatively, there may be as-yet undiscovered complexity to the real stress placement rule. Possibly there are lexical classes involved, each with its own stress rule. Or Ura could simply allow exceptions to the basic stress pattern shown thus far. A few of the exceptions discovered in the course of this research are shown below; a longer (far from comprehensive) list is found in the Appendix in Table 8. A rough estimate would be that twenty percent of Ura words have irregular stress (if indeed the regular pattern has been correctly identified in this section).



Stress exceptions		
310	'da.b-em	mountains-DL
311	'ru-βek	people
312	'ud-i,ɔm	two
313	u'ra-mət	Ura (ADJ)
314	u'ra-mət-,ka	Ura man
315	'ka.i.rak-ka	Kairak man

(Secondary stress was difficult to determine in 315.)

#### 4.5.5 Words containing epenthetic [a]

An epenthetic [a] occurring between stem and suffix in some nouns (described more fully in 5.1.1) seems to be ignored in stress assignment in some cases (316-318 below), but not in others (319-321).

316	sa'γɔŋ, sa'γɔŋ-a-,γa	eyes PL, SG
317	i'grɔŋ, i'grɔŋ-a-,γa	flies PL, SG
318	snɔŋ, 'snɔŋ-a-,γa	thoughts, heart-SG

319	e's-a-γi	hawks' nests-SG
320	,marə'β-a-γa	vertical house posts-SG
321	ɹə'ŋ-a-it	backs-SG

Perhaps significantly (though puzzlingly), the instances when it does not bear stress are all words with /ŋ/-final stems.

### 4.5.6 Loanwords

Stress on loanwords can provide good insight into the stress patterns of a language, particularly if the stress in the borrowed word is different from in the donor language. Ura does have loanwords, and furthermore the stress is changed from English/Tok Pisin.

322	'masin	machine
323	'risit	receipt
324	ma'rasin	medicine
325	kɔ'kɔpɔ	'Kokopo (place name)
326	ka'rɔlin	Carolyn (name)

However, perplexingly, the stress is not where one would expect it to be based on the rule described in 4.5. In 325 the stress is as predicted but in the other four words it is penultimate despite heavy final syllables.

In closing it should be restated that stress has been particularly difficult to gauge consistently and conclusively for many words, due to both difficulty in discernment and to inconsistency in reporting and production by speakers for many words. The patterns described in this chapter should be taken as tentative rather than decisive. Further research into this area may well be an enlightening and worthwhile pursuit.

## 5 Morphophonology

As has been alluded to during the previous chapter, there is variation present in Ura that is not motivated (solely) by the phonological environment. Those areas of morphophonological variation that have been discovered during the course of research will be discussed in this chapter.

Recall that the examples are in normalised phonetic (not phonemic) transcription unless otherwise stated.

### 5.1 Epenthetic [a]

There are two environments in which an epenthetic [a] is seen with reasonable frequency:

between a noun stem and suffix, and at the end of possessive pronouns. A discussion follows.

The pre-suffixal [a] is marked with morpheme breaks on either side for clarity. In 5.1.2,

where the epenthetic [a] has different (phonological) motivation, no such marking is made.

#### 5.1.1 Pre-suffix epenthetic [a]

For some nouns, an epenthetic [a] occurs in between the stem and suffix.

327	marap, marəβ- <b>a</b> -ya	vertical house posts PL, SG
328	it, iɿ- <b>a</b> -it	lice PL, SG
329	βuk, βuɣ- <b>a</b> -yi	coconut ( <i>Kokos nucifera</i> ) growth/sprout (Tok Pisin 'kru') PL, SG

It is noteworthy that this was not a point of variation for speakers. When investigating other phenomena, claims about the true pronunciation of words could vary from speaker to speaker,

or even from one discussion to the next with the same speaker. This is evidenced in the upcoming section on inconsistent reporting (5.1.2.4). In contrast, the reported presence or absence of the epenthetic [a] never varied.

Around fifteen to twenty percent of nouns display epenthesis in the allowable environment (discussed below), but there is no apparent phonological or semantic coherence within the set of those that do and those that do not.

### Near-minimal pairs

330	mənap, mənəβ-it	(gloss uncertain, possibly ‘tiredness’) PL, FLAT/THIN.DL (eyelids DL)
331	marap, marəβ-a-γi	vertical house posts PL, SG

332	laɪt, laɪt-ki	navels PL, SG
333	laet, luɔ-a-γi	house walls PL, SG

334	is-ka	paths/roads-SG
335	es, es-a-γi	hawks’ nests PL, SG

336	ses, ses-ka	string (for making string bags) PL, SG
337	mes, mes-a-γa	grasshoppers PL, SG

338	em, em-gi	tusks PL, SG
339	em, em-a-it	mushrooms PL, SG

We will now look at the environments in which epenthesis does occur. More examples show that epenthesis only happens with monosyllabic suffixes.

	<b>Monosyllabic suffix</b>	<b>Polysyllabic suffix</b>	<b>Gloss</b>
340	barɔr- <b>a-it</b>	barɔr- <b>itnək</b>	betel palm ( <i>Areca catechu</i> ) fronds FLAT/THIN.SG, FLAT/THIN.PL
341	li.el- <b>a-it</b>	li.el- <b>itnəm</b>	rooster tail feathers FLAT/THIN.SG, FLAT/THIN.DL
342	es- <b>a-ɣi</b>	es- <b>iɽəm</b>	hawks' nests SG, SM.DL
343	em- <b>a-it</b>	em- <b>iɽŋ</b>	mushroom SG, constellation SM.PL <sup>19</sup>
344	saɣŋ- <b>a-ɣa</b>	saɣŋ- <b>itnək</b>	eyes-SG, eyes-FLAT/THIN.PL (faces)

Table 9 and Table 10 in the Appendix list over 250 nouns grouped according to whether or not epenthesis occurs. As mentioned in the consonants section 4.2.2.1, we do not find it at all with stems ending in the palatals. At this point one can only speculate about the cause of this. It could be coincidence, but the sheer number of attested epenthesis examples with stems ending in other phones makes the gap rather conspicuous. Perhaps the palatals' limited distribution in general is an indication of them having entered the language more recently; possibly after the development of this (well-established and regular) epenthesis pattern.

Epenthetic [a] behaves differently to the standard /a/ in that it does not alternate with /ə/.

Exploring this further, recall that the discussion of vowel centring for /a/ in 4.3.3.1 showed two otherwise arbitrary sets of words, one where a final-syllable /a/ in the stem alternated

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<sup>19</sup> 'Constellation' is metaphorical; the word for a cluster of dim stars is the word for mushrooms, with a SM.PL suffix.

with /ə/ and another where it did not. Overlap is observable in words like marəβ-a-ya above, where both centring and epenthesis occur. One would expect words where both epenthesis and centring are possible to be fairly evenly distributed between the four possibilities shown below.

	No /a/ → [ə]	/a/ → [ə]
No epenthetic [a]		
Epenthetic [a]		

Table 11 in the Appendix shows that in fact there was only one word məran-a-ɣi ‘overgrown’ (and this not double-checked; there is potential for recording error) found in the course of this research which displays epenthesis but no centring; the other three categories have between seven and eighteen entries, as follows.

	No /a/ → [ə]	/a/ → [ə]
No epenthetic [a]	18	12
Epenthetic [a]	1	7

This leads to the conclusion that there is a strong tendency for [a]-epenthesis not to occur following an /a/ in the preceding syllable (but rather following the centred alternant /ə/ in these cases). This tendency can also be observed in the following table. Epenthesis occurs when the final nucleus of the stem (ordinarily [a] in these words) has a different alternant in the suffixed form. Syllable boundaries and diphthongs are marked near the nucleus in question, where they were clear.

345	lu.at, lu.ɿ-a-γi	house walls PL, SG
346	igūam, igum-a-it	fern (grows under cacao ( <i>Thea abroma</i> ) tree) PL, SG
347	naŋ, nauŋ-a-γa	opossums PL, SG
348	artaɔ, artu.aγa	black cane for woven walls PL, SG
349	laɔ, lu.aγa	eggs PL, SG
350	lae, li.aγa	type of tree PL, SG
351	ɿae, ɿi.aγi	large dark spotted lizards PL, SG

In 348-351 above the morpheme breaks have been omitted, as it is conceivable that the [a] in question could be not epenthetic but rather part of the stem. This would mean vowel change independent of an epenthetic [a]. This seems less likely, however, because of the existence of similar words with no epenthesis, which remain unchanged as follows:

352	βaǎ, βaǎ-γi	grandmothers PL, SG
353	raɔ, raɔ-γi	walnut (trees) PL, SG
354	γadaɔ, γadaɔ-γi	taro ( <i>Colocasia antiquorum</i> ) leaves cooked PL, SG

355	ɿae, ɿae-γi	small men's string bags PL, SG
356	sāel, sāel-γa	left, left-M.SG (left-handed male)
357	gāep, gāep-ka	black palm (species of <i>Caryota</i> ) PL, SG

However we do observe vowel change that is definitely independent of an epenthetic [a]:

358	βiam, βim-gi	peanuts ( <i>Arachis hypogaea</i> ) PL, SG
359	miyuaŋ, miyuj-gi	creeper with soft leaves and flowers PL, SG

It would be useful to know what happens in loanwords, but regrettably there are very few discovered in the course of this research that take suffixes. One is kəβ-it ‘comb (N)’, which shows no epenthesis. Another, kapa ‘iron (roofing)’ becomes kaβ-itnək in the FLAT/THIN plural, interestingly losing rather than gaining an [a]. If other suffixed loanwords could be found, it may show whether epenthesis happens in only in native words, or perhaps reveal some pattern in the loanwords it applies to synchronically.

It is assumed that the tables above, though naturally only including a subset of the Ura vocabulary, nevertheless provide a reasonably unbiased representation of the language as a whole. Further research into this area would be very valuable; if no further words were found in the epenthesis/no-centring category whilst the other categories were duly added to, this would further strengthen the evidence for it being a combination violating a morphophonological constraint.

In summary, the epenthetic [a] occurs between monosyllabic suffixes and a set of stems that have very little in common other than having neither palatals nor [a] in their final syllable.



### 5.1.2 Epenthetic [a] in possessive pronouns

Another point of interest within Ura is variation of the phonetic form of the possessive pronoun. The normally-occurring forms are shown below <sup>20</sup>:

	SG	DL	PL
<b>1</b>	gu	aun	aut
<b>2</b>	gi	ain	aŋən
<b>3.M</b>	a	ain	aɬə
<b>3.F</b>	at	ain	aɬə
<b>3.Neut</b>	aŋət	aŋət	aŋət

However, sometimes they occur with an epenthetic [a] word-finally:

	SG	DL	PL
<b>1</b>	gŭa	auna	auɬa
<b>2</b>	gia	aina	aŋəna
<b>3.M</b>	a <sup>21</sup>	aina	aɬa
<b>3.F</b>	aɬa	aina	aɬaʰ
<b>3.NEUT</b>	aŋəɬa	aŋəɬa	aŋəɬa

<sup>20</sup> Forms for dual, third person neuter and first and second person plural in both the normal and epenthetic [a] sets from Rosensteel et al (Grammar) (nd.)

<sup>21</sup> Adjacent homorganic vowels are not pronounced separately, and vowel length was unclear.

<sup>22</sup> aɬə + a gives us aɬa; there are no vowel sequences or diphthongs containing [ə] in Ura (which is no doubt the reason for this elision).

### 5.1.2.1 Phonological motivation

The examples in the rest of this section are all focused on the first person singular possessive pronoun (gu/gǔa). The other pronouns appeared to pattern in the same way, so for efficiency's sake the selection of gu or gǔa was the focus of investigation, after a time of also checking for consistency with aɪə/aɪa 'their.3.F.PL'.

The variation displays phonological motivation, as shown below.

- 1 If a noun stem is vowel-initial or monosyllabic with a nonbranching nucleus, the pronoun will occur with the extra final [a].

<b>Nouns taking <u>gǔa</u></b>			
<u>gǔa im-ga</u>	my dogs-M.SG	<u>gǔa dam</u>	my boils
<u>gǔa eməs</u>	my coconuts ( <i>Kokos nucifera</i> )	<u>gǔa sap</u>	my traditional bludgeons
<u>gǔa artən</u>	my jaws/cheeks	<u>gǔa βət</u>	my houses
<u>gǔa ur</u>	my forest/woods/bush	<u>gǔa si</u>	my red cedars

(See Table 12 of the Appendix for more examples of nouns that take gǔa)

- 2 If the noun stem is polysyllabic, or has a branching nucleus, the normal pronoun will occur.

Polysyllabic stems		Long-nucleus stems	
gu ɣusem	my intestines	gu ɣɔ̃p	my tears
gu βadək	my toes	gu ɣaɔ̃	my uncles (mother's brothers)
gu saɣəŋ	my eyes	gu la:r	my sugarcane ( <i>Saccharum officinarum</i> ) PL
gu səgən	my traditional string bags	gu raɔ̃	my walnut trees

(See Table 13 of the Appendix for more examples of nouns that take gu)

Compare also the following minimal pairs:

With [a]		Without [a]	
gǔa ɣum	my cough/mucus	gu ɣu:m	my knees
gǔa lat	my gardens	gu laɪt-ki	my navels-SG
gǔa ɣep	my spears	gu ɣɔ̃p	my tears

The selection of gu/gǔa is determined by the whole stem, and only the stem. In the first table under 2 above, we see stems taking gu which do not have branching nuclei. This proves that (consonant-initial) polysyllabic stems must take gu; gu/gua selection is not dependent merely on the first syllable. It is also clear below that only the stem affects the selection of gu/gǔa, as we compare some previous stems with their suffixed singular forms.

Stem		Suffixed form	
gǔa dam	my boils	gǔa dam-gi	my boils-SG
gǔa sap	my traditional bludgeons	gǔa sap-ki	my traditional bludgeons-SG
gǔa βət	my houses	gǔa βət-ka	my houses-SG
gǔa si	my red cedars	gǔa si-γa	my red cedars-SG

A vowel-initial noun will take gǔa even if the stem does have a branching nucleus:

360	gǔa egǔin-gi	my necks-SG
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This sensitivity to a branching nucleus, and the irrelevance of a coda, makes Ura a ‘Type 2’ language in Juliette Blevins’ (1995:214-215) categorisation. She lists three types, based on which syllable structures are heavier than others. Type 1 languages have nonbranching rhymes as light syllables, and branching rhymes as heavy. This cannot apply to Ura, as words with branching rhymes such as dam, sap and βət above are light (that is, still taking gǔa).

