

A Micronesian Merger Mystery: the fate of Proto-Oceanic *R

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Proto-Oceanic *R was irregularly lost or merged with another liquid in several branches of Oceanic. In Southern Oceanic, the likelihood of *R loss increases from north to south (Geraghty 1990, François 2011b). This squib examines the merger and loss of *R in Micronesian, where the pattern is most similar to the southernmost languages of North Central Vanuatu. I discuss scenarios of lexical diffusion and population dispersal that could have led to the observed state of affairs.

Keywords: Micronesian; Proto-Oceanic; lexical diffusion; drift

1. INTRODUCTION.¹

In Micronesian languages, Proto-Oceanic (POc) *R was irregularly lost or merged with POc *r. In most other branches of Remote Oceanic, *R is likewise lost or merges with another liquid. In Central Pacific, *R is almost always lost (Geraghty 1990, Ross and Næss 2007:472, Ross et al. 2023).

The main result of Geraghty (1990) and François (2011b) is that the likelihood of *R-loss in Southern Oceanic increases with distance from the Solomons; we might call this pattern the *Geraghty-François Generalization*. François identified as many as 15 isoglosses within North Central Vanuatu (NCV) displaying a multilayered implicational generalization about the loss of *R. The geography of *R-loss appears to have resulted from lexical diffusion arrested mid-course.

In this context, the Micronesian facts present two interrelated puzzles. First, the Micronesian family shows uniform reflexes of *R as either \emptyset or PMc *r (and in two cases, *ŋ), across all languages (Bender et al. 2003a). Second, as detailed in this squib, a comparison of *R reflexes between Micronesian and NCV presents a perplexing situation: Micronesian, despite its location far to the north of Southern Oceanic, displays the pattern of a southernmost NCV language, located somewhere just south of Efate. The suspect is in two places at once.

I now turn to a more detailed comparison of the Micronesian and Southern Oceanic facts in Section 2, followed by a discussion of phonological and

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lexical factors affecting *R outcomes in Section 3. A proposal for interpreting these facts is offered in Section 4.

2. PROTO-OCEANIC *R IN MICRONESIAN AND ELSEWHERE.

2.1. GERAGHTY-FRANÇOIS GENERALIZATION.

As noted by Geraghty 1990, the likelihood of *R loss in Remote Oceanic correlates with the distance from the Solomons. Geraghty's original conjecture was verified for NCV with a larger data set by François (2011b), resulting in a fine-grained pattern of at least 15 isoglosses in a north-south cline. Other Southern Oceanic branches, also display *R loss in approximate, but not perfect, agreement with the Geraghty-François Generalization. In François' view, the observed distribution of *R reflexes came about as follows: a rapid settlement of the archipelago by a community speaking a relatively uniform variety close to POc, followed by *R loss originating in the southern end of the continuum and diffusing north, in turn followed by rapid spread of the merger *R > *r solidifying the state of incomplete loss across the linkage.

2.2. *R IN MICRONESIAN.

2.2.1. If *R is retained in Micronesian, it is retained in NCV.

Jackson (1986) examined about a dozen Micronesian etyma comparing the outcomes with NCV; much more data are now available in both families. Micronesian reconstructions below are mostly from Bender et al. 2003a,b, supplemented by additional ones in some cases. The data reveal a nearly exceptionless implication: retention of *R in Micronesian entails its retention at least somewhere in NCV. This section lists all etyma supporting this claim. Etyma which retain *R but have no NCV cognates are listed in the Appendix.

The data are sorted into three groups. There are many forms with retention in both Micronesian and NCV (Table 1), and many items with loss in Micronesian and at least somewhere in NCV, i.e. to the south of one of François' isoglosses (Table 2). A smaller number of cases show loss in Micronesian but retention in NCV (Table 3). The reverse situation, loss in NCV and retention in Micronesian, is unambiguously seen only in one item, *takuRu 'back'. A few other items appearing to flout the generalization, all problematic, are discussed in the following subsection.

