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THE SYNCHRONIC AND DIACHRONIC PHONOLOGY OF NAURUAN: TOWARDS A DEFINITIVE CLASSIFICAITON OF AN UNDERSTUDIED MICRONESIAN LANGUAGE

by

KEVIN HUGHES

A dissertation submitted to the Graduate faculty in Linguistics in partial fulfillment of the requirements for the degree of Doctor of Philosophy, The City University of New York

2020

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Towards a Definitive Classification of an Understudied Micronesian Language

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This manuscript has been read and accepted by the Graduate Faculty in Linguistics in satisfaction of the dissertation requirement for the degree of Doctor of Philosophy

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ABSTRACT

The Synchronic and Diachronic Phonology of Nauruan:

Towards a Definitive Classification of an Understudied Micronesian Language

by

Kevin Hughes

Advisor: Prof. Juliette Blevins

Nauruan is a Micronesian language spoken in the Republic of Nauru, a small island nation in the central Pacific. Lack of data and difficulty in analysis has hindered progress in better understanding Nauruan for decades, particularly regarding its phonology and its classification within the Micronesian family. Because of these challenges, earlier researchers have presented their work on Nauruan as highly tentative. This dissertation establishes more confident analyses of Nauruan phonology, sound change and classification, which have been made possible through original fieldwork.

Approximately one hundred hours of digital recordings have been collected as part of this research, including wordlists, phrases, narratives, and spontaneous speech and conversation. Seventeen individual Nauruan speakers contributed to this work. This diverse body of data has allowed for much needed insight into the Nauruan language and its relation to the other Micronesian languages.

A revised Nauruan phoneme inventory is proposed and a range of associated phonological processes are identified and discussed. Particular attention is paid to the phonetics

of Nauruan speech sounds, including articulatory and acoustic properties of consonants and vowels. Also included is an analysis of Nauruan stress and prosody. Nauruan is shown to have a weight-sensitive stress system, as is typical of Micronesian languages.

The prevailing view on Nauruan classification has been that it is a Micronesian language that should be classified apart from all other members of the family. This classification is based on little Nauruan data and should be reevaluated. To this end, this dissertation compiles nearly 300 lexical comparisons and shows regular sound correspondences between Nauruan, Proto-Micronesian and individual Micronesian languages. Additionally, a range of Nauruan morphological paradigms are shown to have parallels across the Micronesian family. The analysis supports classifying Nauruan as a Micronesian language but has produced no compelling evidence for classifying Nauruan apart from the nuclear Micronesian group. As such, the nuclear/non-nuclear distinction within the family appears to be unnecessary. The evidence suggests that all Micronesian languages, including Nauruan, have descended from Proto-Micronesian. Possible classifications for Nauruan within the Micronesian family are discussed and evaluated. Several stages of pre-Nauruan are also reconstructed, which suggests that Nauruan has undergone a significant degree of internal sound change. This may have contributed to earlier perceptions of Nauruan as a non-nuclear Micronesian language.

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1 Introduction

This dissertation aims for a more thorough and accurate account of Nauruan phonology than has been possible previously, in both the synchronic and diachronic domains (cf. Nathan 1973a, Jackson 1986). Fieldwork conducted as part of this research has greatly increased the body of available Nauruan data and has brought more confident accounts of Nauruan phonology, sound change, and classification within reach.

This introductory chapter provides background information on the Nauruan language and its vitality, reviews earlier work on Nauruan, and describes the scope and methodology of the fieldwork which has informed this research. The remainder of this section provides a summary overview of the subsequent chapters of this dissertation.

Chapter 2 presents a revised account of the Nauruan phoneme inventory, as well as phonetic and phonological description of the Nauruan speech sounds. This contrasts with the earlier account of Nathan (1973a), which is presented as highly tentative. A range of associated phonological processes are identified and discussed.

Chapter 3 describes Nauruan prosodic structure, including syllables, phonotactics, reduplication processes, stress, and phrase prosody. Nauruan is shown to have stress placement that is dependent on syllable weight. The phonetic correlates of Nauruan stress are described and illustrated, and the Nauruan stress system is compared to those of other Micronesian languages.

Chapter 4 discusses Nauruan sound change and classification. Regular sound correspondences are established between Nauruan, individual Micronesian languages, Proto-Micronesian, and Proto-Oceanic. In contrast to the prevailing view on Nauruan classification, it is argued that that Nauruan should not be classified apart from the nuclear Micronesian group (cf. Jackson 1986, Lynch et al. 2011: 117). Several possible classifications for Nauruan within

this group are discussed.

1.1 The Nauruan Language

Nauruan (ISO 639-2 [nau]) is a Micronesian language spoken in the Republic of Nauru, a small island nation in the central Pacific. Nauru is roughly eight square miles in size and is situated south of the Marshall Islands and to the west of Kiribati, just barely south of the equator. There are approximately 9300 people who speak Nauruan as a first language, most of whom reside on Nauru (Eberhard, Simmons & Fennig 2019). There are smaller diaspora populations of speakers across the Pacific region, particularly in Australia and New Zealand. Nauruans face serious challenges to their language vitality, much of which can be traced to Nauru's history as a center for phosphate mining.

1.1.1 Language Vitality and Historical Context

Nauruan language vitality is best explained in the context of Nauruan history. Nauruans have faced many challenges since European contact, including disease epidemics resulting in significant population loss, the recovery from which is celebrated annually on October 26th, Angam Day. This holiday is observed in remembrance of the day in 1932 when the population once again reached 1500, a level that was not seen since 1905 and which was considered enough to be self-sustaining (Rensch 1993: viii-ix). This significant population loss resulted from a previously unprecedented influx of Europeans and foreign workers to the island to exploit natural phosphate deposits. The phosphate mining industry on Nauru is associated with several serious problems that Nauruans still face today, including environmental degradation, economic depression, and language endangerment.

Before European contact, Nauru was a lush island populated by twelve independent tribes. Today the tribes of Nauru are still of great cultural importance, with traditional tribal

membership inherited matrilineally, though contemporary Nauruan society is no longer strictly divided along these lines. The extent of early contact with peoples outside of Nauru is not well known, though there is at least some evidence of contact with Kiribati speakers before European contact was established. People from Kiribati are mentioned in traditional Nauruan narratives and are sometimes central figures in such stories. Alois Kayser, a Catholic missionary who spent much of his life on Nauru, provides some valuable insight into traditional Nauruan cultural practices and the natural environment in a series of documents translated and republished under the title *Nauru One Hundred Years Ago* (volumes 1-4). These documents cover the cultural importance and traditional practices surrounding the Pandanus tree and its fruit, traditional fishing practices, traditional games and sports, and traditional oil processing.[1] Though Kayser obviously documented these cultural practices well after European contact, they are very likely to be far older, and many of the practices that Kayser describes are not well-known among contemporary Nauruans.

The first Europeans known to have visited Nauru were whalers aboard the British ship Hunter in 1798, led by Captain John Fearn, who gave the island its original English name Pleasant Island, after his positive impression of the Nauruan people and the island itself (Spennemann 2002: 552; Fabricius et al. 1992: 160-161). According to his log entry the ship did not land but was greeted by some 300 Nauruans who met the ship in boats on the reef, bearing gifts of coconuts and fruit. From this Fearn concluded the island was fertile and well populated, and that the inhabitants had previously had some contact with Europeans, though details of any earlier contact remain unknown. Contact with whaling ships became well established from about 1830, as they began visiting Nauru to replenish provisions with increasing frequency. This

[1] I have so far been unable to locate a copy of the fourth and final volume, which covers traditional oil processing, neither on Nauru nor through any library catalogue.

caused problems for the local population, as beachcombers began settling on Nauru and disrupting trade practices. In combination with the introduction of firearms and alcohol to the island, this led to a devastating civil war between the Nauruan tribes that lasted from 1878 to 1888 (Fabricius et al. 1992: 160-161).

Germany annexed Nauru in 1888 as part of the German Protectorate of the Marshall Islands (Firth 1978: 37), which ended the civil war. After this time Nauru ceased to be called Pleasant Island in official documentation and took on the name Nauru, after the Nauruan name for their homeland, /næoero/. Germany governed Nauru until the outbreak of WWI in 1914. In November of that year, Australian forces took control of the island (Rensch 1993: vii). Remnants of German influence are still evident in Nauruan vocabulary today (e.g. /mak/ 'money' from /maɐ̯k/ *Mark*; /mondak/ 'Monday' from /moːntaːk/ *Montag*; /pretak/ 'Friday' from /fʀaɪ̯taːk/ *Freitag*; /tʃiraŋe/ 'snake' from /ʃlaŋə/ *Schlange*), though the most significant Western influence has come from English speakers, in particular speakers of Australian English.

In 1905 Germany granted the Pacific Phosphate Company rights to begin mining operations on Nauru. This marked the beginning of decades of mining operations which have significantly damaged Nauru's natural environment. Today much of the interior of Nauru, colloquially known as Topside, is characterized by barren rock pinnacles. This is a direct result of phosphate mining and contrasts starkly with the dense vegetation of the island's interior that existed before Western intervention. The destruction has continued steadily since mining operations began, affecting not only the natural beauty of the island's interior but the survival of plant and animal species. Several consultants have noted particular plants, trees and animals that they recall from their youth but which they no longer see on the island, the loss of which is likely attributable to environmental destruction from phosphate mining.

Between the discovery of phosphate deposits and the end of WWI about 630,000 tons of phosphate was removed from Nauru (Gowdy and McDaniel 1999: 334). After WWI, control of the phosphate mining industry was passed to the British Phosphate Commission. This operation was under joint control of Britain, Australia and New Zealand, and remained in control until Nauruan independence in 1968. The phosphate mining industry generated some 34 million Australian dollars in revenue from 1920 to 1968 (Gowdy and McDaniel 1999: 334), but it was not until after Nauruan independence that Nauruans began to profit from the mining operations.

The Nauru Phosphate Corporation took full control of mining operations in 1970 (Manner et al. 1985: 187), and this led to an economic boom. A high standard of living was established on Nauru, though it would be relatively short-lived. Much of this new-found wealth was mismanaged (Connell 2006), and with the depletion of phosphate reserves Nauru fell into an economic depression from which it has still not recovered. Due to the economic situation some have expressed concern that diaspora populations will continue to grow and the local population will shrink (Connell 2006: 60-61). The phosphate reserves on Nauru are largely depleted and the industry has lost much of its profitability, but mining operations are still ongoing. There is motivation to extract the minimal deposits that remain, even at the cost of continued environmental damage.

The environmental future of Nauru is also under threat from rising sea levels globally (Stephen 2011, Lister 2015). Due to the destruction of the island's interior, living space is limited mostly to a strip of coastal land encircling the island.[2] This is precisely the area that will suffer the greatest impact as sea levels rise.

These economic and environmental challenges are a direct threat to Nauruan language

[2] One exception is the residential area that surrounds Buada Lagoon.

vitality. Nauru is the center of Nauruan language and culture, and it is crucial that it remains so to give future generations the best chance to continue using the language. Economic depression and environmental damage threaten the Nauruan homeland and the Nauruan language.

Another significant threat to Nauruan language vitality is the influence of English (Barker 2012). English is well established on Nauru and is a language of daily use. Public school classes use English extensively, and there are few educational materials that are written in Nauruan. News is typically delivered in English, in both newspapers and in television broadcasts.[3] English is used extensively in the government as well, even though Nauruan is an official language. A wide range of English borrowings are evident in colloquial speech, and code-switching is very common. Attrition in vocabulary is prominent among younger people, who appear to use less Nauruan vocabulary than older generations. Ethnologue gives Nauruan an EGIDS rating of 3,[4] though notes that children may not be learning the language (Lewis, Simons, and Fennig 2019; Wurm 2007). UNESCO categorizes Nauruan as severely endangered (Moseley 2010).

Nauruans have a positive attitude towards their language overall, across generations. There is interest in the preservation of Nauruan language and culture, and the government of

[3] Apart from interview segments, in which residents often speak Nauruan.

[4] Ethnologue's EGIDS (Expanded Graded Intergenerational Disruption Scale) rating system is used to measure the status of a language in terms of endangerment or development. The scale runs from 0 for "International Language" to 10 for "Extinct". Nauruan's rating of 3 indicates "Wider Communication", which acknowledges "the language is used in work and mass media without official status to transcend language differences across a region", though it must be noted that Nauruan meets some criteria for higher (lower vitality) ratings on the EGIDS scale. Though Nauruan is a language of daily communication on Nauru, the increasing dominance of English in people's daily lives, in education, and in government, as well ongoing disputes surrounding spelling standardization, might suggest a rating of 5. Regarding EGIDS ratings 4 (Educational) and 5 (Developing), Ethnologue states "This largely focuses around issues of standardization and literacy acquisition and the degree to which those are institutionally supported and have been adopted by the community of language users." Furthermore, concerns over the transmission of Nauruan to future generations might call for a still lower vitality rating. Regarding EGIDS ratings 6a (Vigorous) and 6b (Threatened), Ethnologue states "the primary factor in focus is the state of daily face-to-face use and intergenerational transmission of the language." The particularities of Nauruan language vitality make it difficult to capture the overall level of concern with a single EGIDS rating, as Nauruan appears to meet some of the criteria for rating 3 (Wider Communication), rating 5 (Developing), and rating 6b (Threatened). A full and detailed explanation of the EGIDS rating system can be found on Ethnologue's website: www.ethnologue.com/about/language-status.

Nauru has commissioned a Language Division to support these efforts. The Language Division is focused on promoting the Nauruan language, developing language resources, and handling community concerns over the Nauruan language generally. The documentary work conducted as part of the present research program is aimed, in part, at helping the Language Division to meet goals related to language maintenance and revitalization. So far, the division has been provided with some recording equipment and other technological assistance, as well as consultation regarding educational and revitalization goals. A major issue of concern to the Language Division is the establishment of a standard orthography for use in educational and governmental capacities. As discussed in the following section, this issue has been ongoing in the Nauruan community for a very long time.

1.1.2 Orthography

In this dissertation Nauruan is written using a phoneme-based system with IPA characters rather than any established orthography.[5] This is done to avoid endorsing any specific spelling system. There are several different orthographic traditions on Nauru, and the question of which orthography should be adopted as a standard has been an important issue in the Nauruan community for a long time. There is a desire to standardize the orthography for educational and other official purposes, but disagreements surrounding standardization have stalled progress for decades. The first written record discussing spelling standardization can be found in a 1938 report from the Nauruan Language Committee, which officially recommends a series of spelling reforms to the government of Nauru (Rensch 1993: 224-228). The spelling standardizations recommended by the 1938 committee were never adopted, neither for practical nor official use,

[5] Except where Nauruan data is reproduced from another source. In those cases, Nauruan is written as it appears in the original work; *nga*, *ña*, or *ṇa* 'I' rather than /ŋa/ 'I', for example.

though the reforms were apparently accepted by the government at the time (Rensch 1993: x-xi).

The most common orthographies encountered today include the one used in the Nauruan Protestant Bible (Delaporte and Detudamo 1907), the one used by Alois Kayser in his translations of Catholic religious texts and other writings, and a range of spellings commonly used on social media and in text messages, which are often intermingled with English words and phrases. A range of other orthographies have been used in various places but have never been put to practical use by Nauruans. These include the orthography used by Kayser in his grammar of Nauruan (1936); orthographies used in prayer books and other religious texts (e.g. Presses Missionnaires 1954); the orthography used in Delaporte's pocket Nauruan dictionary (1907; Trussel (b)); the orthography used in Hambruch's writings (1914, 1915); and spelling variations found in the Nauruan dictionary (Curriculum Centre Press 1994; Jacob 1996).

1.2 Nauruan Phonology in the Literature

The earliest published description of Nauruan speech sounds comes from Father Alois Kayser's 1936 book *Nauru Grammar*.[6] While Kayser's grammar is valuable, very little of the work is dedicated to the sound system (1936: 1-6). For what is there, the descriptions of Nauruan speech sounds are not especially useful. Kayser describes the speech sounds in relation to the orthography he was developing at the time, under the heading *phonetics and writing*. He describes them by referencing phones in European languages including English, French and German, though he does describe aspects of Nauruan speech articulation more specifically in some places. Kayser lists different pronunciations under each of the vowel letters. It can

[6] There was earlier work on Nauruan by Philip Delaporte, a protestant missionary who translated the New Testament into Nauruan with the assistance of Timothy Detudamo and Jacob Aroi. Delaporte also published a pocket German-Nauruan dictionary in 1907 (Trussel (b)). Unfortunately, Delaporte provides no explanation regarding the pronunciation of the speech sounds his orthography represents.

sometimes be difficult to tell what Kayser's intention was, as the contrasts are not made clear. For example, under the letter *a* Kayser writes "a … as in 'father'" … "a̲ … as in "quantity'" … "a̤ … as in (the French) 'Madame' … "a̲ … as in 'path'" (1936: 1). Using example words with no phonetic description makes interpretation of the speech sounds dependent upon the English dialect of the reader, or their familiarity with other European languages. Kayser associates a range of speech sounds to single letters, which is suggestive of groups of allophones associated to a phoneme, but he bases his groupings on an approximation of English spelling rather than any phonological analysis.

The earliest published discussion of Nauruan by a linguist appears to be a brief entry by Capell in his survey of south Pacific languages (1962: 251-253), though this work offers no Nauruan data or analysis. Capell notes that Nauruan's classification as Micronesian is unsatisfactory because "its Austronesian content seems to be quite small", though it is unclear why he believes this. Nauruan's status as a nuclear Micronesian language has been questioned (Jackson 1986), but the fact that it is Austronesian should have been as clear then as it is now. Capell notes well the influence of European contact on the Nauruan community, and the prevalence of English in the daily lives and education of Nauruans, though he appears to be wrong in claiming that Nauruan "is now reduced to the position of a home idiom rather than a literary and cultivated language". Nauruan is under continued threat from the increasing dominance of English, but it is still a language of daily use both inside and outside of the home, and it certainly constitutes an important part of Nauruan identity. Capell also notes the difficulty of the language, describing it as "extremely complicated" in all respects save its syntax. There is also brief discussion of the literature on the language up to that point, including Kayser's (1936) grammar and Hamburch's writings (1914, 1915), the latter of which is described as "quite

inadequate". Issues surrounding Nauruan orthography are also noted, which is a problem that persists to this day.

It was not until the early 1970s that linguistic research on Nauruan began to pick up, the bulk of which was carried out at the University of Hawaii. During that period, Alex Deiye served as a consultant to researchers in the linguistics department at the university. The culmination of this research is Geoffrey Nathan's article *Nauruan in the Austronesian Language Family* (1973a).[7] Nathan's work is presented as a highly tentative account of Nauruan phonology and sound change, but nonetheless has been influential in establishing the prevailing view on Nauruan phonology and classification in the literature (Jackson 1986: 211-214; Rensch 1993: i; Johnson 1999; Lynch et al. 2011: 117). Nathan explicitly notes the difficulty of Nauruan in terms of its phonetics and phonology and considers his phonemic analysis to be preliminary and "jury-rigged" (Nathan 1973a: 479-481).

As Nathan had suspected, there appear to be several inaccuracies in his analysis of the language.[8] Some of these inaccuracies have been carried on in discussions of Nauruan phonology and classification in the literature. For example, Jackson (1986) draws on data from Nathan (1973a-c, n.d.) in arguing for Nauruan's exclusion from the nuclear Micronesian group, a view which persists in the literature (e.g. Lynch et al. 2011: 117), but which appears to be incorrect. A full review of Jackson's work is provided in Chapter 4, alongside a new account based on original data and analysis.

[7] Nauruan is also briefly discussed by Bender (1971: 434-435, 438, 457-458), who notes that Dyen (1965) had included the language as one of 40 coordinate branches of his Austronesian Linkage, and that "no especially close affinities have been found either in or outside of Micronesia [for Nauruan and Yapese]." There is also an unpublished manuscript by Hough (1974) entitled *Summary of Nauruan Phonology*.

[8] For example, the assertion that Nauruan loses PMc *t in all environments; failure to note the conditioning environment for PMc *l > r (§4.1.15); and the claim that PMc *l > n never occurs in Nauruan when this is the unconditioned correspondence for PMc *l (§4.1.15). There are also a number of misphonemicizations of Nauruan words (e.g. *inno-n* 'mother' for /ine-n/ 'mother of', or *-u, -o* '1sg. suffix' for /-ɨ/ '1sg.').

1.3 Data and Fieldwork

This dissertation is informed by fieldwork conducted between the years of 2015 and 2017, resulting in over 100 hours of digital recordings with Nauruan speakers. Fieldwork was conducted primarily in The Republic of Nauru, but also in New York City with visiting Nauruans. There were 17 individual speakers consulted for this research, ranging in age from about 25 to 75, all but three of whom were women. The data consist of wordlists, elicitations, narratives, conversational speech, and descriptions of images. One consultant participated in ultrasound imaging of consonant articulations, to allow for more accurate phonetic descriptions of some consonants (see Chapter 2). Work planned for the future includes the full transcription and glossing of the data, and preparation of all materials for deposit in a language archive, and also locally with the Language Division. Archives under consideration include the Pacific and Regional Archive for Digital Sources in Endangered Cultures (PARADISEC) and The University of Hawaii's Kaipuleohone language archive. The bulk of this data will likely be available to the wider scholarly community after archiving is complete, though access may be restricted in some cases, in keeping with the wishes of the Language Division or individual consultants who contributed to this research. This body of work has significant documentary value and should aid the scholarly community in future studies of Nauruan language and culture.