Type 2 languages have nonbranching nuclei as light syllables, and branching nuclei as heavy. This fits with Ura. Type 3 languages have a ternary distinction, with nonbranching rhymes as light, branching rhymes as heavy and branching nuclei as heaviest. This does not apply to Ura because there is no need for a distinction between nonbranching and branching rhymes.

One problem to resolve is that of #CC stems. Blevins (1995:214) states that “[i]n all but a very few cases, syllable weight is defined without reference to the prevocalic portion of the syllable.” So although one would not expect a complex onset to have any bearing on variation governed by nucleus weight (heavy syllables) and initial vowels, there is nevertheless some

complication for stems with initial consonant clusters. The following table illustrates the difficulty.

gu slum	my deformed limbs	gǔa sdəm	my ears
gu snəŋ	my thoughts	gǔa sləp	my bones
gu srəp	my ringworm ( <i>Tinea corporis</i> )	gǔa snək	my excrement
gu srəŋ	my long, pale brown tree grubs		
gu sru-γi	my old woman-F.SG		
gu βlam	my pigs		

Two more words, sləj-ige ‘body’ and snəŋ-gi ‘hip’, were reported inconsistently.

It is unclear how to analyse these data. One proposal is that the words above taking gu do not in fact begin with a consonant cluster but with a CVC syllable that is realised as CC. This seems rather contrived though, as the same could easily be said about those in the right-hand column. All three words above taking gǔa relate to one’s body, but so do some on the left. It has proved, after much exploration, to be beyond the scope of this research to satisfactorily integrate them into the gu/gǔa pattern.

A process that on the one hand is sensitive to vowel-initial nouns, and on the other hand is sensitive to polysyllabic stems, and nucleus length in monosyllabic stems, is rather unexpected. Further to this is the fact that [a]-epenthesis is what occurs before vowel-initial stems (nearly all of them polysyllabic), while it only occurs before consonant-initial stems if the stem is ‘simple’ enough (containing neither multiple syllables nor a long nucleus).

One idea is that the consonant-initial monosyllabic stems taking gǔa all originally began with an /a/ which has since been assimilated with the very common final /a/ in determiners and possessives. This would mean (still unexpectedly, but at least more uniformly) that gǔa occurs before vowel-initial stems and gu before consonant-initial ones. Counterevidence for this is the presence of present-day words beginning with /a/, for example artən ‘jaws/cheeks’, and the lack of evidence for this in related languages.

### 5.1.2.2 Support from loanwords

Rules 1 and 2 above are supported consistently in loanwords, as shown in Table 14 of the Appendix. A sample of the table is found below.

<b>gu</b>		<b>gǔ a</b>	
<b>Borrowed word</b>	<b>Gloss</b>	<b>Borrowed word</b>	<b>Gloss</b>
baket	bucket	ambrela	umbrella
raıs	rice	ki	key
tutbras	toothbrush	pen	pen

### 5.1.2.3 Exceptions

The eight clear exceptions to the rules stated in this section, arising from the approximately 150 Ura noun stems checked, are shown below. These words were consistently reported with the opposite possessive pronoun to what is predicted.

	<b>Exceptions to <u>gu-gǔ a</u> rules</b>	
361	gu t-lam	my type.of.cane.PL
362	gu dui (stem alternant <u>du</u> l)	my stones
363	gu mam	my father

364	gu nan	my mother
365	gu li	my Lee (non-Ura name)
366	gǔa sdəm	my ears
367	gǔa sləp	my bones
368	gǔa snək	my excrement

### 361 gu t-lam

The [t] here is a prefix, rare in Ura, which is a nominaliser, deriving nouns from verbs. The other nouns investigated that have this prefix share the same syllable structure and take gǔa:

369	gǔa t-mən-gi	doors-SG
370	gǔa t-məs	food (general)

### 362 gu dui (stem alternant du1)

If the selection of gu/gǔa is based on the original form of the noun stem, this makes gu dui an exception. Recall the cross-linguistic comparison of βlam/βem-ga (at 129 under 4.3.1.4.2) where we saw cognates had forms more like βlam than βem. Then in the last table under 5.1.2.1 we saw (however unexpectedly) the occurrence of gu βlam for ‘my pigs’ – as if the initial CC of βlam classifies the syllable as heavy (and therefore requiring gu). The first person possessive pronoun form occurring with βem-ga ‘my pigs-M.SG’ is also gu. This would suggest that dui could be expected to take gǔa, having cognates with a short nucleus (as shown below) and a stem alternant of the same form in some suffixed words (see 5.4.1). The following table is repeated from 84 and shows a synchronic comparison of dui in some of the languages closely related to Ura.

Ura	Gloss	Kairak	Mali	Qaqet
dui	stones	dul	dul	dul

This leaves us in need of finding some suitable ‘middle ground’ between the significance of the current form of a noun and the significance of its origins.

### **363-364 gu mam, gu nan**

It is not uncommon for the terms for ‘father’ and ‘mother’ to be phonologically or morphophonologically exceptional.

### **365 gu li**

The only possibility seems to be that the [i] is long (but very rare, if so); this would mean a branching nucleus, and explain the gu.

### **366-368 gǔa sdəm, gǔa sləp, gǔa snək**

At first it appears that [s] may be a prefix, perhaps having to do with one’s body or inalienable possession. This would give us a consonant-initial monosyllabic stem with a short nucleus, and explain the occurrence of gǔa. However there are very similar words that take gu:

371	gu snəŋ	my thoughts
372	gu slum-gi	my deformed limbs-SG
373	gu srap	my ringworm ( <i>Tinea corporis</i> )



### 5.1.2.4 Inconsistent reporting

For a further eight words there were some discrepancies between speakers. Variation in reporting did occur in yet a further approximately eight words, but was negligible. The words below, in contrast, had significant numbers of speakers claiming gu and gūa as the correct first person possessive pronoun. See Table 15 of the Appendix for more detailed information on reporting.

Words inconsistently reported as <u>gu/gua</u>		
374	je, jil-it	plant with edible leaves ( <i>Abelmoschus manihot</i> ) (Tok Pisin ‘aibika’) PL, SG
375	jə.e, i-ya	small bamboo for woven walls PL, SG
376	laə	eggs
377	ʔan-itnək	gums-FLAT/THIN.PL
378	sləj-ige	bodies-FLAT.SIDED.SG
379	snəj-gi	hips-SG
380	sur	fences
381	βas	breadfruit ( <i>Artocarpus incisa</i> ) PL

### 5.1.2.5 Exceptional noun class

There is also a small, closed class of nouns which take neither gu nor gūa, but ŋūa instead.

382	ŋūa es	my children
383	ŋūa ɣeŋ	my teeth
384	ŋūa βəs, βəs-ki	my heads PL, SG
385	ŋūa ɬəc, ɬəj-et	my hand and arm PL, SG

These could be classed as ‘inalienable’, though why these objects and not others are included in the class is not immediately obvious; examples 377 and 379 above seem no more alienable than one’s arm and especially one’s teeth.

The existence of noun class that is lexically conditioned (despite some semantic cohesion) makes the unexplainable (and therefore apparently lexical) exceptions in 5.1.2.3 above more tolerable.

Despite the exceptional first person possessive pronoun shown in the above examples, they all take the regular third person plural pronoun aɪə. Not all speakers interviewed remembered (initially, at least) that these words belonged to a different class; some claimed the possessive pronouns were gu or gũa, in keeping with what the phonological form of the stem would predict according to the rules stated under 5.1.2.1.

### 5.1.2.6 Non-phonological motivation?

It should be noted that some Ura speakers have said this gu/gũa variation marks notions of ‘past’ and ‘seen / not seen’. One rather linguistically-aware speaker explained the following:  
*gũa i.a [‘my mangoes’] marks ‘not seen’, or ‘past’; also ‘met before’; this phrase carries some sense of the mangoes having been mine for a long time.*  
*gu i.a marks ‘seen’; also ‘here’ or ‘now’.*

Because the patterning is mostly accounted for by the few phonological rules above, it seemed unnecessary to investigate this apparent semantic/grammatical distinction; however it would make interesting further study pursuit.

Another interesting epenthesis investigation would be the word-initial [a]-epenthesis observable on some monosyllabic borrowed words. This has been left for future research due to its peripheral relevance, but some examples can be found within Table 14 of the Appendix. The instances of epenthesis are clear when comparing monosyllabic Tok Pisin words with their English glosses. Epenthesis also occurs before morphemes other than person-number marking; however this too was not pursued, due to time constraints.

## 5.2 /ŋ/

Noun stems ending in /ŋ/ often display /ŋ/-elision when suffixes are added. Elision occurs after the usual post-nasal voicing of any initial stop in the suffix.

386	/ŋeŋ-ka/
	[ŋe-ga]
	pebbles-SG

The elision does not, however, occur with vowel-initial suffixes.

387	yəseŋ	hair/fur PL
388	yəse-ga	hair/fur-SG
389	yəsiŋ-it	hair/fur-FLAT/THIN.SG
390	yəsiŋ-ini	hair/fur-SM.SG

In all cases where this elision is not observed before consonant-initial suffixes, [a]-epenthesis (see section 5.1.1) between /ŋ/ and the consonant occurs. There were no words of the form [...ŋ-C...] observed during the course of this research.

The epenthetic [a] is present in approximately a quarter of all /ŋ/-final nouns observed in the course of this research, while /ŋ/-elision occurs in the remainder.

We must ask whether this is phonologically motivated or not; whether /ŋ/ is elided in some phonological environments and [a]-epenthesis occurs elsewhere, for example. Table 16 of the Appendix contains a list of all /ŋ/-final nouns discovered in the course of this research which display elision; Table 17 contains all those found displaying epenthesis. There appears to be no phonological or semantic coherence within the two groups. The existence of a minimal pair below further supports there being no phonological motivation; two homophones each behave differently.

Minimal pair:

391	/taeŋ-ka/
	[ɽae-ga]
	drains-SG

392	/taeŋ-ka/
	[ɽaeŋ-a-ɣa]
	earthworms-SG

(Another possibility is, of course, that the phonemic form for one of these two stems is not /taeŋ/; however there was no evidence to suggest this was the case. A cross-linguistic comparison may reveal more information in this area.)

### 5.3 *Exceptional realisations of allophonically variable obstruent phonemes*

As discussed in section 4.2.2.2.1.6, allophonically variable obstruent phonemes have voiced spirantised realisations between vowels and liquids. However a small number of exceptions exist, where we observe no spirantisation or voicing. The table below contains all examples discovered either by Rosensteel or in the course of this research. The lack of /c/ examples is no doubt due to /c/'s limited frequency.

393	arpus	fall and incur death or injury while inactive
394	etaŋ	large mass/crowd of animate things (e.g. people, pigs; but not bees or birds)
395	mənatəm	sleep (V)
396	ituya	type of duck (One interviewed group claimed this was onomatopoeic, which may explain its exceptionality.)
397	guki, guki-ŷi	type of spirit PL, SG
398	ɣaku	no, not
399	səkət	hassle, torment, cause strife to
400	ɣəkɪ	perhaps
401	maɾɛka	a few, several
402	ɣəkɪ	perhaps
403	turki.a	(name)

Conversely, one also observes a phonemic /kk/ occurring as [ɣ] rather than [k]. Examples below are shown in the plural followed by the singular, where both forms were collected

during this research. The suffixes for masculine and feminine singular are /-ka/ and /-ki/ respectively. Morpheme breaks have not been marked, due to uncertainty regarding to which morpheme the [ɣ]s belong.

	/kk/ as [ɣ]		Gloss
	/k/-final stem	stem + /ki/ or /ka/	
404	narək	narəɣi	yams (species of <i>Dioscorea</i> ) PL, SG
405	irək	irəɣa	isolated growth of cane (species of <i>Calamus</i> ) used for making clotheslines and blinds PL, SG
406	ɣək	ɣeɣi	caves PL, SG
407	lek	liɣi	hole in the side of something PL, SG
408	sek	seɣa	stories PL, SG
409	ɣabarek	ɣabareɣa	tall pandanus with tall thin roots PL, SG
410	ɣaβuk	ɣaβuɣa	crocodiles PL, SG
411	madək	madəɣa	raindrops PL, SG <sup>23</sup>

As detailed further in section 5.1.1, for some nouns an epenthetic [a] occurs in between the stem and suffix. The exceptions to the /kk/ as [ɣ] pattern observed above are either of this epenthetic kind, or are in the originally expected /kk/ as [k] form.

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<sup>23</sup> Data from Rosensteel et al (Dictionary Notes) (nd.)

	<b>/kk/ with epenthetic [a]</b>	<b>Gloss</b>
412	ɬalek, ɬaley-a-ya	(gloss unknown) PL, SG
413	βuk, βuy-a-yi	coconut ( <i>Kokos nucifera</i> ) growth/sprout (Tok Pisin ‘kru’) PL, SG

	<b>/kk/ as [k]</b>		<b>Gloss</b>
	<b>/k/-final stem</b>	<b>stem + /ka/</b>	
414	γək-kək	γək-kəkka	babies PL, M.SG
415	mi.ək	mi.əkka	papaya ( <i>Carica papaya</i> ) PL, SG

The stem in 414 above is reduplicated: /kək-kək/.

The number of examples for each of the tables above show that the ‘default’ is for adjacent /k/s across a morpheme boundary to be realised as [ɣ]. As further evidence of this, one woman, when trying to recall whether there was a singular word for βadək (toes), said “βadɔya” to herself but then said it didn’t sound good, and told me there was no singular. She never tried “βadəkka” or “βadɔyaya” aloud.

## 5.4 //

### 5.4.1 // within Ura





The bǎi/baul, dui/dul and γǎi/γaul stems show that the /i/-final variants occur before consonants or a word boundary, and the /l/-final variants elsewhere. Regarding the vowel alternation observable, no conclusions were drawn during the course of this research. It seems, however, that there is some consistency between bǎi/baul and γǎi/γaul; these and other vowel alternations would make an excellent topic for further research.

