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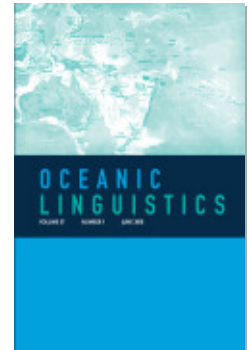
## The Genetic Status of Lamalamic: Phonological and Morphological Evidence

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# The Genetic Status of Lamalamic: Phonological and Morphological Evidence

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This paper investigates the genetic status of Lamalamic, a grouping of Lamalama, Umbuygamu, and Rimanggudinhma, three languages from the east coast of Cape York Peninsula (Australia). Lamalamic has long been assumed in the literature to form a subgroup of Paman (Pama-Nyungan), but its status as a genetic unit has not yet been examined in a systematic way. I provide evidence from historical phonology and morphology to show that the three languages do form a subgroup of Paman, defined by shared innovations in phonology and morphology. At the same time, the analysis also provides a detailed picture of the origins of some of the unusual phonological properties that set the Lamalamic languages apart in the broader Australian context, like the development of fricative series, prenasalized plosives, voicing contrasts for plosives and trills, dental glides, and CV metathesis resulting in diphthongs.

**1. INTRODUCTION.**<sup>1</sup> This paper investigates the genetic status of Lamalamic, a grouping of Lamalama, Umbuygamu, and Rimanggudinhma, three languages from the Princess Charlotte Bay region on the east coast of Cape York Peninsula (Australia). Lamalamic has long been assumed to form a subgroup of Paman (Pama-Nyungan) in the literature, but its status as a genetic unit has not yet been examined in a systematic way. In this paper, I provide evidence from historical phonology and morphology to show that the three languages traditionally subsumed under Lamalamic do form a subgroup of Paman. This subgroup is defined by shared innovations in phonology and morphology,

1. My greatest debt is to the old people who taught me Umpithamu, Umbuygamu, and Lamalama: Florrie Bassani, Bobby Stewart, and Daisy Stewart. I also thank the younger Lamalama people who support continuing work on the languages. I am grateful to Bruce Rigsby for sharing his Lamalamic materials and for advice and mentorship over the years, and to Bruce Sommer and the Fryer Library at the University of Queensland for providing access to his Lamalamic recordings. I thank Barry Alpher for sharing his list of Pama-Nyungan etyma, which was invaluable for this work, and Peter Sutton for sharing his work on Flinders Island Language. Hilary Chappell and her colleagues at EHESS and CRLAO first gave me the time to start work on this topic, and provided very helpful and encouraging comments on preliminary presentations of part of this material. An earlier version of this paper was presented at a seminar at the Australian National University: I thank Don Daniels, Nick Evans, Harold Koch, Amanda Lissarrague, David Nash, David Osgarby, Alan Rumsey, and Jane Simpson for very useful comments, suggestions, and challenging questions. I also thank Barry Alpher, Harold Koch, and the reviewers for very detailed and generous comments on an earlier version of the text. Fieldwork and archival work on Umbuygamu and Lamalama was supported by the Research Foundation-Flanders, the Endangered Languages Documentation Programme (MDP0133), and the Research Council of the University of Leuven (GOA/12/007).

specifically the development of a voicing contrast in trills, the setup of verbal inflections, and a number of innovative forms in nominal morphology. Within this subgroup, Umbuygamu and Lamalama form a phonologically innovative branch, while Rimanggudinhma forms a more conservative branch. Apart from the case for subgrouping, the analysis also provides a detailed picture of the historical origins of some of the unusual phonological properties that set apart the Lamalamic languages in the broader Australian context, like the development of fricative series, prenasalized plosives, voicing contrasts for plosives and trills, dental glides, and CV metathesis resulting in diphthongs.

Laycock (1969) was the first to use the term Lamalamic to group together Lamalama, Umbuygamu, and Rimanggudinhma. His analysis was exploratory, based on preliminary fieldwork, and mainly used typological evidence to group the languages, comparing features of phonology and morphosyntax, without doing any historical-comparative analysis *per se*. In this sense, it is not surprising that he also included Umpithamu in the Lamalamic set, which is morphosyntactically similar due to long-standing contact (Rigsby 1997; Verstraete 2012), but on historical-comparative grounds belongs to the Middle Paman subgroup of Paman (Verstraete and Rigsby 2015:192–94). Sommer (1976a, b) was the first to do a partial historical analysis, focused mainly on CV metathesis and the development of voicing contrasts for plosives. Finally, Rigsby (1997) investigated areal convergence between the Lamalamic languages and their neighbors, focusing on the sociolinguistic basis of this convergence. He also suggested, based on a lexicostatistical analysis, that Rimanggudinhma may be an outlier within Lamalamic, sharing quite a bit of lexicon with neighboring Thaypanic languages.<sup>2</sup>

Taken together, the literature clearly suggests that Lamalamic forms a genetic unit, as a subgroup of Paman (see Hale 1964, 1966), but this remains to be demonstrated in a systematic way. Putting together a more systematic historical-comparative analysis for Lamalamic is important for a number of reasons. One is that the case is not equally strong for all proposed Lamalamic languages. While Umbuygamu and Lamalama are obviously closely related, the status of Rimanggudinhma remains somewhat unclear, and at least Rigsby (1997) suggests that potential links with Kuku Thaypan should be investigated. A second reason is that Lamalamic languages stand out in the broader Australian context through their unusual phonologies, with features like fricative series, prenasalization, and voicing contrasts for plosives and trills. All of these features are relatively rare in the general Australian context (see Evans 1995; Butcher 2006; Fletcher and Butcher 2014), but they are found in a number of other subgroups of Paman in Cape York Peninsula (see, for instance, Hale 1976a on Northern Paman). A historical-comparative analysis will help to shed light on the origins of these features within Lamalamic, and how they relate to similar features in other Paman subgroups. Finally, there are also some recent studies of other Paman subgroups in Cape York Peninsula, like Alpher (2016) on the newly proposed Alaya-Athima subgroup

2. Rigsby (1997: 172) cites “just under 50%” similarity between Umbuygamu and Lamalama, and “less than 20%” similarity of Rimanggudinhma to Umbuygamu and to Lamalama (based on a 100-item O’Grady-Klokeid list). My own counts (also based on a 100-item list but using a larger lexical database) are slightly higher, but they basically confirm Rigsby’s observations about the distinct status of Rimanggudinhma and the need to investigate links with Kuku Thaypan: 54 percent sharing between Umbuygamu and Lamalama, 26 percent between Rimanggudinhma and Lamalama, 24 percent between Rimanggudinhma and Umbuygamu, and 23 percent between Rimanggudinhma and Kuku Thaypan.

that incorporates the Thaypanic languages, or Verstraete and Rigsby's (2015:173–94) reexamination of Hale's (1976b) Middle Paman. The analysis of Lamalamic presented here adds to the emergence of a more detailed picture of subgrouping in Cape York Peninsula, which may eventually also contribute to a better understanding of Paman itself, which has been posited as a subgroup of Pama-Nyungan, but again not really demonstrated in a systematic way (see Hale 1964; Bowern and Atkinson 2012).

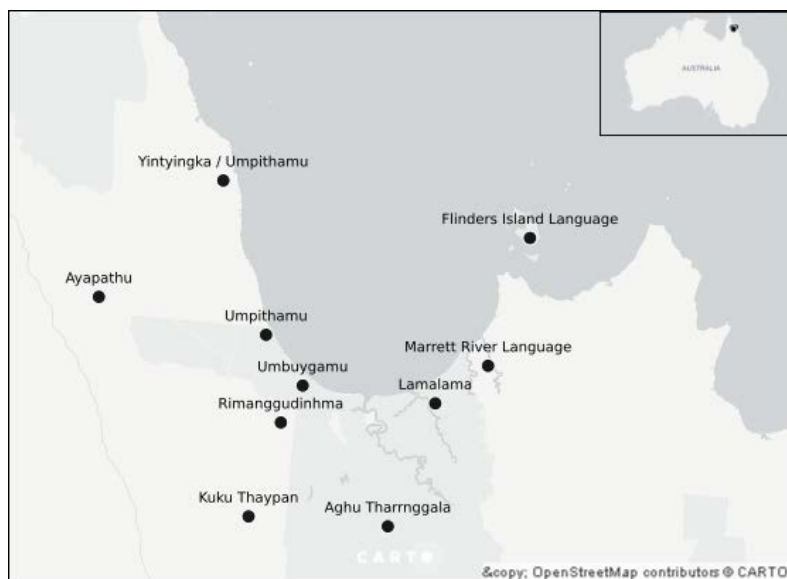
The argument will be developed in three steps. Section 2 provides some basic information about the languages and the nature of the data used for the analysis. Section 3 investigates Lamalamic historical phonology, looking at the development of fricatives, dental glides, and voicing contrasts for trills, as well as the fate of plosives and nasals more generally, and developments in the vowel system. The analysis shows that the majority of phonological innovations is shared between Lamalama and Umbuygamu, and that the origins of fricatives and voicing contrasts, in particular, are different from those of similar categories in other Paman subgroups. Rimanggudinhma is more conservative phonologically, and its genetic status is harder to determine on the basis of phonological innovations alone. It shares a small number of phonological innovations with Umbuygamu and Lamalama, only one of which can be established as a subgroup-internal innovation (the rest are most likely diffusional). The strongest evidence for including Rimanggudinhma in Lamalamic comes from the morphological analysis in section 4, which shows that there are features in the morphology of verbs, nominals, and pronouns that are found only in Lamalamic, and not in any of the neighboring languages or other subgroups further afield. Section 5 rounds off with a conclusion.

## 2. LANGUAGES AND DATA

**2.1 LANGUAGES.** Lamalama, Umbuygamu, and Rimanggudinhma are located at the southern end of Princess Charlotte Bay, about halfway up the east coast of Cape York Peninsula, in Australia's northeast. Map 1 sketches the relative locations of the three languages and their immediate neighbors. Rigsby (1992) provides more detailed information about locations, and the social structures mediating the relation between land and language in this region. The languages neighboring the Lamalamic languages are Umpithamu and Yintyingka (with related dialect Ayapathu) to the north and northeast (both Middle Paman, see Verstraete and Rigsby 2015), Kuku Thaypan and Aghu Tharrnggala to the south and southwest (both Alaya-Athima, see Alpher 2016), and Marrett River Language and Flinders Island Language to the east (see Sutton 1975, 1995a; subgrouping unclear).