An "R" in the NCV column indicates retention, a "∅" indicates loss. In Table 2, a number in the NCV column refers to the isogloss as described in François 2011b:166–167. So, for example, the number 7 in the row for *draRaq 'blood' means that NCV languages south of isogloss 7 lose *R, while languages north of that isogloss retain it. (Isogloss 7 separates Torres-Banks languages from the rest of NCV). Higher-numbered isoglosses are located further south, so a higher number in that column means more NCV languages retain *R. A question mark in the NCV table indicates doubt

expressed in François 2011b. Here and below PMc forms followed by ‘+’ are those not found in Bender et al. 2003, commented in the following subsection. NCV facts are almost exclusively from François 2011b, in a few cases cross-checked in Clark 2009.

The three tables show that when it comes to *R loss and merger, Micronesian languages behave as if they were located immediately to the south of Efate.

TABLE 1. *R RETAINED IN MICRONESIAN AND NCV

POc	PMc	NCV	gloss
*biRibiRi	*piŋipiŋi	R	‘ <i>Hernandia nymphaeifolia</i> ’
*ma-Raqan	*maraa	R	‘light in weight’
*magaRut	*m ^w axaru+	R	‘flying fish’
*mawiRi	*ma(i,u)ŋi	R	‘left’
*meRaq	*mera	R	‘red’
*ŋoRo	*ŋoro	R	‘snore’
*paRa(q)	*far(a,e)	R	‘lung’
*pura	*wura	R	‘bubble; be full’
*taRaqaŋ	*taraa	R?	‘ <i>Sargocentron</i> spp.’
*taRi, *taRin	*tari	R?	‘noose’
*tuRi	*turi	R	‘sew, pierce’
*wakaR, -a	*wakara	R	‘root’

TABLE 2. *R LOST IN MICRONESIAN AND NCV

POc	PMc	NCV	gloss
*(p,b)anaRo	*fanao+	∅	‘ <i>Thespesia populnea</i> ’
*p ^(w) aRara	*paara	∅	‘handle’
*pusiRa	*wu(s,S)ia ??	∅	‘ <i>Aplonis</i> sp.’
*Rum ^w aq	*[u,i]m ^w a	∅	‘house’
*Runut	*unu	∅	‘strainer’
*Ruqa	*ua	∅	‘neck’
*tabiRa	*tapia	∅	‘bowl’
*tapuRiq	*tawui	∅	‘conch shell’
*taRutu	*tautu	∅	‘porcupine fish’
*kuRiap	*kua	2	‘dolphin’
*ñañoRap	*ñañoa	5	‘yesterday’
*draRaq	*caa	7	‘blood’
*kuRita	*kuyita	7	‘octopus, squid’
*taRaq	*taa	7	‘cut’
*cakaRu	*sakau	7?	‘reef’
*suRi	*cuyi	8	‘bone’
*paRu	*-fau	8?	‘ <i>Hibiscus</i> ’
*paRi	*fai	11	‘stingray’
*kiRe	*kie	13	‘pandanus’
*paRas	*faa, *faa-(s,S)i	14	‘step, tread on’

TABLE 3. *R LOST IN MICRONESIAN, RETAINED IN NCV

POc	PMc	NCV	gloss
*kiRam	*kia	R?	‘adze’
*ŋiRac	*ŋ(e,i)a	R	‘ <i>Pemphis acidula</i> ’
*qaRus	*ayu, *ayu-Sa	R?	‘current’
*Raŋa	*yaŋa	R?	‘spider conch’
*RapiRapi	*(faka)afi	R	‘evening’
*Rav[e,i]	*afi	R	‘pull on line’
*saRe	*sae	R	‘tear’
*toRas	*ma-toa	R	‘hardwood’

2.2.2. Apparent exceptions to the generalization.

There are four items that appear to flout the implicational generalization. First, PRO *vaRo ‘*Neisosperma oppositifolium*’. This word, however, is exceptional more generally for the Geraghty-François Generalization, with an unexpected pocket of *R-loss in a region dominated by *R-retention (François 2011b:165). If retention is treated as regular, *vaRo behaves like items in Table 1.