There are plenty of instances of /l/ realised as [l] within Ura also; Table 19 of the Appendix contains a selection of such words.

#### 5.4.2 /l/ cross-linguistically

Table 18 in the Appendix shows a variety of Ura words that have cognates containing /l/ in other Baining languages. A sample is shown below, with words in the normalised phonetic transcription (not orthography) used in the rest of this thesis. Gaps represent incomplete investigation, not necessarily a lack of cognate.

Ura	Gloss	Kairak	Mali	Qaqet
eǵuin	necks	lǝǵoin	lǝǵoin	lǝǵoin
eməs	coconuts ( <i>Kokos nucifera</i> )		laməs	laməs
gaep	black palm (species of <i>Caryota</i> ) PL	galǝp-ki	galǝp	galǝp
γǎebaŋ	tongues	γulpeŋ	γulbaŋ	γulbaŋ

Generally, the table is described by the following informal representations. The first element(s) denote related languages, and the second element(s) the Ura equivalent.

IV → e

al → a

əl → e

ul → œ

It is not clear from these data whether this happened across morpheme boundaries, within morphemes, or both. It should be noted that none of these representations is true ‘across the board’, though there are far fewer exceptions to the first ‘formula’ than to the others.

As can be deduced from Table 18 of the Appendix, there are more differences between the cognates than is represented above. The /l/ alternation between languages is in some places confused or obscured by other vowel alternations, or the fact that counterparts of Ura’s /e/ phoneme do not exist in the other languages. It is likely that a significantly larger cross-linguistic comparison would reveal clearer patterns; in the absence of such data it is wisest to make no generalisations other than the limited application of the four ‘formulae’ above.

A thorough cross-linguistic comparison of Ura and its related languages would likely provide enlightening information concerning /l/ and its alternants, and would be an excellent topic for further research.

**5.5 /m/**

For nouns ending in /m/, final [b] is observed in some suffixed forms, for example:

416	<b>im</b>	dogs
417	<b>im-ga</b>	dogs-M.SG
418	<b>ib-əm</b>	dogs-RND.SIDED.SG (puppy)

Table 20 of the Appendix shows all instances of this recorded during the course of this research. A summary of the results is found below.

/m/ as [m]	/m/ as [b]
-∅	-em
-ka	-əm
-ki	-am
-iəm	-ap
-ini	-əs
-iɔm	-it
-iɔŋ	-et
-itnəm	-er
-itnək	

This is described by the following rule:

/m/ → [b] / \_ + VC#

There were only two counterexamples found in the course of this research (mentioned below). The alternation must occur synchronically because it occurs also in loanwords. One example is the word for comb, /kɔm/ in Tok Pisin. Being a distinctly flat item, the singular form in Ura takes the FLAT/THIN singular suffix *-it*. This is pronounced [kɔbit].

The morpheme boundary is essential, as shown by the phonetic [m] (not [b]) in the monomorphemic [eməs] ‘coconuts’.

It also only applies to /m/; other nasals do not pattern this way, as shown below.

419	ɟan-it	gums-SG
420	snaŋ-em	hips-DL
421	ɣəsɪŋ-it	feathers-SG

With regard to [a]-epenthesis, there were very few nouns with /m/-final stems discovered in the course of this research that displayed epenthesis. Out of the few that did, three suffixed forms met the criteria for occurring with a [b] alternant. Their forms are as follows:

422	igüam	fern (grows under <i>Thea abroma</i> (cacao) tree)
423	igum-a-it	fern (as above)-FLAT/THIN.SG

424	em	mushrooms
425	em-a-it	mushrooms-SG
426	eb-em	mushrooms-DL

These data suggest that the epenthetic [a] ‘blocks’ the expected alternation with [b].

## 6 Lexicographic application

In this section we will consider and give practical samples for the content of an Ura dictionary. The discussions that follow should be taken as suggestions rather than prescriptions, intended to provide practical application for some of the thus-far mainly theoretical content of this thesis. At the time of writing, work on a dictionary was in progress. The Ura translation team have been using an ‘elicitation’ technique (Hartmann, 1983:68-69) rather than solely ‘observation.’ For Ura, this involves meetings of the team to brainstorm for all known words on specific topics (for example all words for bodies of water; all words for light; all insects).

One of the first questions to be addressed is that of who will be the primary users of the dictionary. The Ura translation team have advised that Ura speakers themselves are those whom it is designed to serve, though others may have access to it once it is well-developed. A secondary and very important result (and/or purpose) of the dictionary’s existence will be the detailed record it provides of the Ura lexicon, including phonetic, phonological, morphological and grammatical information.

Ura already has a reasonably established orthography which for the most part distinguishes between the various phonetic realisations of the voiceless plosives, so it is not practical to make orthographic suggestions relating to such matters. However there is uncertainty amongst those involved in Ura translation and literacy about other issues. These include whether a grapheme such as <y> (for [j]) is needed, and how to handle various instances of epenthesis, alternation and elision, whether by listing particulars for each entry or by explaining them by means of a rule. On most of these issues, investigation has not been comprehensive prior to this thesis. These issues will be discussed in the sections that follow.

It is certainly open to debate whether in the end it is better to simply list all forms in each entry instead of relying on dictionary users' familiarity with a set of rules in the introduction. This may be the better option for those rules affecting smaller numbers of words (for example /m/ - [b] alternation and final [ŋ] elision). The final decision on such a matter would need to be made after considering many factors, including the target population of users, feedback from speakers on usefulness and felt appropriateness, and printing costs.

The following explains the layout of sample entries presented from 6.1 onwards. An example is shown below for reference. Headwords are in Ura orthography but are not marked with <orthographic brackets>, unlike in the rest of the thesis. Pronunciation follows in [square brackets] but is in a normalised transcription, as used for the majority of examples in previous chapters. The grammatical category (in SMALL CAPS) and a gloss then follow. Where possible, examples for this thesis have been chosen whose orthographic form is most similar to their phonetic form, to minimise difficulty for readers unfamiliar with Ura orthographic conventions; however the relevant ambiguous symbolisations (a few of which were mentioned in section 2.2 of methodology) are found in the table at the end of this introductory section. **Bold** is suggested for marking stressed syllables (as well as headwords), and **bold with underlining** for primary stress. Ura words (or portions thereof) within glosses or notes are underlined as they are in the rest of the thesis. Where further emphasis is needed, the use of *italics* is modelled.

**sarem** [sare**em**] NOUN bellies. SG: saringi

It is debatable whether IPA or orthography should be used for showing pronunciation; IPA provides more accurate information but has symbols foreign to almost all dictionary users. If the pronunciation note is primarily to indicate stress, orthography would be an acceptable alternative, as long as note was made elsewhere in the dictionary concerning the informal use

of square brackets, and the IPA equivalents of phonetically ambiguous Ura graphemes. IPA will be used for the pronunciation sections of the example entries that follow.

For the purpose of practicality in the context of this thesis, let us suppose that the dictionary information for each word would be written in English. Since this is in fact a possibility for the dictionary's eventual realisation and use in Papua New Guinea, it would be prudent to use English suitable for those with, at best, a high school education in English as a second language. Technical linguistic terminology is therefore kept to a minimum in dictionary entries and notes. Let us assume that adaptation appropriate for an edition for the potentially large proportion of readers without any high school education would be made later.

Where possible, issues are addressed in the order in which they occur in previous chapters, although some re-ordering was necessary to introduce suggestions in a natural sequence.

**Selected Ura orthographic conventions, where different from IPA:**

Consonants		Vowels	
Ura symbol	Phone	Ura symbol	Phone
v	β	ä	ə
rh	ɽ	o	ɔ
qy	ɟ		
q	ɣ		
ny	ɲ		
ng	ŋ		
r	r		



## 6.1 Stress

As discussed in 4.5, stress in Ura is (thus far) not altogether predictable but it is also not contrastive. This means it is not essential for it to be marked in Ura orthography in order to differentiate between words, and indeed it is not marked in the current system.

It would however be pertinent for an Ura dictionary to include information about stress, both for practical purposes and to add to the volume of recorded information on the language. It seems best to mark stress on each word: whatever the underlying Ura stress system, it is not explicitly evident to the outsider at least, and neither would it be wise for archiving purposes to deal with stress only at the beginning of the dictionary and rely on correctly indicating all those words that are exceptional. Further to this, bold and/or underlining on the stressed syllable(s) could be used instead of the IPA stress marks in order to allow greatest accessibility to all readers, as follows. Primary stress could be **bold with underlining**, and secondary stress **bold** only.

**mäni** [**məni] NOUN middle**

**masirhäm** [**ma****s**iɾ**ə**m] NOUN dreams

Some comment on the tentative overall stress pattern for Ura would be appropriate in the introductory notes. The following is a suggestion, adapted from the second paragraph of 4.5.

Different stress alone does not make different words in Ura. Normally stress is on the second-to-last syllable. But if the last syllable has two vowels, or a consonant at the end, or both, then stress is on the last syllable. Sometimes stress does not follow this pattern.

Stress is shown on every word, with primary (strongest) stress **bold underlined**, like this: [rigi] and secondary (weaker) stress in **bold** only, like this: [**du**yu**us**].

## 6.2 Vowel centring

In section 4.3.3 we observed different kinds of vowel centring. Those instances that are morphophonological must be explicitly mentioned in the dictionary entries for the words concerned; this relates to centring of /a/ to /ə/ in suffixed forms.

**rhap** [**ɹ****ap**] NOUN traditional stone axes. SG: rhäpki

The second kind of centring described, seen in forms of sa ‘to’, is clearly phonologically conditioned, with only one exception. However, since this centring is only manifest in one word (as far as this research has discovered), it seems better to put a note on its alternation directly in the entry, rather than in a note at the beginning of the dictionary.

**sa** [**sa**] PREP to. If sa comes before a consonant, it will be sä instead, except for sa gem.

Centring to /ə/ in reduplicated forms was also morphophonologically conditioned, but since each reduplicated word would constitute a separate entry in a dictionary, the form of each will be explicit from the outset. An introductory note would therefore be rather redundant.

## 6.3 Vowel harmony

As discussed in 4.3.3.4, about half of words containing a final-syllable /e/ alternate with /i/ before a suffix containing /i/ in its first syllable. Since there is no obvious majority, we may choose whether harmony or lack of harmony should be marked explicitly in a dictionary. It seems clearly preferable to mark the occurrence of harmony, as follows:

**sen** [**sen**] NOUN knives. SG: singi

#### **6.4 Exceptional realisations of voiceless plosives**

As with vowel centring in suffixed forms (6.2), the exceptional realisations of allophonically variable obstruent phonemes mentioned in 5.3 must be noted explicitly. With regard to the phonetically voiceless plosives occurring intervocalically, these headwords will be immediately identifiable as exceptional, since Ura orthography distinguishes between the various realisations of voiceless plosives. They need no special address here.

The phonemic /kk/s occurring as [ɣ], on the other hand, all arise in singular (suffixed) forms, and so will need to be mentioned in each entry. An example follows.

**sek** [**sek**] NOUN story. SG: sega

As was mentioned in the relevant section, almost all instances of /kk/ are either of the [ɣ] kind, or are words where an epenthetic [a] occurs, giving [ɣaɣ]. For a few words, /kk/ occurs as [k]. All instances of the pre-suffix epenthetic [a] must be noted anyway, so it is appealing to mark explicitly only the instances of [k], and mention /kk/ as [ɣ] in an introductory note.

This is certainly an option. However, because of the relatively small number of entries affected, it would also be easy enough to mark each [ɣ] form, as in the example above. This would likely improve the ease of use of the dictionary, giving user one less ‘rule’ to be mindful of. An introductory note may also be quickly forgotten with such infrequent application.

### 6.5 *Alternation of [l] with vowels or Ø*

In section 5.4 it was shown that there exists some alternation between /l/ and vowels or Ø, both within Ura and cross-linguistically. Although there may be some regularity to the variation, it seems unreasonable to expect dictionary users to develop familiarity with (let alone know already) such patterns in order to deduce correctly the appropriate word form, particularly where patterns cannot be observed without knowledge of cognates in other languages. Opaque forms should be listed with each headword; where there is a majority pattern within the forms contained in an entry, this could be briefly specified and the exceptions noted. Suggested examples follow.

**boi** [**bɔĩ**] NOUN cloth. Suffixes other than -ka and -ki attach to a different form baul.

**vlam** [**βlam**] NOUN pigs. Suffixes attach to a different form yem.

Such alternation highlights the more widespread dilemma of phonemic versus phonetic orthographic conventions, and potential parallels with the decisions made regarding dictionary entries. A more phonemic orthography is efficient (requiring less symbols) and takes advantage of native speakers' implicit knowledge of the phonology of their language; however, humankind seems prone to holding written form as having greater authority than spoken form. However well-designed an orthographic system, the reality is that the further from phonetic pronunciation the graphemes are in any given word, the greater the opportunity for speakers to eventually conform their pronunciation to the phonetic values of the graphemes designed to serve them. It seems quite possible that a parallel situation could arise with regard to a dictionary. However competently a set of introductory rules describes the phonological processes of a language, it would be too easy for users over time to neglect such rules and take entries at face value, assuming standard suffixation and the likes for each headword unless otherwise specified within the entry. Although all living languages change,

it would be far preferable for these changes to arise from factors other than treating a descriptive dictionary as a prescriptive document.

## 6.6 Epenthetic [a]

The occurrence of an epenthetic [a] in two circumstances was discussed in 5.1. These will be discussed separately.

### 6.6.1 Pre-suffix epenthetic [a]

As stated in 5.1.1, only around fifteen to twenty percent of nouns display epenthesis in the allowable environment (for which an example follows.)

427	/es-ki/
	[es- <b>a</b> -yi]
	hawks' nests-SG

It therefore seems prudent in a dictionary to take advantage of this clear majority and make comment only where an epenthetic [a] of this kind occurs. A comment for the dictionary's introductory notes could read as follows:

For some nouns, an -a- is inserted between the stem and suffix, if the suffix has only one syllable. But for most nouns, the extra -a- never occurs at all. Also, if the suffix is longer than one syllable, there will never be an inserted -a-.