2 The Nauruan Speech Sounds

This chapter provides a description of the Nauruan speech sounds and associated phonological processes. The first attempt at describing Nauruan phonology by a linguist predates the current work by some time (Nathan 1973a), though by Nathan's own assessment that analysis is highly tentative.

> From the outset let me state that Nauruan is an extremely difficult language to work with particularly with regard to the phonology. Pinning down the phonetics has been a particularly exasperating problem, while conditioning allophones has also proved a troublesome task … Phonetically, Nauruan is one of the most difficult languages I have ever encountered. It has a number of phones they don't teach one about in phonetics class, one of which has escaped my analysis to this day … On top of this is my difficulty in coming up with a reasonable phonemicization. The jury-rigged version that follows is to be considered highly tentative, particularly in dealing with the vowels. (Nathan 1973a: 479-481)

Though Nauruan still poses analytical challenges, the amount of available data has improved significantly as have the tools available for phonetic analysis. The ability to record and phonetically analyze data relatively quickly using digital audio recorders and software such as Praat (Boersma and Weenink 2017) has afforded this work an advantage over the work carried out in the 1970s. This work stands apart in aiming for a more phonetically detailed description and in being based on a more diverse body of Nauruan speech data. A more accurate description of Nauruan phonology is now within reach and is the goal of the present chapter.

§2.1 presents the Nauruan phoneme inventory according to the present analysis. Differences between the proposed phoneme inventory and that of Nathan (1973a) are highlighted

and discussed.

§2.2 provides a description of the articulatory and acoustic properties of the Nauruan consonants. Minimal or near-minimal pairs are provided for each speech sound along with spectrograms and waveforms where this aids illustration. Still images from ultrasound video are also included in some cases, where this helps to clarify articulatory features.

§2.3 provides the same treatment for the Nauruan vowel inventory. Minimal or near-minimal pairs are provided for each speech sound, along with additional articulatory data where this aids description.

§2.4 provides background information on Nauruan language contact and describes some characteristics of Nauruan loanword phonology.

2.1 Phonemes and Phonological Distribution

Table 2.1.1 shows the Nauruan phoneme inventory under the current analysis. Each phoneme is represented using an IPA symbol, except for /ř/ which is a kind of fortis trill with greater airflow obstruction than /r/.

There are several differences between the phoneme inventory proposed here and that of Nathan (1973a). Nathan suggests that the plain dorsal stops /k/ and /g/ are ‘post velar’ (1973a: 481), though presently they appear to be velar stops. Nathan further suggests the existence of a phoneme /gʷ/ in Nauruan (1973a: 483), but the current study finds no evidence for this synchronically. All labialized velar stops appear to be voiceless, /kʷ/. Nathan suggests that a phoneme /ŋʷ/ is required for some analyses, though he does not give any more detail than this (1973a: 482). This phoneme is proposed to have existed in Old Nauruan (§4.1.7), but it is not considered part of the synchronic phoneme inventory under the present analysis.

Regarding the vowels, Nathan proposes that Nauruan has contrastive vowel length

(1973a: 483), while the current analysis does not. There is, however, evidence that Nauruan had phonemically long vowels historically (§4.1.24). Nathan also considers the Nauruan central vowels [ɨ] and [ɐ] to be allophones.[9] Here they are analyzed as quasi-allophones which are contrastive in some environments but not others (§2.3.2). Nauruan /ɨ/ appears to be a phoneme, an observation that is supported by historical and comparative evidence (§4.1.19). The central vowel [ɐ] occurs as both a free variant and a conditioned allophone of /a/.

[9] Nathan transcribes [ɐ] as ʌ.

Table 2.1.1 – The Nauruan Phoneme Inventory

Consonants

	Bilabial	Alveolar	Palatal	Velar
Stop [10]	pʲ bʲ	t d		k g
	pˠ bˠ	ʧ ʤ		kʷ
Nasal	mʲ mːʲ	n		ŋ
	mˠ mːˠ			
Glide [11]	(w)		ɟ j	w
Rhotic		r ř		

Vowels

	Front	Central	Back
High	i	ɨ	u
Mid	e	[ɐ] [12]	o
Low	æ	a	

[10] The stops /t/ and /d/ may also occur with a dental place of articulation. This appears to be a free variation.

[11] Nauruan /j/ may occur with light to moderate frication. Nauruan /w/ is rounded, and therefore is simultaneously bilabial and velar.

[12] The central vowel [ɐ] occurs as a raised variant of /a/.

The distinctive features that distinguish each Nauruan phoneme under the present analysis are shown in Tables 2.1.2 – 2.1.4 below. Table 2.1.5 is a list of the synchronic phonological rules observed in Nauruan so far, and is discussed in more detail below. Tables 2.1.6 – 2.1.8 summarize the possible surface consonant-vowel (CV) combinations for every consonant and vowel in the inventory.

Table 2.1.2 – Consonant Features: Coronals

	t	d	tʃ	dʒ	n	r	ř
[consonantal]	+	+	+	+	+	−	+
[sonorant]	−	−	−	−	+	−	−
[syllabic]	−	−	−	−	−	−	−
LARYNGEAL							
[voice] [13]	−	+	−	+	+	+ (−)	+ (−)
MANNER							
[continuant]	−	−	−	−	−	+	+
[nasal]	−	−	−	−	+	−	−
[delayed rel.]	−	−	+	+	−	−	−
PLACE							
CORONAL	✓	✓	✓	✓	✓	✓	✓
[anterior]	+	+	−	−	+	+	+
[dist.] [14]	− (+)	− (+)	+	+	−	−	−
DORSAL							
[back]	−	−	−	−	−	−	−

[13] Both /r/ and /ř/ are sometimes realized as a partially or fully devoiced variant which is fricated rather than trilled. The frequency of this variation varies from speaker to speaker.

[14] Both /t/ and /d/ are optionally dental. Where they are dental they have the feature [+distributed].

Table 2.1.3 – Consonant Features: Labials, Velars, and Glides

	pʲ	bʲ	pˠ	bˠ	mʲ	mːʲ	mˠ	mːˠ	j	j̟	k	g	kʷ	ŋ	w
[consonantal]	+	+	+	+	+	+	+	+	−	+	+	+	+	+	−
[sonorant]	−	−	−	−	+	+	+	+	+	−	−	−	−	+	+
[syllabic]	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
[long]	−	−	−	−	−	+	−	+	−	−	−	−	−	−	−
LARYNGEAL															
[voice]	−	+	−	+	+	+	+	+	+	+	−	+	−	+	+
MANNER															
[continuant]	−	−	−	−	−	−	−	−	+	+	−	−	−	−	+
[nasal]	−	−	−	−	+	+	+	+	−	−	−	−	−	+	−
[delayed rel.]	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
PLACE															
LABIAL	✓	✓	✓	✓	✓	✓	✓	✓					✓		✓
[round]	−	−	−	−	−	−	−	−					+		+
DORSAL	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
[high]	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
[low]	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
[back]	−	−	+	+	−	−	+	+	−	−	+	+	+	+	+

Table 2.1.4 – Vowel Features

	i	e	æ	ɨ	a	[ɐ]	u	o
[consonantal]	–	–	–	–	–	–	–	–
[sonorant]	+	+	+	+	+	+	+	+
[syllabic]	+	+	+	+	+	+	+	+
LARYNGEAL								
[voice]	+	+	+	+	+	+	+	+
MANNER								
[continuant]	+	+	+	+	+	+	+	+
[nasal]	–	–	–	–	–	–	–	–
PLACE								
LABIAL							✓	✓
[round]							+	+
DORSAL	✓	✓	✓	✓	✓	✓	✓	✓
[high]	+	–	–	+	–	–	+	–
[low]	–	–	+	–	+	–	–	–
[back]	–	–	–	+	+	+	+	+

Table 2.1.5 is a list of synchronic phonological rules which have been observed in Nauruan. This table is cross-referenced in §2.2 and §2.3, where these rules are described within subsections on the specific phonemes they target. Table 2.1.5(a-d) summarize the conditions under which consonantal secondary articulations are not realized phonetically. This can be modeled as a delinking of the DORSAL place feature, such that the surface consonant has no designation for any dorsal feature. The final devoicing rule in Table 2.1.5(e) can be modeled by assigning the feature [−voice] to a phrase-final consonant. The rule given in Table 2.1.5(f) models the raising of /a/ to [ɐ] following [−back, +high, −low] consonants. This process must involve the spreading of the feature [−low] rather than [+high] because the resulting phone [ɐ] is central; [−high, −low] (§2.3.2). The rule in Table 2.1.5(g) describes /a/ raising that results from

formant undershoot, as described in §2.3.2. The phoneme /a/ also raises variably in open syllables, as indicated in Table 2.1.5(h). Table 2.1.5(i-j) summarize phonological processes targeting /u/, which is centralized to [ɨ] after consonants that surface with velarization, and which is fronted to [ʉ] after segments with the features [+high, −back] (palatals and [i]) or [+anterior] (alveolars). The latter process mirrors other sounds changes involving "front" consonants in the Micronesian family, as discussed in §2.3.4.1 (Bender 1968, Marck 1975, Rehg 1981: 43-46, Rehg 1991: 396).

Table 2.1.5 – Phonological Rules in Nauruan

a.	Palatal dissimilation	$C^{j} \rightarrow C$ / ___ {i, e}	
b.	Velar dissimilation	$C^{ɣ} \rightarrow C$ / ___ {o, u}	See also (c, i) [15]
c.	Velar dissimilation (central)	$C^{ɣ} \rightarrow C$ / ___ {ɨ, a}	variable
d.	Word-final neutralization	$\{C^{w}, C^{ɣ}, C^{j}\} \rightarrow C$ / ___#	
e.	Phrase-final devoicing	$C \rightarrow [-\text{voice}]$ / ___ $]_{\varphi}$	
f.	/a/ raising, assimilation	a → ɐ / {C^{j}, ʲ, j, i} ___	
g.	/a/ raising, undershoot	$a \rightarrow ɐ$ / (C_{α}) ___$C_{\beta}]_{\sigma}$	$C_{\alpha} \neq$ w, $C_{\beta} \neq$ w r n
h.	/a/ raising, open syllables	a → ɐ / ___ $]_{\sigma}$	variable
i.	/u/ dissimilation	u → ɨ /$C^{ɣ}$ ___	variable
j.	/u/ dissimilation (labiovelar)	u → ɨ /{k^{w}, w} ___	
k.	/u/ fronting	u → ʉ /$C_{[-\text{back}]}$ ___ [16]	

[15] Table 2.1.5 (b) and (i) represent complementary distributional constraints involving the vowel /u/. Rule (b) indicates that secondary velarization is not phonetically salient where an underlyingly velarized consonant occurs before [u] or [o]. Rule (i) describes an alternate distribution in which /$C^{ɣ}$u/ surfaces with velarization intact, but the vowel /u/ is realized phonetically as [ɨ]. Note also (c), which indicates that where [ɨ] surfaces, velarization may or may not be phonetically salient. Consider, for example, the word /$b^{ɣ}um^{ɣ}$/ 'night, 24-hour day'. This word varies across the following phonetic realizations: [bum] ~ [$b^{ɣ}$ɨm] ~ [bɨm]. Note that although [ɨ] is a phonetic variant of /u/, there is independent evidence that /ɨ/ is also a phoneme (§2.3.2.3).

[16] Conditioning segments include coronal or palatal consonants; [t], [d], [r], [ř], [n], [ʲ], [j], [b^{j}], [p^{j}], [m^{j}].

Tables 2.1.6 – 2.1.8 show the surface consonant-vowel (CV) combinations that are possible in Nauruan under the present analysis. This illustrates the distributional restrictions associated with the rules listed in Table 2.1.5 above.

Table 2.1.6 – Surface CV distributions, Coronals

		Consonants						
		t	d	n	r	ř	tʃ	dʒ
Vowels	i		[di]	[ni]	[ri]	[ři]	[tʃi]	[dʒi]
	e	[te]	[de]	[ne]	[re]	[ře]	-	-
	æ	[tæ]	[dæ]	[næ]	[ræ]	[řæ]	-	-
	ɨ	[tɨ]	[dɨ]	[nɨ]	[rɨ]	[řɨ]	-	-
	a	[ta]	[da]	[na]	[ra]	[řa]	-	-
	ɐ	[tɐ]	[dɐ]	[nɐ]	[rɐ]	[řɐ]	-	-
	ʉ	[tʉ]	[dʉ]	[nʉ]	[rʉ]	[řʉ]	-	-
	o	[to]	[do]	[no]	[ro]	[řo]	-	-

Table 2.1.7 – Surface CV distributions, Labials

		Consonants [17]					
		pʲ	bʲ	mʲ	pˠ	bˠ	mˠ
Vowels	i	[pi]	[bi]	[mi]	[pˠi]	[bˠi]	[mˠi]
	e	[pe]	[be]	[me]	[pˠe]	[bˠe]	[mˠe]
	æ	[pʲæ]	[bʲæ]	[mʲæ]	[pˠæ]	[bˠæ]	[mˠæ]
	ɨ	[pʲɨ]	[bʲɨ]	[mʲɨ]	[pˠɨ], [pɨ]	[bˠɨ], [bɨ]	[mˠɨ], [mɨ]
	a	-	-	-	[pˠa], [pa]	[bˠa], [ba]	[mˠa], [ma]
	ɐ	[pʲɐ]	[bʲɐ]	[mʲɐ]	[pˠɐ], [pɐ]	[bˠɐ], [bɐ]	[mˠɐ]
	u	-	-	-	[pu]	[bu]	[mu]
	ʉ	[pʲʉ]	[bʲʉ]	[mʲʉ]	-	-	-
	o	[pʲo]	[bʲo]	[mʲo]	[po]	[bo]	[mo]

[17] The geminate bilabial nasals have the same distributional restrictions as their singleton counterparts.

Table 2.1.8 – Surface CV distributions, Velars and Glides

		Consonants [18]						
		j	ɟ	k	g	k^w	ŋ	w
Vowels	i	[ji]	[ɟi]	[ki]	[gi]	[k^wi]	[ŋi]	[wi]
	e	[je]	[ɟe]	[ke]	[ge]	[k^we]	[ŋe]	[we]
	æ	[jæ]	[ɟæ]	[kæ]	[gæ]	[k^wæ]	[ŋæ]	[wæ]
	ɨ	[jɨ]	[ɟɨ]	[kɨ]	[gɨ]	[k^wɨ]	[ŋɨ]	[wɨ]
	a	-	-	[ka]	[ga]	[k^wa]	[ŋa]	[wa]
	ɐ	[jɐ]	[ɟɐ]	[kɐ]	[gɐ]	[k^wɐ]	[ŋɐ]	-
	u	-	-	[ke]	[ge]	-	[ŋe]	-
	ʉ	[jʉ]	[ɟʉ]	-	-	-	-	-
	o	[jo]	[ɟo]	[ko]	[go]	[k^wo]	[ŋo]	[wo]

2.2 Nauruan Consonants

This section begins with an overview of Nauruan place features (§2.2.1) and a discussion of voicing and length features (§2.2.2). This is followed by descriptions of individual consonant phonemes organized into sections by manner of articulation (§2.2.3 – §2.2.6). Each consonant phoneme is described and is accompanied by illustrative data, including a list of phonological processes that target the phoneme and a table of example words forming minimal or near-minimal pairs. Phonological processes listed within each phoneme description cross-reference Table 2.1.2 in the preceding section, which provides a generalized list of phonological processes in Nauruan.

Phonetic descriptions of Nauruan speech sounds are included in each subsection. Accompanying data may include spectrograms, waveforms, and/or ultrasound images.

[18] There are no identified instances of [g^w], including before non-back vowels where labialization would be expected to surface. This suggests that /g^w/ does not exist in the Nauruan phoneme inventory. The only labialized stop is voiceless [k^w], which has its origin in geminate pre-Nauruan *w:.

Spectrograms have been generated using Praat speech analysis software, with formant frequencies indicated (Boersma and Weenink 2017). Waveforms are also generated using Praat. Waveforms are presented with the word token divided into its constituent segments by vertical lines. Secondary articulations are included as part of their associated consonant segments, so that the division between consonants such as [pʲ], [bʲ], [pˠ], [bˠ] and following vowels are drawn at the point where the formant frequencies of the secondary articulation begin their transition to the formant frequencies of the following vowel. The formant transitions can be observed in accompanying spectrograms. Waveforms and spectrograms for oral stops are further accompanied by notes regarding length (closure duration) and release features. Closure duration for stops is measured from the point of closure up to the point of release, either before a following vowel or before a secondary articulation. In the latter case, a vertical dashed line is drawn in the waveform to indicate the end of the release burst and the beginning of the secondary articulation. For consonants with secondary articulations, then, the vertical lines which divide a token word into its constituent segments do not align with the measurement of closure duration. Furthermore, closure duration is measured only for intervocalic segments because the point of closure in word-initial segments is difficult to determine based on acoustic measurement. Descriptions of release features use the terms “weak” or “strong”, which describe the relative acoustic energy of the release. Weak consonant releases are low-energy, sometimes to the point of frication without any discernable burst, while strong releases are characterized by clear bursts with relatively greater acoustic energy. Where present, ultrasound images are single frames at the point of greatest constriction in a primary consonant articulation or a secondary articulation, as indicated.

2.2.1 Place of Articulation

The Nauruan consonants utilize four primary places of articulation, shown across the top of Table 2.1.1; labial, alveolar (dental), palatal, and velar. Palatal, velar, and labial features also occur in secondary articulations on some consonants, as described below. Secondary articulations may not be phonetically salient under certain conditions, described in Table 2.1.5(a-d).

Labial sounds include an oral stop series and a nasal series, each having contrastive velarization or palatalization: /pʲ/, /pˠ/, /bʲ/, /bˠ/, /mʲ/, /mˠ/. Bilabial nasals also contrast for length: /mːʲ/, /mːˠ/. The glide /w/ is labiovelar, being rounded, and so is also included in the set of bilabial consonant phonemes.

Alveolar sounds include two stops, /t/ and /d/, which can also occur with a dental place of articulation.[19] The active articulator appears to be the tongue tip, making these sounds apical. Also included are an alveolar nasal and two rhotics. One of the rhotics can be described straightforwardly as an alveolar trill, /r/, while the other is a trill with greater airflow obstruction, /ř/. Both sounds are sometimes realized as a kind of voiceless fricative which might be transcribed as [r̝̊]. This variant has the same alveolar place of articulation but has reduced or absent trilling and can sometimes sound breathy. Its frequency of use varies from speaker to speaker. It can sometimes be difficult to differentiate between /r/ and /ř/ phonetically, and it is possible that these two sounds are undergoing a merger for at least some Nauruan speakers.

Sounds with a palatal place of articulation include an approximant that frequently occurs

[19] Nauruan /t/ and /d/ are variably dental. Consultants have explicitly indicated that the tongue tip should be placed on the alveolar ridge during articulation. Still, in running speech the tip of the tongue is occasionally visible between the teeth, though not protruding beyond the teeth, which provides evidence for a variably dental articulation. Note that Nathan describes /t/ and /d/ as exclusively dental (1973a: 481).

with light to moderate frication, represented here as /j̞/ and treated as having the feature [+consonantal]. This speech sound contrasts with /j/ which never occurs with any degree of frication and is classified as [−consonantal], e.g. /ej̞u/ ‘three’ vs. /eiju/ ‘seven’. Additionally, the Nauruan bilabials /bʲ/, /pʲ/, /mʲ/ have palatal secondary articulations.

Velar sounds in Nauruan include three oral stops, one of which is labialized; /k/, /kʷ/, /g/. Nathan suggests that the plain velar stops /k/, /g/ have a post-velar place of articulation, while labiovelar /kʷ/ occurs with a velar place of articulation (1973a: 481). However, a uvular (post-velar) articulation has not been observed for these speech sounds in the present study, and they are classified here as velar stops. Other velar phonemes included are the nasal /ŋ/ and the labiovelar approximant /w/.

2.2.2 Voicing and Length

This section provides an overview of voicing and length features in Nauruan phonology. Voicing is a contrastive feature among oral stops in Nauruan, as exemplified by these minimally contrastive phoneme pairs: /pʲ/, /bʲ/; /pʸ/, bʸ/; /t/, /d/; /k/, /g/. The labiovelar stop /kʷ/ is voiceless, though it has no voiced counterpart. All other Nauruan speech sounds, including nasals, glides and trills, are voiced except in instances of phrase-final devoicing among oral stops and occasional voiceless phonetic variants of the rhotics.

Nauruan is a true voicing language in that voiced and voiceless oral stop consonants are distinguished by negative vs. short-lag (unaspirated) positive voice onset time (Lisker and Abramson 1964; Kakadelis 2018: 35). True voicing languages are different from aspirating languages, where oral stops contrast in being unaspirated (having short-lag positive VOT) or aspirated (having longer positive VOT). In Nauruan, voiced ([+voice]) stops maintain or initiate phonation before the point of release release (pre-voicing or negative VOT). Voiceless ([−voice])

stops lack phonation at the point of release and allow for immediate initiation of phonation in following voiced segments after release (short-lag unaspirated positive VOT).

Kayser's description of the Nauruan speech sounds describes the stops as English-like (1936: 1), but this does not seem accurate. What are generally labeled voiced and voiceless stops in English are not always distinguished by negative versus positive VOT. At the beginnings of word-initial stressed syllables, for example, voiced stops in English generally have short-lag unaspirated positive VOT, while voiceless stops in the same position are aspirated, and have a relatively longer positive VOT (Ladefoged 2006: 147-148). This description suggests that English is an aspirating language rather than a true voicing language like Nauruan (Lisker and Abramson 1964; Kakadelis 2018: 35). In line with what is expected of a true voicing language, Nauruan oral stops are never aspirated.