Some other items appear to go against the implication. PRO *b^wakaRe ‘*Diodon* sp., porcupine fish’, with *R-loss in NCV below isogloss 13, has just one apparent Micronesian retention is STW *pøkæreŋ* ‘*Pleuranacanthus sceleratus*, puffer’ (Ross et al. 2011:128), a problematic form due to final consonant; it could be a loan, but a source is not clear. POc *kaRuki is clearly retained in PMc *karuki ‘white sand crab or ghost crab’, with many reflexes (PUL *yárik*; CRL *arigh*; MRS *karik^w*; KIR *kauki*; KSR *kuluk*). The etymon does not have a match in NCV except in PEO *kaRuve ‘k.o. beach crab’, a related form with a different final syllable. It probably has its own independent history that is not expected to correlate with the fate of *kaRuki. Ross et al. 2011:117 list WOL *xazipe* (orthographic *garipi*, Sohn and Tawerilman 1976) as a reflex of *kaRuve, but *-p-* in this form is irregular (†*-f-* would be expected).

Finally, the only clear exception to the implicational generalization is *takuRu ‘back’, showing *R loss in NCV south Torres-Banks (isogloss 7), but retention in Micronesian.

2.2.3. Comments on other items.

Two forms show PMc *-ŋ- from *R, both flanked by *i: *mawiRi > *ma(i,u)ŋi ‘left’, *biRibiRi > *piŋipiŋi ‘*Hernandia*’, but this is not a regular outcome in that environment; cf. POc *taŋiRi ‘*Scombridae* spp.’ > PMc *taŋiri, *jiRi ‘*Cordyline*’ > PMc *(s,S)ii+, possibly reflected in Chuukese *ī(n)*, Pohnpeian *dī(y)* (these may not be cognates as final consonants are problematic). See next section on conditioning.

PMc *m^waxaru ‘flying fish’ from POc *m^wagaRut is attested in Nau *em^wor* ‘flying fish’; the PCK form *maṅaru (Bender et al. 2003b) appears related but irregular (Ross et al. 2011:48; Blumenfeld 2022).

The form *meRaq ‘red’ has doublet reflexes in NCV: reflexes meaning ‘red’ retain *R, while reflexes meaning ‘dye’ lose it (François 2011b). The Micronesian reflexes appear of the former type. Wol *mal* ‘reddish thing’ may be added to the forms listed in Bender 2003a.

POc *ku(r,R)jap would have yielded PMc †kuya instead of *kua; *y*-loss here may follow a “natural path” (Ross et al. 2011:246, fn.8) but it is unclear if it is regular.

POc *toRas ‘a taxon of hardwood trees’ appear in Micronesian as stative *ma-toa ‘firm, hard’; these two etyma need not have identical histories.

POc *pusiRa ‘starling’ only appears in Pon *sie* (Ross et al. 2011:348), a highly doubtful reflex.

In some cases data are insufficient to test the generalization. POc *kuRapu ‘*Epinephelus* sp.’ appears in Mrs *kūro* and Nau *i-wuro* ‘brownmarbled grouper, *Epinephelus fuscoguttatus*’ (Fisheries 2004). Ross et al. 2011:65 list one NCV form, Namakir *kuav* ‘grouper (generic)’; I am not able to find any other NCV reflexes.

2.3 OTHER SOUTHERN OCEANIC GROUPS.

Table 4 shows the comparison of Micronesian reflexes with other South Oceanic groups as reported in François 2011b. The term “group” in the column header refers to the subgroup indicated in each row. So, for example, there are three items retained in both South Vanuatu and Micronesia, seven items retained in South Vanuatu and lost in Micronesia, etc. The patterns are not significant on Fisher’s exact test for any of the subgroup. The numbers are, of course, too small to draw any firm conclusions.