A sample entry is as shown, with the epenthetic [a] in italics.

es [**es**] NOUN hawks' nests. Singular: *esaqi*

### 6.6.2 Possessive pronoun epenthetic [a]

Section 5.1.2 addressed the occurrence of an epenthetic [a] at the end of possessive pronouns.

Epenthesis occurs when the when the following noun stem is either vowel-initial or monosyllabic with a short nucleus; two examples follow, using the first person possessive pronoun.

428	/gu ur/
	[gǔa ur]
	my forest/woods/bush

429	/gu si/
	[gǔa si]
	my red cedars

Since this pattern is a good predictor of epenthesis, there is even less motivation than with pre-suffix epenthesis (6.6.1) for specifying epenthetic status for every noun in the dictionary.

Again, sample introductory notes and examples are provided: the first two examples are of ‘regular’ words (one taking gu and the other gǔa), followed by two of the ‘exceptions’.

Possessive pronouns (like gu, angān, ain) have an -a added at the end when they come before a word that starts with a vowel, or a word whose stem has only one syllable, with just a plain vowel. For the other words, there is no added -a. There are a few exceptions, and these are noted in the relevant entries.

**ur** [ur] NOUN forest/woods/bush

**si** [**si**] NOUN red cedars

**mam** [**mam**] NOUN father. Possessive pronoun: *gu mam*

**sur** [**sur**] NOUN fences. Unclear whether possessive pronoun has an added *-a*.

As in 6.6.1, there remains the risk of negligent recording error, or unawareness of the exceptional words that do exist, especially since reporting of the epenthetic [a] in this particular environment was not always consistent (as mentioned in 5.1.2.4). Explicit record for each word should therefore be made in this case also, though removing such detail for all but exceptions in the form of the dictionary which is to be printed. Section 5.1.2.6 is yet further reason to be minimally explicit in a dictionary for general use. If there is a possibility of non-phonological motivation for *gu/gūa*, with different forms of the pronoun depending on tense or visibility, it is preferable to avoid specifying only one acceptable form of the possessive pronoun, lest that become held as a prescriptive pattern to be followed.

### **6.7 /m/ alternating with [b]**

Section 5.5 outlines the occurrence of [b] instead of [m] as the stem-final consonant in some suffixed noun forms. As explained, the alternation is regular, with [b] occurring before VC suffixes and [m] elsewhere. However, the presence of an epenthetic [a] ‘blocks’ this alternation. The dictionary’s notes on this could read as follows:

For nouns that end in m, this m becomes a b when one-syllable suffixes starting with a vowel are added. If an a is added before the suffix, there is no change from m to b.

Alternatively, such a note could be made for all headwords ending in [m].

## 6.8 [ŋ] elision

There is no apparent phonological or semantic motivation for the elision of [ŋ] at the end of stems apart from the fact that if it does occur, it will only occur directly before consonant-initial suffixes, when there is no intervening epenthetic [a] (as indicated in 5.2). In a dictionary entry, any [ŋ]-final stem with no note on the presence of an epenthetic [a] may be assumed to occur before consonant-initial suffixes without the final [ŋ] (but with the post-nasal voicing expected from 4.2.2.2.1.3 on the initial consonant of the suffix.)

A suitable introductory note for the dictionary is as follows:

Any noun stem ending in ng will lose the ng when a suffix beginning with a consonant is added directly to it (i.e. in nouns with no inserted -a-.) The consonant at the start of the suffix will be pronounced as if it was still after an ng.

No note need be made in individual entries unless further research finds exceptions to this pattern.

## 6.9 <y> grapheme

As discussed in the second paragraph under section 6, the need for a <y> (or similar) grapheme is a specific issue of uncertainty within the Ura translation and literacy team. Recommendations regarding this are accordingly included here.

There was discussion in 4.3.1.3.1 regarding /i/ in an onset, functioning as a consonant [j]. The conclusion reached in that section was that there was insufficient evidence for positing a distinct /j/ phoneme, since there is no unambiguous support for it elsewhere.



This certainly does have some bearing on the decision of whether to propose a <y> grapheme for Ura. On the other hand, if the words from 4.3.1.3.1 are written <iaung>, <iaus> and <ioe>, this gives no orthographic clue that these words are preceded by gu and not gǔa (which, as explained in 5.1.2.1, is the sample possessive pronoun variant expected before vowel-initial words.) It is not that for example <gu iaung> is irregular in terms of the normal pattern of gu/gǔa distribution, merely that its spelling may make it seem superficially irregular.

The Ura alphabet already uses <y> in the digraphs <qy> and <ny> for [j] and [ɲ] respectively. However, there would be no risk of confusion. Any need for a <y> would be in onset position and these particular onsets are also word-initial. This would leave no opportunity for a <y> to directly follow a <q> or <n> without a word break and thus create ambiguity between [ɣj] and [j], or [ɲj] and [ɲ].

The choice then, as far as a dictionary entry is concerned, is between spelling these words with the vowel grapheme <i>, noting explicitly their apparent exceptionality in taking gu, and spelling them with the consonant grapheme <y>, in which case no explanatory note would be necessary about the selection of gu.

Evaluating these options, we may bear in mind that there is already an independently motivated group of exceptions to the gu/gǔa paradigm (5.1.2.3). In contrast, listing such words with an initial consonant grapheme would bring about practical problems of their location in an alphabetical dictionary: in a very short <y> section, and not with the <i> entries where they would likely be sought. It may also make them outwardly appear more conspicuous than is perhaps warranted.

It would therefore seem that the optimal entry style would be as follows:

**iaung** [**jaung**] NOUN tree seedlings (POSS: *gu iaung*)

### **6.10 Cautionary note on data-gathering for the dictionary**

A problem with this chapter's strategy for marking some of the morphophonological alternations is that having merely a marked-unmarked distinction leaves opportunity for negligent error. Let us suppose the absence of, say, epenthesis is not marked in the preparatory stage of recording of words for the dictionary. Failure to indicate epenthesis that is present would then result not in an obvious omission but in a **filling** of the default 'marking' (that is, no epenthesis). This is certainly a vital point to bear in mind. However, the risk of inaccuracy must be weighed against the practical obstacle of the sheer volume required to specify epenthetic status for every noun in the dictionary – and that twofold, taking into account both pre-suffix and possessive pronoun [a]-epenthesis. An optimal solution would compromise neither accuracy nor efficiency.

Perhaps the best method is this: in gathering data for the dictionary, explicit record should be made of the presence or absence of epenthetic [a] – and similarly other alternations or features – where they could conceivably occur (as described in previous sections). This information should stay recorded within each entry during the process of consolidating the dictionary, for checking and comparison purposes. Indeed, this version of the dictionary should be preserved long-term. But in the final stages of preparing the dictionary for realisation as a printable document, such information should be included only where it is exceptional or deemed appropriate for noting.

This solution seems to preserve accuracy and maximum information while making the most of the phonological and morphophonological rules that are present within Ura.

Negligent error and the risk of speakers conforming to the (not unwaveringly phonetic) orthography are two ever-present dangers of this (and many a) lexicographic project.

However it is worthwhile considering Béjoint's (2000:4-5) words on this matter. He points out how easy it is to criticise if one does not acknowledge the very real challenges, and says, "no difficulty is insurmountable in lexicography – or no dictionary would ever have been published – but there are few easy answers."

## 7 Summary

Considering the small number of Ura speakers and its exposure to other languages, it seems to be relatively strong. It is still used in the home and for general interaction. Ura speakers are aware of some changes currently in progress in their language and various factors contributing to this, and generally view these changes negatively, holding the old way of speaking as better. There is concern among adult speakers that children are not learning Ura properly; however only time will tell whether this will result in decline towards language death, or is instead simply the global cry of most generations concerning their offspring, and of much less dire consequence.

Ura has 15 consonant phonemes (voiced and voiceless plosives and nasals of bilabial, dental, palatal and velar position), and a tap, fricative and lateral approximant (all of alveolar position). The voiceless plosives alternate with voiced plosives and fricatives depending on their phonological environment. Nasals do not show place assimilation. There are six vowel phonemes; /e/, /ɔ/ and /ə/ have distribution and cognates that suggest relatively recent emergence in Ura, but /i/, /a/ and /u/ show no such signs. Both stress and the status of most diphthongs are in need of further research and more comprehensive explanation. Ura syllable structure allows complex onsets but not complex codas. Nuclei can be monophthongs or diphthongs.

As regards morphophonology, an epenthetic [a] is observable in some contexts, as is alternation of /a/ with /ə/ in other contexts. Vowel centring and harmony occur, though not always, in the phonological environments conducive to such phenomena. Stem-final /ŋ/-elision occurs, as does alternation of /l/ with vowels and Ø.

In the process of producing an Ura dictionary, each of the recommendations made in the previous chapter will need individual evaluation by Ura speakers and the translation team.

One of the more general issues is when to list all forms for a particular alternation and when to instead explain the alternation in an introductory note, with no reminder in individual entries. Consideration would need to be given to factors such as entry length, overall dictionary length and printing costs, ease of use and felt appropriateness, and (not least of all) the undesirable possibility of speakers conforming their usage to an incorrectly-understood (or incorrect) dictionary prescription.

As regards future work, a thorough cross-linguistic comparison of Ura and its related languages would likely be very insightful, providing further clarity on multiple issues discussed in this thesis.

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## 9 Appendices

### I. Papua New GuineaUra speakers' comments in the original Tok Pisin

To preserve anonymity, speakers (or groups of speakers) are referred to with letters only. Comments are recorded here with headings relating to sections in the main paper, but are in their original context; that is, several topics may be covered in one comment. As in the sociolinguistics chapter, my own comments are marked in [square brackets].

#### *i. Perceived causes of language change (see 3.2)*

K, 20 February 2005:

liɣər – ‘g’ i woklong senis nau. Ol olupela man bilong bifo, ol i tok liɣər. Tasol kainkain tokples i kam insait nau; Pidgin wantaim Tolai, na i kamapim senis insait ol tokples. Sampela leta i lus. Ol Tolai ol i nogat ‘q’ long tokples. Na taim ol mangi ol i harim ol Baining ol i tok olsem yaku, ol i tok, em wanem kain tokples? Yu mas tok kaku. Na tu ol bikman bilong bifo ol i skul long Tolai.

kaku/yaku: em mas yaku, nogat kaku. Em samting bilong ol pikinini, bilong nau tasol. Long bifo, olgeta i save tok yaku. Dispela senis i stat long kamap long tenpela ia i go pinis. Ol pikinini ol i stat long tok yaku bifo long ol i go long skul. [Note though that his wife then unconsciously uttered /yaku/ as [kaku] just after we finished talking about it, and everyone laughed a lot.]

Mipela mas holim pas long pasin bilong toktok bilong bifo, na bihainim stret. Nau i woklong faulap. Bilong wanem? Planti ol Tolai ol i kam insait, na tu planti Baining ol i marit long outsait. Bilong dispela samting ol senis i kamap, na ol i no kamap bifo.

L, 2005:

Senis i kamap long:

1. Marit long outsait - ol pikinini bilong tupela, ol toktok bilong em i miks.
2. Sapos mipela save slip klostu long arapela kain, mipela save kisim sampela tokples bilong ol.



3. Dívelapment. Stat long kolim long ol tok Inglis ol nupela samting. Planti ol samting we bifo, mipela i no gat, olsem i kam nupela, mipela save kolim bihainim Inglis o Tok Pisin. e.g. redio, kar, rokrok.

4. Ol lapun man ol i bin skul long Kuanua. tokples i bin miks wantaim Kuanua.

M, 2005:

Ol Tolai, ol i no inap pronaunsim [ɣ]. Pikinini ol i no inap pronaunsim [ɣ]. Ol i kolim bihainim – em isi long ol pikinini na ol husat i no save long tokples.

Planti ol pikinini ol i save kolim rigi: ‘liqi’. ‘r’ i no kamap yet.

[ɹ] – em had long ol autsaid lain long kolim. Bai ol i kolim [r] tasol. Ol pikinini tu, tasol espesheli ol arapela kain man.

[β]: ol i ken kolim.

[ɣ]: yayak ‘ankol’. Pikinini: kakak

Ol i kisim long Kairak i kam.

mɾən ‘hevi’: məɾən.

Bifo, stil yet ol papa ol i no save long miks wantaim ol arapela tokples. Ol i bin skul long Kuanua – papa bilong mi. Jenereishin bilong mi i stat long adoptim. Mi skul long Inglis, no mi no save long tok Tolai. Mi save usim pure Uramät yet.

Espesheli ol yangpela we ol i skul, em i had long tanim long Inglis i go long tokples. Inglis i strong tru. Taim bilong kam bek long haus, ol i lainim nem bilong olgeta samting long Inglis bifo long nem bilong tokples, na bihain ol i les long lainim ol nem long tokples.

Sampela papa ol i lainim pikinini long Tok Pisin tasol. Bihain em bai had long ol i kam daun long tokples.

Ol papamama ol i no save lainim gut ol pikinini long tokples. Olsem na Tok Pisin na Inglis i save go insait. Ol arapela tokples i kam insait: Kuanua, na ol arapela Baining tokples.

Mipela ken spik ‘pure’ – bihain taim, taim mipela dai pinis, bihain taim ating em bai miks olgeta. Mipela i laip yet, yupela i strong na putim long pepa, long buk.

D, 22 March 2005:

Sapos you harim tokples bilong ol lain long hap [over the road?], bai yu save em i paul liklik.

Ol mama ol i marit long ol Tolai, na ol i no skulim pikinini gut long tokples long mipela yet.

E, 21 Feb 2005:

Sapos ol i lainim tok, ol i kolim kaku. Ol autsaid man tu ol i kolim kaku. Mipela save stretim ol pikinini wanwan taim. Mipela save stretim ol, tasol sampela ol i lain pinis long kaku, olsem na taim ol i bigpela, ol i kolim kaku yet. kakak em i wankain. yayak. Dispela senis i kamap nau tasol. I no long taim. Mipela i no save stretim ol autsaid man.