The only Nauruan phonemes that clearly contrast for length are the bilabial nasals: /mʲ/, /mːʲ/; /mˠ/, /mːˠ/. There are no apparent phonemic length contrasts among other nasals, approximants, nor vowels. Length differences among oral stops are not salient at word edges. At word edges, contrasts between minimally contrastive oral stop pairs appear to be cued exclusively by voicing rather than length.[20] Intervocalic stops in Nauruan, as in many languages, exhibit a clear correlation between voicing and duration. Voiceless oral stops are significantly longer than their voiced counterparts between vowels. Earlier accounts of Nauruan phonology have suggested that voiceless oral stops could be geminates, presumably because of the phonetically salient length difference where they occur between vowels (Nathan 1973a: 481; Johnson 1999: 58). However, it does not seem appropriate to consider the Nauruan oral stops to

[20] In phrase-final positions oral stop consonant voicing is neutralized, as are secondary articulations, resulting in phrase-final oral stops of the shape [p], [t], [k].

be geminates phonemically. The length contrast is only phonetically salient in intervocalic positions, while the voicing contrast is salient in all positions within words; initial, medial, and final.

2.2.3 Oral Stops

The Nauruan oral stop series includes palatalized and velarized bilabial stops and lacks phonemically plain bilabial stops: /pʲ/, /pˠ/; /bʲ/, /bˠ/.[21] Nauruan additionally has a pair of alveolar (variably dental) stops /t/ and /d/, and three velar stops; /k/, /g/, /kʷ/.

Nauruan oral stops contrast in voicing and release features. Phonation begins before the initiation of closure in voiced stops, which are also generally characterized by weak release. A weak release is associated with a relatively low-energy release burst, where one is present. Intervocalic voiced stops tend to be more lenited and may have a short period of frication rather than any burst at all. It is not uncommon for intervocalic tokens of /bˠ/, /bʲ/, /g/ to be realized as [βˠ], [βʲ], [ɣ] respectively. Though phonation begins before release in voiced stops, phonation is sometimes reduced immediately before the point of release. Among voiceless consonants, any preceding phonation ceases immediately after the initiation of closure, and at the point of release there is generally a zero or near-zero positive VOT, consistent with unaspirated stops. As described in the preceding section, this characterizes Nauruan as a true voicing language. Nauruan voiced oral stops have negative VOT, while voiceless oral stops have short-lag (unaspirated) positive VOT. Voiceless stops generally reflect some degree of release burst. Though weak bursts among voiceless stops are possible (particularly word-initially), voiceless stops are not realized with phonetic frication as is sometimes observed among voiced stops.

To exemplify the voicing and length features of oral stops, Figures 2.1 – 2.4 present

[21] This is also observed for Marshallese (Choi 1995: 326).

waveforms of words containing tokens of /t/ and /d/ in intervocalic and word-initial positions. Approximately equivalent differences can be found when comparing other minimally contrastive oral stop pairs. The intervocalic stops in Figures 2.1 – 2.2 are measured for length from the point of closure relative to the preceding vowel, up to the completion of the release burst that begins the transition into the following vowel. The word-initial stops in Figures 2.3 – 2.4 are measured for voice onset time relative to the point of release. It is not possible to measure the total length of closure in word-initial tokens because the initiation of stop closure is not acoustically salient. Voiceless /t/ in Figure 2.3 has a 0 millisecond VOT because voicing in the following vowel begins immediately after the end of the release burst. Voiced /d/ in Figure 2.4 has a negative VOT of 80 milliseconds, which is the duration of time for which phonation is active during closure up to the end of the release burst.

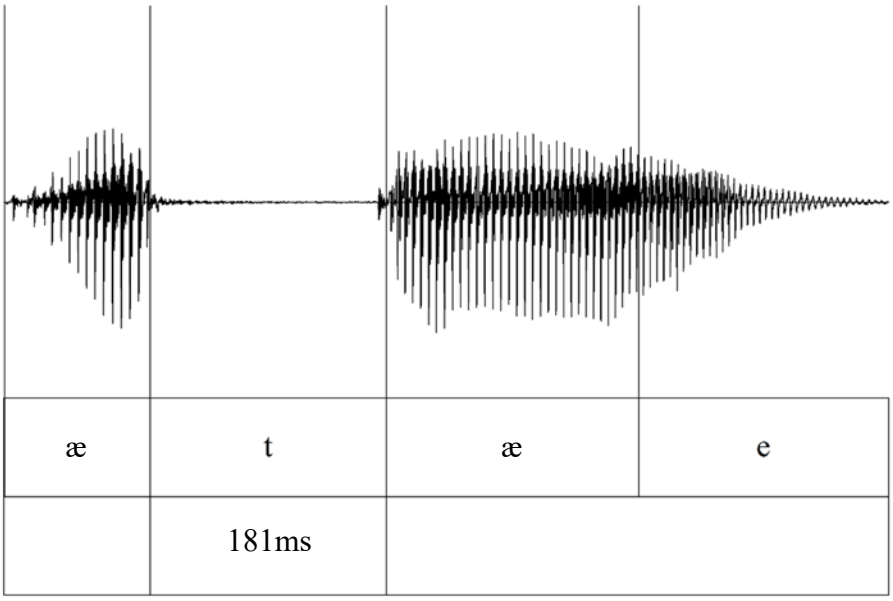

Figure 2.1 – Intervocalic voiceless oral stop [t] in a token of /ætæe/ ‘ten’

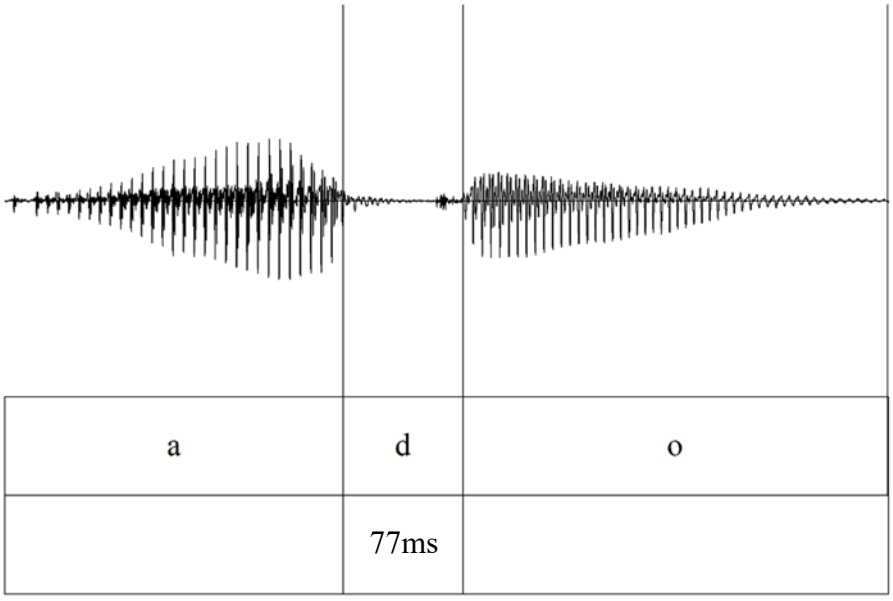

Figure 2.2 – Intervocalic voiced oral stop [d] in a token of /ado/ ‘nine’

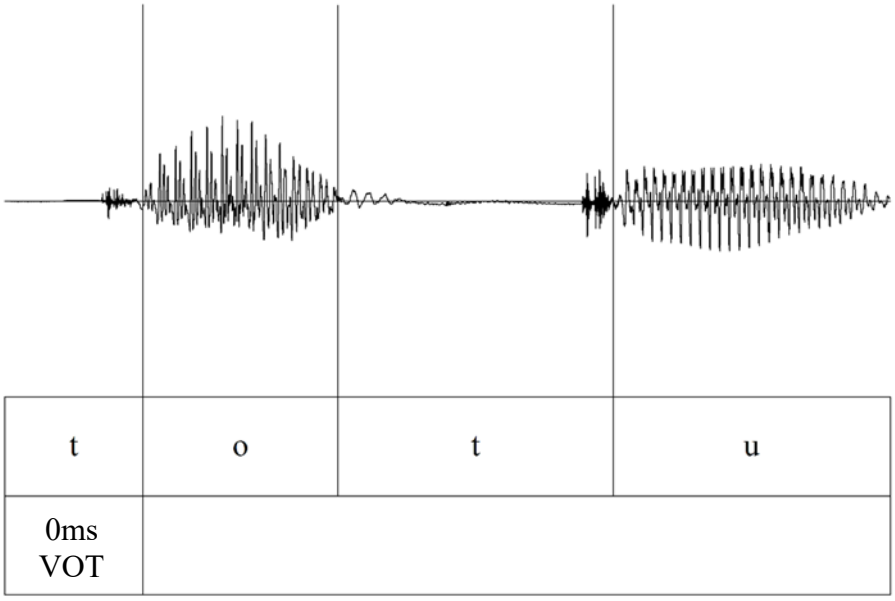

Figure 2.3 – Word-initial voiceless oral stop [t] in a token of /totu/ 'put, place’

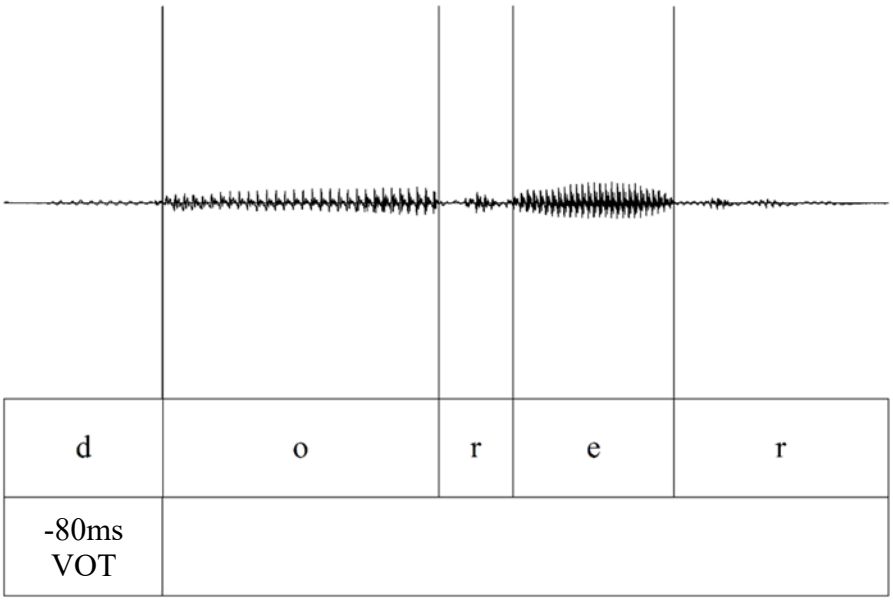

Figure 2.4 – Word-initial voiced oral stop [d] in a token of /dorer/ 'language, speech'

For word-initial oral stops it can sometimes be difficult to perceive whether a token is voiced or voiceless. Some consultants have even expressed uncertainty as to the voicing status of certain initial stops. This might suggest the beginnings of voice contrast neutralization word-initially, though at present the contrast is pervasive enough that neutralization is not apparent, even if word-initial phonation is variable at times.

Speakers' perception of voicing in some segments might also be influenced by spelling conventions. It is possible that familiarity with a particular orthographic representation can influence the perception of a voicing contrast, where there is none phonetically. For example, consider the word [kæbʲæp], spelled *Gabab*, which is the name of a dangerous coastal sea channel in Nauru. The name is derived from the root word /æbʲæbʲ/ 'kill',[22] with the addition of the causative/nominalizing prefix /k-/.[23] This word is pronounced [kæbʲæp], even though the

[22] See also /æbʲi/ 'kill, hit'.

[23] The meaning of *Gabab*, [kæbʲæp], is something like 'that which kills.' The channel is well-known for its

spelling *Gabab* does not suggest the voicelessness of the initial consonant. That spelling might reflect the misperception of an initial unaspirated [k] by English or German speaking missionaries, who helped to establish spelling conventions on Nauru. Both English and German are aspirating languages (Kakadelis 2018: 35), while Nauruan is a true voicing language which distinguishes voiced and voiceless stop pairs exclusively by negative versus positive VOT.

Consider also that variations in Nauruan spelling may be driven by phonological processes in the language. The word /mʲeg/ 'live, stay', for example, can be spelled either *mek* or *meg*, depending on the orthography used. Some consultants have stated that they are unsure if this word ends in [k] or [g], having seen both spellings and being uncertain what the "real" sound is. In tokens where this word is suffixed the stem-final phoneme becomes clear; [megən] 'lived, stayed' suggests /mʲeg/ rather than /mʲek/. Underlying /mʲeg/ surfaces as [mʲek] only where it is phrase-final (Table 2.1.5(e)), though since both [mʲeg] and [mʲek] occur in the language it is understandable why spellings with word-final 'g' and 'k' exist concurrently.

2.2.3.1 /pʲ/

Phonological rules:

a. $p^j \rightarrow p$ / ___ i, e Table 2.1.5(a)

b. $p^j \rightarrow p$ / ___ # Table 2.1.5(d)

The Nauruan phoneme /pʲ/ is a voiceless palatalized bilabial stop. It is pronounced [p] before the non-low front vowels /i/ and /e/, and word-finally. Like other voiceless oral stops, it is

dangerous rip currents. The precise meaning of the [k] prefix is uncertain. It has both causative and nominalizing functions, and usually means something like 'that which is the source or cause of X', where X is the stem, though its addition sometimes results in unexpected meanings, or in no apparent change of meaning.

longer than its voiced counterpart /bʲ/ in intervocalic positions.

Table 2.2.1 is a list of minimal and near-minimal pairs showing that /pʲ/ is a contrastive speech sound in Nauruan. Figure 2.5 is an ultrasound image of [pʲ] which illustrates the tongue position at the point of greatest constriction during palatalization. The body of the tongue is close to the palate at its highest point. Spectrogram and waveform images of [pʲ] tokens are provided in Figures 2.6 and 2.7, with additional notes on voicing and release features.

Table 2.2.1 - Contrastive Pairs, /pʲ/

a.	/e-pʲæ/	[epʲæ]	‘turn, curve’ (n.)	cf. [ebʲæ]	‘crack, tear’ (n.)
b.	/apʲi/	[api]	‘make float’	cf. [apʸi]	‘turn on’
c.	/pʲe-n/	[pen]	‘stone of, hard area of body’	cf. [ben]	‘arm of, hand of’
d.	/pʲi-da/	[pʲida]	‘float up, surface’	cf. [pʸeda]	‘go around’
e.	/e-ka-pʲi/	[ekapi]	‘float’ (for fishing, n.)	cf. [ekabit]	‘paint’ (v.)

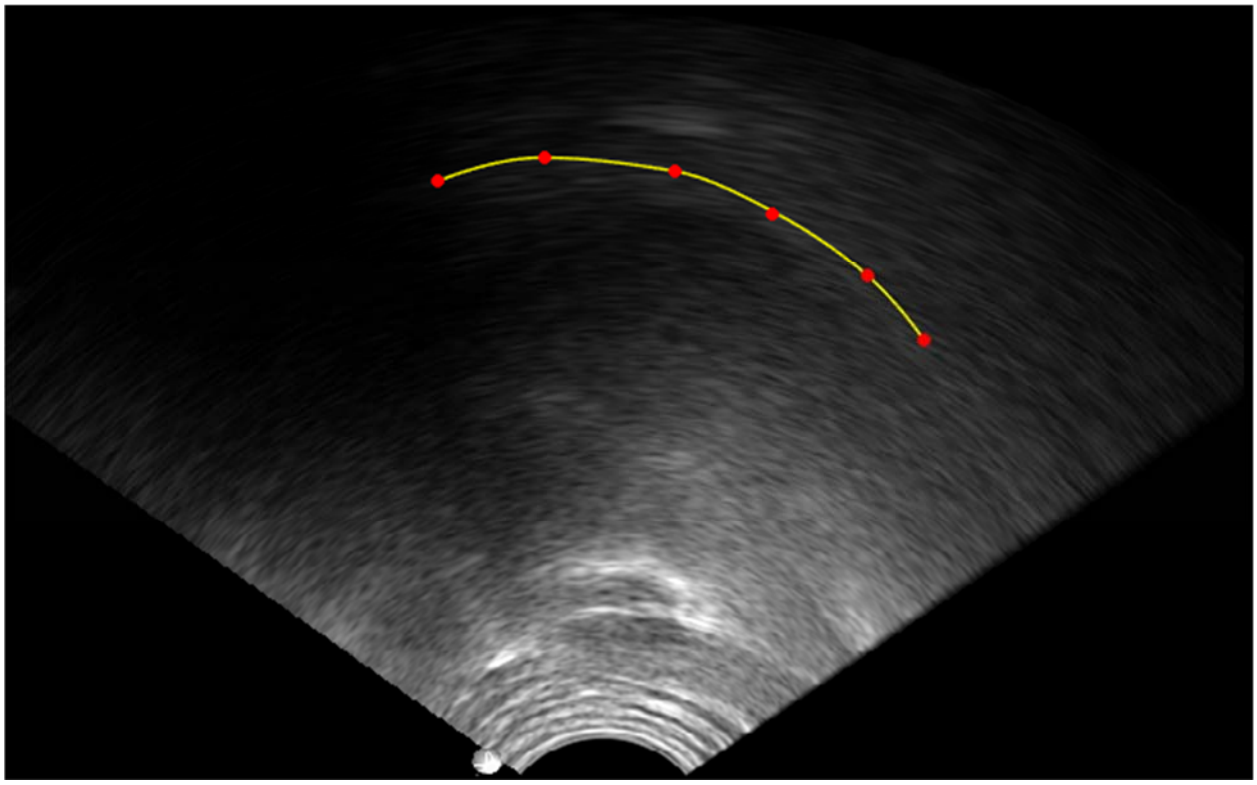

Figure 2.5 – Ultrasound image of palatalization: [pʲ] in [wipʲʁ] 'fast’

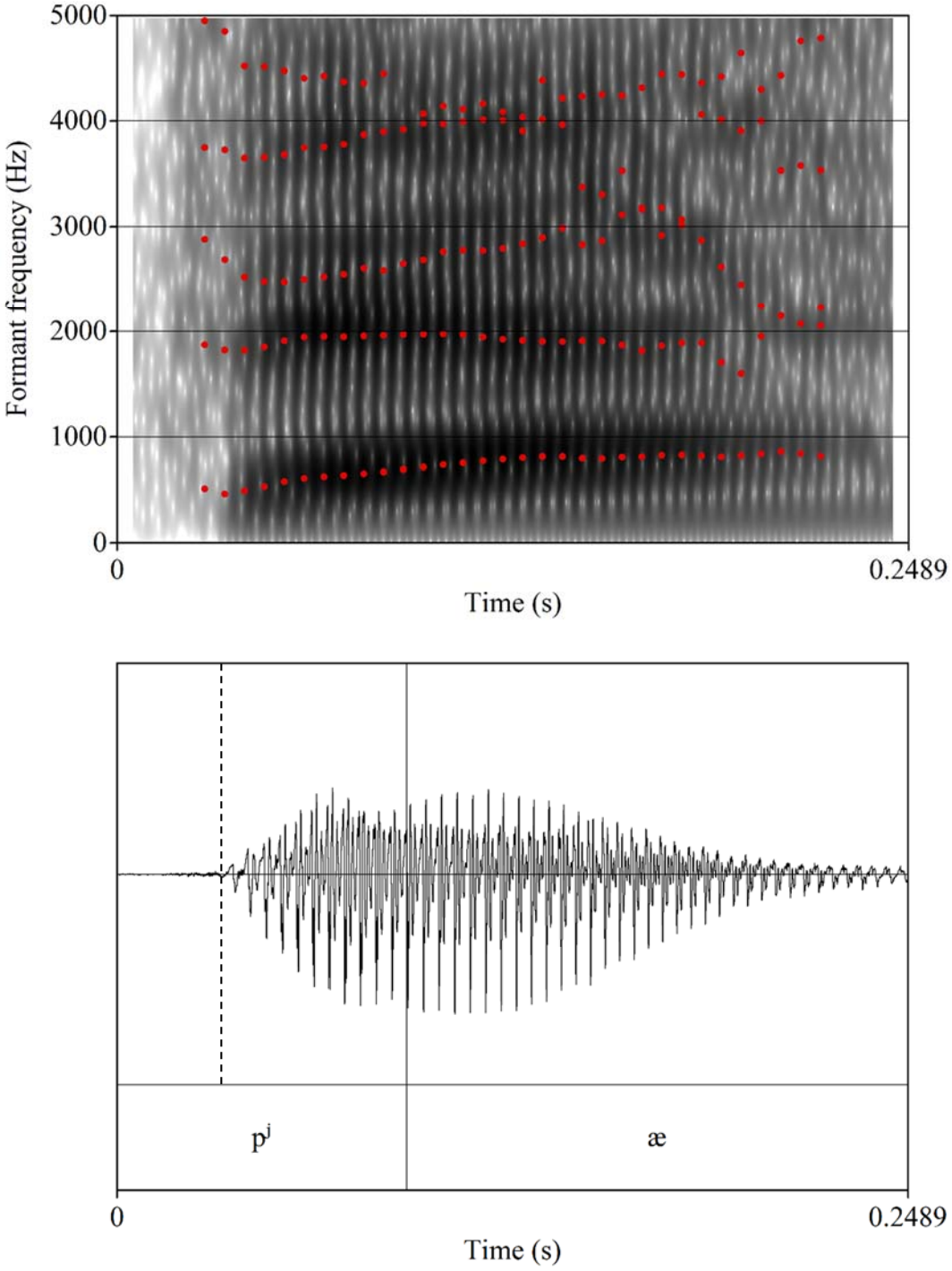

Figure 2.6 - Spectrogram and waveform: [pʲ] in [pʲæ] ‘turn, curve’