All three languages are known under a range of different names in the literature. Lamalama is also known as Mbarrumbathama (for example, Sommer 1999a; Verstraete n.d.), which is actually the name of one of about twenty clans associated with the language. The name Lamalama itself is an exonym from the Umpila language, based on the Umpila term *lama* 'dry', which may refer to the dry country in the lower bay (Rigsby 1992). Umbuygamu is again an Umpila-based exonym, but the language is also known as Morrobolam (for example, Ogilvie 1994), the name of one of the three clans associated with the language. Finally, Rimanggudinhma is the name of one of the two clans

MAP 1. RELATIVE LOCATION OF LAMALAMIC  
AND NEIGHBORING LANGUAGES<sup>†</sup>



<sup>†</sup> This map was created with Carto (<https://carto.com>). The map provides rough relative locations, and is intended for reference purposes only. For more detail, the reader is referred to Rigsby (1992).

associated with the language. There is also a name that specifically refers to this language in the literature (Kuku Warra, used in Sommer 1999b), but as discussed in Rigsby (2005:138–39), this type of name is actually a deictic expression that means ‘bad language’, following a pattern used by speakers of various languages in the region to refer to languages that are distant from the ones they are familiar with.

None of the three languages has any active speakers, but there is a sizable corpus of archival recordings, representing nine speakers for Lamalama (see Verstraete n.d. for details), eight speakers for Umbuygamu (see Verstraete 2017), and five speakers for Rimanggudinhma. There are sketch grammars for all three languages (Sommer 1999a for Lamalama, Ogilvie 1994 and Sommer 1998 for Umbuygamu, and Godman 1993 and Sommer 1999b for Rimanggudinhma), as well as studies of specific aspects of phonology and morphosyntax (Sommer 1976a, b; Rigsby 1992, 1997; Verstraete 2011, 2012, 2017, n.d.).

**2.2 DATA.** The Lamalamic data used for this study come from my own recordings of Lamalama and Umbuygamu, as well as Bruce Rigsby’s and Bruce Sommer’s recordings of all three languages. The lexical representations used here are based on a retranscription of lexical materials in all of these recordings. At several points, the phonological analysis underlying these representations differs significantly from that provided in earlier sources on the languages, specifically Sommer (1999a) for Lamalama, Sommer (1998) and Ogilvie (1994) for Umbuygamu, and Godman (1993) for Rimanggudinhma.

I will comment on these differences where they are relevant; for more details, the reader is referred to Verstraete (2017, n.d.).

The comparative data used in this study come from a range of sources. Reconstructed forms are mainly from Alpher (2004a, b) for Proto-Pama-Nyungan (PPN), and Hale (1976a, b) for Proto-Paman (PP); reconstructions without a subgroup label, often “local” reconstructions within Paman, are from Alpher (n.d.). Data from other Paman languages are used for a number of purposes.

- First, there is a range of phonologically more conservative languages, which are used to illustrate conservative cognates if no reconstructed forms are available. These include Middle Paman languages (Umpila, Thompson 1988 [UMPL]; Umpithamu, Verstraete fieldnotes [UMPT]; Wik Ngathan, Sutton 1995b [WN]), as well as Dya-bugay (Patz 1991) [DYAB], Yir Yoront (Alpher 1991) [YY], and Kuuk Thaayorre (Gaby 2006) [KTHY].
- Second, there are the directly neighboring languages, which are used to assess the boundaries of Lamalamic. Apart from the Middle Paman languages Umpithamu and Yintyingka (Verstraete and Rigsby 2015), these include Kuku Thaypan (Rigsby 1976, ms) [KTHP], Aghu Tharrnggala (Jolly 1989), and Flinders Island Language (Sutton 1975).
- Finally, there are a range of phonologically innovative Paman languages from further afield, used to determine whether Lamalamic innovations really are subgroup-defining. These include Uradhi (Crowley 1983), Anguthimri (Crowley 1981), and other Northern Paman languages (Hale 1976a).

**3. ASPECTS OF HISTORICAL PHONOLOGY.** In 3.1, I provide basic information about the phonology of Lamalama, Umbuygamu, and Rimanggudinhma—specifically phoneme inventories and root structure. The next four subsections discuss aspects of historical phonology, viz. the development of fricative series in Lamalama and Umbuygamu (3.2), the fate of plosives and nasals (3.3), developments in the classes of glides and trills (3.4), and developments in the vowel system (3.5). Some uncertainties remain, especially where there are few cognate sets to be examined, but the resulting picture is sufficiently clear to be used as evidence for the question of subgrouping. The concluding section (3.6) evaluates the findings in light of the question of Lamalamic as a genetic unit, showing that historical phonology groups together Umbuygamu and Lamalama on the basis of a large number of shared innovations, while Rimanggudinhma is relatively more conservative, sharing only a few phonological innovations with the other Lamalamic languages.

### 3.1 PRELIMINARIES

**3.1.1 Phoneme inventories.** Tables 1–3 list the phoneme inventories of the three languages. In the wider Australian context, these inventories deviate quite strongly from what Butcher (2006) has characterized as the “typical” Australian inventory, that is, a “long, flat” inventory with paired plosives and nasals for a relatively large number of places of articulation, plus approximants, trills, and laterals for a smaller number of

TABLE 1. CONSONANT INVENTORY: LAMALAMA

|                      | Bilabial | Dental | Alveolar | Palatal | Velar | Glottal |
|----------------------|----------|--------|----------|---------|-------|---------|
| Plosive              | p b      | t̪ d̪  | t d      | c ɟ     | k     | ʔ       |
| Prenasalized plosive | mb       | ṁḍ     | nd       | ɲɟ      | ŋɡ    |         |
| Nasal                | m        | ṁ      | n        | ɲ       | ŋ     |         |
| Fricative            | ɸ        | θ      | ɾ        | ʃ       |       | h       |
| Lateral              |          |        | l        |         |       |         |
| Trill                |          |        | r        |         |       |         |
| Approximant          | w        |        | ɹ        | j       |       |         |

TABLE 2. CONSONANT INVENTORY: UMBUYGAMU

|             | Bilabial | Dental | Alveolar | Palatal | Velar | Glottal |
|-------------|----------|--------|----------|---------|-------|---------|
| Plosive     | p b      | t̪ d̪  | t d      | c ɟ     | k ɡ   | ʔ       |
| Nasal       | m        | ṁ      | n        | ɲ       | ŋ     |         |
| Fricative   | ɸ        | θ      |          | ʃ       |       | h       |
| Lateral     |          |        | l        |         |       |         |
| Trill       |          |        | ɾ r      |         |       |         |
| Approximant | w        | ø      | ɹ        | j       |       |         |

TABLE 3. CONSONANT INVENTORY: RIMANGGUDINHMA

|                      | Bilabial | Dental | Alveolar | Palatal | Velar |
|----------------------|----------|--------|----------|---------|-------|
| Plosive              | p b      | t̪ d̪  | t d      | c ɟ     | k ɡ   |
| Prenasalized plosive | mb       | ṁḍ     | nd       | ɲɟ      | ŋɡ    |
| Nasal                | m        | ṁ      | n        | ɲ       | ŋ     |
| Lateral              |          |        | l        |         |       |
| Trill                |          |        | ɾ r      |         |       |
| Approximant          | w        | ø      | ɹ        | j       |       |

places. In the Lamalamic languages, this “basic” Australian inventory is extended in a number of ways: these innovations will be the focus of the historical-comparative analysis in the following sections.

First, there are three types of extensions in the system of plosives. All Lamalamic languages show a phonemic voicing contrast for plosives, for all or most places of articulation. Lamalama and Rimanggudinhma also have a contrasting series of prenasalized plosives, analyzed as unitary phonemes mainly on the basis of their root-initial distribution (but with different origins, see further discussion in 3.3.2 below). Umbuygamu and Lamalama also have a glottal plosive; there is no evidence for a contrastive glottal place of articulation in Rimanggudinhma.

Second, Lamalama and Umbuygamu both have a series of phonemic fricatives. In Lamalama, this also includes the equivalent of what is a voiceless trill in the other two languages. Rimanggudinhma has no evidence for phonemic fricatives: all of the putative fricatives identified in the literature (Sommer 1999b and Godman 1993) can be reanalyzed as allophones of velar plosives or labial approximants, or as dental glides. Similarly, what has been analyzed as a voiced dental fricative in earlier work on Umbuygamu (for example, Ogilvie 1994) should be reanalyzed as a dental glide on phonetic and phonological grounds (see 3.4.2 below, and Verstraete 2017, for details).

Finally, all Lamalamic languages also have a voicing contrast for trills; in Lamalama, there is some evidence to analyze the equivalent of a voiceless trill as a fricative rather than a trill (see Verstraete n.d. for details), but its origins are clearly as a voiceless trill (see 3.4.1 below).

When compared with the consonant inventories, vowel inventories in Lamalamic are somewhat less remarkable in the broader Australian perspective. Umbuygamu has a system of five vowels /i u ε ɔ a/ without contrastive vowel length; Rimanggudinhma has a system of six vowels, including an additional high central vowel /ɨ/; and Lamalama has a system of three vowels /i u a/ without contrastive length, as well as two diphthongs /ia ua/, which result from a process of CV metathesis (see 3.5).

Examples will be presented in a fairly standard Australian orthography, that is, using digraphs for dental and palatal plosives and nasals (<th>, <dh>, <nh>; <ty>, <dy>, <ny>), for the velar nasal (<ng>), and for the voiced trill (<n>), as well as simplified representations for homorganic nasal-plosive sequences (thus <ndh> instead of <nhdh>, etc.). This is slightly extended to represent the larger Lamalamic inventory: the glottal stop is represented with <ʔ>, the voiceless trill with <rh>, the dental glide with <ð>, and the fricative series with <f> (bilabial), <θ> (dental), <sh> (palatal), and <h> (glottal). In reconstructed forms, <c> and <ñ> represent the reconstructed laminal set (following Alpher 2004a:107).

**3.1.2 Root structure: Initial-dropping.** A second defining feature of Lamalamic phonologies concerns the structure of roots, which are characterized by the historical loss of initial consonants or entire initial syllables. Most, if not all, Proto-Paman and Proto-Pama-Nyungan roots can be reconstructed with initial consonants (see Hale 1976b; Alpher 1976, 2004b). In the Lamalamic languages, as in many languages of Cape York Peninsula, these are systematically reflected without the initial consonant, or even without the initial syllable (see Alpher 1976 and Blevins 2001 for overviews of this phenomenon in Cape York Peninsula and elsewhere in Australia).

Umbuygamu (UMB) shows pervasive loss of initial consonants, while Lamalama (LL) shows pervasive loss of entire initial syllables, as shown in the examples in (1a,b) below. Rimanggudinhma (RIM) mostly shows loss of entire syllables, as in (1a,b), but there are also cases where the vowel is retained, as shown in (1c).<sup>3</sup>

| (1) | LL    | UMB   | RIM    | Comparative  |             |
|-----|-------|-------|--------|--------------|-------------|
| a.  | nggul | ongal | gol    | *kungul      | ‘mosquito’  |
| b.  | karr  | agarr | nggarr | PP *pangkarr | ‘flesh’     |
| c.  | yuarr | uyarr | udyarr | UMPT wuyarra | ‘green ant’ |

For Umbuygamu, this implies that the canonical root is a bisyllabic vowel-initial root, while for Lamalama and Rimanggudinhma the canonical root is a monosyllabic consonant-initial root. All languages have a sizable group of exceptions. In Lamalama, almost 20 percent of roots are vowel-initial: almost all of these derive from a secondary process of prefixation of an element /ar/, /aɪ/, or /al/, as shown in (2) below. In Umbuygamu, over 30 percent of roots are consonant-initial: some of these can be analyzed (synchronically

3. As mentioned in 2.2, reconstructions without a protolanguage label are from Alpher (ms); these are usually “local” reconstructions within Paman.

or diachronically) as the result of contextual dropping of initial vowels in compound structures, as shown in (3) below.