Dispela senis i kamap bilong ol papamama - hau ol i laik skulim ol pikinini. Sapos yu go long bus yu bai harim ol i tok klia. Ol pikinini ol i harim ol mamapapa tok kaku wanwan taim na ol i bekim, na ol i laik kaku moa yet long yaku, em isi moa. Na ol mamapapa ol i sem long stretim ol. Na tu ol dispela tok yaku, yale ('noken'), yayak ('ankol'), yəkək...

F, 2005:

kale i no stret. yale. Bifo mipela i no bin gat dispela leta 'q'. Nau Gary em i bin kamapim dispela leta 'q', na mipela amamas. Mipela planti taim save bihainim alfabet bilong ol Tolai. Em i no bilong hariap. Senis bihainim ol alfabet bilong ol Tolai. Long mekim isi bilong ol narapela. Mipela senisim long lainim ol long tokples bilong mipela. Na nau i stap wantaim mipela yet. Nogat risan wai dispela senis i stap yet.

G, 2005:

Nau ol i kisim liklik Tok Pidgin. Ating em i no gut tumas. Taim ol Uramät ol i marit long ol Sepik o kain olsem, ol i save usim planti Tok Pidgin. Ol i lus tingting pinis long tokples. Ol i putim planti tok pidgin stret long Ura.

Ol pikinini ol i save kolim kaku, nogat yaku. yale, ol pikinini save kolim kale. Ol liklik pikinini em had long ol long pronaunsim [ɣ]. Ol i kolim [k]. Nau mi save kolim yaku na yale tasol.

## ***ii. Responses to language change (see 3.2.8)***

M, 2005:

Mipela ken spik pure – bihain taim, taim mipela dai pinis, bihain taim ating em bai miks olgeta. Mipela i laip yet, yupela i strong na putim long pepa, long buk.

D, 22 March 2005:

Na mipela save tingting long bihain taim [bilong bifo?]. Ol tokples bilong mipela ol i mas kisim gut. Sampela mangi nau, sapos yu askim ol long nem bilong dispela diwai long hap, ol i

no bai save... Bihain dispela pikinini bai marit long narapela, na dispela pikinini i no inap tok long tokples bilong mipela Uramät.

E, 21 Feb 2005:

Mipela i les long holim pas long dispela senis i kamap nau. Mipela i laikim wei ol tumbuna i bin save toktok. Pasin bilong ol tumbuna em i gutpela moa long pasin bilong nau.

Ol yangpela man na meri ol i no les long yusim ol haptok bilong tumbuna, tasol sampela i niupela long ol, na ol bai tok pilai long dispela. [funny, amusing, intriguing, not mocking]

### **iii. [ɣ] → [k] (see 3.3)**

L, 7 March 05:

Tru tru tok em [ɣa]. Tasol bikos long mipela em hariap, mipela tok [ka]. Harim bilong mi long kale, kaku, em i olsem i no stret tumas.

-Lee: Senis i kamap nupela? -L: Em i bin kamap longtaim liklik. Bifo liklik. I no samting bilong ol pikinini; long ol papa bilong mipela. Ating em bilong stat long tok hariap hariap. Ol mama ol i save lainim ol bebi olsem kale, kaku na bihain ol i save stretim ol. Mipela i save kros liklik, o tok 'noken', taim mipela harim wanpela mama em i stat long lainim ol toktok bilong bebi long ol. Nogut ol bebi kamap bikpela na i stap yet long toktok olsem ol bebi.

Narapela em 'ankol'. Mama ol i save lainim ol pikinini long tok kakak tasol long tru tru tokples, em yaɔ̃. Nau, planti ol bikpela ol i save toktok kakak yet. Tasol long harim bilong mipela, i no stret.

-Lee: kakak em i kam long yaɔ̃, o em nupela wod? -L: Ating em mas ol is senisim yaɔ̃ i go long kakak, bai em i isi moa.

-Lee: rigi / ligi ? -L: Yangpela yangpela – fopela krismas. Sampela mamapapa ol i kolim stret ol wods, na sampela ol i save bebi bebi long ol pikinini. I no gat sampela man we ol i bikpela pinis tasol i save kolim 'ligi' yet.

D, 2005:

Lee: Mi bin harim olsem sampela ol i bigpela pinis, na ol i tok kale na kaku.

D: Mipela save olsem tokples em yale, yaku.

#### ***iv. Non-phonological motivation? (see 5.1.2.6)***

L, June 2005:

Em olsem yu bungim bifo; i karim liklik krai olsem em bin bilong mi longpela taim pinis.

[This all was agreed on by three other linguistically-aware speakers.]

## **II. Fuller example sets**

Although for some examples the gloss is unknown, these are included in the hope of future research providing such information, rather than discarding the linguistic information that is known. (DICT) refers to an item obtained from the work by Rosensteel et al towards an Ura dictionary; as in the rest of the thesis, any items containing ambiguity in relevant places due to orthography have not been included. In cross-linguistic tables, the letters U, K, M and Q in brackets correspond to the Ura, Kairak, Mali and Qaqet languages respectively.

Morpheme boundaries are marked where very obvious or known, but not otherwise. yəlɔski ‘cockatoo’, for example, appears to have a -ki suffix, but since the plural was not elicited during the course of this research, one cannot say for certain.

As mentioned in 2.2, sometimes multiple suffixed forms are given for one stem, to exemplify stem or suffix alternation, or the absence of such. In these cases a comma separates the forms, and their respective glosses. Where the gloss for one form has two components, these components are separated by a slash /. A slash separating two Ura word forms indicates variation in reported pronunciation, which remained debated after further investigation.

In the table below, multiple forms for each stem are only supplied when each form was checked for its qu/gūa selection. Often additional forms can be found in other tables within the Appendix, if these are sought.

### **Table 1 Occurrence of [r] and [ɾ] (see 4.2.5.1.2)**

As in the sociolinguistics chapter, letters are substituted for people’s names. Where a person is shown in both the ‘tap’ and ‘trill’ columns, both were uttered in their tokens of the word. Where there is no entry for a particular person, it was unclear at the time of recording and

regrettably could not be checked on tape afterwards, as there is no sound on the section of the tape for that particular session.

Phonological environment	Word	Gloss	Tap	Trill
#_	ras-it	fingernails-SG	J	J H L
	radəŋga	base of tree trunk	J	H L
	ru-ga	man	H	J H L
	rat	molars	J L	H L
	ri-gi	water/river-SG		J H L
	ras	fingernails	J	J H L
	rib-it	buttocks-SG		J H L
	rəb-əm	thighs-SG		J H L
V_C	mər-ŋət	good thing (non-human)	J H L	
	γðarnaya	index finger	J H L	
	γərnas	hot (from sun)	J H L	J
	artən	jaws/cheeks	J	J H
	arpus	fall and incur death or injury while inactive	J H L	H L
	ŋeɔɣa	red parrot SG	J H L	
	artən-gi	jaw/cheek/chin-SG	L	J H
	lauryie	the wind blows	J H L	J H
	γumar-γumar-γa	clean (ADJ)	J H L	J L
	mər-mər-səs	easy	J H L	H L

Phonological environment	Word	Gloss	Tap	Trill
V_V	bəɔɔəm	chest	J H L	
	sarim-gi	bellies-SG	J H L	
	marap	vertical house posts	J H L	J
	narem-ga	corner (of a room)	J H L	J

	garəs-ka	sea	J H L	
	γurət	red	J H L	J
	airəska	he is sorry/sad	H L	J
	irək	type of bush cane PL	H L	J
	ura	or / hey! / name of language	J H L	J
	maren	rats	J H L	
C_V	sru-γi	old woman-F.SG	J H L	
	brap	mud / soft ground	J H L	
	grəp-grəp	tree beetles	J L	
	βrap	fly (V)	J H L	
	βret	scars (N)	J H L	
	γrər	calf muscle	J H L	
	srap	ringworm ( <i>Tinea corporis</i> )	J H L	
	γəbruru	type of ant PL	J H L	
	mru-γa	old (of non-human thing) SG	J H L	
	mədrəm	knowledge		J H L
	γrət	strength	J H L	
	igrəp	flies (N)	J H L	
	uβrap-a-γa	fog SG	J H	H L

Phonological environment	Word	Gloss	Tap	Trill
_#	γitər	rain (V)	J H L	L
	γrər	calf muscle	J H L	L
	ligər	money	J H	L
	nagər	lean (against a wall)	J	H L
	γaβər	palm used for flooring ( <i>Kentiopsis archontophoenix</i> )	J H	L
	βukdur	explosion	J H L	
	la:r	sugarcane ( <i>Saccharum officinarum</i> ) PL	J H	J H L
	γər-γur	angry	J H L	
	ǰar	life	J	H L
	γar	legs	J	H L
	γǰar	say	J H	H L
	daβər	above	J	H L
	mamər	good/thankyou	J	H L

**Table 2 /a/ uncentered in vowel combinations (see 4.3.3.1)**

ɟae, ɟae-γa	small men’s string bags PL, SG
ɟaeŋ, ɟaeŋ-a-γa	earthworms PL, SG
βaǰ-γina, βaǰ-γi	grandmothers PL, SG
ǰar, ǰar-γa	life, young/new
jaüs, jaüs-ka	evil spirits PL, SG
laet, laıt-ki	navels PL, SG
raɔ, raɔ-γi	walnut (trees) PL, SG
sāel, sāel-γa	left, left-M.SG (left-handed male)

**Table 3 Reduplication with /V/ → [ə] (see 4.3.3.3)**

βər-βar	shiver
kət-kut	chop (wood)
nəs-nes-ki	sharp
βlək-plək	of various colours: striped, spotted
grəŋ-grəŋ	tree beetles
ŋūaləŋ-ŋūaləŋ	flowers (of bush or tree)
βrəs-pres	break, disperse
βəc-pac	coil, twist (V)
rəβ-ə-rip	swell up
βrəc-prac	squash (V)
γrəc-krəc	grumble (of stomach)
ləβ-ə-lip	hedge, bush-border of property
γər-γur	angry
γnəs-knes	worry, be frustrated

**Table 4 Reduplication with no vowel change (see 4.3.3.3)**

er-er	crickets
ir-ir	hiccups (N)
eŋ-eŋ-əm	round (ADJ)
im-im-ga	whirlwind
βrit-prit	spill (INTRANS)
γila-γila	sugargliders
sak-sak-pəm-ga	light (ADJ; weight)
γumar-γumar-γa	clean (ADJ)
βuk-puk	ripen
βur-βur	rub in (ointment)
but-but-ki	smoke (of a fire)
βluc-pluc	be becoming loose



γəŋ-ɡəŋ-gi	butterflies-SG
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**Table 5 Reduplication with /ə/ (see 4.3.3.3)**

γrəs-krəs	rustle
βnək-pnək	whimper
gər-gər	thorns
γrəŋ-ɡrəŋ	crack, pop (of bones)
βrən-brən	shake, shiver
γən-gən-gi	earthquakes-SG
ɹən-dən-ga	sturdy, stable
tsəm-tsəm	writing

**Table 6 Vowel harmony occurring (see 4.3.4.1)**

ɹəm-ga	ɹim-gi	boy, girl
deŋ	diŋ-it	weave (V), mat-SG
em-ga	im-gi	boy, girl
enep	eniβ-iɹəŋ	tribes/generations PL, SG
γəsəŋ	γəsiŋ-ini	hair/fur PL, SM.SG (strand of hair)
γael	γail-γi	wallaby PL, F.SG
γaəŋ	γaiŋ-it pət	stars, very starry (DICT)
γale-γα	γali-γi	stay there M.SG, F.SG
γeŋ	γi-gi	teeth PL, SG
gamðe	gamu-iəm	men PL, DL
laet	laīt-ki	navels PL, SG
lek	li-γi	hole in the side of something PL, SG
naɹper-ta	naɹiɹ-iɹəŋ, naɹiɹ-γi	leaders/firstborn(?), SM.PL, F.SG
narem-ga	narim-gi	corner inside a house, bay
nəeŋ	nui-gi	hunger PL, SG
nes	nis-ki	birds' tails PL, SG

reŋ	ri-gi	water/river PL, SG
sarem	sarim-gi	bellies PL, SG
sœŋ	süi-gi	rain, rain-SG (rain shower)
sen	sin-gi, sin-ini	knives PL, SG, SM.SG

**Table 7 Exceptions to vowel harmony (see 4.3.4.1.1)**

ɟæ-ɣi	small men's string bags-SG
βem-ini, βem-gi	pig-SM.SG, F.SG
eɣðe-ɣi	clouds-SG
eŋ-a-ɣi	shoulders-SG
er-er-ɣi	crickets-SG
es-a-ɣi, es-iɰm	hawks' nests SG, SM.DL
eseŋ-a-ɣi	moss-SG
et-ki	large garden-SG
ɣðep-ki	tears-SG (small puddle)
ɣek, ɣe-ɣi	caves PL, SG
gæp-ki	black palm (species of <i>Caryota</i> ) SG
maneŋ-a-ɣi	foreheads-SG
nəs-nes-ki	sharp
səɣðe-ɣi	forked posts/branches-SG

**Table 8 Words with exceptional stress (see 4.5.4)**

sə'ɣ <sup>w</sup> eŋa-ɣa	ankles-SG
ɣumar-'ɣumar-ɣa	clean (ADJ)
'gamðe	people
'snəŋ-a-ɣa	heart (thoughts-SG)
'unbem	two F
'dab-em	mountains DL
'ru-βek	people

'udi,om	two
u'ra-mət	Ura (ADJ)
u'ra-mət-ka	Ura man-M.SG
'ka.irak-ka	Kairak man
'liləs	ants