- VOT 0 ms
- Weak burst before secondary articulation

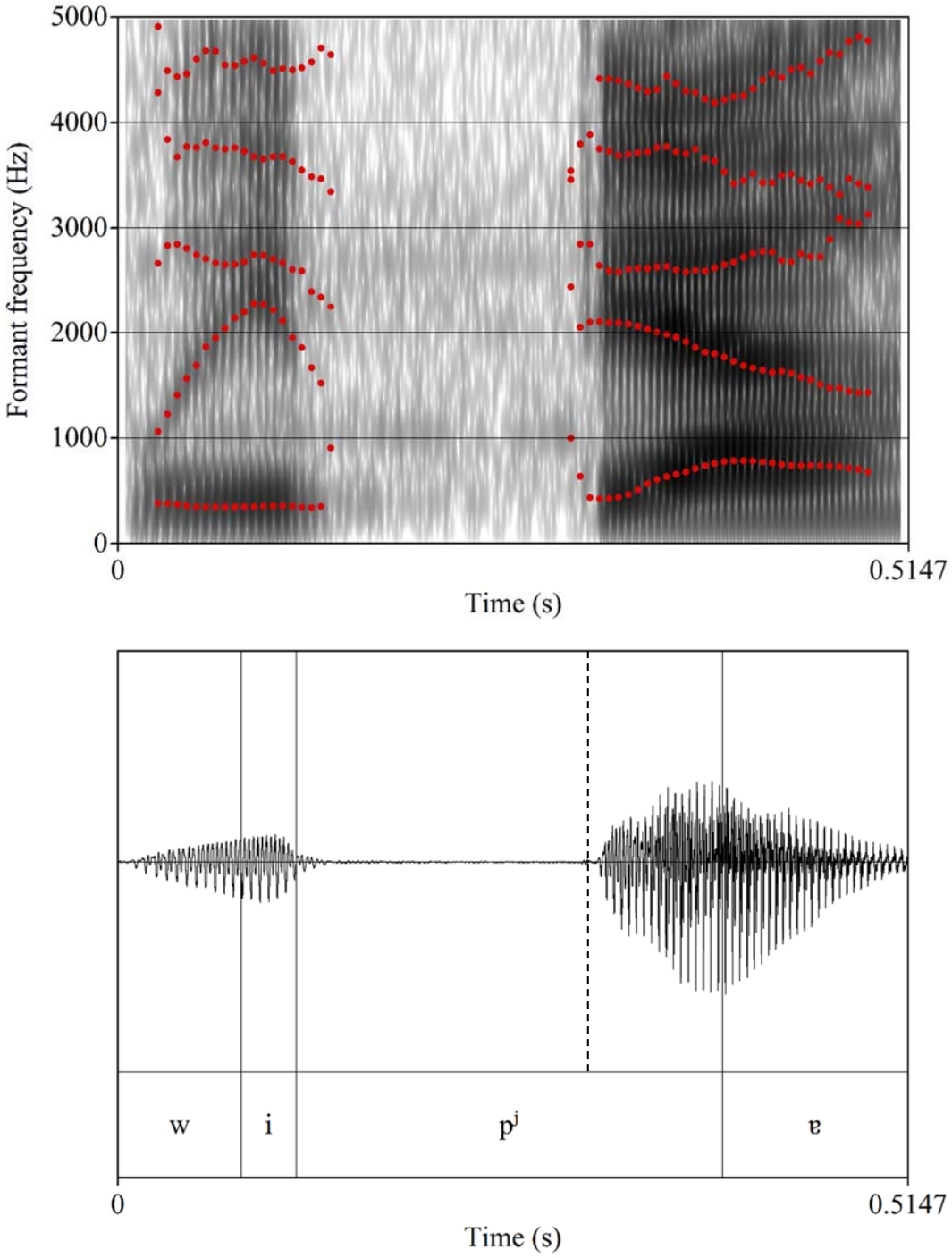

Figure 2.7 - Spectrogram and waveform: [pʲ] in [wipʲɐ] ‘fast’

- VOT 6 ms
- Weak burst before secondary articulation
- Closure duration: 187 ms

2.2.3.2 /bʲ/

Phonological rules:

a. $b^j \rightarrow b$ / ___ i, e Table 2.1.5(a)

b. $b^j \rightarrow b$ / ___ # Table 2.1.5(d)

c. $b^j \rightarrow p$ / ___ $]_\varphi$ Table 2.1.5(e)

The Nauruan phoneme /bʲ/ is a voiced palatalized bilabial stop. It is pronounced [b] before the non-low front vowels /i/ and /e/, and word-finally. Like other voiced oral stops, it is shorter than its voiceless counterpart /pʲ/ in intervocalic positions. It generally has a weak release burst and is sometimes realized with a brief period of frication rather than a burst between vowels; [β], [β^j]. In phrase-final position voicing is lost and it is realized phonetically as [p].

Table 2.2.2 is a list of minimal and near-minimal pairs showing that /bʲ/ is a contrastive speech sound in Nauruan. Figure 2.8 is an ultrasound image of [b^j] which shows the tongue position at the point of greatest constriction during palatalization. The body of the tongue is close to the palate at its highest point. Spectrogram and waveform images of [b^j] tokens are provided in Figures 2.9 and 2.10, with additional notes on voicing and release features.

Table 2.2.2 - Contrastive pairs, /bʲ/

a.	/obʲu/	[obʲʉ]	‘buttocks’	cf. [abu]	‘take, carry’
b.	/dʒibʲæ/	[dʒibʲæ]	‘break off’	cf. [ibʸæ]	‘catch, arrest’
c.	/ibʲi/	[ibi]	‘placenta’	cf. [ibʸɨ]	‘grandparent’ [24]
d.	/bʲebʲe/	[bebe]	‘light (weight)’	cf. [epepeɟ]	‘consider (something)’
e.	/æbʲi/	[æbi]	‘kill, hit, stop’	cf. [epi]	‘float’ (n.)

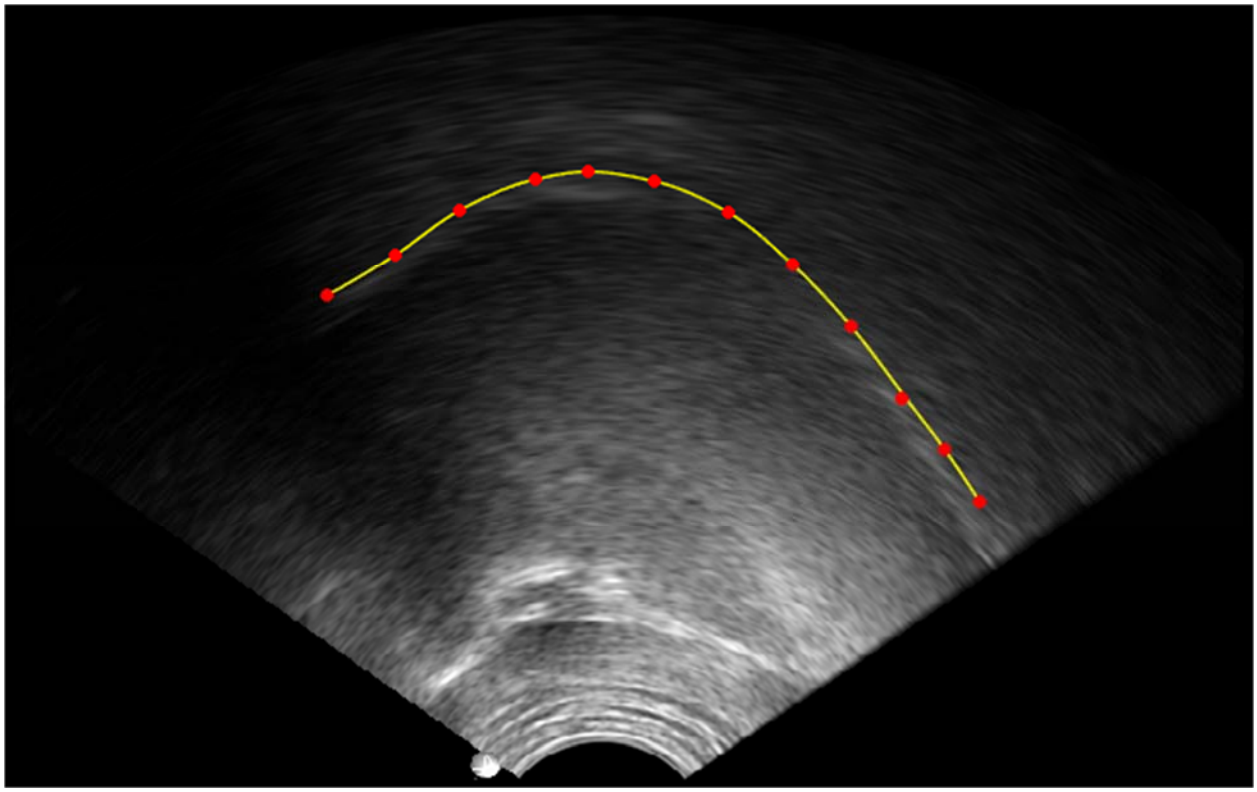

Figure 2.8 – Ultrasound image of palatalization: [bʲ] in [ebʲɐk] ‘fresh water’

[24] The same word is used for ‘grandchild’.

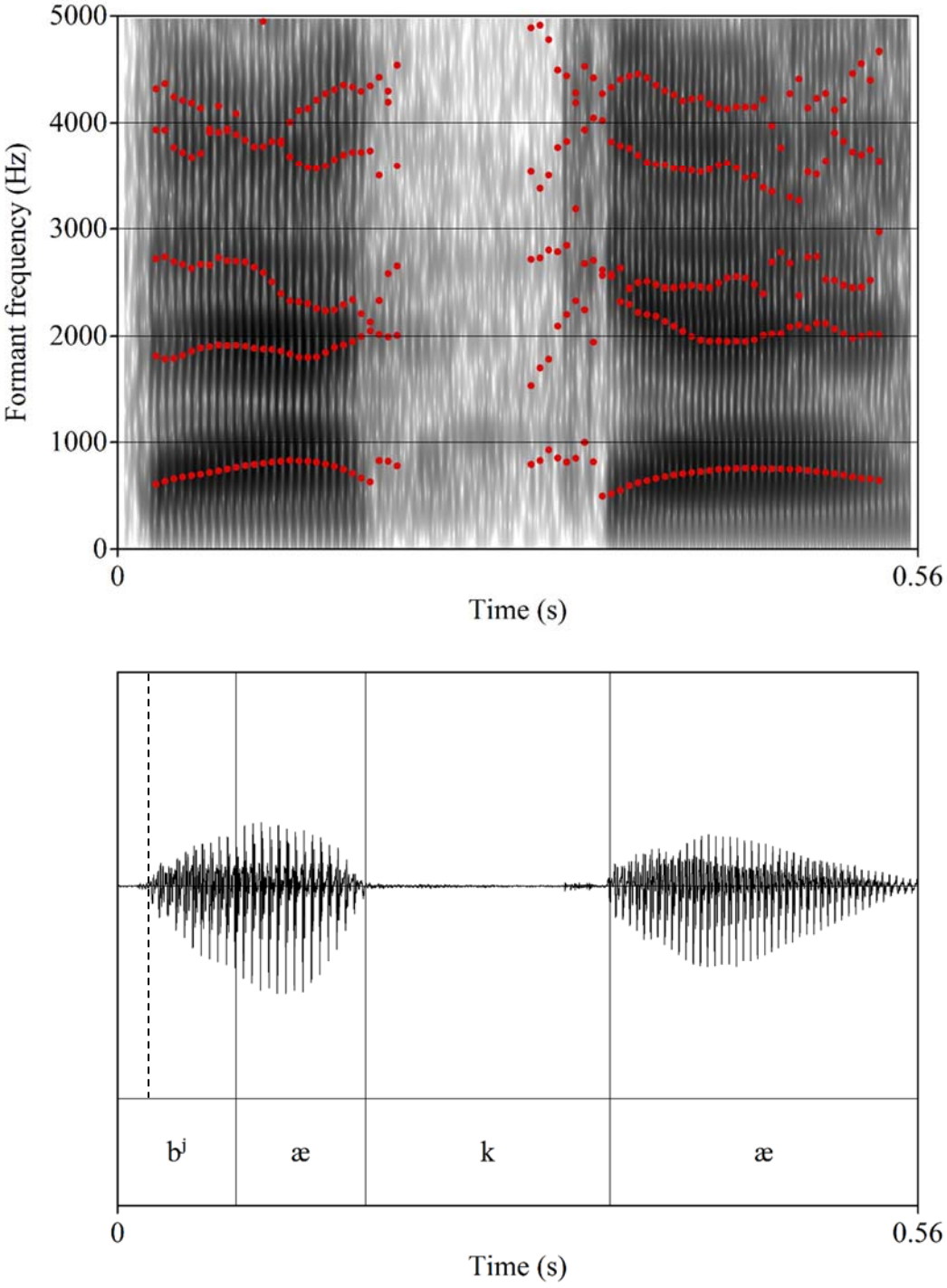

Figure 2.9 - Spectrogram and waveform: [bʲ] in [bʲækæ] ‘bad’

- VOT -4 ms
- Weak or absent burst before secondary articulation

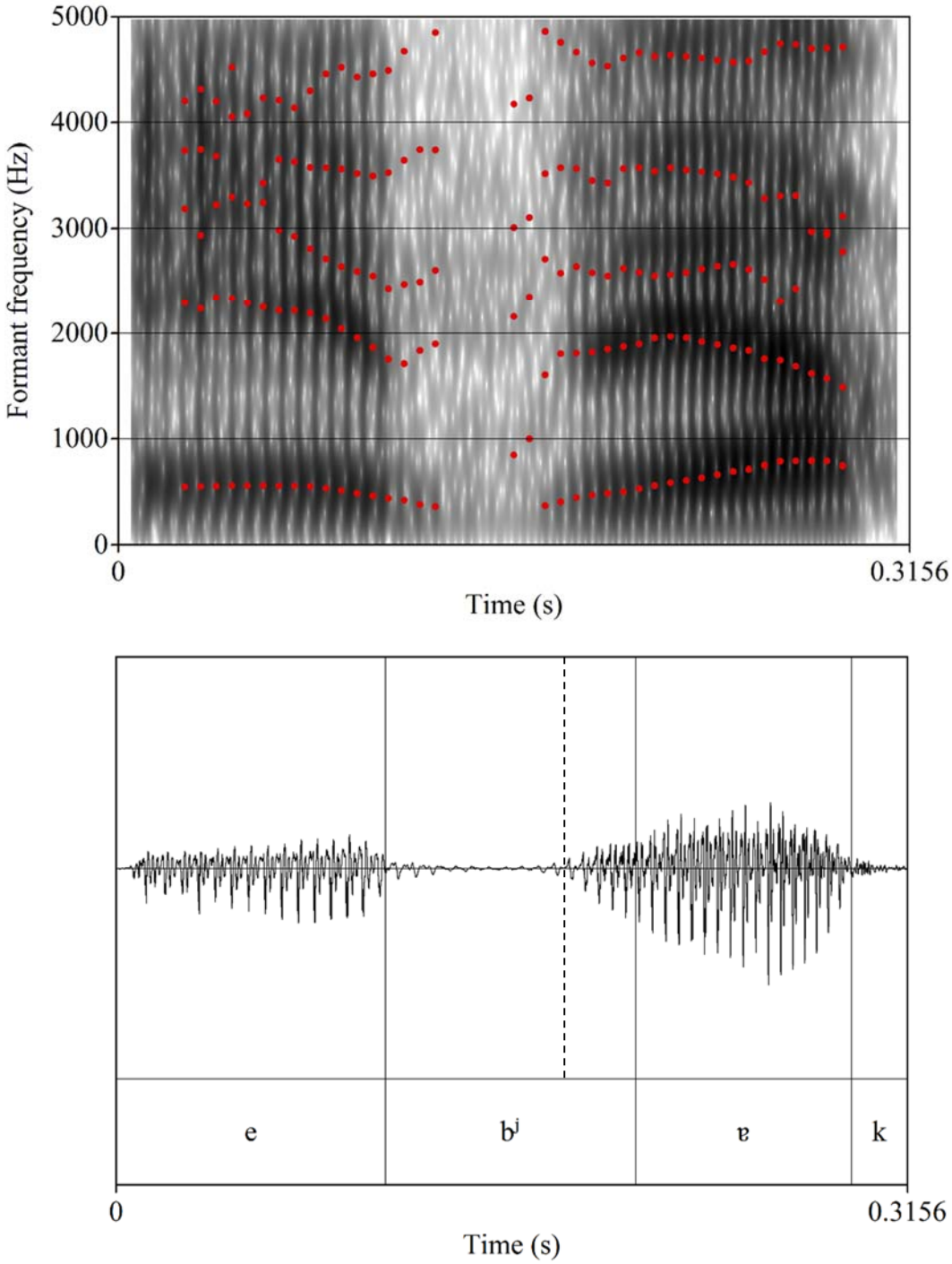

Figure 2.10 – Spectrogram and waveform: [bʲ] in [ebʲɐk] ‘water’

- Voicing maintained (negative VOT)
- Weak or absent burst before secondary articulation
- Closure duration: 70 ms

2.2.3.3 /pˠ/

Phonological rules:

a. pˠ → p / ___ o, u Table 2.1.5(b)

b. pˠ → p / ___a, ɨ (variable) Table 2.1.5(c)

c. pˠ → p / ___# Table 2.1.5(d)

The Nauruan phoneme /pˠ/ is a voiceless velarized bilabial stop. It is pronounced [p] before rounded back vowels and word-finally. Velarization is variably absent before the central vowels /a/ and /ɨ/. Like other voiceless oral stops, /pˠ/ is longer than its voiced counterpart /bˠ/ in intervocalic positions.

Table 2.2.3 is a list of minimal and near-minimal pairs showing that /pˠ/ is a contrastive speech sound in Nauruan. Figure 2.11 is an ultrasound image of [pˠ] which shows the tongue position at the point of greatest constriction during velarization. The body of the tongue is close to the velum at its highest point. Spectrogram and waveform images of [pˠ] tokens are provided in Figures 2.12 and 2.13 with additional notes on voicing and release features.

Table 2.2.3 – Contrastive pairs, /pˠ/

a.	/pˠe/	[pˠe]	‘round, fat’	cf. [bˠe]	‘because, for’
b.	/pˠij pˠij/	[pˠijəpˠij]	‘shine, sparkle’	cf. [bˠijəbˠij]	‘miscarriage’
c.	/pˠoe/	[poe]	‘inland’	cf. [boe]	‘Boe’ (district)
d.	/a-pˠe/	[apˠe]	‘swell up’	cf. [epe]	‘stone’
e.	/epˠo/	[epo]	‘pandanus’	cf. [ebo]	‘bruise’ (n.)