(2) LL arrbuar    UMB upar    ‘barramundi’

(3) /waɪɛ’pal/ ‘head hair’ (compare /a’waɪ/ ‘head’, /ɛ’pal/ ‘hair’)

A final change that is relevant to root structure concerns trisyllabic protoforms, which are generally reflected without final vowels in Lamalamic:<sup>4</sup> the consonant of the third syllable is retained in the case of sonorants, as shown in (4). There are no cognate sets with definite evidence for an original obstruent in the third syllable, but at least the set in (5) seems to suggest that obstruents are lost along with the final vowel.

- |     |                 |        |                  |                                   |
|-----|-----------------|--------|------------------|-----------------------------------|
| (4) | LL              | UMB    | RIM              | Comparative                       |
|     | a. bual         | upal   | pal              | PP *ñupala ‘you dual’             |
|     | b. arrtuam      |        | undam            | UMPT untamu ‘waterlily (part)’    |
|     | ‘waterlily sp.’ |        | ‘waterlily root’ |                                   |
|     | c. ndharr       | anharr | dharr            | PP *kañarra ‘saltwater crocodile’ |
- 
- |     |     |     |                    |
|-----|-----|-----|--------------------|
| (5) | UMB | RIM | Comparative        |
|     | uta | uta | PP *kuta(ka) ‘dog’ |

Aspects of root structure will not be explored in more detail in this paper: phenomena like initial dropping are widespread in Cape York Peninsula (Alpher 1976; Hale 1976a; Sutton 1976), and known to have diffused across genetic boundaries, which means that they cannot be used as a diagnostic feature to single out Lamalamic as a genetic unit. Root structure is relevant for historical phonology, however, in the sense that most of the innovations in the Lamalamic consonant inventory are attested at the first consonantal position, that is, the reflex of what is the first intervocalic position in the protoforms. In what follows, I will use the template  $C_1V_1C_2V_2C_3V_3$  to refer to the structure of reconstructed roots (following Alpher 2004a), with  $C_1$  standing for the reconstructed initial consonant,  $V_1$  the vowel in the first syllable,  $C_2$  the consonant (or cluster) in the first intervocalic position, and so on.

**3.2 THE DEVELOPMENT OF FRICATIVES.** Lamalama and Umbuygamu both have a series of four phonemic fricatives: / $\phi$   $\theta$   $\int$  h/. None is very frequent in the lexicon, which means there are relatively few cognate sets that can be examined. Those we can find suggest a clear origin for each of the fricatives, but some uncertainties remain about the context in which they originate.

**3.2.1 Bilabial fricatives.** Bilabial fricatives are found in Lamalama and Umbuygamu, but they are marginal in Umbuygamu (only four attested roots, out of about 750), which suggests that they may be loan phonemes there. The relevant cognate sets that include Lamalama / $\phi$ / indicate an origin in an intervocalic bilabial glide /w/, as shown in (6) below, which itself may originate in earlier lenition processes, as shown by the conservative Dyabugay cognate in (6a).

4. Thanks to Barry Alpher (pers. comm.) for pointing this out. Apparent exceptions are usually due to increments postdating the loss of final vowels, as in Umbuygamu kin terms, where *-ya* is a historical increment found in much of the paradigm (see [24c], for instance). See also footnote 14.

|     |         |                 |             |            |
|-----|---------|-----------------|-------------|------------|
| (6) | LL      | Other Lamalamic | Comparative |            |
| a.  | fia-    | UMB iwa-        | DYAB giba-  | ‘scrape’   |
| b.  | fiw     | UMB ewew        |             | ‘crab sp.’ |
| c.  | wu firr | RIM gomba werr  | YY kewrr    | ‘snot’     |
| d.  | fua     | UMB ufa         | KTHP wo     | ‘sand’     |
| e.  | arrufu- | UMB orrawa-     |             | ‘warm’     |

The precise intervocalic context that triggers the development is harder to determine, but there is some evidence to suggest that a preceding high vowel at  $V_1$  may have served as the trigger. The nature of the following vowel at  $V_2$  is unlikely to have played a role, as all vowel qualities are attested roughly equally following / $\phi$ / in Lamalama. The quality of the preceding vowel at  $V_1$  cannot always be determined, given the loss of initial syllables in Lamalama, but where we can reconstruct it, it is invariably high in cognate sets with / $\phi$ / . This is evidenced in the Umbuygamu cognates in (6)—see 3.5 on the reconstruction of vowel qualities in (6e)—as well as the first vowel of the diphthongs in Lamalama (6a, d), which originate in CV metathesis (see further in 3.5). Moreover, roots with /iw/ or /uw/ are almost completely absent in the Lamalama lexicon, which is consistent with a change to / $\phi$ / in these contexts, while /wi/ and /wu/ are well attested. (This kind of skewing is not found in Umbuygamu. Umbuygamu has a good number of forms with /iw/, /ew/, /uw/, or /ow/, which together with the very low number of roots with / $\phi$ / (like [6d]) suggests that / $\phi$ / may be a loan phoneme.)

**3.2.2 Palatal fricatives.** Palatal fricatives are found in Lamalama and Umbuygamu. They are infrequent in both languages (15 roots out of 670 and 5 out of 750, respectively); again, their very low frequency in Umbuygamu suggests a possible origin in loans from Lamalama. There are relatively few cognate sets, some of which are listed in (7) below, but all suggest an origin as an intervocalic alveolar approximant / $\text{ɹ}$ /.

|     |              |             |     |             |
|-----|--------------|-------------|-----|-------------|
| (7) | LL           | UMB         | RIM |             |
| a.  | shuw         | oraw        |     | ‘jealous’   |
| b.  | arshu        | ora         | aru | ‘worm’      |
| c.  | arshiam      | irang       |     | ‘shoulder’  |
| d.  | dharr arshin | orrang eren |     | ‘tree fork’ |
| e.  | shar         | ishar       |     | ‘bark’      |

It is, again, hard to determine exactly which configuration triggered the development, but it may be possible to make a case for a preceding high vowel at  $V_1$ . The vowels following / $\text{ɹ}$ / are diverse, while preceding vowels that can be reconstructed are usually high. Still, a preceding high vowel at  $V_1$  cannot be the full story, because there are sufficient roots with /u $\text{ɹ}$ / and /i $\text{ɹ}$ / in the Lamalama lexicon to show that not all potentially relevant instances of / $\text{ɹ}$ / underwent the change.

Note that the initial /a/ vowel in the Lamalama forms in (7b–d) belongs to a historical increment (/a $\text{ɹ}$ /, /a $\text{r}$ /, or /a/) found in some roots, as described in 3.1.2. The increment is always /a $\text{ɹ}$ / before / $\text{ɹ}$ /, which at first sight may seem to suggest a gradual development from approximant to fricative. However, the increment postdates developments at  $C_2$  (see Verstraete to appear), and /a $\text{ɹ}$ / is found more generally in Lamalama before fricatives (except dentals) and glides, so it cannot be regarded as a phonetic trace of / $\text{ɹ}$ /.

**3.2.3 Dental fricatives.** Dental fricatives are the most frequent fricative phoneme, more so in Umbuygamu than in Lamalama, but unlike in the previous cases the difference in frequency is not so large as to suggest loan status. There are two types of correspondence sets in the data: one in which Lamalama and Umbuygamu both have dental fricatives, as illustrated in (8) below, and one in which Umbuygamu dental fricatives correspond to voiceless dental plosives in Lamalama, as illustrated in (9).

- |     |              |              |                              |               |
|-----|--------------|--------------|------------------------------|---------------|
| (8) | LL           | UMB          | Comparative                  |               |
| a.  | θuarr        | uθarr        | PPN *kuc <sup>(v)</sup> arra | ‘two’         |
| b.  | θun          | oθan         | UMPL tyuutyun                | ‘cotton tree’ |
| c.  | θiam ‘cramp’ | iθam ‘cramp’ | *tinca-                      | ‘be cramped’  |
- 
- |     |          |       |                |         |
|-----|----------|-------|----------------|---------|
| (9) | LL       | UMB   | Comparative    |         |
| a.  | thurr    | oθarr | UMPT oonthorro | ‘dead’  |
| b.  | thal     | eθal  | KTHY piintha   | ‘bone’  |
| c.  | thuthulu | oθal  | PPN *ngulcu    | ‘black’ |

The correspondence sets suggest two things: (i) dental fricatives systematically correspond to laminal plosives in protoforms, reflected as dental or palatal plosives in cognates from other languages, and (ii) a preceding high vowel appears to be part of the contextual trigger for the change.

The rest of the story remains uncertain, but the cognate sets in (9) further suggest that plosive voicing may have played a role as an intermediate step. Laminal plosives are normally reflected as dental plosives in Lamalamic (see further in 3.3): single laminal plosives at C<sub>2</sub> are reflected as voiced dental plosives in Lamalama and voiceless dental plosives in Umbuygamu, while homorganic nasal-plosive clusters at C<sub>2</sub> are reflected as voiceless dental plosives in Lamalama and voiced dental plosives in Umbuygamu. In this perspective, the voiceless dental plosives in Lamalama in the correspondence sets in (9a,b) are simply the regular reflection of homorganic clusters. In Umbuygamu, the “regular” voiced plosive reflex may have served as an intermediate step in the lenition process towards fricatives; this may also explain the correspondence with a heterorganic nasal-plosive cluster in (9c), although there are not enough cognate sets to determine how such clusters are reflected more generally. It is less clear what unites the items in the correspondence sets in (8). Given the pattern in (9), one could speculate about loans from Umbuygamu to Lamalama at the voiced plosive stage in cases like (8c), or irregular developments to voiced plosives in the other cases, but at the moment it is not possible to go beyond speculation.

All instances of V<sub>1</sub> in (8) and (9) are high, as reflected in the Umbuygamu forms and the diphthongs in Lamalama, but even with an intermediate step of plosive voicing, an explanation in terms of a vowel height remains incomplete. First, there are two potential cognate sets without a high first vowel, listed in (10) below.

- |      |    |            |  |            |
|------|----|------------|--|------------|
| (10) | a. | UMB aθa    | *waca (Alpher n.d., attributed to O’Grady) | ‘fire’     |
|      | b. | UMB amaθal | UMPT matha                                 | ‘seagrass’ |

These may still turn out to be false cognates, but what is more important is that there are other forms with high V<sub>1</sub> where the following laminal plosive is systematically reflected as a plosive rather than a fricative (voiced or voiceless; see 3.3 below). Given that there are relatively few correspondence sets, for the time being I cannot do more than note

these anomalies, and hope that further work will reveal an additional factor to describe more precisely which forms with high  $V_1$  lead to the development of dental fricatives.