**Table 9** [a] epenthesis (see 5.1.1)

Epenthetic [a]	Gloss
artaə, artua-ya	black cane for woven walls PL, SG
gaə, gua-ya	(gloss unknown) PL, SG
laə, lua-ya	eggs PL, SG
lae, li.a-ya	type of tree PL, SG
γḏeə, γui-a-γi, γui-a-ya	<i>Saccharum spontaneum</i> (Tok Pisin 'pitpit') PL, SG, year
marap, marəβ-a-ya, marəβ-a-iəm, marəβ-a-et	vertical house post PL, SG, DL, LONG.THICK.SG (marəβ-a-et from dictionary notes)
mayat, mayəɫ-a-γi, mayəɫ-a-em	sulphur-crested cockatoos PL, SG, DL (mayəɫ-a-em from dictionary notes)
luat, luɫ-a-γi	house walls PL, SG
it, iɫ-a-it	lice PL, SG
səβət, səβəɫ-a-ya	(gloss uncertain; səβət is glossed in as 'to on')
barɔr-itnək, barɔr-a-it	betel palm ( <i>Areca catechu</i> ) fronds PL, SG
γar, γər-a-γi, γər-a-et, γər-isem, γər-ige	legs PL, SG, LONG.THICK.SG, LONG.THICK.DL, FLAT.SIDED.SG
li.el-a-it, li.el-itnəm, li.el-itnək	rooster tail feathers SG, DL, PL
γel, γel-a-ya, γel-a-iəm	native spinach ( <i>Aramanthus gangeticus</i> ) (Tok Pisin 'aupā') PL, SG, DL
βəl, βəl-a-ya	(gloss unknown) PL, SG
gəs, gəs-a-ya	kagua (edible plant of fig family; English equivalent

	unknown) PL, SG
eməs, eməs-a-γi	coconuts ( <i>Kokos nucifera</i> ) PL, SG
naŋas, naŋəs-a-γa, nagnəs-a-it, naŋəs-itnək	native tobacco PL, SG, FLAT/THIN.SG, FLAT/THIN.PL
γuβis, γuβis-a-γa	hawks PL, SG
es, es-a-γi, es-i-ɔm	hawks' nests PL, SG, SM.SG
mes, mes-a-γa	grasshoppers PL, SG
γəɬaməs-a-γa	nephew (GRAM)
βuk, βuy-a-γi	coconut ( <i>Kokos nucifera</i> ) growth/sprout (Tok Pisin 'kru') PL, SG
βai.am, βai.əm-a-γa	small brown wasps PL, SG
em, em-a-it, eb-em, em-i-ɔŋ	mushrooms PL, SG, DL, constellation
igũam, igum-a-it	fern (grows under <i>Thea abroma</i> (cacao) tree) PL, SG
səgəŋ, səgəŋ-a-γa, səgəŋ-a-i-ɔm	string bags PL, SG, DL
gəɬəŋ, gəɬəŋ-a-γa	termites PL, SG
eŋ, eŋ-a-γi, eŋ-a-em, eŋ-ini	shoulders PL, SG, DL, fire dance
eseŋ, eseŋ-a-γi	moss PL, SG
igrəŋ, igrəŋ-a-γa	flies PL, SG
manəŋ, manəŋ-a-γi	foreheads PL, SG
sayəŋ, sayəŋ-a-γa, sayəŋ-a-i-ɔm, sayəŋ-a-it, sayəŋ-itnək	eyes PL, SG, DL eyes FLAT/THIN.SG, FLAT/THIN.PL (faces SG, PL)
γumaŋ, γumaŋ-a-γi	spiders PL, SG
gənaŋ, gənaŋ-a-γi	brains PL, SG
ɬəŋ-itnək, ɬəŋ-a-it	backs (N) PL, SG
naŋ, nauŋ-a-γa	opossums PL, SG
snəŋ, snəŋ-a-γa	thoughts, heart-SG
ɬaəŋ, ɬaəŋ-a-γa	earthworms PL, SG

**Table 10** no [a]-epenthesis (see 5.1.1)

ɬɔc, ɬɔj-et	hand and arm PL, SG
ɬɔyɔp-ki	full
ɬɔkgurət-ki	owls-SG
ɬəmən-gi	thick
ɬən-dən-ga	sturdy/stable
ɬɔp-ka	dew (DICT)
ɬæ, ɬæ-ya	small men's string bags PL, SG
ɬaŋəm-gi	bananas-SG
ɬaŋe, ɬaŋe-ya	flesh PL, SG
ɬap, ɬap-ki	traditional stone axes PL, SG
ɬaun, ɬaun-ga	type of tree which marks seasons – new leaves = rain time, losing leaves = sun time PL, SG
ɬɔem-ga	children-M.SG
ɬɔm-ga	ghost / ancestral spirit-SG
ɬinəm-ga	fish-SG
ɬicpəm-gi	wet (ADJ)
artən, artən-gi	jaws/cheeks, jaw/cheek/chin
bəŋ-bəŋ-gi	clay (DICT)
βəm, βəm-gi, βəb-it	mouths PL, SG, FLAT/THIN.SG (lip)
βəs-ki	heads-SG
βət-ka	houses-SG
βaɬɔc-ka	quarter moon/new moon/sliver (DICT)
βaɬ, βaɬ-γi	grandmothers PL, SG
baes-ka	balsa (wild) (DICT) SG
βas-ki	breadfruit ( <i>Artocarpus incisa</i> ) SG
baur-γi	trap (GRAM)
bɔiβəm-ga	green coconut ( <i>Kokos nucifera</i> ) (for drinking) SG

bɔ̃i-γi (stem alternant <u>baul</u> ), baul-əm, baul-em, baul-ini, baul-it	clothing SG, waistcloth SG, DL, cloth SM.SG, cloth FLAT/THIN.SG
bi.as-ka, bi.as-ki	blood, sore/cut/wound
βim-ga, βim-gi	peanut, peanut plant ( <i>Arachis hypogaea</i> )
βim-gi	almond tree (DICT) SG
bipmət-ki	blunt
βlam, βem-ga, βem-gi	pigs PL, M.SG, F.SG
βugur-γa	sticks-SG (for smacking children)
βurəs-ki	rapids (DICT) SG
but-but-ki	smoke (of a fire)
dədən-ga	mute man M.SG
dəŋ, dəŋ-it	woodchips PL, SG
dam-gi	mountain/volcano/boil-SG
dugus-ka	little/last finger-SG
dui-γa (stem alternant <u>dul</u> )	stones-SG
du.im-ga	elbows-SG
durac-ki, durac-ka	fowls F.SG, M.SG
eɣen, eɣen-ga	lime powder (Tok Pisin ‘kambang’) PL, SG
eβən-ga	young man M.SG
ebanan-gi	reddish ground frog SG
eβɔp-ki, eβɔβ-em	female human SG, DL
edəm-gi	clubs-SG (household tool, for ‘paitim malu’)
eγɔc-ka	weak
eγðe-γi	clouds-SG
egər-γa	Eclectus parrots M.SG
egüin-gi	necks-SG
egut-ka	husband (?spouse-M.SG)

em, em-gi	tusks PL, SG
emən-gi	level ground / plain SG
emərnas-ki	black and yellow striped snake SG
em-ga	boy (debated; <u>ɟemga</u> proposed as preferred alternative)
engəc-ka	‘tru’ stone, various colours (DICT)
erer-γi	crickets-SG
esər-γa	yellow liquid from stones near a spring (DICT)
γəβəc-ka	sword grass ( <i>Imperata arundinacea</i> ) (Tok Pisin ‘kunai’) SG
γəbu, γəbu-γa	tree with edible fruit ( <i>Pometia pinnata</i> ) (Tok Pisin ‘ton’) PL, SG
γəngən-gi	earthquakes-SG
γərək-dəm-gi, γərək-dəm-ηət	dry (ADJ), NON.HUMAN.PL
γərdət-ki	slings-SG
γərnas-dəm-gi	hot
γərnas-mət, γərnas-mət-ka	hotspring (DICT) PL, SG
γəsəp-ki	cliff
γəsəŋ, γəsəŋ-it, γəsəŋ-ini	hair/fur PL, FLAT/THIN.SG, SM.SG
γaβər-γi	areca palm ( <i>Kentiopsis archontophoenix</i> ) (Tok Pisin ‘limbum’) for making house floors SG
γadaə, γadaə-γi	taro leaves (cooked) PL, SG
γaěβeə, γaěβeə-it	wingbeans PL, SG
γael-γa	wallabies-M.SG
γaeŋ, γae-ga	stars PL, SG
γalakman-gi	soft, squishy, cushy (DICT)
γaluc-ka	lizards-SG
γalun, γalun-ga	type of taro ( <i>Colocasia hontosoma</i> ) (Tok Pisin ‘singapo’) PL, SG
γarum-ga	mud crabs / water crabs SG

չոյ-ցոյ-ցի	butterflies-SG
չոյք-կա	small lake/big puddle/dam (DICT)
չօս, չոս-ցի, (DICT) չոս-ինի	sand PL, SG, SM.SG
չօբօյն-ցա	tongues-SG
չօք, չօք-կի	tears PL, SG (small puddle)
չօկօկ, չօկօկա	babies PL, M.SG
չօտ-կա	short
չօտնաչօս-ցա	vertical spring (DICT)
չեկ, չեյի	caves PL, SG
չեկճոմ-ցի	ripe coconuts ( <i>Kokos nucifera</i> ) SG
չեք, չեք-կա	spears (for throwing) (N) PL, SG
չիար-յի	(gloss unknown)-SG
չիլօտ-կի	Eclectus parrots F.SG
չիրօք-կի	salt (N)
չրօտ-կա / չօրօտ-կա	strong
չլար-յա	rainbows-SG
չլիմ-ցի	noses-SG
չլսոյն, չլսոյն-ցա	blue flies PL, SG
չլու.աղ, չլու.ա-յա	(gloss unknown) PL, SG
չլում, չլում-ցի	white, Caucasian female F.SG
չումար-չումար-յա	clean (ADJ)
չւրեմ-ցա	betel nut ( <i>Areca catechu</i> ) SG
չւ:մ-ցի	knees-SG
չ <sup>w</sup> եմեն-ցի, չ <sup>w</sup> եմեն-ցա	common small water frog F.SG, M.SG
գոյոյն-իտ	cockroaches-SG
գոնոն-ցի	mucus-SG
գոթօմ-ցի	fruit-SG
գօք-կի	black palm (species of <i>Caryota</i> ) SG



galəŋ-gi	waterfall-SG (DICT)
gamðe-ya, gamu-iəm	man SG, DL
garəs-ka	sea
gət-ka	big bamboo for splitting into walls SG
gləŋ-gi	chink/chip in knife or spade blade
iəβ-it	taro ( <i>Colocasia antiquorum</i> ) leaves uncooked SG
ǎar-ya, ǎar-ŋət	new, raw
jaūs-ka	evil spirits-SG
iβət-ki	ground/earth-SG
iβilyi	(gloss unknown)
idan-gi	freshwater eels SG
ie, yil-it	plant with edible leaves ( <i>Abelmoschus manihot</i> ) (Tok Pisin ‘aibika’) PL, SG
iγum-ga	flood (N)
iγur-γi, iγur-it	tail (of dog) SG, FLAT/THIN.SG
ǎar-γi	cucumbers-SG
iləŋ-gi	charcoal-SG
im-ga	dogs-M.SG
im-im-ga	whirlwind
iŋas-ki	thin
iŋbranaski	whirlpool
iŋnaska	corner (of a road)
irək, irəya	bamboo for making blinds PL, SG
isəŋ-gi	bush breadfruit (brown) SG
isəm, isəm-ga	birds PL, SG
isac, isac-ki	bunch/bundle (N) (DICT) PL, SG
is-it	mountain ridge
is-ka	path/road-SG
ləβ-ə-lip-ka	hedge / bush-border of property SG

ləc-pek, ləc-ka	younger brothers PL, SG
ləlayun-ga	floating timber (DICT) SG
la:r-γi	sugarcane ( <i>Saccharum officinarum</i> ) SG
laet, laīt-ki	navel PL, SG
layəs-ki	(gloss unknown; perhaps a type of cucumber)
lay-itnək, lay-it	(gloss unknown) PL, SG
lai-γa, lai-γi, lai	bed, floor, (?floor/bed) PL
laur-γi, laur-əm	wind, windstorm (DICT)
ligər, ligər-ige	money PL, SG
ligət-ki	ashes
liləs-ka	ant SG
lilit, lilit-ka	(gloss unknown) PL, SG
ludəŋ, ludəŋ-it, ludə-ga	betel pepper ( <i>Piper betel</i> ) (Tok Pisin ‘daka’) PL, FLAT/THIN.SG, SG
lus-ki	traditional wooden pots SG
mənən-ga	pus
mənəp, mənəβ-itnəm, mənəβ-it	(gloss uncertain, possibly ‘tiredness’) PL, FLAT/THIN.DL (eyelids DL), FLAT/THIN.SG (eyelid)
mərən-bəm-ga	heavy
mərdən-ga	pigeon (grey, flies low) SG
mərmət-ki	sweet
məsū, məsū-γa	honeybees PL, SG
marəs-ka	oil (melted fat) (DICT)
maren-ga	rats-SG
masən-ga	wallabies-M.SG
masiɽəm, masiɽəm-gi	dreams PL, SG
mat-ka, mat-ki	older brother, older sister
mər-γa	big
mi.ək, mi.əka	papaya ( <i>Carica papaya</i> ) PL, SG

mudəm-gi	fire SG
mumum-ga	iguanas-SG
ηəʃaləm-gi	medium-sized bat with face marking SG
nəbup-ki	brown snake (very short and fat) SG
ηəmսոյ, ηəmu-ga, ηəmսոյ-əմ, ηəmսոյ-ից	trees (general) PL, SG, RND.SIDED.SG, FLAT.SIDED.SG
nərəp-ka	bat (medium-sized brown, with mark on face)
nəs-nes-ki	sharp
naʃer-ta	leaders (GRAM)
narək, narəyi	yam (species of <i>Dioscorea</i> ) PL, SG
narem-ga	corner (of a room)
nəոոյ-ga	mosquito-SG
ηոտ-ki	crow-SG
ηեօր-յա	lorikeet-SG
nes, nis-ki	tail (of bird) PL, SG
ηլալ-յա	lame man M.SG
rəp-ga	sword grass ( <i>Imperata arundinacea</i> ), long (Tok Pisin ‘kunai’)
rəc-ka	straight
rəc-ηոտ	right, correct
rəm-ga	thighs-SG
raօ, raօ-յի	walnut (trees) PL, SG
ras-it	fingernails-SG
rəknan-gi	green tree frogs SG
rib-it	buttocks-SG
ri-յա, ri-յի, ri-յա	untidy/forgetful [meaning debated] man, woman, PL
səcjəm-ga	rotten (transcription of [cʝ] uncertain)
sən, sən-ga	cane for making furniture PL, SG
səs-ta, səs-ki	young unmarried women PL, SG

səsur-ya	blind man M.SG
sǣl-ya	left-M.SG (left-handed male)
sak-sak-pəm-ga	light (ADJ, weight)
sap-ki	traditional bludgeons-SG
sarem, sarim-gi	bellies PL, SG
sa.un-ga	belts-SG
sœŋ, sŷi-gi	rain, rain-SG (rain shower)
sdəm-gi	ears-SG
sen, sin-gi	knives PL, SG
ses, ses-ka	string (for making string bags) PL, SG
si, si-yi	red cedars PL, SG
siyir-ya	dirty (ADJ)
silel, silel-yi	(gloss unknown)
sinəp-ki	white quartz (DICT)
sir-iqəŋ	germs-SM.PL (DICT)
sləc, sləj-ige	body PL, SG
sləp, sləp-ki, sləp-ka	bones, bone, stalk
snaŋ, snaŋ-em, snaŋ-gi	hips PL, DL, SG
surduŋ-ga	bat (tiny brown) SG
sur-ya, sur-yi, sur	fence, wall, PL
t-let-ka	small river branch that happens in flooding (DICT)
t-mən, t-mən-gi	door PL, SG
uyup-ki	hole, (DICT) (man-made)
u.ŷu-ya	long
ulan-gi	pythons-SG
uluŋ-gi	small grey snakes that moves slowly SG
un-gi	shade-SG (umbrella)
up-ka	valleys-SG

urən-gi	crayfish/shrimps (Tok Pisin ‘kindam’) SG
ur-ya, ur-əm, ur-ap	island (DICT) SG, RND.SIDED.SG, RND.SIDED.PL
ur-yi	forest/woods/bush SG
usəp-ki	heaven (DICT)
us-ka	level ground between river and mountains