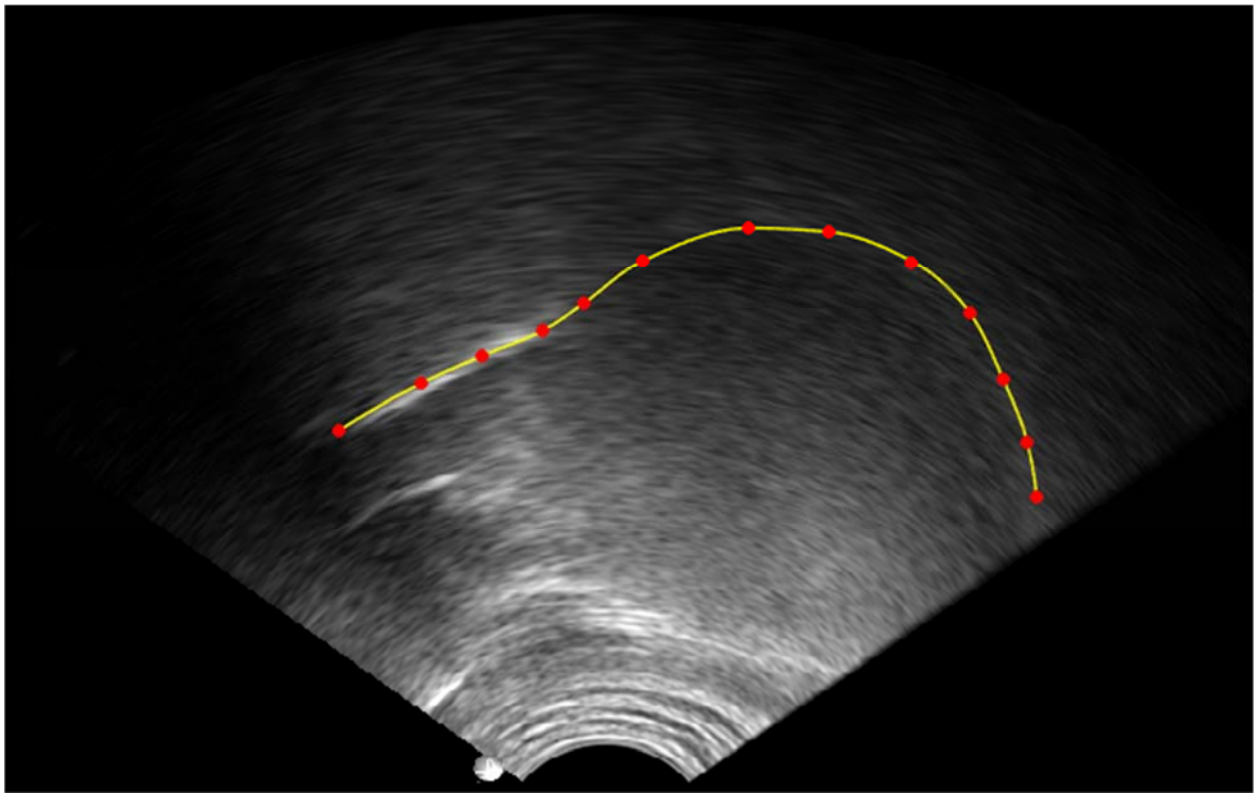

Figure 2.11 – Ultrasound image of velarization: [pˠ] in [pˠægo] ‘seaward’

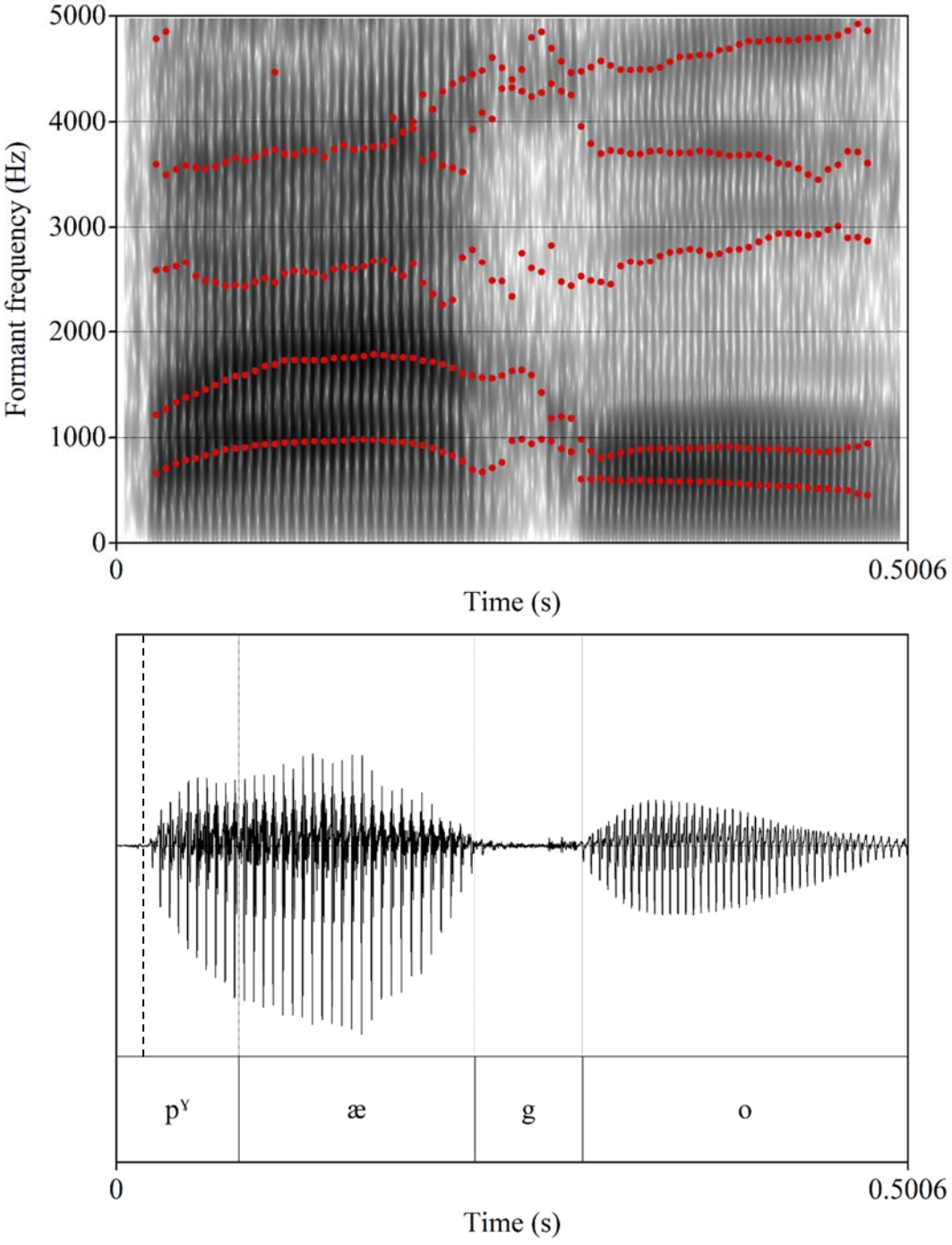

Figure 2.12 – Spectrogram and waveform: [pˠ] in [pˠægo] ‘seaward’

- VOT 4 ms
- Weak release burst before secondary articulation

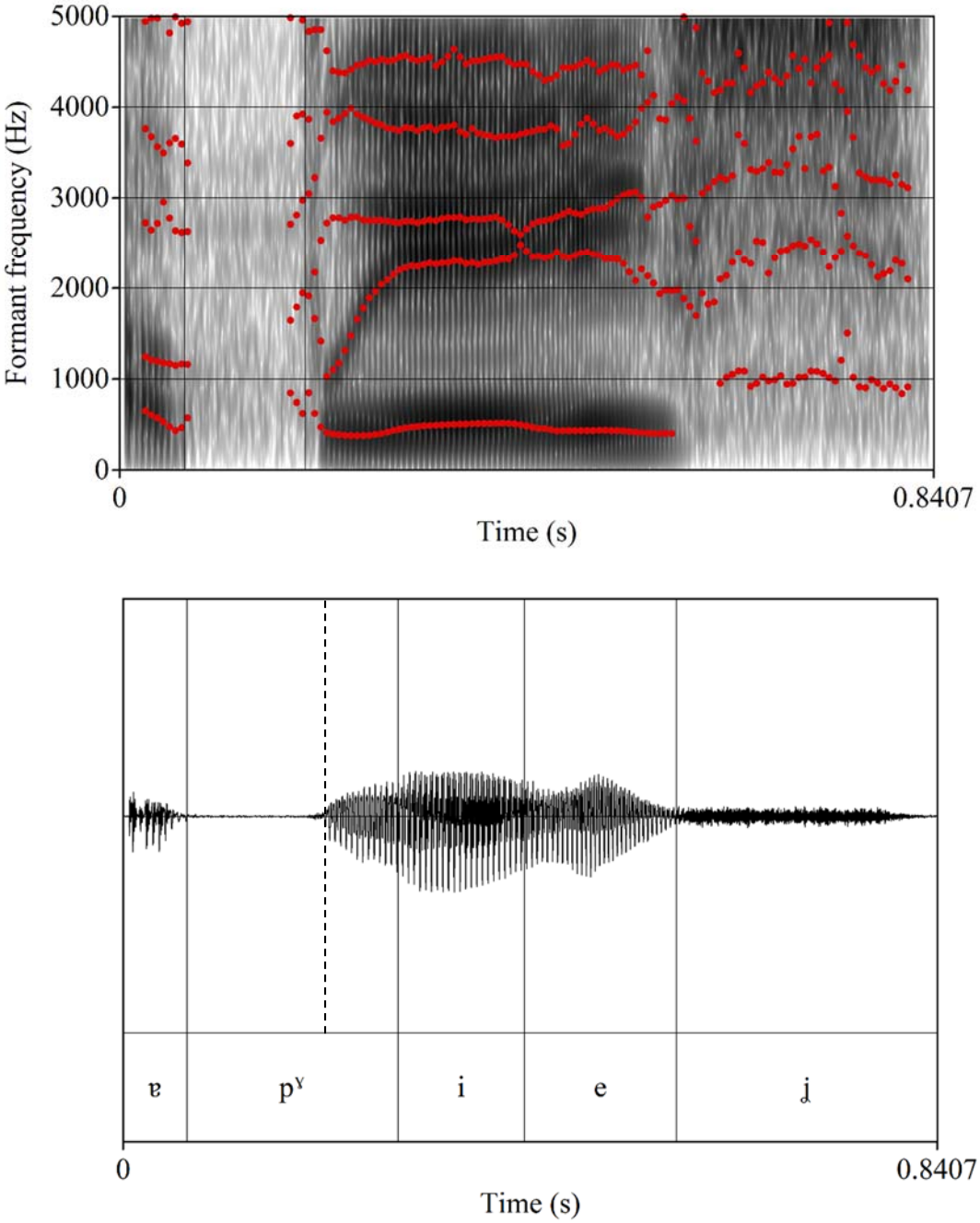

Figure 2.13 – Spectrogram and waveform: [pʸ] in [ɐpʸiej̩] ‘turn on’

- VOT 0 ms
- Diffuse burst before secondary articulation
- Closure duration 124 ms

2.2.3.4 /bˠ/

Phonological rules:

a. bˠ → b / ___ o, u Table 2.1.5(b)

b. bˠ → b / ___ɨ, a (variable) Table 2.1.5(c)

c. bˠ → b / ___# Table 2.1.5(d)

d. bˠ → p / ___]$_{\varphi}$ Table 2.1.5(e)

The Nauruan phoneme /bˠ/ is a voiced velarized bilabial stop. It is pronounced [b] before rounded back vowels and word-finally. It is devoiced to [p] in phrase-final position. Velarization is variably absent before the central vowels /a/ and /ɨ/. Like other voiced oral stops, it is longer than its voiceless counterpart /pˠ/ in intervocalic positions.

Table 2.2.4 is a list of minimal and near-minimal pairs showing that /bˠ/ is a contrastive speech sound in Nauruan. Figure 2.14 is an ultrasound image of [bˠ] which shows the tongue position at the point of greatest constriction during velarization. The body of the tongue is close to the velum at its highest point. Spectrogram and waveform images of [bˠ] tokens are provided in Figures 2.15 and 2.16 with additional notes on voicing and release features.

Table 2.2.4 – Contrastive pairs, /bˠ/

a.	/bˠæbˠæ/	[bˠæbˠæ]	‘seed, nut’	cf. [pˠæpˠe]	‘muscular’
b.	/bˠi-n/	[bˠin]	‘his/her home’	cf. [pˠiɟ]	‘light’
c.	/ebˠe/	[ebˠe]	‘old’	cf. [epe]	‘stone’
d.	/ibˠijæ/	[ibˠijæ]	‘feces’	cf. [ibʲijɐ]	‘milkfish’
e.	/abˠaŋ/	[ɐbɐŋ]	‘thirsty’	cf. [epɐŋ]	‘hole, pit’

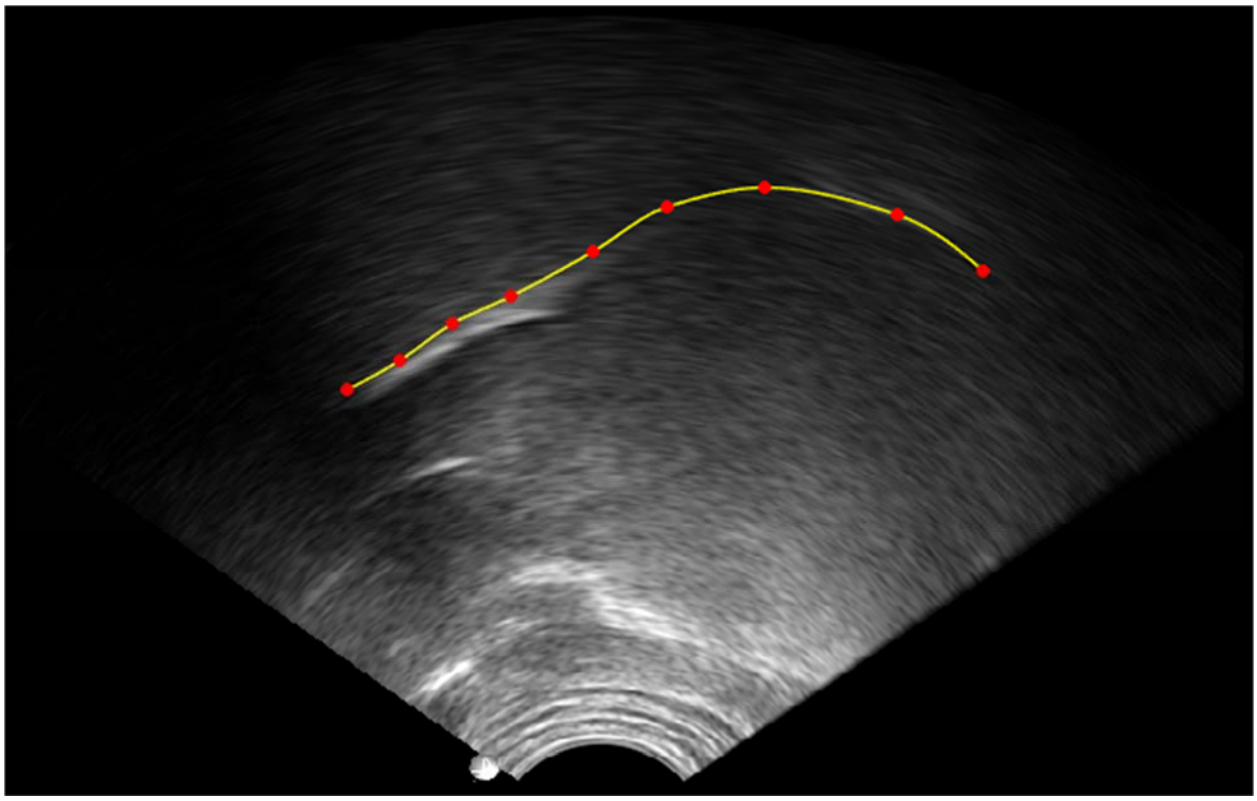

Figure 2.14 – Ultrasound image of velarization: [bˠ] in [tɯbˠæ] ‘thanks’

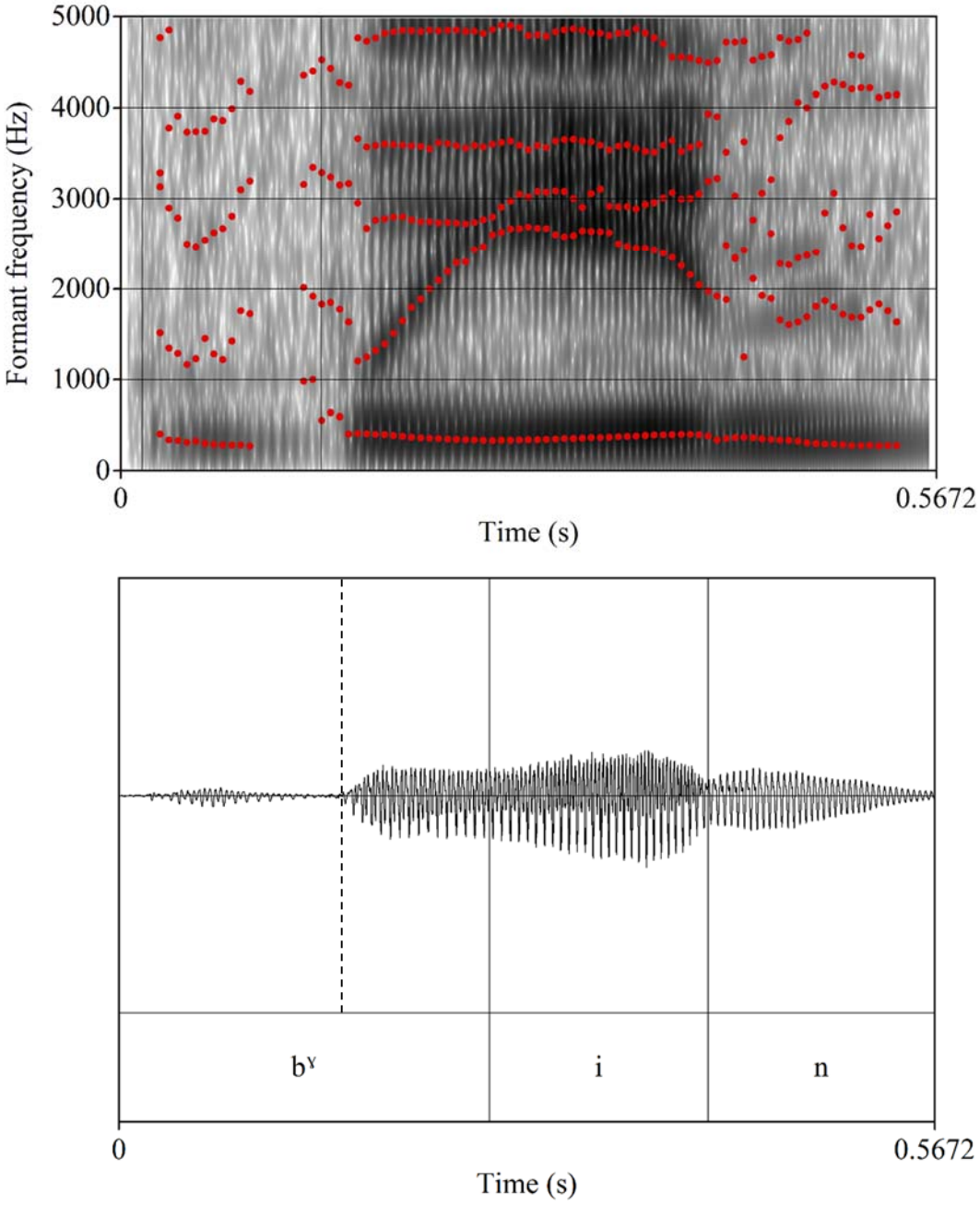

Figure 2.15 – Spectrogram and waveform: [bʸ] in [bʸin] ‘his/her home’

- VOT -124 ms
- Weak burst before secondary articulation

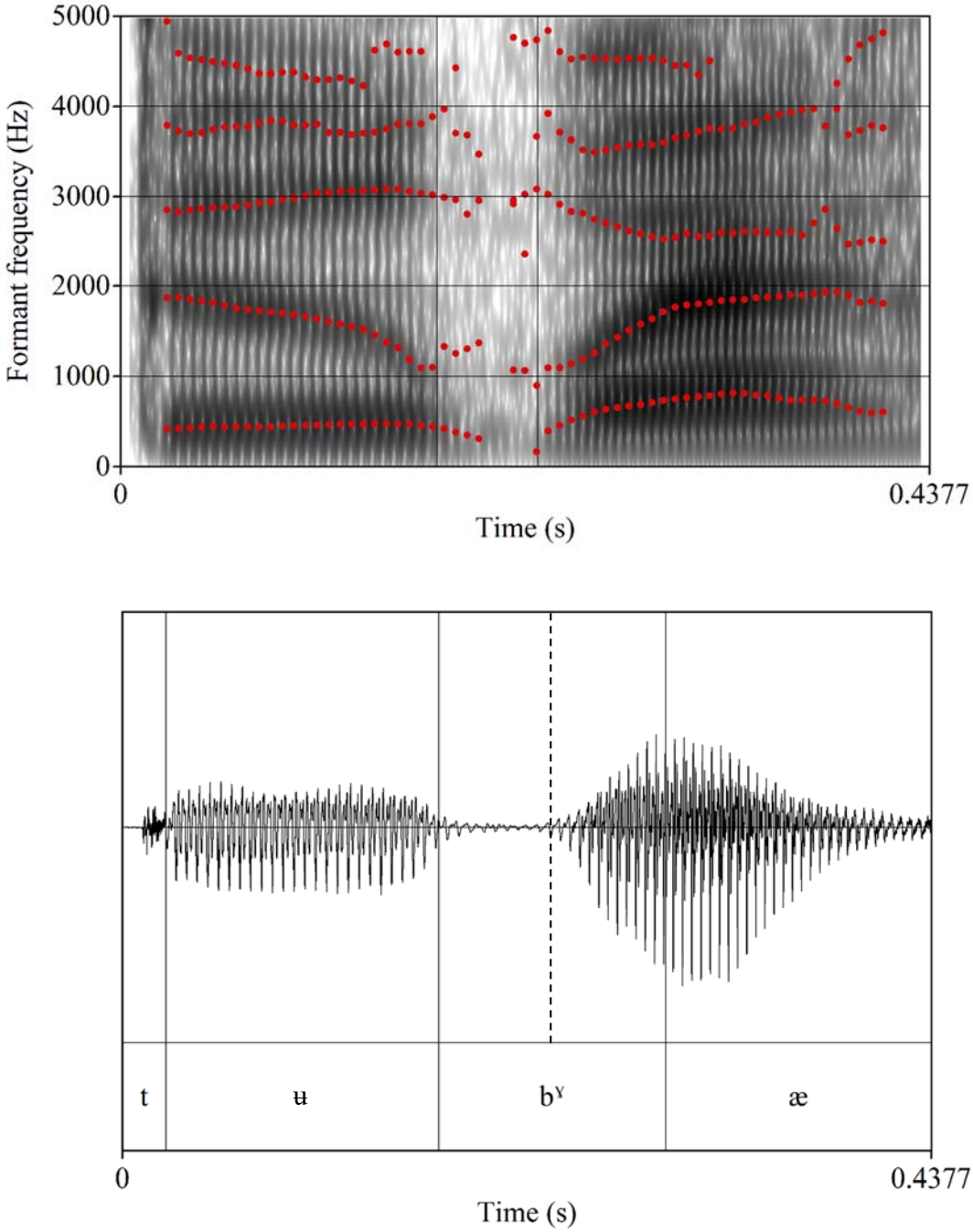

Figure 2.16 – Spectrogram and waveform: [bˠ] in [tʉbˠæ] ‘thanks’

- Voicing maintained (negative VOT)
- Weak or absent release burst before secondary articulation
- Closure duration 55 ms

2.2.3.5 /t/

The Nauruan phoneme /t/ is a voiceless apical stop. The place of articulation for /t/ varies between alveolar and dental, with no apparent phonological contrast between the two. Unlike the bilabial oral stops, /t/ has no secondary velarization or palatalization. As with other voiceless oral stops it is longer than its minimally contrastive counterpart /d/ in intervocalic positions. Its place of articulation has been established by asking consultants to describe what part of the tongue is used and where it is placed in the mouth during articulation, and from visual observation in the case of dental variants.