**3.2.4 Glottal fricatives.** Glottal fricatives are found in Umbuygamu and Lamalama, in roughly equal numbers. The correspondence sets suggest that /h/ derives from a velar plosive following a high back vowel, in two contexts: when the preceding high vowel is long, as in (11), or when the velar plosive is part of a homorganic nasal-plosive cluster, as in (12).

|      |           |     |                         |                      |
|------|-----------|-----|-------------------------|----------------------|
| (11) | LL        | UMB | Comparative             |                      |
| a.   | hu        | oha | PP *kuuku               | ‘language’           |
| b.   | ohan      |     | UMPT ngoorrko, RIM agon | ‘mopoke (k.o. bird)’ |
| (12) | LL        | UMB | Comparative             |                      |
| a.   | ka-       | ha- | *kuungku-               | ‘make wet’           |
| b.   | (arrnggu) | aha | PP *kungkarr            | ‘north’              |

In the correspondence sets in (12), only Umbuygamu has developed the glottal fricative, which provides a key to the specific trigger of the process. Homorganic nasal-plosive clusters are reflected as voiced plosives in Umbuygamu, and as voiceless ones in Lamalama (in this sense, the Lamalama form in [12b] probably does not belong in the set). This suggests that only voiced reflexes of velar plosives develop into glottal fricatives in this context, which also makes sense in terms of general models of lenition (for example, Gordon 2016:153–55). From this perspective, it is not unlikely that the glottal fricatives in (11) also developed via a voiced stage /ug/, possibly conditioned by the preceding long vowel.<sup>5</sup> The form in (11b) is instructive in this perspective: clusters of a trill and a velar plosive are normally reduced to a trill in Lamalamic languages—unlike other trill-plosive clusters, which are reduced to plosives; see further in 3.4.1 on trills, and 3.3.1 on the fate of velar plosives in general—but voicing conditioned by the preceding long vowel (preserved in Umpithamu) may have reversed the reduction process, as also suggested by the Rimanggudinhma form.

**3.3 PLOSIVES AND NASALS.** Plosives and nasals are discussed together here, as their development is closely interlinked in the Lamalamic languages. I first discuss the development of voicing contrasts in Umbuygamu and Lamalama, and then the development of voicing in Rimanggudinhma and prenasalized plosives in Lamalama and Rimanggudinhma.

**3.3.1 Voicing contrasts.** All three Lamalamic languages have a phonemic voicing contrast for plosives, but its origins are different for Lamalama and Umbuygamu on the one hand, and Rimanggudinhma on the other. In Lamalama and Umbuygamu, voicing originates in a contrast between single plosives and homorganic nasal-plosive clusters at  $C_2$ , as discussed in this section, while in Rimanggudinhma it mainly originates in a contrast between single intervocalic plosives and nasals at  $C_2$ , as will be discussed in the following section.

5. This is the only potential instance of long vowels conditioning consonant lenition in Lamalamic, unlike in Northern Paman and Thaypanic, where long  $V_1$  is the major factor conditioning lenition at  $C_2$  (Hale 1976a; Rigsby 1976); see also 3.6 below. Vowel length at  $V_1$  also plays a role in the development of prenasalized plosives (and voiced plosives) from nasals: see 3.3.2.

Voiced and voiceless plosives in Lamalama and Umbuygamu belong to different correspondence sets, illustrated in (13) and (14) below.

|      |                     |          |           |                            |            |
|------|---------------------|----------|-----------|----------------------------|------------|
| (13) | LL                  | UMB      | RIM       | Comparative                |            |
|      | a. panam            | banam    | mbana     | UMPT ampanu                | 'own'      |
|      | b. tuy <sup>6</sup> | oda      | ndo       | PPN *ñuntu                 | 'you SG'   |
|      | c. ndirra ti-       | de-      | nde-      | PPN *wanti                 | 'fall'     |
|      | d. karr             | agarr    | nggarr    | PP *pangkarr               | 'flesh'    |
| (14) | LL                  | UMB      | RIM       | Comparative                |            |
|      | a. bual             | upal     | pal       | PP *ñupala                 | 'you dual' |
|      | b. wa arrbarr       | wa aparr | gu alparr | PP *calparr 'chin'         | 'beard'    |
|      | c. dha-             | tha-     | tha-      | PPN *pac <sup>(9)</sup> a- | 'bite'     |
|      | d. di-              | te-      | te-       | PP *kati                   | 'come'     |

In Umbuygamu, voiced plosives systematically reflect homorganic nasal-plosive clusters in protoforms, as in (13), while voiceless plosives reflect single intervocalic plosives, as in (14).<sup>7</sup> In Lamalama, this is the other way round; voiceless plosives reflect homorganic clusters, as in (13), while voiced plosives continue single intervocalic plosives, as in (14). Homorganic nasal-plosive clusters are generally continued as such in Rimanggudinhma, as shown in (13), but there are a few instances, always preceding a low vowel, where they are simplified to a plosive, as shown in (15) below. In such cases, the plosive is invariably voiced, probably deriving from the fact that homorganic clusters always have a voiced plosive component in Rimanggudinhma.

|      |                  |              |            |
|------|------------------|--------------|------------|
| (15) | RIM              | Comparative  |            |
|      | a. ugað          | PP *kungkarr | 'north'    |
|      | b. gal           | PP *paangkal | 'shoulder' |
|      | c. ga- 'swallow' | PPN *mungka- | 'eat'      |

Places of articulation are generally preserved in the process, but two notes are in order here. The first concerns the single laminal series in protoforms, which is mainly reflected as a dental plosive in all three languages, as in (14c) above (see also 3.2.3 on developments to dental fricatives following high vowels in some contexts). Accordingly, palatal plosives are rare in Lamalama and Umbuygamu: the main set of exceptions is before high front vowels, for voiceless palatals in Lamalama and voiced palatals in Umbuygamu, as illustrated in (16).

|      |                 |   |
|------|-----------------|---|
| (16) | LL tyirr 'dust' | UMB aθa edyerr 'ashes' (= 'fire', 'dust') |
|------|-----------------|---|

Rimanggudinhma has rather more palatal plosives than Umbuygamu and Lamalama. This is due to a specific pathway leading to palatal plosives that is found only in Rimanggudinhma: intervocalic palatal glides at C<sub>2</sub> are generally reflected as voiced palatal plosives, as shown in (17) below.

6. One speaker in the corpus (Daisy Salt) consistently has *thuy* for 2SG.NOM, which is etymologically unexpected (see also Rigsby 1997:175–76).

7. C<sub>2</sub> clusters consisting of a trill or a lateral followed by a plosive are usually reflected on the same pattern as single intervocalic plosives in Umbuygamu and Lamalama, as shown in (14b). One exception concerns trills and laterals followed by velar plosives: see 3.4.1.

|      |       |       |        |              |             |
|------|-------|-------|--------|--------------|-------------|
| (17) | LL    | UMB   | RIM    | Comparative  |             |
| a.   | ya    | aya   | dyu    | PPN *ngayu   | 'I'         |
| b.   | yuarr | uyarr | udyarr | UMPT wuyarra | 'green ant' |
| c.   | yum   | oyang | dyong  |              | 'breast'    |
| d.   | yay   | yaya  | dyað   |              | 'father'    |

The second note on place of articulation concerns velar plosives. Lamalama lacks a voiced velar plosive altogether, while Umbuygamu has both voiced and voiceless velar plosives, but voiceless ones are relatively rare (about one-quarter the number of voiced velar plosives). These asymmetries can be attributed to two specific developments affecting single velar plosives: the common source of voiceless velar plosives in Umbuygamu and what would be voiced velar plosives in Lamalama. One of these was discussed in 3.2.4 above, where single velar plosives were shown to develop into glottal fricatives in specific contexts following high back vowels. The other is a shift from velar to glottal plosives in intervocalic position, usually between two low vowels, as illustrated in the correspondence sets in (18) below.

|      |        |       |        |             |                |
|------|--------|-------|--------|-------------|----------------|
| (18) | LL     | UMB   | RIM    | Comparative |                |
| a.   | rha'an |       | rhakan |             | 'swordfish'    |
| b.   |        | a'a-  | ka-    | *taka-      | 'growl'        |
| c.   |        | a'an  |        | UMPT yakun  | 'wild potato'  |
| d.   |        | a'ama |        | PPN *ñaaka  | 'here' 'close' |
| e.   | 'aw    | 'aw   | kuw    |             | 'inside'       |

**3.3.2 Nasals.** Single intervocalic nasals are continued in two ways in Lamalamic, as reflected in two types of correspondence sets. On the one hand, there are correspondence sets with single nasals in Umbuygamu, prenasalized plosives in Lamalama, and voiced plosives in Rimanggudinhma, as illustrated in (19). On the other hand, there are correspondence sets with single nasals throughout, as shown in (20).

|      |        |        |       |                  |                       |
|------|--------|--------|-------|------------------|-----------------------|
| (19) | LL     | UMB    | RIM   | Comparative      |                       |
| a.   | mba    | ama    | ba    | PP *pama         | 'person'              |
| b.   | mbaldu | amal   | bal   | PP *camal        | 'foot'                |
| c.   | ndha   | nha    | dha   |                  | 'reciprocal'          |
| d.   | ndharr | anharr | dharr | PP *kañarra      | 'saltwater crocodile' |
| e.   |        |        | de-   | PP *cana-        | 'stand'               |
| f.   | nggu   | onga   |       | *kungu           | 'water'               |
| (20) | LL     | UMB    | RIM   | Comparative      |                       |
| a.   | mim    | emem   |       | PPN *caami 'WMB' | 'mother-in-law'       |
| b.   | muriy  | mor    |       | PPN *piimur 'FZ' | 'FyZ'                 |
| c.   | maya   | maya   | mað   | PPN *ngama       | 'mother'              |
| d.   | niy    | ani    | ni    | PPN *ngaani      | 'what'                |
| e.   | nya-   | na-    | ina-  | PPN *ñiina-      | 'sit'                 |
| f.   | nua-   | una-   |       | PPN *wuna-       | 'lie down'            |
| g.   | nga    | anga   |       | UMPT nhanga      | 'breath, lungs'       |

The correspondence sets in (19) show that, in Rimanggudinhma, the source of voiced plosives is different from Umbuygamu and Lamalama: voiced plosives generally derive from single intervocalic nasals, except for the cases discussed in (15) above. Voiceless

plosives, by contrast, derive from single intervocalic plosives as in Umbuygamu, as shown in (14) above.