TABLE 4. OTHER SOUTH OCEANIC

Group	Ret. in group	Ret in group	Lost in group	Lost in group
	Ret. in Mc	Lost in Mc	Ret. in Mc	Lost in Mc
Vanikoro	5	5	2	3
South Vanuatu	3	7	6	9
New Caledonia	2	5	7	11

3. UNDERSTANDING THE SOUND CHANGE.

3.1. CONDITIONING.

No robust conditioning environment for *R outcome can be identified in NCV, as noted both by both Geraghty (1990) and François (2011b). The same is true of Micronesian: for example, POc *taRaq ‘cut’ loses its *R (PMc *taa), while nearly identical *taRaqa ‘*Sargocentron* spp., squirrelfish’ retains it (PMc *taraa). A systematic check of Micronesian outcome based on

the influence of adjacent vowel height and backness of *R's position in the word shows no statistically significant effects.

While attempts at formulating a general condition futile, one hypothesis that has a fighting chance is Geraghty's observation that *R tends to be retained between identical vowels. François (2011b:172) does not find support for the claim based on NCV data, but it is statistically significant for Micronesian, illustrated in the Table 5 ($p = 0.019$, Fisher's exact test). A statistical check of the NCV data could not be performed based on the presentation in François' paper. In and of itself, the lack of regularity in a change causing replacement of phonemes is neither surprising nor problematic (e.g. Kiparsky 2016).

TABLE 5. *R BETWEEN IDENTICAL VOWELS IN MICRONESIAN

	Retained	Lost
between same Vs	14	8
between different Vs	16	34

3.2. FUNCTIONAL LOAD.

Because phonetic conditioning is difficult to ascertain here, it is worth exploring other functional pressures, in particular functional load, which is known to inhibit merger (Wedel et al. 2013).

Functional load can be calculated by token, which is impossible here in absence of a corpus, or by type, simply counting minimal pairs. I have made the counts using the POc forms in the ACD (Blust et al. 2023). Functional load thus calculated appears not to have played a role in *R merger: is neither the case that *R~*r contrast has lower functional load than other *R contrasts, nor is it the case that *R overall has lower functional load than other phonemes.

Table 6 shows the number of minimal pairs with *R for the phonemes with more than 10 pairs. The number of total minimal pairs for each phonemes is shown in Table 7.

TABLE 6. MINIMAL PAIRS FOR *R IN THE ACD

*l	*k	*t	*s	*p	*n	*r	*ŋ	*q	*b	*m
37	36	32	29	27	26	26	16	13	12	9

TABLE 7. TOTAL MINIMAL PAIRS IN THE ACD

*t	*k	*p	*s	*l	*b	*r	*q	*n	*ŋ	*R	*m	*w
576	554	517	484	436	342	331	326	322	312	290	261	123
*d	*ñ	*g	*p ^w	*c	*j	*dr	*y	*m ^w	*b ^w	*k ^w		
69	54	49	48	46	46	36	35	25	25	5		

While the overall functional load appears to have played no role in the merger, the tendency to retain *R between identical vowels invites a speculative explanation along similar lines: loss of *R in such an environment would create sequences of same vowels that were perhaps confusable with singleton vowels.

3.3. A PROXY FOR FREQUENCY.

Diffusion such as observed here can correlate with a lexical measure such as frequency, or some other factor that contributes to informativity of a form (Kiparsky 2016). Corpus-dependent measures are, of course, inaccessible in a reconstructed proto-language, but we can call a surprise witness to testify in their place. The same properties might correlate with membership in the class of so-called ‘basic vocabulary’, and thus the likelihood of retention of a word (Tadmor et al. 2010), which can be estimated for protoforms, even if crudely. For each etymon containing *R that is retained in Micronesian, I counted the number of primary branches of Oceanic that also retain that etymon (regardless of *R outcome), using data from the six volumes Ross et al. (2016–2023). Etyma that lose *R in Micronesian are retained in 7 Oceanic branches on average, while etyma that merge *R with *r in Micronesian are retained in 5.4 Oceanic branches on average. The difference between these means is significant on a t-test ($t = 2.7$, $df = 60.8$, $p < 0.01$). To put it another way, words which are less retainable in general—for example, because they are less frequent or less ‘basic’—are ones where *R is more likely to merge with *r in Micronesian.