Table 2.2.5 is a list of minimal and near-minimal pairs showing that /t/ is a contrastive speech sound in Nauruan. Spectrogram and waveform images of [t] tokens are provided in Figures 2.17 and 2.18 with additional notes on voicing and release features.

Table 2.2.5 – Contrastive pairs, /t/

a.	/ætæe/	[ætæe]	‘ten’	cf. [edæe]	‘time’
b.	/tere-m/	[terem]	‘your neck’	cf. [dəreminu]	‘insect’
c.	/tægæg/	[tægæg]	‘stuck’	cf. [dæŋæŋ]	‘black, dark’
d.	/dær/	[dær]	‘cry’	cf. [tær]	‘our’ (dual inclusive suffix)
e.	/tutu/	[t̪ut̪u]	‘small child, baby’	cf. [d̪ud̪u]	‘soak’

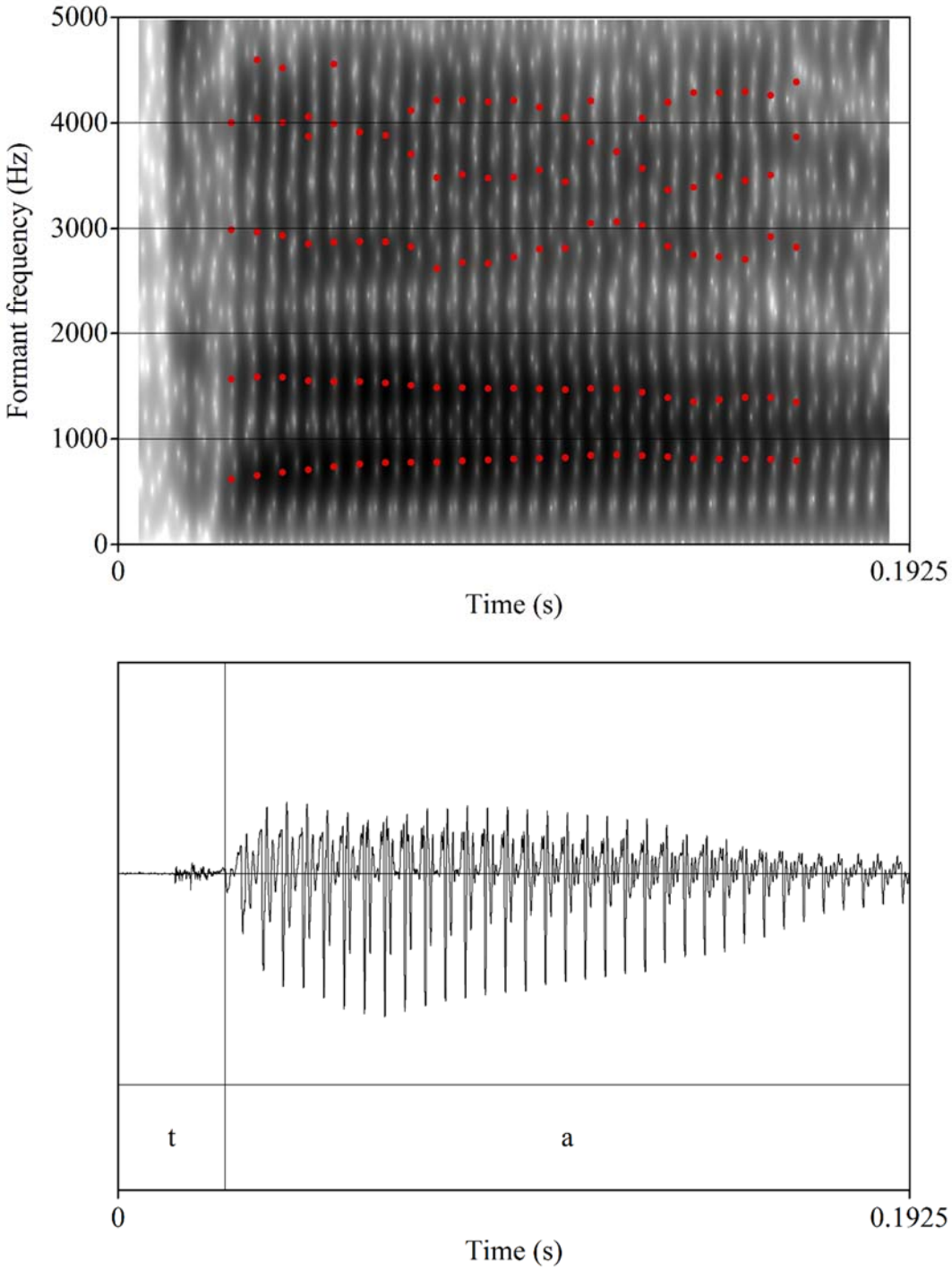

Figure 2.17 – Spectrogram and waveform: [t] in [ta] ‘only’

- VOT 0 ms
- Strong burst

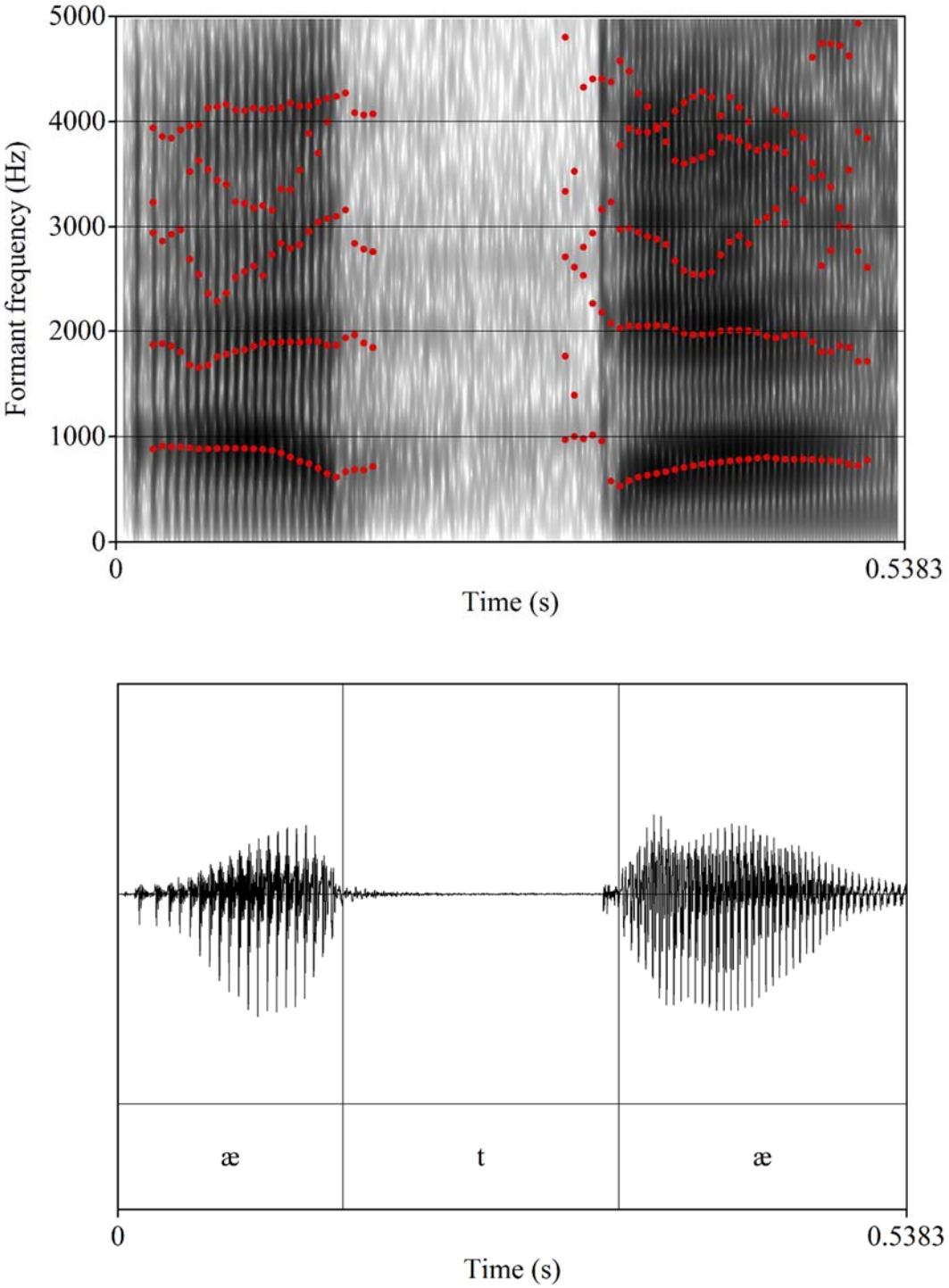

Figure 2.18 – Spectrogram and waveform: [t] in [ætæ] ‘we’ (plural incl.)

- VOT 0 ms
- Strong burst
- Closure duration 177 ms

2.2.3.6 /d/

Phonological rules:

a. $d \rightarrow t / ___]_{\varphi}$ Table 2.1.5(e)

The Nauruan phoneme /d/ is a voiced apical stop. The place of articulation of /d/ varies between alveolar and dental, with no apparent phonological contrast between the two. Unlike the bilabial stops, /d/ has no secondary velarization or palatalization. As with other voiced oral stops it is shorter than its minimally contrastive counterpart /t/ in intervocalic positions. Its place of articulation has been established by asking consultants to describe what part of the tongue is used and where it is placed in the mouth during articulation, and from visual observation in the case of dental variants.

Table 2.2.6 is a list of minimal and near-minimal pairs showing that /d/ is a contrastive speech sound in Nauruan. Spectrogram and waveform images of [d] tokens are provided in Figures 2.19 and 2.20 with additional notes on voicing and release features.

Table 2.2.6 - Contrastive pairs, /d/

a.	/dædær/	[dædær]	‘weep’	cf. [tæræ̱re]	‘Saturday’
b.	/dorer/	[dorer]	‘language’	cf. [tore]	‘steal, rob’
c.	/kadær/	[kadær]	‘make noise’	cf. [watær]	‘our’ (dual exclusive)
d.	/eædu/	[eædʉ]	‘gift’	cf. [eætʉ]	‘spit out’
e.	/dæŋə-n /	[dæŋən]	‘friend of’	cf. [tæŋən]	‘place of’

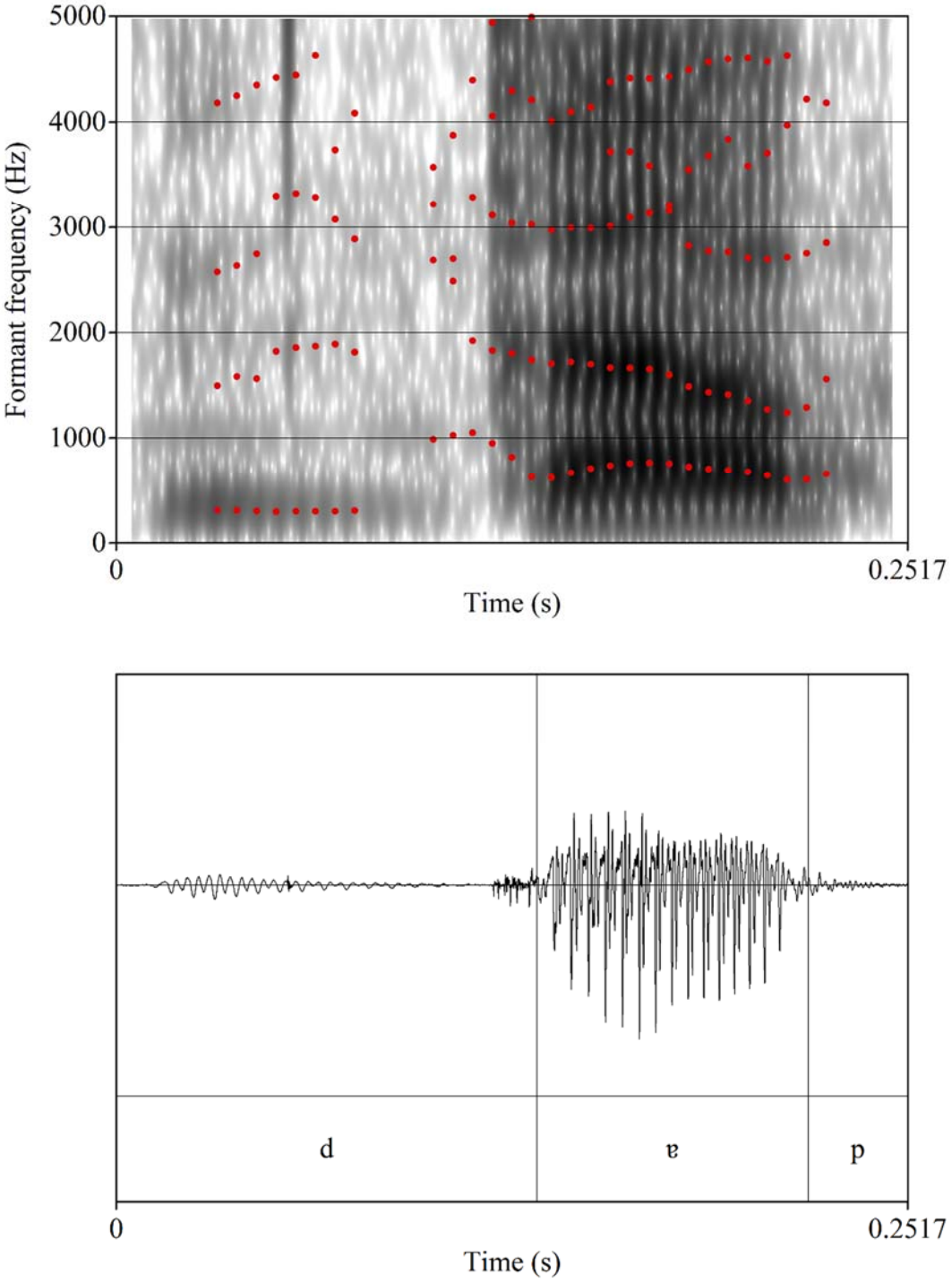

Figure 2.19 – Spectrogram and waveform: [d] in [dɐp] ‘straight, true’

- VOT -108 ms
- Strong burst

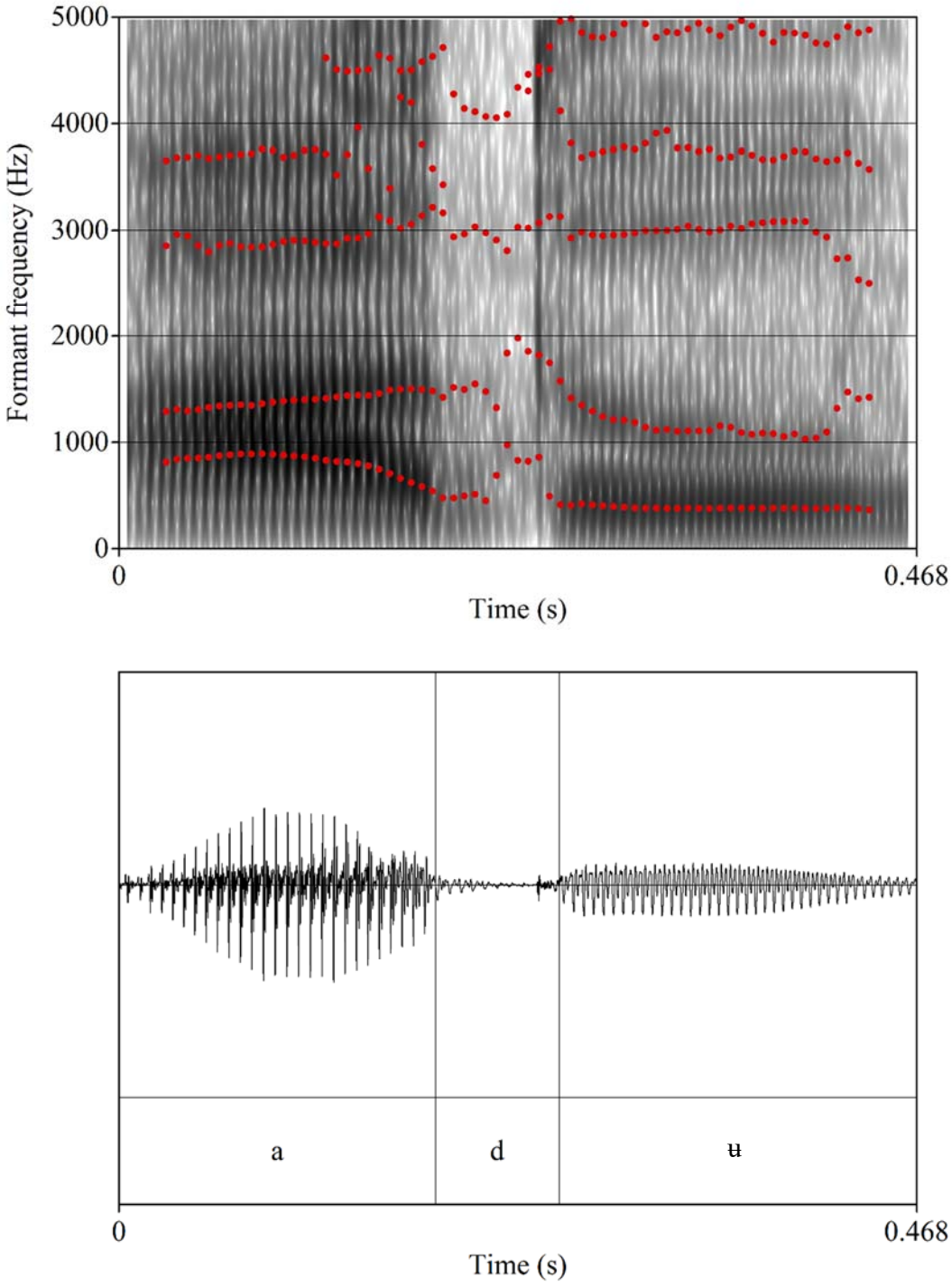

Figure 2.20 – Spectrogram and waveform: [d] in [adʉ] ‘gift’

- Voicing maintained (negative VOT)
- Strong burst
- Closure duration 75 ms

2.2.3.7 /tʃ/

The Nauruan phoneme /tʃ/ is a voiceless palato-alveolar affricate. This phoneme and its voiced counterpart /dʒ/ do not appear to differ from one another significantly in length. This sound only appears before the high front vowel /i/, which is interpreted here as a distributional restriction rather than a case of allophony. While [t] and [tʃ] are in complementary distribution before [i] in Nauruan, /tʃ/ also has a historic source in *k before *i (§4.1.4) and may occur as an analog to [ʃ] in loanwords; e.g. /tʃiraŋe/ ‘snake’ from German *Schlange* /ʃlaŋə/ or /tʃape/ ‘sheep’ from German *Schafe* /ʃaːfə/. There is no complementary distribution between [k] and [tʃ] in Nauruan, so that k → tʃ / __i does not appear to be a synchronic alternation.

Table 2.2.7 is a list of minimal and near-minimal pairs showing that /tʃ/ is a contrastive speech sound in Nauruan. Spectrogram and waveform images of [tʃ] tokens are provided in Figures 2.21 and 2.22 with additional notes on voicing and release features.