These developments raise a number of questions. One is what distinguishes the two correspondence sets in (19) and (20), that is, which nasals continue as single intervocalic nasals, and which become prenasalized plosives in Lamalama and voiced plosives in Rimanggudinhma. Sommer (1976b) argues that this distinction relates to vowel length at  $V_1$ , neutralized in Lamalamic but compensated in the following consonant: protoforms with long  $V_1$  continue as the second set, with simple nasals throughout, while protoforms with short  $V_1$  trigger the first, with prenasalized plosives in Lamalama and voiced plosives in Rimanggudinhma. Vowel length is definitely part of the story: evidence for long  $V_1$  is only found in the second set, and never in the first. However, this cannot be the only factor, as shown by examples like (20c,f,g), all of which have evidence of a short  $V_1$ . A comparison between these forms and the ones in (19) suggests that the nature of the initial consonant also plays a role: the first set derives from forms with initial obstruents, while the second derives from forms with initial sonorants. Together, the features of length and the sonorant-obstruent contrast suggest a more general feature of syllable weight: heavy initial syllables trigger the second set, with nasals throughout, while light initial syllables trigger the first, with prenasalized plosives in Lamalama and voiced plosives in Rimanggudinhma.<sup>8</sup> This type of conditioning is quite similar to what has been observed for the development of prestopped nasals in Arandic (see Koch 1997, 2004), south-central Australia (Hercus 1992, 1994), and south-western Cape York Peninsula (Black 1980), where prestopping is blocked by nasals at  $C_1$  and/or long vowels at  $V_1$ . The main difference appears to be that, in Lamalamic, any initial sonorant blocked the developments in (19), as shown by initial /w/ in (20f).<sup>9</sup>

A second question is how exactly plosive voicing developed from nasals in Rimanggudinhma. One obvious solution is to link it to Lamalama, where nasals developed into prenasalized plosives under the same conditions, as shown in (19). From this perspective, Rimanggudinhma may have undergone the same development, with prenasalization dropping off and the voiced plosive component remaining as a new contrasting element. One potential problem with this account is that it does not appear to work for nasal-plosive sequences derived from homorganic clusters at  $C_2$  in Rimanggudinhma, which do not lose the nasal, as shown in (13). One could speculate about a phonetic difference between the two types of nasal-plosive sequences motivating loss versus retention of the nasal (see further below), but the problem does suggest that it may be useful to explore alternative explanations. One such explanation, suggested by Harold Koch (pers. comm.), is that the key to the developments in (19) may lie in an earlier phase of prestopping across Lamalamic, as attested synchronically in Umbuygamu, with a relatively long plosive phase

8. Interestingly, syllable weight has usually been attributed to properties of rhymes, but recent work has shown that onsets can also be involved (see Ryan 2016 for an overview). This would be another instance of onsets playing a role in weight differences, at least diachronically.

9. Thanks to Barry Alpher (pers. comm.) and Harold Koch (pers. comm.) for pointing out this parallel, and the alternative explanation it may suggest for the development of voiced plosives in Rimanggudinhma. There is, in fact, an alternative etymon \*nguna- for (20f) (Koch pers. comm.), which could simplify the condition for (20) to initial nasals rather than initial sonorants, but all of the Cape York languages I could check suggest \*wuna- rather than \*nguna-, which makes this somewhat less likely.

phonetically (see Verstraete 2017; conditioning, if any, remains unclear). This could then be the source for the single plosive in Rimanggudinhma, as well as the prenasalized plosive in Lamalama, following a process of metathesis after the loss of initial vowels. Again, however, this account is not unproblematic: there is no synchronic evidence for pre-stopping in Lamalama or Rimanggudinhma, and in Umbuygamu, where it is attested, the plosive phase is consistently voiceless rather than voiced. I will not explore this question any further here, as this would require detailed phonetic work: any convincing account of the nature of the nasal-plosive paths in (19) will have to depend on a close comparative analysis of the phonetics of plosives, in combination with nasals, in the three languages.

The development of prenasalized plosives in Lamalama raises one final issue. When defined as a homorganic nasal-plosive sequence that can occur root-initially, prenasalized plosives are found both in Lamalama and in Rimanggudinhma (see further in Riehl 2008 on arguments for and against analyzing such sequences as unitary segments). Their origins are quite different, however, as is the further distribution of homorganic clusters in the two languages. In Lamalama, initial nasal-plosive sequences derive from intervocalic nasals, as shown in (19) above, repeated in (21a). In Rimanggudinhma, by contrast, they simply continue homorganic nasal-plosive clusters that happen to have become root-initial through the dropping of the original initial syllable, as shown in (13) above, repeated in (21b).

|      |     |       |             |          |
|------|-----|-------|-------------|----------|
| (21) | LL  | RIM   | Comparative |          |
| a.   | mba |       | PP *pama    | 'person' |
| b.   |     | mbana | UMPT ampanu | 'own'    |

This difference goes hand in hand with a difference in the distribution of nasal-plosive clusters elsewhere in the languages. In Lamalama, the concurrent development of homorganic nasal-plosive clusters into voiceless plosives has largely eliminated homorganic clusters. This is reflected in the fact that the Lamalama lexicon has less than 20 instances of homorganic nasal-plosive clusters beyond initial position (in a total of 670 roots), while in a typical Australian language this is the unmarked and most frequent cluster type root-internally (see Hamilton 1996a:78–83). Rimanggudinhma, by contrast, appears to have retained nasal-plosive clusters elsewhere, as reflected in the fact that about 40 percent of word-internal clusters attested in Rimanggudinhma roots are homorganic nasal-plosive clusters. Taken together, these developments imply that in Lamalama, nasal-plosive sequences are virtually limited to root-initial position, while in Rimanggudinhma they are about equally represented initially and internally. Phonologically, therefore, Lamalama sequences are good candidates for unitary segments, while for Rimanggudinhma, both a unitary and a cluster analysis is possible, at least theoretically. I will not discuss this any further, as further analysis would require more detailed phonetic and phonological work (see Riehl 2008), but from a comparative perspective, what is relevant is that superficially similar structures in Lamalama and Rimanggudinhma have quite different origins and distributions.

Developments in the nasal series generally retain the place of articulation, but there is one process in Lamalama that does affect place of articulation. Final velar nasals are uniformly reflected as final bilabial nasals in Lamalama, as shown in (22) below. The only exception is the interjection *yang* 'yes', shared with Umbuygamu, which is also the only item ending in a velar nasal in Lamalama.

|      |         |        |         |               |
|------|---------|--------|---------|---------------|
| (22) | LL      | UMB    | RIM     |               |
| a.   | arshiam | irang  |         | ‘shoulder’    |
| b.   | birham  |        | perhang | ‘red bream’   |
| c.   | rhum    | orhang |         | ‘black snake’ |
| d.   | yum     | oyang  | dyong   | ‘breast’      |

**3.4 TRILLS AND GLIDES.** There are two notable innovations in the system of trills and glides in Lamalamic languages: a voicing contrast for trills, found in all three languages, and a dental glide, found in Umbuygamu and Rimanggudinhma.

**3.4.1 Voiceless trills.** The development of a voicing contrast for trills is shared between Lamalama, Umbuygamu, and Rimanggudinhma, as shown by the large number of correspondence sets in which all attested Lamalamic forms show either a voiceless trill, as in (23), or a voiced one, as in (24).<sup>10</sup>

|      |              |         |       |                            |                          |
|------|--------------|---------|-------|----------------------------|--------------------------|
| (23) | LL           | UMB     | RIM   | Comparative                |                          |
| a.   | rhua         | urha    | rha   | PPN *ñurra                 | ‘you PL’                 |
| b.   | rhia         | irha    | irhar | *yirra ‘one’ (Alpher p.c.) | ‘other’                  |
| c.   | rha-         | rha-    |       | PP *carra- ‘stand it up’   | ‘stand’                  |
| d.   | rhur         | orhar   |       |                            | ‘white apple’            |
| e.   |              | orha    | arho  | PP *yurru ‘elbow’          | ‘arm’                    |
| f.   | arhur ‘salt’ |         | rhorr | ‘saltpan’                  |                          |
| (24) | LL           | UMB     | RIM   | Comparative                |                          |
| a.   | arriada      | irrata  |       | PPN *rirra                 | ‘tooth’                  |
| b.   | arram        | erram   |       |                            | ‘know’                   |
| c.   | array        | orraya  | arroð | UMPT uurratha              | ‘older brother’          |
| d.   | arria-       | irra-   |       | PP *yirrkka-               | ‘talk’                   |
| e.   | arrua thal   | urraðal |       | *kurrka                    | ‘neck’                   |
| f.   | ndharr       | anharr  | dharr | PP *kañarra                | ‘saltwater<br>crocodile’ |

There are few sets that have cognates beyond Lamalamic, but those sets that have them, like (23a), (23c), or (23e), indicate that voiceless trills derive from voiced trills. The paucity of cognates beyond Lamalamic—almost all are listed in (23) and (24)—also makes it difficult to determine precisely in which contexts trills became voiceless and when they remained voiced. There are at least two clear tendencies. First, trills in clusters with velar plosives remain voiced and drop the plosive, as shown in (24d,e) (the dropping of velar plosives, the opposite of what normally happens in trill-plosive clusters, can be linked to other tendencies that do away with a subset of velar plosives, as discussed in 3.3.1 above). Second, the contrast only seems to have developed at C<sub>2</sub>, like most of the innovations discussed so far, and not at C<sub>3</sub>, as shown by correspondence sets like (24f).<sup>11</sup> Accounting for the rest of the data is more problematic. So far, we have seen two factors that can play a role in changes at C<sub>2</sub>: vowel height for the development of fricatives, and syllable weight (vowel length and sonorant/obstruent status of C<sub>1</sub>) for the development of nasals to prenasalized and voiced plosives. Sonorant/obstruent status does not appear to

10. As mentioned in 3.1.1.1, the equivalent of a voiceless trill in Lamalama is phonemically analyzed as a fricative, but it clearly originates in a voiceless trill, so it is treated as such in this section.

11. Thanks to Barry Alpher (pers. comm.) for pointing this out.

be a very good candidate here, as sonorant onsets are found in both types of correspondence sets, and vowel length cannot really be judged, as there is only one correspondence set (24c) with indications of long V<sub>1</sub>. Vowel height looks like a good candidate at first sight: if an initial vowel can be reconstructed, it is usually high in the correspondence set with voiceless trills. This would also fit in nicely with the fact that voiceless trills are phonetically close to fricatives, due to the presence of a fricative component, which in Lamalama has led to phonemic status as a fricative rather than a trill (see Verstraete n.d. for arguments).<sup>12</sup> Even this feature, however, is not the perfect candidate, as the correspondence sets with voiced trills also show quite a few instances of high initial vowels, as in (24). For the time being, therefore, the split between sets with voiced and voiceless trills has to remain unexplained, but the consistency of this split within Lamalamic, with correspondence sets showing either voiced or voiceless trills throughout, is a relevant argument in subgrouping, as will be explained in more detail in 3.6.

**3.4.2 Dental glides.** Both Umbugamu and Rimanggudinhma have developed a dental glide, which in both languages extends the series of approximants to almost the same size as plosive and nasal series. In previous work on the two languages, /ɖ/ has been analyzed as a voiced fricative (see Ogilvie 1994, Sommer 1998). However, there is evidence from phonetic realization (no friction component in most instances) and phonological patterning (ability to occur in root-final position) to analyze it as a glide rather than a fricative (see further in Verstraete 2017).