**Table 11 /a/ centering and the epenthetic [a] (see 4.3.3.1)**

	/a/ as [a]		/a/ as [ə]	
<b>No epenthetic [a]</b>	nan, nan-ga	mother INFORM, FORM	ɬap, ɬəp-ki	traditional stone axes PL, SG
	mam, mam-ga	father INFORM, FORM	ɣɔ̃ɛbaj, ɣɔ̃ɛbaj-ga	tongues PL, SG
	durac, durac-ki	fowls PL, SG	ɬajam, ɬajəm-gi	bananas PL, SG
	sap, sap-ki	traditional bludgeons PL, SG	mənap, mənəβ-itnəm	(gloss uncertain, possibly ‘tiredness’) PL, FLAT/THIN.DL (eyelids DL)
	dam, dam-gi	mountains/boils PL, SG	mudam, mudəm-gi	fire PL, SG
	bulap, bulap-ka	housebroken/tame animals PL, SG	isaj, isaj-gi	bush breadfruit PL, SG
	la:r, la:r-ɣi	sugarcane ( <i>Saccharum officinarum</i> ) PL, SG	iɬap, iɬəβ-it	taro leaves, uncooked PL, SG
	βas, βas-ki	breadfruit ( <i>Artocarpus incisa</i> ) PL, SG	ilaj, ilaj-gi	charcoal PL, SG
	snaj, snaj-em	hips PL, DL	ɬajam, ɬajəm-ga	woven belts for carrying firewood PL, SG
	ulan, ulan-gi	snakes PL, SG	gaβam, gaβəm-gi	seeds/fruit PL, SG
	ɣumar, ɣumar-ɣa	clean (ADJ)	ɣəβac, ɣəβac-ka	sword grass ( <i>Imperata arundinacea</i> ) (Tok Pisin ‘kunai’) PL, SG
	ɣila-ɣila, ɣila-ɣila-ɣa	sugargliders PL, SG	gənən, gənən-gi	mucus PL, SG

	/a/ as [a]		/a/ as [ə]	
<b>No epenthetic [a]</b>	srap, srap-ki	ringworm ( <i>Tinea corporis</i> ), cloak (N)		
	γulu.aη, γulu.a-gi	great grandparents PL, SG		
	bəηaη, bəηaη-əs	night PL, GRPD		
	nənaη, nəna- ga	sandflies PL, SG		
	salaη, sala- ga	karakap (leafy green vegetable) PL, SG		
	si.aη, si.a-gi	men's bush-rope bags PL, SG		
<b>Epenthetic [a]</b>	məran, məran-a-γi	grass PL, overgrown	γar, γər-a-et	legs PL, SG
			naηas, naηəs-a-γa	native leaf tobacco PL, SG
			gəɬaη, gəɬəη-a-γa	termites PL, SG
			γumaη, γuməη-a-γi	spiders PL, SG
			marap, marəβ-a-γa	vertical house posts PL, SG
			mayat, mayət-a-γi	cockatoos PL, SG
			βaɪ.am, βaɪ.əm-a-γa	small brown wasps PL, SG

**Table 12** gǘa form for 1.Poss.SG (see 5.1.2.1)

In Table 12 and Table 13, multiple forms for each stem are only supplied when each form was checked for its gu/gua selection. Often additional forms can be found elsewhere within the Appendix, if these are sought.

gǘa	ɹəŋ-a-it, ɹəŋ-itnək	backs SG, PL
gǘa	ɹəpki	(gloss unknown; related to ‘dew’?)
gǘa	artən, artən-gi	jaws/cheeks, jaw/cheek/chin
gǘa	as-it, as-itnək	grass skirt belts PL, SG
gǘa	βəm, βəm-gi	mouths PL, SG
gǘa	βəm-itnək, βəm-itnəm, βəbit	mouths FLAT/THIN.PL, FLAT/THIN.DL, FLAT/THIN.SG (lips PL, DL, SG)
gǘa	βət, βət-ka	houses PL, SG
gǘa	βas-itnək, βas-it	breadfruit ( <i>Artocarpus incisa</i> ) leaves PL, SG
gǘa	bək	(gloss unknown)
gǘa	dam	mountains
gǘa	d-er	taro (very large)
gǘa	d-ige, d-igleŋ	taro (piece) SG, PL
gǘa	eɹen-ga	lime powder
gǘa	eβən-ga	young man (?spouse-M.SG)
gǘa	eβəp-ki	female humans SG
gǘa	eɣer	(gloss unknown)
gǘa	egər-ɣa	Eclectus parrot-M.SG
gǘa	egǘingi	necks-SG
gǘa	egut-ki, egut-pek	husbands SG, PL
gǘa	em	mushrooms
gǘa	eməs, eməs-a-ɣi	coconuts ( <i>Kokos nucifera</i> ) PL, SG
gǘa	eŋ-a-em, eŋ-itnək, eŋ-a-ɣi	shoulders DL, PL, SG
gǘa	ɣar, ɣər-a-ɣi, ɣər-isem, ɣər-a-et	legs PL, SG, DL, LONG/THICK.SG



gǘa	ɣel	native spinach ( <i>Aramanthus gangeticus</i> ) (Tok Pisin ‘aupa’)
gǘa	ɣep, ɣep-ka	spears PL, SG
gǘa	ɣum, ɣum-gi	cough/mucus PL, SG
gǘa	gɔs, gɔs-a-ɣa	kagua (edible plant of fig family; English equivalent unknown) PL, SG
gǘa	gɔt	big bamboo for splitting into walls
gǘa	iɟap	taro leaves, uncooked
gǘa	i.a <sup>24</sup> , ila-ɣi	mangoes ( <i>Mangifera indica</i> ) PL, SG
gǘa	ɨar	life
gǘa	iβət-ki	ground, earth
gǘa	igǘam	fern (grows under <i>Thea abroma</i> (cacao) tree) PL
gǘa	ɨ̄ar	cucumbers
gǘa	im-ga	dogs-M.SG
gǘa	iringi	bamboo musical instrument
gǘa	isaɲ	bush breadfruit PL
gǘa	is-it	mountain ridge
gǘa	is-ka	paths/roads-SG
gǘa	it	lice
gǘa	ləc-ka	younger brothers SG
gǘa	lat	garden PL
gǘa	mat-ka, mat-ki	older brother, older sister
gǘa	mes, mes-a-ɣa	insects PL, SG
gǘa	mudam	fire
gǘa	rəb-ap, rəb-əm	thighs PL, SG

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<sup>24</sup> The few speakers I asked said this was spelt <iya>, not <ia> or <iqya>. <qy> is the grapheme for [j].

gǘa	ras-itnək, ras-it	fingernails PL, SG
gǘa	rat	molars
gǘa	reŋ, ri-gi	water/river PL, SG
gǘa	rim-itnək, rib-it	buttocks PL, SG
gǘa	sən	cane for making furniture PL
gǘa	səs-ki	young unmarried women F.SG
gǘa	sap	traditional bludgeons
gǘa	sek, seya	stories PL, SG
gǘa	sen, sin-gi	knives PL, SG
gǘa	ses	string (for making string bags) PL, SG
gǘa	si, si-ya	red cedars PL, SG
gǘa	t-məs	food
gǘa	t-mən-gi	doors-SG
gǘa	un, un-gi	shade, shade-SG (umbrella)
gǘa	up-ka	valleys-SG
gǘa	ur	forest/woods/bush

**Table 13** gu form for 1.Poss.SG (see 5.1.2.1)

gu	ɖəbən	saliva
gu	ɖadiŋ-it	coconut ( <i>Kokos nucifera</i> ) leaf mat
gu	ɖaŋam, ɖaŋəm-gi, ɖaŋəm-ga	bananas PL, SG, rope of bananas
gu	ɖaŋe, ɖaŋe-ya	flesh PL, SG
gu	ɖinəm, ɖinəm-ga	fish PL, SG
gu	ɖiŋaŋmət-ki, ɖiŋaŋmət-ŋət	vehicles SG, PL
gu	βaɖ-yi, βaɖ-yina	grandmothers SG, PL
gu	βadək	toes
gu	bɔɿ-yi (stem alternant <u>baul</u> )	clothing SG
gu	βiam	peanuts ( <i>Arachis hypogaea</i> )
gu	bi.as-ka	sores/cuts/wounds-M.SG (blood)

gu	βlam, βem-ga	pigs PL, M.SG
gu	βləl / βələl	leafy green vegetables (general) PL
gu	brəɫ-əm / bərəɫ-əm, bərəɫ- ap	chests PL, SG
gu	duim	elbows
gu	durac-ka	fowls SG
gu	ɣəbu, ɣəbu-ɣi	stomachs PL, SG
gu	ɣələski	cockatoos SG
gu	ɣərɔr / ɣrɔr	calf muscle
gu	ɣəsəŋ	hair/fur PL
gu	ɣaβat	dancers
gu	ɣaʔ	uncle (mother's brother)
gu	ɣaɔ, ɣaɔ-imek, ɣa.ɔs	PL, PL, SG. (Gloss uncertain; a body part, possibly 'lungs')
gu	ɣalun	type of taro ( <i>Colocasia hontosoma</i> ) (Tok Pisin 'singapo') PL
gu	ɣarumga	water crabs / mud crabs
gu	ɣəbəŋ, ɣəbəŋ-ga	tongues PL, SG
gu	ɣəeɔ, ɣui.a-ɣi, ɣui.a-ɣa	<i>Saccharum spontaneum</i> (Tok Pisin 'pitpit') PL, SG, year
gu	ɣəp	tears
gu	ɣəkəkə	babies-M.SG
gu	ɣŋar	veins
gu	ɣulim, ɣulim-gi	noses PL, SG
gu	ɣusem	intestines
gu	ɣu:m-gi	knees-SG
gu	gənəŋ, gənəŋ-gi	mucus PL, SG
gu	gənəŋ, gənəŋ-a-ɣi	brains PL, SG
gu	jaŋŋ	tree seedlings
gu	jaŋs, jaŋs-ka	evil spirits PL, SG

gu	la:r	sugarcane ( <i>Saccharum officinarum</i> ) PL
gu	lai-ya, lai-yi	bed, floor
gu	laït, laït-ki	navels PL, SG
gu	li.el-a-it, li.el-itnək	rooster tail feathers SG, PL
gu	ligər	money
gu	luɫ-a-yi	house walls SG
gu	mənəβ-itnəm, mənəβ-it	eyelids DL, SG
gu	mənəp	gloss uncertain; possibly ‘tiredness’
gu	mamət	fat (N)
gu	maneŋ, maneŋ-a-yi	foreheads PL, SG
gu	masiɯəm-gi	dreams-SG
gu	mi.ək	papaya ( <i>Carica papaya</i> ) PL
gu	ŋəmu-ya	God-SG
gu	ŋəmuŋ, ŋəmu-ga	trees (general) PL, SG
gu	niʒil-əs, niʒil-imek	livers SG, PL
gu	raɔ, raɔ-yi	walnut (trees) PL, SG
gu	raup	pig lice
gu	səgən	traditional string bags
gu	sayɔŋ	eyes
gu	sarem, sarim-gi	bellies PL, SG
gu	si.aŋ	men’s bush-rope bags
gu	slum, slum-gi	withered/deformed (ADJ), deformed body part
gu	snəŋ, snəŋ-a-ya	thoughts, heart-SG
gu	snagŋaŋ-gi	bladders-SG
gu	srap, srap-ki	ringworm ( <i>Tinea corporis</i> ), cloak (N)
gu	sɔŋ, sɔŋ-a-ya	long pale brown tree grubs PL, SG
gu	sru-yi	old woman-F.SG
gu	sŋi-gi	rain-SG (rain shower)