Table 2.2.7 - Contrastive pairs, /tʃ/

a.	/tʃit/	[tʃit]	‘know’	cf. [dʒit]	‘lick’
b.	/tʃitʃi/	[tʃitʃi]	‘cook’	cf. [dʒidʒi]	‘deflate’
c.	/tʃiw/	[tʃiw]	‘smoke’	cf. [dʒiɐ]	‘not’
d.	/kejetʃi/	[kejetʃi]	‘wish’	cf. [kejejæ]	‘difficult’
e.	/tʃibʲæp/	[tʃibʲæp]	‘tuna’	cf. [dʒibidʒi]	‘knife, metal’

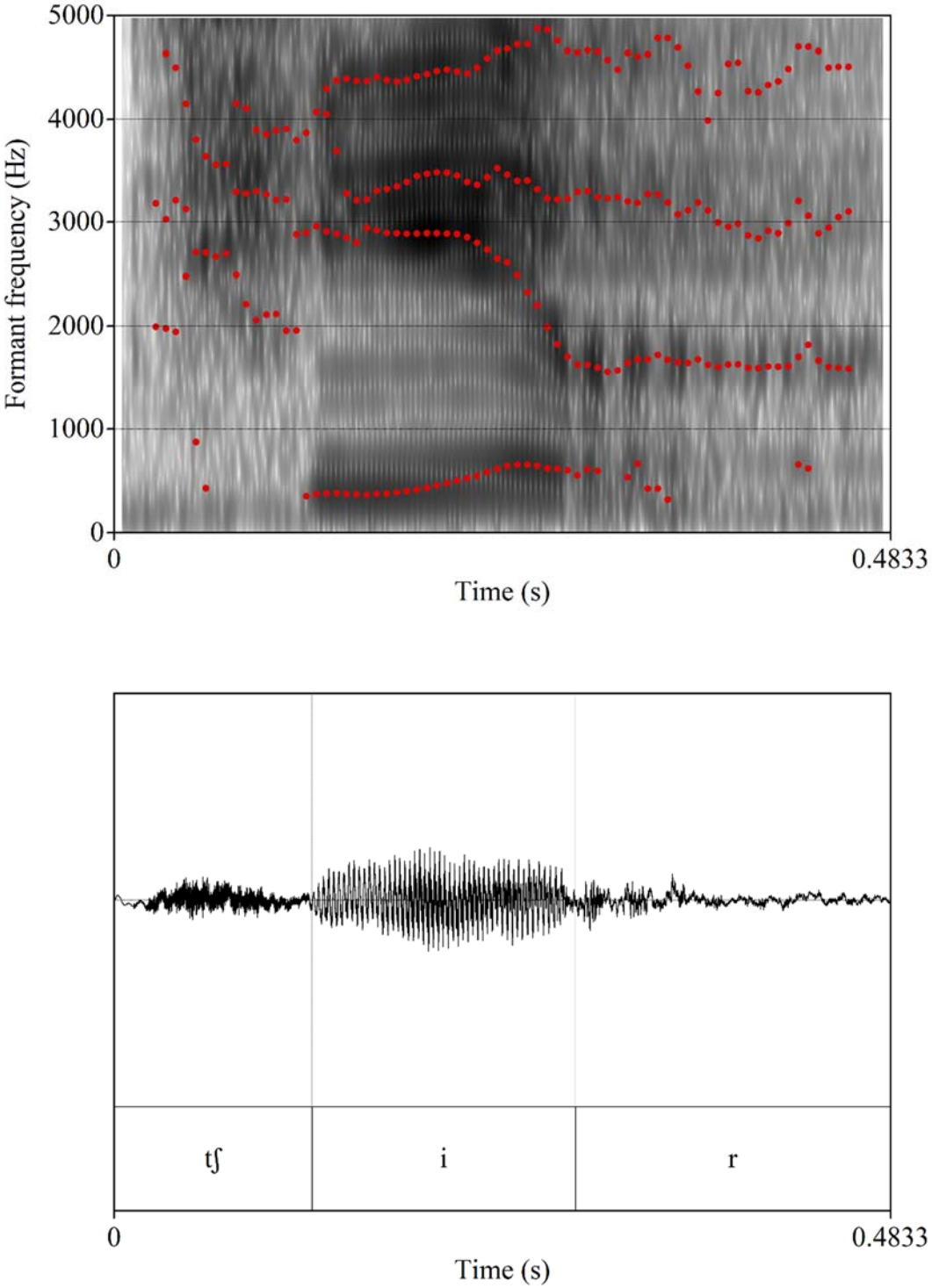

Figure 2.21 – Spectrogram and waveform: [tʃ] in [tʃir] ‘fish strung on a line’

- VOT 0 ms
- Delayed turbulent release (affrication)

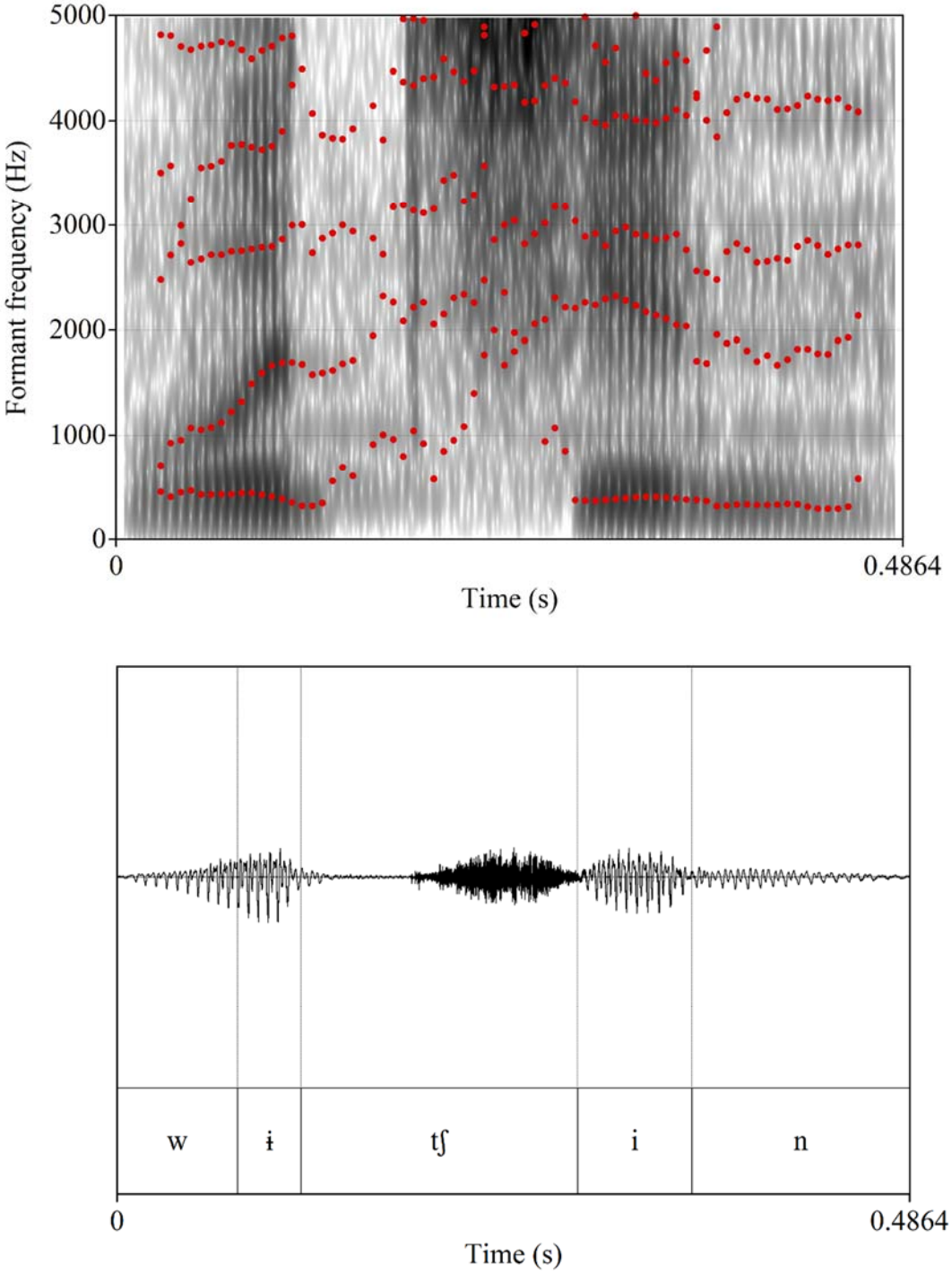

Figure 2.22 – Spectrogram and waveform: [tʃ] in [wɨtʃin] ‘his/her skin’

- VOT 0 ms
- Delayed turbulent release (affrication)
- Closure duration 65 ms

2.2.3.8 /dʒ/

The Nauruan phoneme /dʒ/ is a voiced palato-alveolar affricate. This phoneme and its voiceless counterpart /tʃ/ do not appear to differ from one another significantly in length. This sound only appears before the high front vowel /i/, which is considered here to be a distributional restriction rather than a case of allophony. Synchronically, [d] does not appear to be in full complementary distribution with [dʒ] before [i]. This is shown by a small number of Nauruan words, including /edij/ ‘paddle, move in water’ and /i-dij/ ‘nit (louse egg)’, in which /d/ does not surface as the affricate [dʒ].

Table 2.2.8 is a list of minimal and near-minimal pairs showing that /dʒ/ is a contrastive speech sound in Nauruan. Spectrogram and waveform images of [dʒ] tokens are provided in Figures 2.23 and 2.24 with additional notes on voicing and release features.

Table 2.2.8 - Contrastive pairs, /dʒ/

a.	/adʒitir/	[adʒitir]	‘green’	cf. [ætʃin]	‘from’
b.	/dʒimʸæ/	[dʒimʸæ]	‘close, cover’	cf. [tʃimor]	‘life, flourish, pleasure’
c.	/dʒipʸo/	[dʒipo]	‘spotted’ [25]	cf. [tʃibe]	‘enchant, cast a spell’
d.	/edʒin/	[edʒin]	‘siblings’	cf. [itʃijɐ]	‘servant’
e.	/dʒibʲæ /	[dʒibʲæ]	‘snap off’	cf. [tʃibʲæp]	‘tuna’

[25] Also /dʒidʒipʸo/

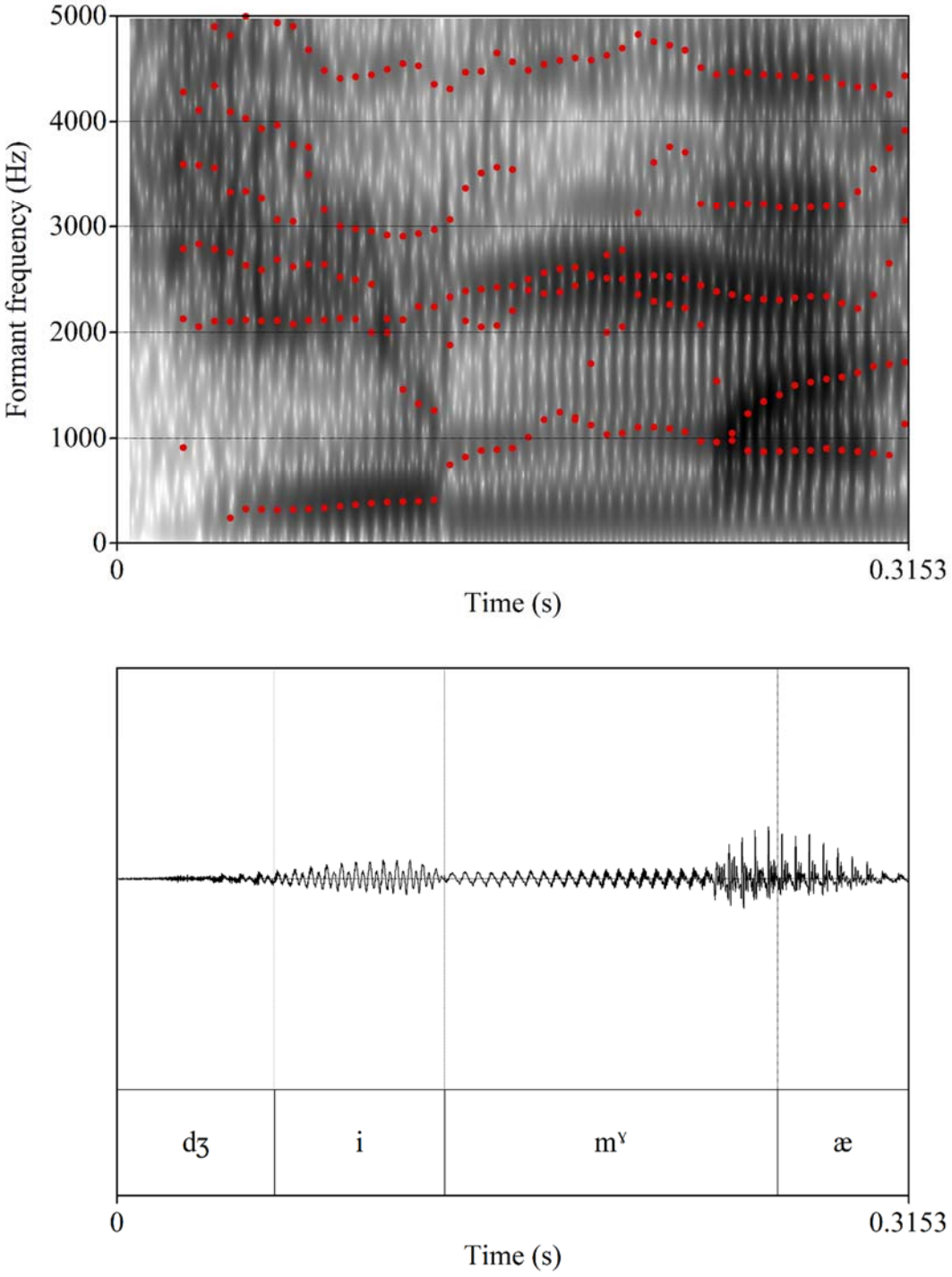

Figure 2.23 - Spectrogram and waveform: [dʒ] in [dʒimˠæ] ‘close, cover’

- VOT -16 ms
- Delayed turbulent release (affrication)

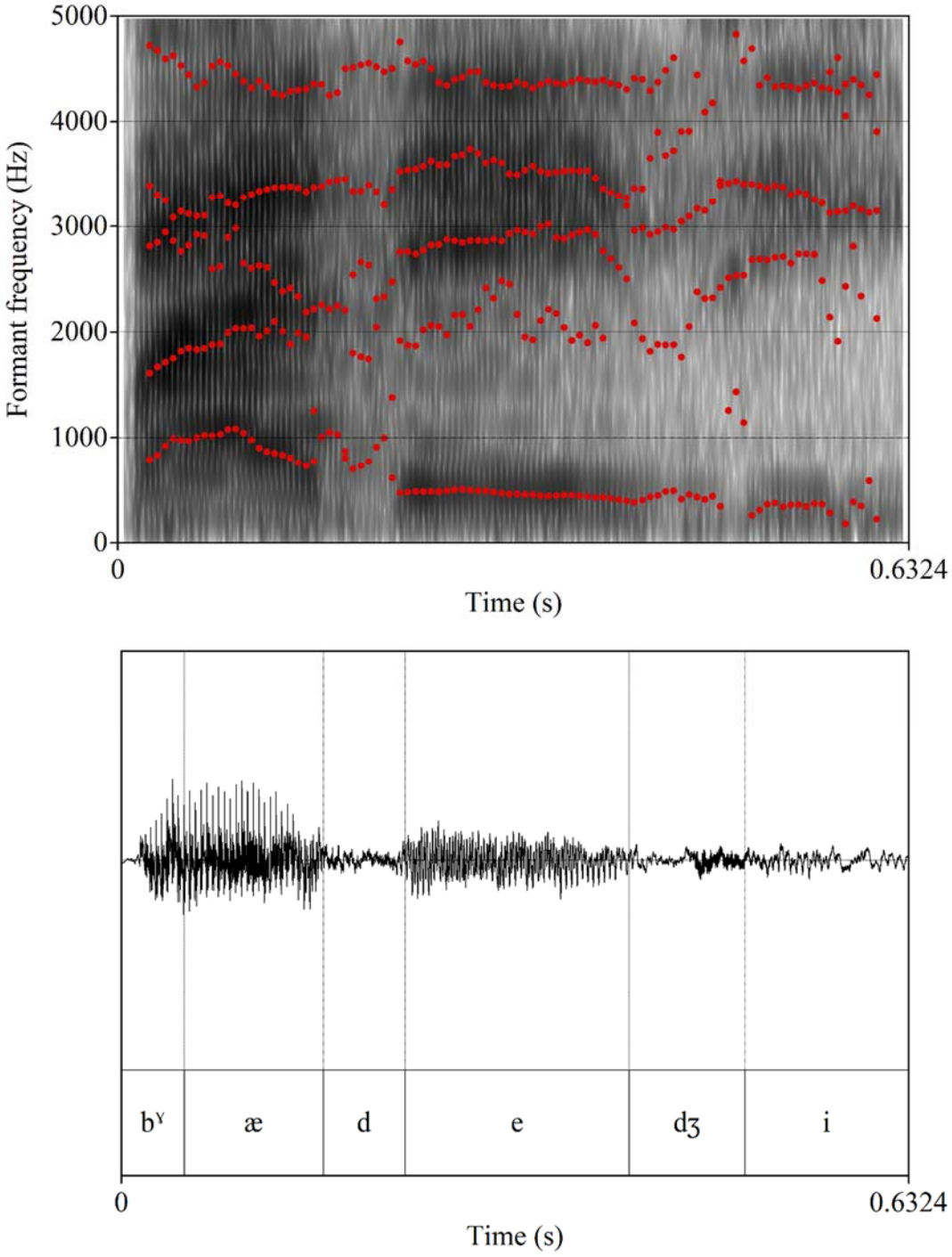

Figure 2.24 - Spectrogram and waveform: [dʒ] in [bʸædedʒi] ‘smoky, grey’

- Voicing maintained (negative VOT)
- Delayed turbulent release (affrication)
- Closure duration (intervocalic) 52 ms

2.2.3.9 /k/

The Nauruan phoneme /k/ is a voiceless velar stop. This phoneme surfaces as [k] in all phonological contexts. As with other voiceless oral stops, it is longer than its minimally contrastive counterpart /g/ in intervocalic positions. Nathan (1973a) describes /k/ and /g/ as having a post-velar place of articulation, though this has not been observed among speakers consulted for this research. Impressionistically, there are no acoustic cues that suggest uvular articulation. Ultrasound imaging further suggests contact with the velum during /k/ articulation (Figure 2.25).

Table 2.2.9 is a list of minimal and near-minimal pairs showing that /k/ is a contrastive speech sound in Nauruan. Spectrogram and waveform images of [k] tokens are provided in Figures 2.26 and 2.27 with additional notes on voicing and release features.

Table 2.2.9 – Contrastive pairs, /k/

a.	/kař/	[kɐ̌]	‘very, much’	cf. [gar]	‘copy, imitate’
b.	/kamʲe/	[kame]	‘stalk’ (v.)	cf. [gamʸe]	‘full from eating’
c.	/æke/	[æke]	‘fight’	cf. [æge]	‘spouse’
d.	/eken/	[eken]	‘what’	cf. [egen]	‘how much?’
e.	/eko/	[eko]	‘nothing’ [26]	cf. [egow]	‘wahoo (fish)’

[26] Compare also /ekeo/ ‘zero, nothing’.