There are very few cognate sets for which Umbugamu and Rimanggudinhma share a form with a dental glide, which suggests its development may have followed independent paths in the two languages. In Rimanggudinhma, moreover, the dental glide seems to have extended beyond its segmental origins, in that the historical addition of a final dental glide now serves as a paradigmatic marker for the subclasses of kin terms and direction terms, as illustrated in (25) below (see further in footnote 14 below on its origin in kin terms, and Koch 2015 for more general discussion of processes of change in small “paradigms” of semantically related lexemes).

|      |                        |                              |
|------|------------------------|------------------------------|
| (25) | RIM                    | Comparative                  |
| a.   | bīð ‘father’s father’  | PPN *kami ‘mother’s mother’  |
| b.   | thīð ‘mother’s father’ | PPN *ngaci ‘mother’s father’ |
| c.   | ugað ‘north’           | PP *kungkarr ‘north’         |
| d.   | kað ‘east’             | PP *naka ‘east’              |

The cognate sets for Rimanggudinhma, some of which are illustrated in (26), suggest that the dental glide may have the same origins as the dental fricatives found in Umbug-

12. It is unclear at the moment why preceding high vowels would serve as a trigger for fricativization. Most instances of fricativization attested in the literature appear to be positional and/or weight-based (see the survey in Lavoie 2001), and the few instances I could find involving vowel quality have high vowel triggers following the consonant—e.g., /j/ allophony in Swedish (Riad 2014:59–60; thanks to a reviewer for this reference); spirantization of /t/ in Ancient Greek (Lavoie 2001:34)—or frontness as the basic trigger, as with intervocalic /w/ strengthening from Latin to French (Jacobs and Van Gerwen 2006:79). Still, there is some evidence that peripheral high vowels in particular show a tendency to have some fricative noise, which is phonologized in some languages in the form of fricative vowels (Faytak 2014). Given the re-weighting toward the second syllable due to initial-dropping in Lamalamic, this is a vowel property that may also be relevant for developments at C<sub>2</sub>.

gamu and Lamalama. As mentioned in section 3.2.3, dental fricatives ultimately derive from laminal plosives, intervocally or in homorganic nasal-plosive clusters, but it remains unclear what the precise conditioning context is.

|      |       |        |         |             |                    |
|------|-------|--------|---------|-------------|--------------------|
| (26) | LL    | UMB    | RIM     | Comparative |                    |
| a.   | θiarr | iθarra | iðarr   |             | 'cross grandchild' |
| b.   | θum   | iθang  | ðom     |             | 'black cockatoo'   |
| c.   |       | oθal   | aðelarr | *kurrcil    | 'navel'            |
| d.   |       |        | aði     | KTHP andhe  | 'spider'           |

For Umbuygamu, there are simply too few secure cognate sets to draw any conclusions. From a comparative perspective, however, the fact that there are hardly any cognate sets with dental glides in both Umbuygamu and Rimanggudinhma is sufficient for subgrouping purposes, because it strongly suggests that they developed independently.

**3.5 VOWELS.** As already mentioned, the vowel systems in the three languages show fewer obvious innovations than the consonant systems, but there are two processes that deserve some discussion: CV metathesis and the development of diphthongs in Lamalama, and the development of mid vowels in Umbuygamu and Rimanggudinhma.

Lamalama has two opening diphthongs /ia/ and /ua/ (see Verstraete to appear, n.d. on the analysis as diphthongs rather than glide-vowel sequences), which are the result of a process of CV metathesis for protoforms with a high  $V_1$  preceding a low  $V_2$ . This is illustrated by the correspondence sets in (27), where the high  $V_1$  is represented in the proto-form or in cognates beyond Lamalama.

|      |         |      |      |             |             |
|------|---------|------|------|-------------|-------------|
| (27) | LL      | UMB  | RIM  | Comparative |             |
| a.   | luan    | ulan | ulan | PP *kulan   | 'possum'    |
| b.   | ndua    | una  |      | PPN *kuna   | 'excrement' |
| c.   | ndiawir | ina  |      | PPN *pina   | 'ear'       |
| d.   | pial    | ibal |      |             | 'quick'     |

Umbuygamu and Rimanggudinhma do not show this type of metathesis, but they do have an allophonic process that reveals the likely origins of metathesis in Lamalama. In roots with a high back  $V_1$  preceding a low  $V_2$ , they show systematic labialization of the intervening consonant. If the initial syllable is elided completely, as happened systematically in Lamalama, then labialization can become phonologized, and diphthongs can develop: see Sommer (1976a) and Verstraete (to appear) for more details on this process, including exceptions like (20e), where a high vowel at  $V_1$  induces palatalization at  $C_2$  in Lamalama.

Umbuygamu and Rimanggudinhma have both developed mid vowels, but they have largely done so along different paths. The correspondence sets for Umbuygamu, illustrated in (28) below, show that mid back vowels in Umbuygamu derive from forms with high back vowels at  $V_1$  and  $V_2$ . Specifically, in Umbuygamu,  $V_1$  in such forms is lowered to a mid vowel, while  $V_2$  is neutralized to /a/.

|      |       |       |      |             |            |
|------|-------|-------|------|-------------|------------|
| (28) | LL    | UMB   | RIM  | Comparative |            |
| a.   | aruy  | oray  | aroð | *nguru      | ‘husband’  |
| b.   | luy   | ola   | lo   | PP *ñulu    | ‘3SG’      |
| c.   | nggul | ongal | gol  | *kungul     | ‘mosquito’ |
| d.   |       | opa   |      | WN pulp     | ‘pheasant’ |
| e.   |       | oma   |      | *mumu       | ‘ant’      |

In correspondence sets for Rimanggudinhma, mid back vowels are also associated with protoforms with two high back vowels, but unlike in Umbuygamu, they develop from the high back vowel at  $V_2$ , while the vowel at  $V_1$  is neutralized to /a/, if it is retained at all. This is illustrated in the Rimanggudinhma form in (28a), as well as the correspondence set in (29) below. Thus, forms of the shape \* $C_1uC_2u$  are reflected as  $oCa$  in Umbuygamu, implying enhancement of the functional load of  $V_1$ , and as  $(a)Co$  in Rimanggudinhma, implying enhancement of the functional load of  $V_2$ .

|      |      |           |       |               |              |
|------|------|-----------|-------|---------------|--------------|
| (29) | LL   | UMB       | RIM   | Comparative   |              |
| a.   | turr | tarrowarr | ndorr | PP *muunturr  | ‘jabiru’     |
| b.   |      |           | ko    | PP *yuku      | ‘tree’       |
| c.   |      | orha      | arho  | PP *yurru     | ‘elbow’      |
| d.   |      |           | ago   | UMPT wankurru | ‘wattle sp.’ |

Mid front vowels in Umbuygamu systematically derive from high front vowels. Specifically, they derive from forms in which a high front vowel at  $V_2$  combines with another high front vowel or a (short) low vowel at  $V_1$ . In such forms, all vowels are leveled to a mid front vowel, leading to vowel harmony, as illustrated in the correspondence sets in (30) below.

|      |            |      |      |              |                   |
|------|------------|------|------|--------------|-------------------|
| (30) | LL         | UMB  | RIM  | Comparative  |                   |
| a.   |            | ewe  | iwi  | UMPT iipinka | ‘whistleduck’     |
| b.   | ndirra ti- | de-  | nde- | PPN *wanti   | ‘fall’            |
| c.   | pumbiy     | emey | bið  | PPN *kami    | ‘mother’s mother’ |

Front mid vowels are relatively rare in Rimanggudinhma, which means there are fewer cognate sets to be examined than for Umbuygamu. Those that can be found definitely suggest that mid front vowels derive from high vowels, but the only pattern that is partly systematic is the association with protoforms with the shape \* $C_1aC_2i$ , as shown in (30b) and (31) below. The form in (31a) suggests that, unlike in Umbuygamu, only the second vowel is lowered to a mid front vowel.

|      |        |       |       |             |        |
|------|--------|-------|-------|-------------|--------|
| (31) | LL     | UMB   | RIM   | Comparative |        |
| a.   | mbadiy | metey | batey |             | ‘no’   |
| b.   | di-    | te-   | te-   | PP *kati    | ‘come’ |

**3.6 CONCLUSION.** Most of the phonological innovations described in the previous sections are shared between Lamalama and Umbuygamu, which demonstrates that they are very closely related. Rimanggudinhma is relatively more conservative by comparison, and shares only a few innovations with Umbuygamu and Lamalama, only one of which can properly be regarded as subgroup-defining. By itself, this may not be sufficient to establish that Rimanggudinhma is Lamalamic, but there is crucial evidence in morphology, which will be discussed in the next section. To conclude the analysis of

phonology, however, I will first summarize the sound changes discussed in the preceding sections, and evaluate their status as innovations in comparison with immediately neighboring languages, and languages of Cape York Peninsula more generally. Table 4 summarizes the major changes discussed so far. Some of these are restricted to one of the three languages, like the development of voiced palatal plosives from glides, and will not be discussed further here. What is of interest to the question of subgrouping are changes shared between two or three languages.

I first discuss the changes that are shared between Umbuygamu and Lamalama, most of which are genuine shared innovations when analyzed in the broader context of Paman languages. Starting with fricatives, none of the languages neighboring Lamalama have developed phonemic fricatives. There is one neighboring language, Kuku Thaypan, in which some voiced plosives have prominent fricative allophones (Rigsby n.d.); in an earlier analysis, the fricative allophone was used as the phonemic label for these items (Rigsby 1976).<sup>13</sup> Even if they are analyzed as fricatives, however, the context in which they developed (following long vowels at V<sub>1</sub>, see further below) is quite different from Umbuygamu and Lamalama. Looking further afield within Paman, several Northern Paman languages have developed phonemic fricative series (Hale 1976a), but again the origins and the contexts are different. In Northern Paman, phonemic fricatives always