4. INTERPRETATION AND SYNTHESIS.

4.1. THE SOUND CHANGE AS A CASE OF DRIFT.

Widely separated but similar pathways of change are symptomatic of drift (Blust 1990, Regh 1991, Blevins 2021). Drift depends on an inherited precursor or precondition that makes it likely *R loss and merger would proceed independently in similar fashion in distant languages. What could that retention be?

One problem is that the phonetics of *R are uncertain. Lynch et al. (2002) interpret it as a uvular trill, while François (2011b:141) and Blust (2013:588) suggest both *r and *R were alveolar flap and trill, respectively. The pattern of retention, particularly the suggestive tendency to lose *R in the more frequent or basic words, makes sense under the scenario where words that are less frequent/predictable are hyperarticulated, while more predictable words are reduced. This could result from selection along a hypo/hyper-articulation continuum, *r—*R—∅, with *r representing maximum fortition and ∅ maximum lenition, and the outcome of *R tending one way or another depending on a speaker’s hypo- or hyperarticulatory target. This would imply

the *reverse* phonetics for *r and *R: the former a trill, the latter a flap, a possibility François (2011b:141) explicitly recognizes. What was retained, then, is that *r—*R—∅ continuum, i.e. structured variation. Together with natural tendencies of fortition and lenition, it would produce similar outcomes in distance locales.

4.2. CONSEQUENCES.

Given the implication “if *R is retained in Micronesian, it is retained somewhere in NCV”, the entire Micronesian family looks like an Efate language. Discounting the fanciful possibility that Micronesian speakers migrated north from Efate, bypassing the rest of the Vanuatu archipelago, what realistic scenario could result in the observed picture, one compatible with the Geraghty-François Generalization as well?

Adopting the idea defended in the preceding paragraphs, that the outcomes of *R represent drift based on an inherited pattern of structured variation, the observed picture becomes less fantastical. All that is needed is for Micronesian to have retained the same precursor(s) that led to the changes in NCV. Still, there are some problematic details worth discussing, in the context of what the facts mean for the prehistory of Micronesia.

The consensus is that Remote Oceania was settled rapidly by speakers of a variety very close to POc itself around 3000–3200BP (Pawley 2007). Initially maintaining close contact, as widely dispersed settlements became denser and more established, they lost ties to distant communities. The linguistic effect of this network-breaking is modern-day language diversity across the linkages of Island Melanesia. The spread of *R loss across the archipelago attests to intercommunity contacts, maintained in a complex social environment (François 2011a).

Micronesian languages are thought to originate somewhere in the Oceanic-speaking territory to their south (Pawley and Ross 2006, Pawley 2018). Archeology points to near-simultaneous settlement of Micronesia around 2000BP (Rainbird 2004, Kirch 2017, Athens 2018). Such rapid settlement of new territory that was typical of the Lapita expansion entails a weak linguistic signal for the origins of Micronesian within the rest of Oceanic. That settlement must have been followed by a prolonged period of contact in which Micronesian subgroup-defining innovations would have had time to accumulate, including the uniform distribution of *R reflexes. Intra-Micronesian contacts must have been maintained for a longer period, relatively to the inception of the *R changes, than similar contacts in Vanuatu. Given Pawley’s (2007) position that linguistic diversification in Vanuatu is relatively recent—a claim echoed by François (2011a)—one might deduce that the loss and merger of *R in Micronesian started earlier than in NCV. If true, this idea lends further support to the concept of *R changes as drift resulting from an inherited phonetic precursor rather than more specific inheritance of loss or merger.