**Table 14** Loanwords and *gu/gǔa* (see 5.1.2.2)

<b>gu</b>		<b>gua</b>	
<b>Borrowed word</b>	<b>Gloss</b>	<b>Borrowed word</b>	<b>Gloss</b>
baket	bucket	abəl	ball
bisket	cracker	abuk	book
feməli	family	ambrela	umbrella
dʒenereita	generator	arəp	rope
gumi	rubber tie	asəp	soap
hendəl	handle	atəl	salt
kabala	pot	bet	bed
kaləs	clothes	kap	cup
kapa	iron (roofing)	kar	car
karasin	kerosene	kəm	comb
kəpi	coffee	ki	key
ketəl	kettle	lam	kerosene lamp
klipbəd	clipboard	lək	padlock
lətu	church	nil	nail (for construction)
leta	ladder	pen	pen
marasin	medicine	pin	pin (dressmaker's)
masin	machine	su	shoe
məni	money	teŋk	tank
məskito	mosquito	ti	tea
metʃes	matches		
milk	milk		
nekles	necklace		
peipa	paper		
pensil	pencil		
pilo	pillow		

plestik	plastic bag/container
plet	plate
raīs	rice
raītiņ ped	writing pad
redio	radio
rula	ruler (stationery)
sol/solt	salt
solūara	sea
sendol	sandal
sia	chair
sikspoket	six-pocketed trousers
sisis	scissors
slipa	jandal/flip-flop/thong
spet	saliva
spun	spoon
striņ	string
suga	sugar
tauol	towel
tebol	table
traūses	trousers
tutbras	toothbrush
ūilberō	wheelbarrow
ūilūil	bicycle
īariņ	earring

**Table 15 Inconsistently reported gu/gǔa form for 1.Poss.SG (see 5.1.2.4)**

ie, ʔil-it	plant with edible leaves ( <i>Abelmoschus manihot</i> ) (Tok Pisin ‘aibika’) PL, SG	<u>gǔa</u> for both: six speakers/interviews <u>gǔa</u> for <u>ie</u> , <u>gu</u> for <u>ʔilit</u> : two speakers/interviews	
jɔ.e, iʔa	small bamboo for woven walls PL, SG	<u>gǔa</u> for <u>iʔa</u> , <u>gu</u> for <u>ʔɔ.e</u> : five speakers/interviews <u>gǔa</u> for both: three speakers/interviews	
laɔ	eggs	<u>gu</u> : four speakers/interviews	<u>gǔa</u> : three speakers/interviews
ʔan-itnək, ʔan-it	gums PL, SG	<u>gu</u> : one (older and apparently very knowledgeable) speaker. He claimed both <u>gu</u> and <u>gǔa</u> sounded okay, but <u>gu</u> was best.	<u>gǔa</u> : five speakers
sləj-ige	bodies-SG	<u>gu</u> : five speakers/interviews	<u>gǔa</u> : four speakers/interviews
snaŋ-gi	hips-SG	<u>gu</u> : two speakers	<u>gǔa</u> : six speakers
sur, sur-ʔi	fences PL, SG	<u>gu</u> : four speakers	<u>gǔa</u> : two speakers
βas, βas-ki	breadfruit PL, SG	<u>gu</u> : three speakers/interviews	<u>gǔa</u> : four speakers/interviews

**Table 16 [ŋ] elision (see 5.2)**

PL	Suffixed form(s)	Gloss
ʔæŋ	ʔæ-ga	drains PL, SG
bəŋaŋ	bəŋa-gi, bəŋaŋ-it, bəŋaŋ-əs	night PL, SG, FLAT/THIN.SG, GRPD.SG (dusk)
βæŋ	βæ-gi	waves (DICT) PL, SG
duŋ-duŋ	duŋ-du-gi	(gloss unknown)
ʔəsəŋ	ʔəsə-ga, ʔəsəŋ-it, ʔəsəŋ-ini	hair/fur PL, SG, FLAT/THIN.SG, SM.SG

γαβη	γαβε-га	ground crabs PL, SG
γαιη	γαιη-га, γαιη-it (DICT)	stars PL, SG
γδεδη	γδεδη-га	small bamboo for shade PL, SG
γηη	γι-γι	teeth PL, SG
γυλυ.αη	γυλυ.α-га, γυλυ.α-γι	great grandparents/type of tree PL, type of tree SG, great grandparent
	γυνη-га, γυνη-it	sun/light/clear (DICT); period of time of sun (DICT)
γυτδэхэνη	γυτδэхэνη-га	centipedes PL, SG
	ιηι-га	crooked
ιι.ηη	ιι.ηη-га	(gloss unknown)
ιυδηη	ιυδηη-it, ιυδηη-га	betel pepper ( <i>Piper betel</i> ) (Tok Pisin 'daka') PL, FLAT/THIN.SG, SG
μα.ηη	μα.ηη-га	hornbill; kokomo PL, SG
ηαμυη	ηαμυ-га, ηαμυη-et, ηαμυη-αμ, ηαμυη-ιγε	trees (general) PL, SG, LONG/THICK.SG, RND.SIDED.SG, FLAT.SIDED.SG
ηαηηη	ηαηηη-га	sandflies PL, SG
ηηη	ηηη-га	pebbles PL, SG (DICT)
ηαηη	ηυι-γι	hunger PL, SG
ρηη	ρι-γι	water/river PL, SG
σασαηη	σασα-га, σασαηη-ιηι	large red ants PL, SG, SM.SG
σαλαηη	σαλα-га	leafy green vegetable (Tok Pisin 'karakap') PL, SG
	σα.α.γι	virgin bush (DICT)
σι.αηη	σι.α-γι	men's bush-rope bags PL, SG
σαηηη	συι-γι, σαηηη-га	rain, rain-SG (rain shower)



**Table 17** /ŋ/ and [a]-epenthesis (see 5.2)

Unaffixed form	Suffixed form(s)	Gloss
	ɹəŋ-itnək, ɹəŋ-a-it	backs (N) PL, SG
ɹæŋ	ɹæŋ-a-ɣa	earthworms PL, SG
eŋ	eŋ-a-em, eŋ-a-ɣi	shoulders PL, DL, SG
eseŋ	eseŋ-a-gi	moss PL, SG
ɣumaŋ	ɣumaŋ-a-ɣi	spiders PL, SG
gəɹəŋ	gəɹəŋ-a-ɣa	termites PL, SG
gənaŋ	gənaŋ-a-ɣi	brains PL, SG
iɣrəŋ	iɣrəŋ-a-ɣa	flies PL, SG
manaŋ	manaŋ-a-ɣi	foreheads PL, SG
naŋ	naŋ-a-ɣa	opossums PL, SG
saɣəŋ	saɣəŋ-a-ɣa	eyes PL, SG
snəŋ	snəŋ-a-ɣa	thoughts, heart-SG

**Table 18** // cross-linguistically (see 5.4.2)

Ura	Gloss	Kairak	Mali	Qaqet
ɟa	take, bear	ral	ɟal	ral
ɟae	small men's string bags	ralaŋ	ɟal	səgən
artaɔ, artu.a- ɣa	black cane for making blinds PL, SG	rəltɔ, rəltɔɣa	ɟaβɔt, ɟaβɔɟaya	atua, atuaya
baes	type of tree PL	berəs	baləs	baɾəs
βlam (stem alternant <u>βem-</u> )	pigs	βle, βləmga	βlam, βləmga	βəlam
d-ige	piece of taro ( <i>Colocasia antiquorum</i> ) SG	dəm	digəl	digliŋ
dui (stem alternant <u>dul</u> )	stones	dul	dul	dul
eβər		ləβər (from one of these three languages)		
eβɔp	female humans		ləβɔp	
eɣup	(gloss unknown)	ləɣup (from one of these three languages)		
egūin	necks	ləgɔin	ləgɔin	ləgɔin
eməs	coconuts ( <i>Kokos nucifera</i> )		laməs	laməs
ɣael	wallabies	ɣəel	ɣael	ɣail
ɣaɛŋ	stars	eldaŋ	ɣaɛŋ	waldaŋ
ɣale	don't/stop it!	ɣale	kule	ɣurɿ
ɣəɓaŋ	tongues	ɣulpeŋ	ɣulbaŋ	ɣulbaŋ
ɣək	caves	ɣəβəl	ɣələk	sləpmət

Ura	Gloss	Kairak	Mali	Qaqet
γ̄ueŋ-ige	branches (of bananas, betelnuts) SG	γuluŋit	γueŋigəl	γuləŋigəl
gāep	black palm (species of <i>Caryota</i> ) PL	galəpki	galəp	galəp
galaə, gala-it	fern, long with no thorns PL, SG	glək, gləγ-it	(speaker did not know word)	sayanəŋ
īar	life	iar	iar	iaməs
i.a, ila-γi	mangoes ( <i>Mangifera indica</i> ) PL, SG	il, ila-γa	βiyual, βiyuayi	ial, ialaya
īiar	cucumbers	elayəs	mədir	alayəs
laə, lua-γa	eggs PL, SG	elə, eləγa	βala, βaluaya	alaə, aluaya
lae, li.a-γa	type of tree PL, SG	le, liayi	ləβe, ləβiaya	lia, liaya
sāel	left (direction)	sel	γais	ruaɾ
sayule	stop/rest	sagəle	sakule	sayuɾi
sage	go to someone	sagəl	sagəl	sagəl
suyǎe	posts (N)	suyul	suyul	suyul
ta	take (archaic Ura: <u>tai</u> <sup>25</sup> )	tal	ɾal	ral
γəi, γəi-γa	bush rope PL, SG	γəlka	γaul (from one of these two languages)	
bəi, bəi-γi	cloth, clothing SG	bəlki	baul	

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<sup>25</sup> Information supplied by Rosensteel, p.c.

<b>Ura</b>	<b>Gloss</b>	<b>Kairak</b>	<b>Mali</b>	<b>Qaqet</b>
sa	bear/give birth (archaic Ura: <u>sai</u> <sup>26</sup> )	sal		sal
-ige	flat-sided	-igəl		
eγǝ	clouds			eγul
γǝβeǝ	wingbeans			γəlβae
egut-ka	husbands-SG (U); young single man (Q)			lugutka
em	mushrooms			ləm
eŋ-a-γi	shoulders-SG			ləŋayi

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<sup>26</sup> Information supplied by Rosensteel, p.c.

**Table 19 /l/ realised as [l] within Ura (see 5.4.1)**

βlaŋan, βlaŋən-ga	type of edible plant PL, SG
βləl	leafy green vegetables (in general) PL
bulap, bulap-ka	housebroken/tame animals PL, SG
ɣael, ɣael-ɣa	wallabies PL, SG
ɣalun, ɣalun-ga	type of taro ( <i>Colocasia hontosoma</i> ) (Tok Pisin ‘singapo’) PL, SG
ɣel, ɣel-a-fa	native spinach ( <i>Aramanthus gangeticus</i> ) (Tok Pisin ‘aupā’) PL, SG
ɣilət-ki	Eclectus parrots F.SG
ɣulim, ɣulim-gi	noses PL, SG
ɣulup, ɣulup-ga	blue flies PL, SG
ɣulum, ɣulum-gi	white; Caucasian female F.SG
gləŋ, gləŋ-gi	chinks in knife or spade blade PL, SG
iləŋ, iləŋ-gi	charcoal PL, SG
ləβ-ə-lip, ləβ-ə-lip-ka	hedge/bush-border of property PL, SG
li.el-itnək, li.el-a-it	rooster tail feathers PL, SG
ŋulal-ɣa	lame man M.SG
sael, sael-ɣa	left, left-M.SG (left-handed male)
sləp, sləβ-əm, sləp-ki, sləβ-ap	bones PL, DL, SG, RND.SIDED.PL
ulan, ulan-gi	snakes PL, SG

**Table 20 /m/ realised as [b] investigation (see 5.5)**

The table below is broken into three sections due to space constraints. If laid out ideally it would be a long landscape table. Suffixes are kept in semantic groupings where possible, but the first section of the table contains at least one form of every word investigated, which prevented the inclusion of the 3.M.SG column, and required each of the others found there. Again for the sake of space, glosses are not repeated in the second and third sections, but the plural forms are. Where no plural form was found, the gloss is substituted in quotation marks.

PL	Gloss	3 F SG	3 M DL	3 F DL	FLAT/THIN SG	GRPD SG
mudam	fires	mudəm-gi		mudəb-em		mudəb-əs
γulim	noses	γulim-gi		γulib-em		
γu:m	knees			γu:b-em		
ɟaŋam	bananas			ɟaŋəb-em		
	mouths	βəm-gi		βəb-em	βəb-it	
	children	ɟɿim-gi	ɟɿim-iəm	ɟəb-em		
kəm	combs				kəb-it	
gaβam	fruit, vegetables with seeds	gaβəm-gi		gaβəb-em		gaβəb-əs
im	dogs		im-iəm			
γulum	white	γulum-gi		γulub-em		
mədrəm	knowledge			mədrab-em		
βlam	pigs	βəm-gi		βeb-em		
γərəm	betelnuts ( <i>Areca catechu</i> )					γərəb-əs
dam	mountains	dam-gi				
rem	buttocks				rib-it	
ɟəŋam	woven belts for carrying firewood				ɟəŋəb-it	
sarem	bellies	sarim-gi				
sdəm	ears	sdəm-gi			sdəb-it	
du.im	elbows		duim-iəm			
bəiβəm	green coconuts		bəiβəm- iəm			

PL	3 M SG	RND.SIDED SG	RND.SIDED DL	RND.SIDED PL	LONG/THICK SG	VERY LARGE
mudam		mudəb-əm				
γulim		γulib-əm	γulib-am	γulib-ap	γulib-et	
γu:m		γu:b-əm	γu:b-am	γu:b-ap		
ʃaŋam		ʃaŋəb-əm	ʃaŋəb-am	ʃaŋəb-ap		
‘mouths’					ʃəb-et	
‘children’	ʃəm-ga	ʃəb-əm	ʃəb-am	ʃəb-ap		
gaβam				gaβəb-ap		
im	im-ga	ib-əm	ib-am	ib-ap		
βlam	βem-ga					βeb-er
dam		dab-əm				
ʃəŋam	ʃəŋəm-ga					
sarem		sareb-əm				

PL	SM SG	SM DL	SM PL	FLAT/THIN DL	FLAT/THIN PL
mudam	mudəm-ini	mudəm-iɬəm			
γulim	γulim-ini	γulim-iɬəm			
γu:m	γu:m-ini		γu:m-iɬəŋ		
ʃaŋam	ʃaŋəm-ini				
‘mouths’	βəm-ini	βəm-iɬəm	βəm-iɬəŋ	βəm-itnəm	βəm-itnək
‘children’	ʃūim-ini				
gaβam	gaβəm-ini				
im	im-ini				
βlam	βem-ini				
rem					rim-itnək