TABLE 4. SOUND CHANGES IN LAMALAMIC

| Class               | Change (C <sub>2</sub> )  | Context   | LL             | UMB         | RIM         |
|---------------------|---|---|----------------|-------------|-------------|
| Fricatives          | *w → φ  | V <sub>1</sub> <sup>hi</sup> _  | +              | +<br>(loan) | —           |
|                     | *(ñ)c → θ   | V <sub>1</sub> <sup>hi</sup> _  | +              | +           | —           |
|                     | *ɹ → ʃ  | V <sub>1</sub> <sup>hi</sup> _  | +              | +<br>(loan) | —           |
|                     | *k → h  | u: _  | +              | +           | —           |
|                     | *ŋk → h   | u _   | —              | +           | —           |
|                     |   |   |                |             |             |
| Plosives/<br>nasals | nasal-plosive<br>→ plosive  |   | (voiceless)    | (voiced)    | (rarely)    |
|                     | plosive → plosive   |   | (voiced)       | (voiceless) | (voiceless) |
|                     | nasal → plosive   | C <sub>1</sub> <sup>obs</sup> V <sub>1</sub> _                                      | (prenasalized) | —           | (voiced)    |
|                     | nasal → nasal   | C <sub>1</sub> <sup>son</sup> V <sub>1</sub> _<br>C <sub>1</sub> V <sub>1</sub> : _ | +              | +           | +           |
|                     | *k → ʔ  | a _ a   | +              | +           | —           |
|                     | *j → ɹ  |   | —              | —           | +           |
| Trills/<br>glides   | *ŋ → m  | _ #   | +              | —           | —           |
|                     | *r → r <sub>o</sub>   |   | +              | +           | +           |
|                     | *c → ʈ  |   | —              | ?           | +           |
| Vowels              | CV metathesis   | V <sub>1</sub> <sup>hi</sup> _ V <sub>2</sub> <sup>lo</sup>                         | +              | —           | —           |
|                     | *C <sub>1</sub> uC <sub>2</sub> u → oCa                                       |   | —              | +           | —           |
|                     | *C <sub>1</sub> uC <sub>2</sub> u → (a)Co                                     |   | —              | —           | +           |
|                     | *C <sub>1</sub> aC <sub>2</sub> i, *C <sub>1</sub> iC <sub>2</sub> i<br>→ eCe |   | —              | +           | —           |

13. Jolly (1989:25–30) mentions two fricatives in Aghu Tharrnggala, but both are doubtful as phonemes, and one can almost certainly be regarded as an allophone of a voiced plosive, as in Kuku Thaypan (Rigsby n.d.).

derive from plosives at the same place of articulation, in the context of an original long vowel at  $V_1$  (Hale 1976a). In this sense, the fricative series in Umbuygamu and Lamalama represent a genuine innovation, found in Lamalama and/or Umbuygamu and not beyond.

Turning now to plosives, several of the languages neighboring Lamalamic have also developed voicing contrasts, but in different conditions than the ones that developed in Umbuygamu and Lamalama. In Kuku Thaypan, for instance, the voicing contrast for plosives (analyzed as a manner contrast in Rigsby 1976) derives from the contrast between plosives following short vowels at  $V_1$ , which developed into voiceless plosives, and plosives following long vowels at  $V_1$  and in some posttonic contexts, which developed into voiced ones (Rigsby n.d.). This is quite different from the origins of Lamalamic voicing contrasts described in 3.3.1. Umbuygamu and Lamalamic both also developed glottal plosives, which are widespread in Cape York Peninsula, including in Middle Paman languages to the north of Lamalamic. In these languages, however, they derive either from an alveolar glide or from an alveolar or bilabial plosive (see Verstraete and Rigsby 2015:178–79), and not from a velar plosive as in Lamalama and Umbuygamu.

If we look beyond the changes defining the close genetic relation between Umbuygamu and Lamalama, there are also a few changes that are shared between Rimanggudinhma and one or both of Umbuygamu and Lamalama. Some of these are only apparently shared, and cannot be used as evidence for relatedness. This is the case, for instance, for mid vowels, which developed in Umbuygamu and Rimanggudinhma, but appear to have followed different paths in the two languages. The same applies to dental glides, again found in Umbuygamu and Rimanggudinhma, but as separate developments, as suggested by an almost complete lack of correspondence sets with dental glides in both languages.<sup>14</sup> Root-initial prenasalized plosives are found in both Lamalama and Rimanggudinhma, but again they have different sources: simple nasals at  $C_2$  following light initial syllables in Lamalama, versus a continuation of original nasal-plosive clusters at  $C_2$  in Rimanggudinhma, which landed in initial position due to dropping of the initial syllable. The development in Rimanggudinhma is also found in Kuku Thaypan (Rigsby 1976), but this is not necessarily a shared innovation: it may simply be the conservative option, in which dropping of the initial syllable is not accompanied by restructuring of clusters at  $C_2$ .

Apart from these apparently shared changes, there are two changes that genuinely link Rimanggudinhma with Umbuygamu and/or Lamalama: the development of intervocalic nasals to plosives, and the development of voiceless trills. Both are genuinely shared, as evidenced by a large number of correspondence sets. The question is, however, whether they are subgroup-defining innovations. In the case of the nasal-plosive path, there are indications that this is not the case. Flinders Island Language, for instance, shows the same

14. In the case of Rimanggudinhma, the dental glide may have entered the system via contact with neighboring Thaypanic languages, where a voiced fricative is an allophone of voiced dental plosives. One notable feature of the distribution of /ð/ in Rimanggudinhma is its systematic use in kin terms (see examples in [25] above), not found in Umbuygamu. This may find its origins in Kuku Thaypan, which has an increment *-dha* in many kin terms, often realized as [ða] (see Rigsby 1976, n.d. for examples). This type of increment probably derives from a 1SG possessive marker, as also found in other languages in the region (e.g., Umpithamu, which has *-tha* on most kin terms).

development from nasals to plosives as in Rimanggudinhma (see Sutton 1975), even though it is not closely related to Lamalamic on any of the parameters discussed here. If we assume that voiced plosives derive directly from prenasalized plosives (see 3.3.2), this may represent a diffusional change radiating out from the development of prenasalized plosives in Lamalama, which affected neighbors regardless of their genetic relationship. This is also confirmed by the fact that the development links Rimanggudinhma with Lamalama and not with Umbuygamu, even though all other changes indicate that Umbuygamu and Lamalama together form a separate branch within Lamalamic.

That leaves just the development of a voicing contrast for trills as a phonological innovation shared between the three languages. This is a genuine shared innovation: it is found in all Lamalamic languages, represented in a large number of correspondence sets, and not found anywhere else, in neighboring languages or further afield. In fact, there are very few cases of voicing contrasts for trills in Australian languages, none of which are close to Cape York Peninsula: for instance, in Yaygir of northern New South Wales (Crowley 1979) or Dharumbal of central Queensland (Terrill 2002:22–23).

To conclude, then, the phonological innovations discussed in this section suggest that all three languages belong to one single subgroup, with Umbuygamu and Lamalama representing a phonologically innovative branch with a broad range of shared innovations, and Rimanggudinhma a more conservative one, with just one innovation to distinguish the whole subgroup from other ones. From a genetic perspective, one single shared innovation in phonology may seem meager as a basis for subgrouping, and the shared origins of prenasalized plosives with Kuku Thaypan may point to an alternative subgrouping. There are two arguments against this, however. First, the apparently shared origin of prenasalized plosives is simply a direct consequence of the disappearance of initial syllables, without restructuring of clusters at  $C_2$ . In other words, it can be regarded as the conservative option rather than an innovation. Rimanggudinhma is overall relatively conservative in terms of its phonological inventory, which means that any arguments for an alternative classification would of necessity also be based on relatively few innovations: compare the case for Middle Paman in Verstraete and Rigsby (2015:192–94), as well as Black (2004) and Miceli (2015:716–17) for more general discussion of this problem. The second argument, perhaps stronger than the first, is the evidence from morphology in the next section, which clearly suggests that Rimanggudinhma belongs with Lamalamic, and not elsewhere.

**4. MORPHOLOGICAL EVIDENCE.** This section discusses aspects of (mainly) inflectional morphology in Lamalama, Umbuygamu, and Rimanggudinhma, and compares these with patterns of inflectional morphology in neighboring languages. Inflectional morphology is relatively simple in Lamalamic, with no traces of conjugation classes in verbal morphology, and limited patterns of allomorphy with nominals. What there is, however, forms a largely uniform pattern across the three languages, which is not found in any of the neighboring languages. Section 4.1 discusses verbal morphology, 4.2 nominal morphology, and 4.3 examines what looks like a recent innovation in the system of free pronouns.

**4.1 VERBAL MORPHOLOGY.** Lamalama, Umbuygamu, and Rimanggudinhma show no evidence of verb classes (conjugational classes), or any kind of allomorphy in verbal inflections. This is relatively rare in the broader Australian context: Dixon (2002:231) notes that about 25 percent of all Australian languages lack conjugational classes. For Lamalamic, however, this is part of a clear areal pattern, with almost all immediate neighbors lacking verb classes (except for Flinders Island Language, Sutton 1975). The two Middle Paman neighbors Umpithamu and Yintyingka both lack verb classes (Verstraete and Rigsby 2015), as do the Alaya-Athima neighbors Kuku Thaypan (Rigsby n.d.) and Aghu Tharrnggala (Jolly 1989). Given that verb classes can be reconstructed for Proto-Pama-Nyungan (Alpher 1990), the loss of verb classes appears to form an areal pattern radiating out from Lamalamic: no Lamalamic languages have them, nor do their Middle Paman and Alaya-Athima neighbors, but Middle Paman languages further away typically have verb classes—for example, Umpila (Thompson 1988) and Kugu Nganhcara (Smith and Johnson 2000)—as do some Alaya-Athima languages, like Ogunyjan (Alpher 2016).

Perhaps more significant than the presence or absence of verb classes is the inventory of morphemes found for inflection, which is remarkably uniform across Lamalamic, and represents a specific selection of morphemes continued from a Proto-Pama-Nyungan system with several conjugation classes. Table 5 lists the morphemes found for Lamalama, Umbuygamu, and Rimanggudinhma, together with their semantic values.

The inventories in table 5 are uniform in two ways. First, there is the architecture, which is uniformly based on a three-way tense distinction between present, past, and potential (rather than past-nonpast, as found in a number of languages in the region), and further has two modal markers—an imperative marker, and a specialized counterfactual marker found in Lamalama and Umbuygamu (it is uncertain at this point if Rimanggudinhma also has one). Secondly, the actual forms of the affixes are uniformly shared across the three languages. The past tense form *-n* continues a Proto-Pama-Nyungan suffix (at least in some conjugations, see Alpher 1990), and is widely shared with neighboring languages, so it is of little use for comparative purposes. The present, potential, and imperative forms are more interesting, however. The imperative form *-l* is not very distinctive by itself—it continues an old imperative suffix in some conjugations (Alpher 1990), and it is also found in neighboring Middle Paman languages Umpithamu and Yintyingka—but crucially it is different from the distinctive imperative suffix *-ng* found in Kuku Thaypan and Aghu Tharrnggala, which Alpher (2016) regards as a diagnostic innovation for northeastern Alaya-Athima languages. The potential form *-y* is distinctive in its own right, since almost all of the neighboring languages with a specialized potential

TABLE 5. VERBAL INFLECTIONS

|                | Lamalama | Umbuygamu | Rimanggudinhma |
|----------------|----------|-----------|----------------|
| Present        | -m       | -m        | -m             |
| Past           | -n       | -n        | -n             |
| Potential      | -y       | -y        | -y             |
| Imperative     | -l       | -l        | -l             |
| Counterfactual | -rra     | -rra      | ?              |

morpheme have a form *-ku* (Umpithamu) or *-ga* (Kuku Thaypan, Aghu Tharrnggala), which continues a Proto-Pama-Nyungan suffix (see Alpher 1990); only Flinders Island Language has a nonpast form *-y* in all three verb classes. The same applies to the present form *-m*. The Middle Paman and Alaya-Athima neighbors do not have any *m*-based form in their verbal paradigms: Umpithamu and Yintyingka have *-ngka* for their present form, and Kuku Thaypan and Aghu Tharrnggala both lack a dedicated present form, and have *-n* as a more general nonpotential form. Flinders Island Language equally lacks a dedicated present form, but it does have a form *-ma* with a value ‘future/imperfective/inhabilitative’ (Sutton 1975).