Finally, I should emphasize that based on data presented I am not claiming a specific Southern Oceanic locus as the origin of Pre-Micronesian speakers. The precursors to *R loss were too widespread, and too susceptible to spread, to make such a claim. There is an issue of timing, however. According to the consensus dates cited above, there appears to be a thousand-year gap between the spread of Lapita culture in Remote Oceania and the arrival of Oceanic speakers in Micronesia. During that thousand years, speakers at the southern end of the continuum shared with speakers in the north the preconditions for *R loss and merger, but the change itself originated much later. A thousand years is an awfully long time to maintain a delicate phonetic precursor such as the one assumed here. Perhaps another alternative is available: the change that triggered the diffusion was not the loss of *R in the south, but the merger of *R and *r in the north—a mirror image of the picture entertained by François (2011b). Such a change could have originated much later than the arrival of POc speakers in Vanuatu, perhaps around the same time that Micronesian languages diverged, and they could have diverged from a more realistic origin somewhere in the northern end of Remote Oceania, rather than the South.

4. CONCLUSION.

In descending order of certainty, this squib has asserted the following: Micronesian languages underwent a pattern of *R attrition similar to what is found in Southern Oceanic; Micronesian languages carry the same change further than any NCV language; the merger with *r can be thought of as fortition, and *R loss as lenition; the hyper/hypoarticulation continuum *r—*R—∅ is the phonetic precursor that led to similar pathways in widely separated areas; it could have originated in Northern Vanuatu as fortition of *R to *r.

I leave with two final questions. One remaining puzzle is why *R was nowhere retained as a distinct phoneme. Perhaps this has to do with the nature of the change itself. Once merger with *r encroached on the distribution of *R, it became a rare phoneme with low functional load prone to loss. Additionally, a generalization named *Garde's Principle* by Labov (1994:311) states that mergers are irreversible by linguistic means, which entails that the diffusing area of a merger can only grow, not shrink. After a sufficiently long time, mergers should leave no pockets of conservatism.

A second, harder question is why *r appears to have never lenited to *R or ∅. Such an outcome would be expected at least sometimes given the scenario sketched above, perhaps as hypercorrection, or as lenition in highly frequent words. This appears to have never happened, and I leave an explanation for this fact open.

APPENDIX: MC RETENTIONS WITH NO COGNATES IN NCV

TABLE 8. NO COGNATES IN NCV

POc	PMc	gloss
*[baR]baR	*parV	‘coral tree’
*baRa-baRa	*paa	‘stem’
*biRa(q,s,Ø)	*pia	‘roe’
*buRat	*p ^w ura	‘ <i>Fagraea</i> ’
*jiRi	*(s,S)ii ?	‘ <i>Cordyline</i> ’
*kamaRi	*kamai	‘ <i>Elagatis</i> ’
*kaRapa	*PCK karafa	‘k fish’
*kaRi(q)ana	*kaiana ?	‘ <i>P. lamekotensis</i> ’
*keRaŋ	*(tap ^w)kea	‘turtle’
*kiRa	*kiakia	‘tern’
*koRo	*koro	‘pubic hair’
*luRa	*PPo luurV	‘small shrimp’
*maRi	*mai	‘breadfruit’
*mwaRi	*m ^w ai	‘roast’
*ŋaRa	*ŋaŋaa	‘duck’
*paqaRo(k), -i-	*faro, -ki-	‘seize’
*paqoRu	*faū PCK	‘new’
*paRak	*(f,p)ara ?	‘hoarse’
*piRu-piRu	*iru-iru	‘ <i>Istiophoridae</i> ’
*qaRuas	*aua	‘fish; mullet’
*Raja	*raŋa	‘duck’
*Reqi	*PPo reeV, reV	‘grass’
*taŋiRi	*taŋiri	‘ <i>Scobridae</i> ’
*tuRu(p)	*PwMc Tuuru	‘wade’
*uRat	*ua	‘vessel’

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