Overall, the reconstruction of Proto-Pama-Nyungan verb suffixes is quite complex and intersects with the reconstruction of verb classes (see, for instance, Alpher 1990; Dixon 2002:215–24; Koch 2014a), so it is difficult to formally designate specific features in Lamalamic as innovations. However, the selection of suffixes continued from a Proto-Pama-Nyungan system with several conjugational classes, in combination with (locally) innovative forms like *-y*, is significant from a historical perspective. The paradigm as a whole is so consistently shared across the three languages, and so consistently different from that in the better-established neighboring subgroups (except perhaps for Flinders Island Language, whose genetic status is uncertain), that it provides good supporting evidence in favor of Lamalamic as a genetic unit.

**4.2 NOMINAL MORPHOLOGY.** Inflectional morphology for nominals in Lamalama, Umbuygamu, and Rimanggudinhma distinguishes between an ergative/instrumental/locative form, a purposive/allative form, a dative form, and an ablative form. This general architecture is not particularly distinctive, except perhaps for the contrast between a purposive/allative form, used to mark the purpose of an action or the target of a movement, and a dative form, for beneficiary-like functions. All of the neighboring languages have one single form covering these domains.

Again, however, it is the actual shapes of the morphemes that are more important. Table 6 lists the relevant morphemes, with patterns of allomorphy as far as they can be established with any certainty. There is some variation in the sources, as could be expected with recordings made with last speakers, but the patterns in table 6 represent the most consistent ones across the sources I used.

TABLE 6. NOMINAL MORPHOLOGY

|              | Lamalama   | Umbuygamu   | Rimanggudinhma   |
|--------------|--|---|--|
| ERG/INST/LOC | Main:<br>-u / C#<br>-w / V#<br>Other:<br>-i / m#<br>-l / mba ‘person’, nda ‘who’,<br>ari ‘place’ | Main:<br>-u / C#<br>-w / V#<br>Other:<br>-i / m#<br>-l / ama ‘person’, na ‘who’,<br>era ‘place’ | Main:<br>-u / C#<br>-w / V#<br>Other:<br>-iy / dhi ‘who’<br>-l / ba ‘person’ |
| PURP/ALL     | -a / C#<br>-rra / V#   | -a / C#<br>-rra / V#  | -a / C#<br>-rra / V#   |
| DAT          | -ma  | -ma   | -ma  |
| ABL          | -am / C#<br>-m / V#  | -am / C#<br>-m / V#   | -am / C#<br>-m / V#  |

The first thing to note is that the forms are remarkably uniform. For the ergative/instrumental/locative, even very specific patterns of lexically and phonologically based allomorphy are shared between Umbuygamu and Lamalama, which confirms their close genetic link. Rimanggudinhma uses the same set of allomorphs, but their distribution is somewhat different, in that the *i*-based allomorph appears to be lexically rather than phonologically determined. In addition, most of the forms in the paradigm are also quite distinctive in comparison with neighboring languages from other subgroups (even if we disregard final vowels in CV-based suffixes, which may be innovative if the loss of final vowels in trisyllabic forms applied to inflected forms). None of the five neighboring languages has a purposive/allative form based on a trill, or a dative form that is cognate with *-ma*. In fact, an exhaustive search of grammars and sketches of Paman languages yielded no dative or allative forms with trills (or apparent cognates), and only one or two cases with *m*-based forms, including the Middle Paman language Umpila, just north of Yintyingka, which has *-ma* as a directional marker (Thompson 1988).

For the ergative/instrumental/locative, the *-l*-based allomorph is, of course, familiar from a comparative perspective: Alpher (2004a) lists *-lu/-ngku* as a reconstructed ergative form for PPN, which suggests that the forms with *-l* in Lamalamic may be lexically based retentions (see also Dixon 2002:158). However, basic ergative allomorphs that consist of a single (semi)vowel, as in Lamalamic, are not found in any of the neighboring languages, and even further afield this is rare. Again, an exhaustive search of Paman grammars and sketches yielded only an *-u* allomorph for stems ending in trills in Dyabugay (Patz 1991), and an *-iy* allomorph in Oyikangand, for consonant-final stems not in *-n*, *-y*, or *-l* (Hamilton 1996b).

To conclude, nominal morphology again provides evidence for Lamalamic as a genetic unit, based on the existence of apparently innovative forms like the purposive/allative and the vowel-based ergative, as well as the consistent sharing of the whole paradigm across the three languages.

**4.3 FREE PRONOUNS.** To round off the discussion of morphology, I briefly discuss the system of free pronouns in Lamalamic, which shows a remarkable innovation in the first person non-singular forms. Table 7 lists the free nominative pronouns in Lamalama, Umbuygamu, and Rimanggudinhma.

TABLE 7. NOMINATIVE FREE PRONOUNS

|         | Lamalama | Umbuygamu | Rimanggudinhma |
|---------|----------|-----------|----------------|
| 1SG     | ya       | aya       | dya            |
| 2SG     | tuy      | oda       | ndo            |
| 3SG     | luy      | ola       | lo             |
| 1DU.INC | lata     | lada      | lenda          |
| 1DU.EXC | lala     | lala      | lela           |
| 2DU     | bual     | upal      | pal            |
| 3DU     | lua      | ula       | lwa            |
| 1PL.INC | labal    | lapal     | lipal          |
| 1PL.EXC | landa    | lana      | dada           |
| 2PL     | rhua     | urha      | rha            |
| 3PL     | nda      | ona       | da             |

Taking into account the phonological developments described in the previous section, the singular forms in this paradigm look unsurprising from a comparative perspective, as do the second person dual and plural forms (see Hale 1976a,b and Alpher 2004a for PP and PPN reconstructions). The first person dual and plural forms, by contrast, are quite unusual. On the one hand, they are different from first dual and plural forms in other Paman languages that have them, which generally continue protoforms like PPN \*ngali, PP \*ngampul(a)/ngampa, or PP \*ngantyan. On the other hand, the Lamalamic forms are also morphologically transparent, combining a stem *la-* or *li-* with second person pronouns to form inclusives, and with third person pronouns to form exclusives. As can be seen in table 7, second and third person singular forms are the basis for the dual forms, and second person dual and third person plural forms are the basis for the plural forms (the only exception is the 1PL.EXC form in Rimanggudinhma, which simply reduplicates the 3PL form instead of adding it to the *li-* stem). The same morphological transparency is apparent in the genitive form of the first person dual (which in all three languages appears to neutralize the inclusive-exclusive distinction found in the nominative). As can be seen in table 8, the genitive forms are built on the oblique (genitive) stems of the third person singular, rather than the nominative stems of the first person dual. Thus, for instance, Rimanggudinhma has *lengam* for 1DU.GEN, using the 3SG.GEN form *ngam*, and not *lelam*, which would be expected if 1DU.EXC.NOM *lela* were no longer transparent.

**TABLE 8. MORPHOLOGICAL TRANSPARENCY IN  
GENITIVE FIRST PERSON DUAL FORMS**

|             | Lamalama | Umbuygamu | Rimanggudinhma |
|-------------|----------|-----------|----------------|
| 1DU.GEN     | lungu    | lingil    | lengam         |
| 3SG.GEN     | nguw     | ongal     | ngam           |
| 1DU.EXC.NOM | lala     | lala      | lela           |

To conclude, these forms are an obvious shared innovation in Lamalamic, forming inclusive and exclusive forms on a rare pattern that I have not seen in any other Paman language, except for their eastern neighbor Flinders Island Language (see data in Sutton 1975). In terms of historical-comparative evidence, this is somewhat less strong than the other aspects in morphology, because it basically concerns a pattern rather than actual shapes (the only potentially shared morpheme involved is the stem *la-/li-*), and an innovation that is probably fairly recent, given its transparency even in nonnominative forms. When added to the morphological evidence discussed in the preceding sections, however, it reinforces the general picture of shared morphological patterning across the three languages.

**5. CONCLUSION.** Taking together the analyses of phonology and morphology in sections 3 and 4, it can be concluded with reasonable confidence that Lamalama, Umbuygamu, and Rimanggudinhma form a genetic unit. Phonological evidence alone is sufficient to show that Umbuygamu and Lamalama are very closely related, together forming a phonologically innovative branch of Lamalamic, which we could call Coastal Lamalamic given that most of their clan countries are coastal (see Rigsby 1992). Rimanggudinhma is phonologically more conservative by comparison, which also

means that phonological evidence is less strong: voiceless trills offer one obvious innovation that is shared with Umbuygamu and Lamalama, but the development of initial prenasalized plosives could, at least at first sight, be taken as a link with Kuku Thaypan and the Alaya-Athima subgroup. As already mentioned, however, this is more likely a conservative feature, that is, the default result of loss of initial syllables without cluster restructuring at C<sub>2</sub>. More generally, a dearth of phonological evidence is a problem that is not atypical for phonologically more conservative Paman (and Pama-Nyungan) languages: given that there are relatively few innovations to go on, weighing up alternative classifications can become difficult (see also Black 2004, Koch 2014b, and Miceli 2015 for more general discussion of this point). The evidence from morphology, however, points towards Lamalama and Umbuygamu, rather than to Kuku Thaypan (and Alaya-Athima more generally). The actual patterns and shapes of verbal and nominal inflection are so obviously shared among the three Lamalamic languages, and so obviously different from those of surrounding subgroups, that it would be difficult to argue against an inclusion of Rimanggudinhma with Umbuygamu and Lamalama. The alternative would be to assume massive borrowing into Rimanggudinhma, not just of morphological patterns—which is well attested in the region (Rigsby 1997; Verstraete 2012)—but also of whole paradigms of actual shapes. This has been attested elsewhere, both in the formation of mixed languages and in other contexts (see Evans 2016), but overall it remains rare enough not to take it as the default.

While the basic picture is clear, the analysis also remains tentative at some points. Especially for some of the phonological innovations, the paucity of cognate sets means that it is possible to point to a source, but not always the exact context that triggered the development. In addition, the analysis has mainly focused on Lamalamic as such, using evidence from other subgroups mainly to assess whether putative innovations really are innovations within Lamalamic. What the analysis has not yet done is to establish how exactly Lamalamic relates to other established subgroups, within the larger picture of the Paman subgroup of Pama-Nyungan. That is a much larger task, however, which will also have to depend on the availability of more detailed studies for specific Paman subgroups, as well as Paman more generally.

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