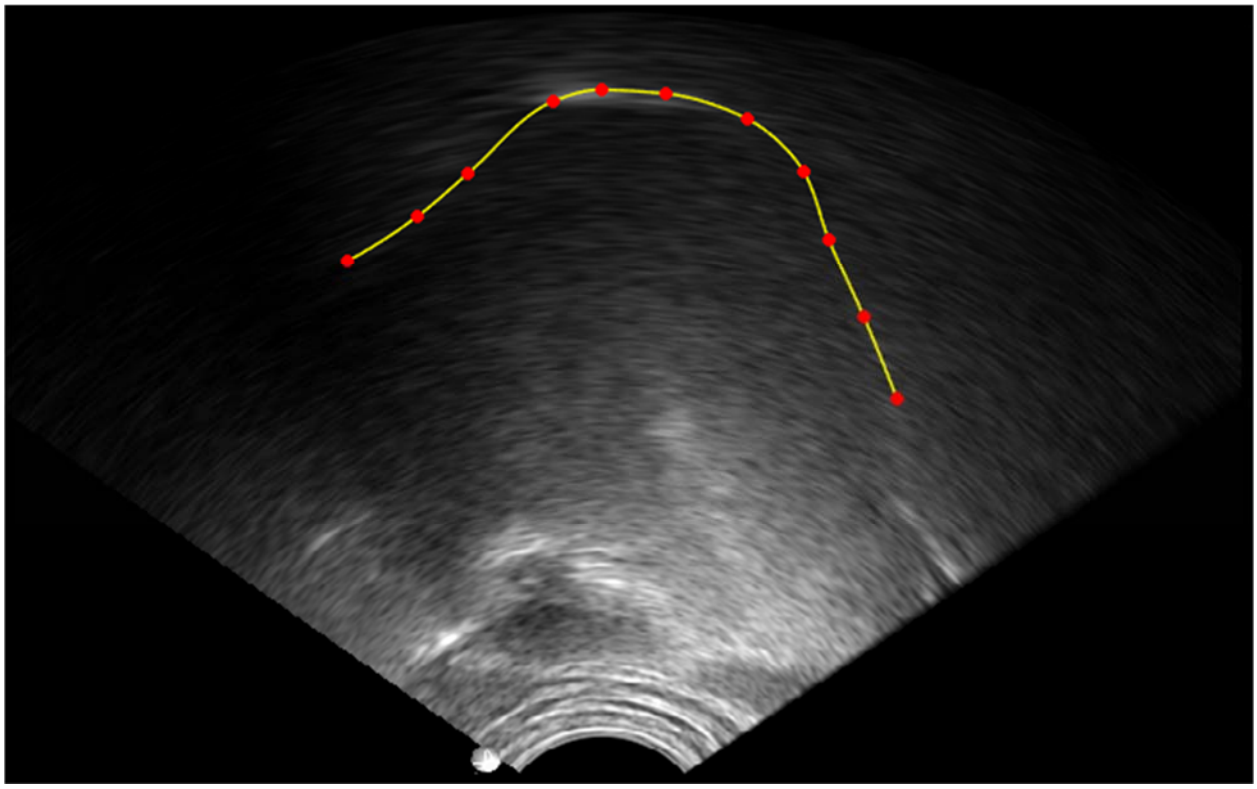

Figure 2.25 – Ultrasound image of velar closure: [k] in [ke] ‘leak’

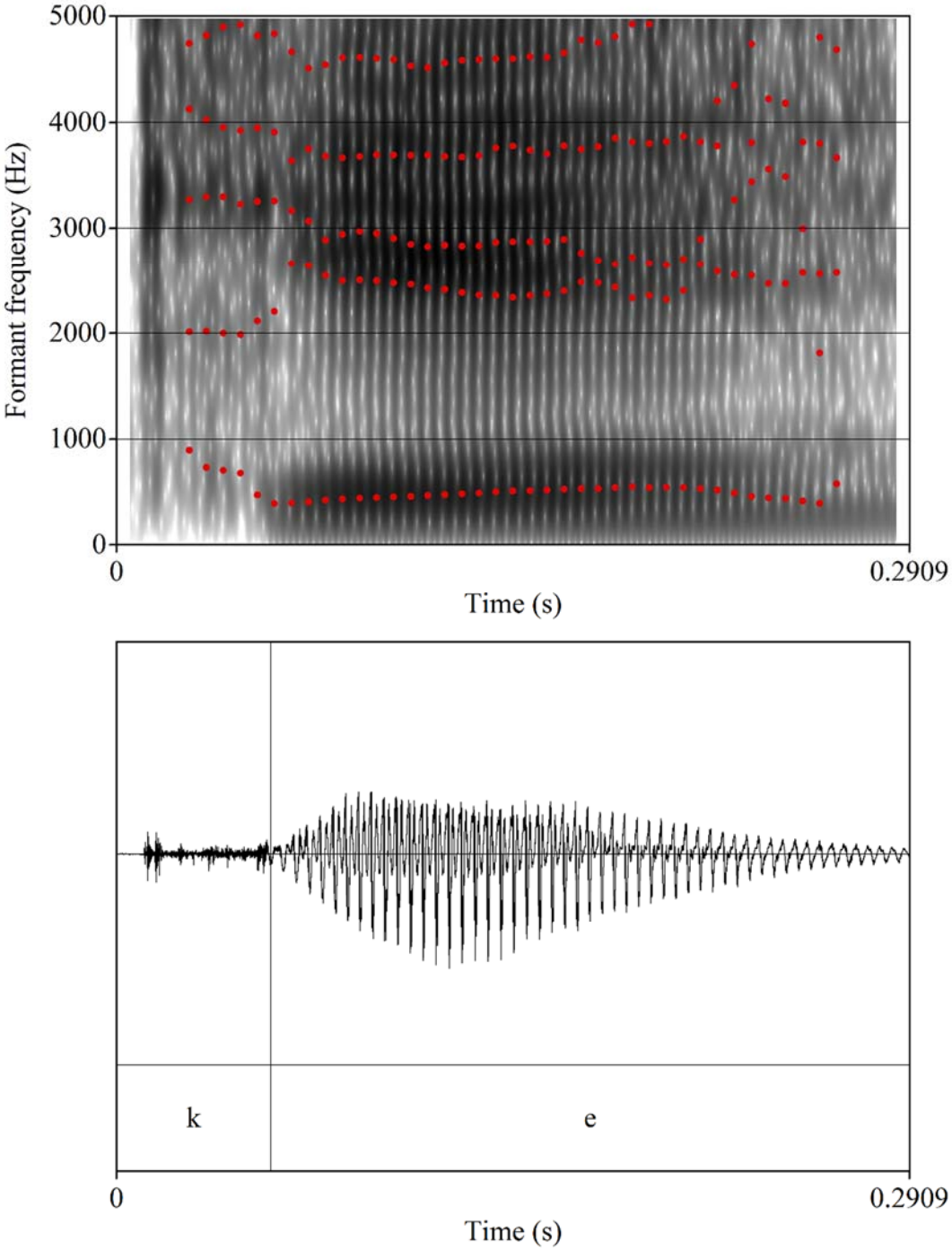

Figure 2.26 – Spectrogram and waveform: [k] in [ke] ‘leak’

- VOT 0 ms
- Strong, diffuse burst

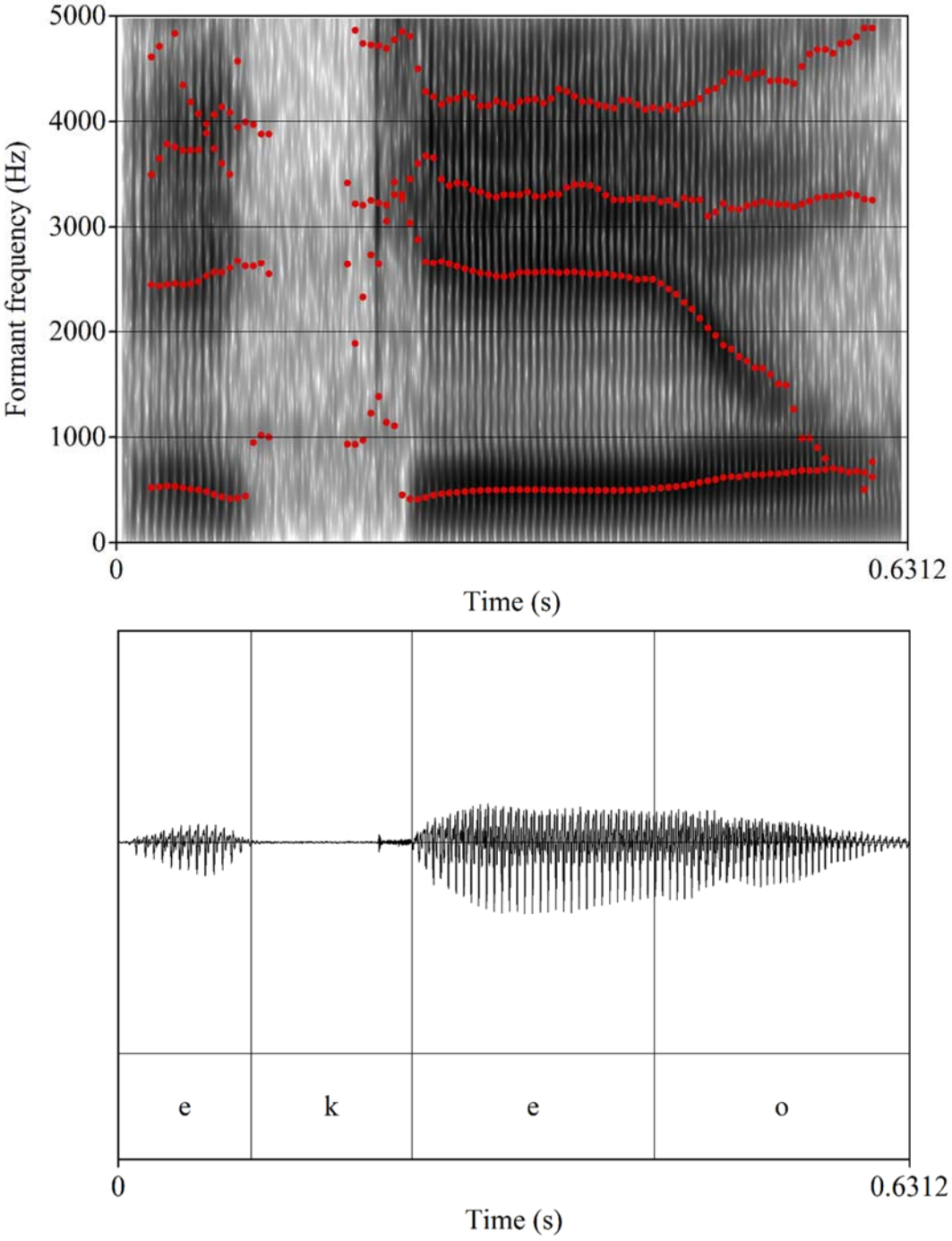

Figure 2.27 – Spectrogram and waveform: [k] in [ekeo] ‘zero, nothing’

- VOT 0 ms
- Strong, diffuse burst
- Closure duration 100 ms

2.2.3.10 /g/

Phonological processes:

a. g → k / ___]$_{\varphi}$ Table 2.1.5(e)

The Nauruan phoneme /g/ is a voiced velar stop. This phoneme is devoiced in phrase-final position, but is otherwise articulated with a voiced release. Intervocalically, it may be weakened to the point of spirantization, surfacing as [ɣ] in some tokens. As with other voiced oral stops, it is shorter than its minimally contrastive counterpart /k/ in intervocalic position. Nathan (1973a) describes /k/ and /g/ as having a post-velar place of articulation, though this has not been observed among speakers consulted for this research. Impressionistically, there are no acoustic cues that suggest uvular articulation. Ultrasound imaging further suggests contact with velum (Figure 2.28).

Table 2.2.10 is a list of minimal and near-minimal pairs showing that /g/ is a contrastive speech sound in Nauruan. Spectrogram and waveform images of [k] tokens are provided in Figures 2.29 and 2.30 with additional notes on voicing and release features.

Table 2.2.10 – Contrastive pairs, /g/

a.	/gar/	[gar]	‘copy, imitate’	cf. [kɐ̌ř]	‘very, much’
b.	/gap/	[gɐp]	‘faint’	cf. [kɐp]	‘deep’
c.	/gow-ej/	[gowej]	‘repeat’	cf. [kowen]	‘flower of’ [27]
d.	/e-gupᵛæ/	[egupᵛæ]	‘sea shell’	cf. [ekubᵛæ]	‘be ignorant of’
e.	/ægu/	[ægu]	‘kiss, lean in’	cf. [iku]	‘cow’ (from German)

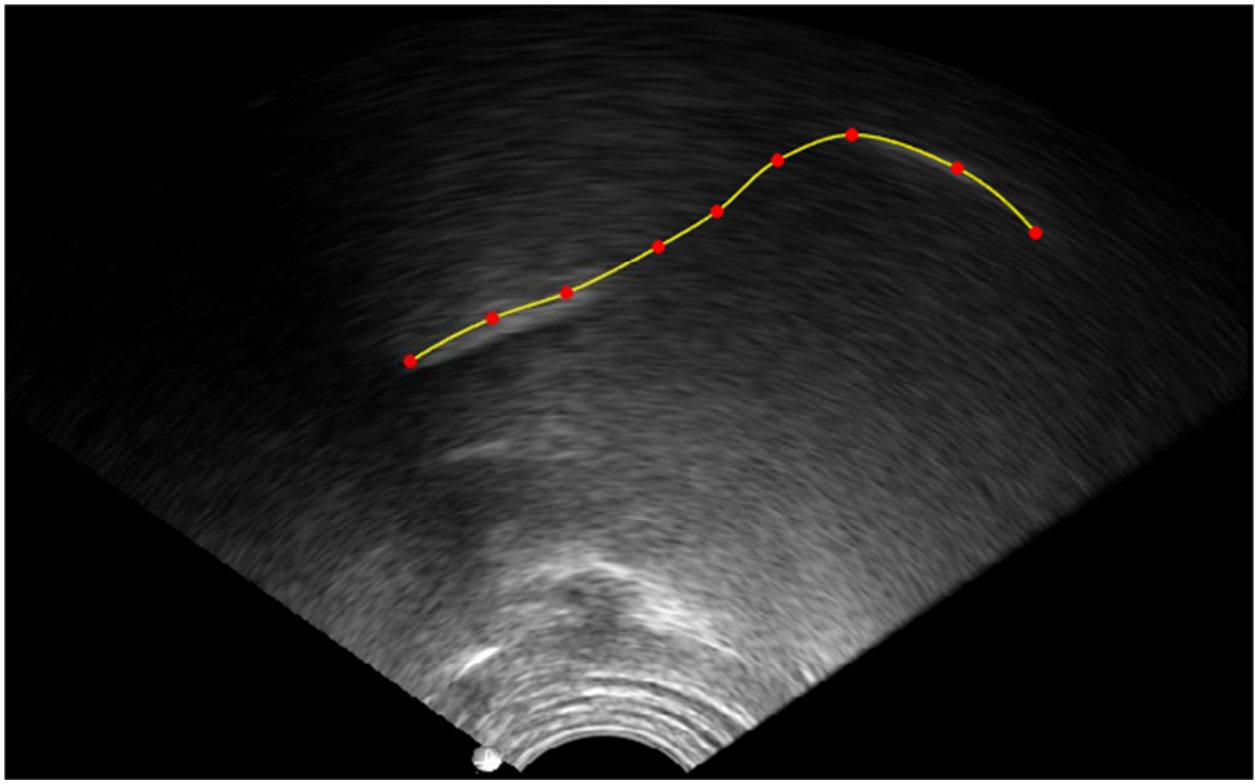

Figure 2.28 – Ultrasound image of velar closure: [g] in [ɨgɐ] ‘yes’

[27] Compare also /kʷæ-n/ ‘flower, blossom, fruit of’.

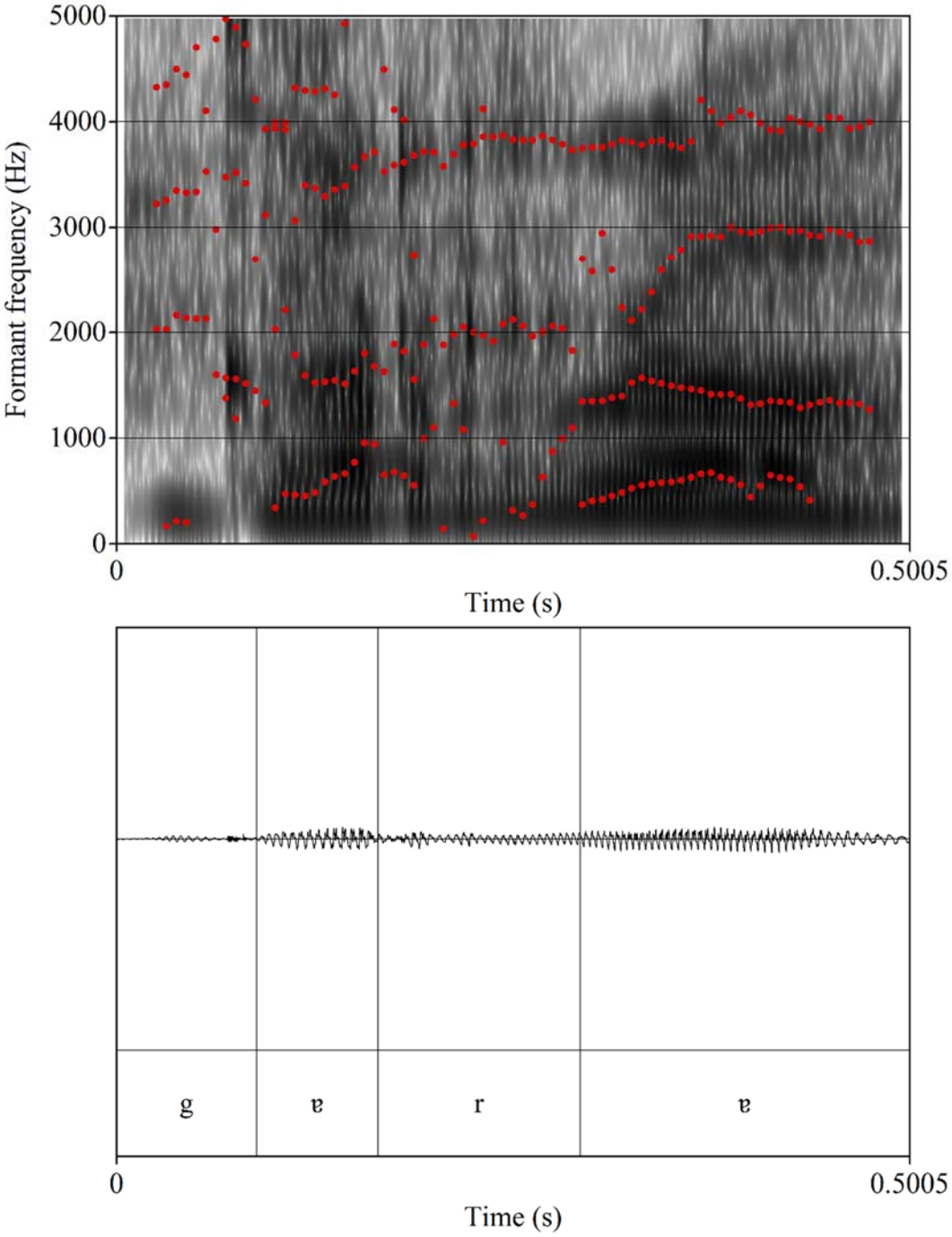

Figure 2.29 – Spectrogram and waveform: [g] in [gɐrɐ] ‘ran off’

- VOT -45 ms
- Release burst immediately before vowel phonation

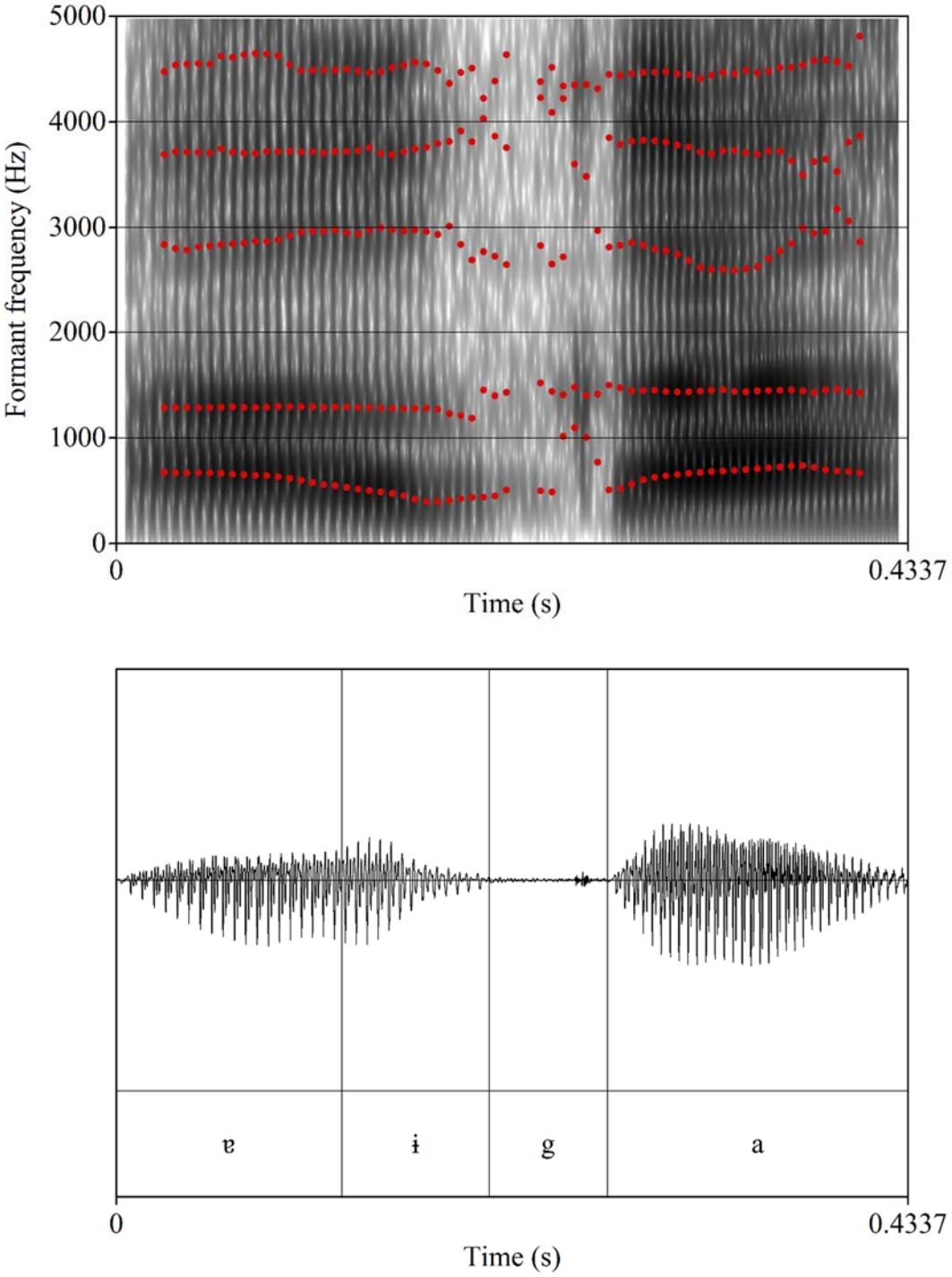

Figure 2.30 – Spectrogram and waveform: [g] in [ɐigɐ] ‘yes, it is so’

- Voicing maintained (negative VOT)
- Strong release burst
- Closure duration 46 ms

2.2.3.11 /kʷ/

Phonological processes:

a. kʷ → k / ___# Table 2.1.5(d)

The Nauruan phoneme /kʷ/ is a voiceless velar stop with secondary labialization. Unlike the other Nauruan oral stops, it does not have a counterpart with which it contrasts minimally in voicing; there is no /gʷ/.[28] It does, however, contrast minimally with /k/. Its secondary labiovelarization is lost in phrase final positions. Its length is comparable to other Nauruan voiceless stops, being longer than voiced stops intervocalically.

Table 2.2.11 is a list of minimal and near-minimal pairs showing that /kʷ/ is a contrastive speech sound in Nauruan. Spectrogram and waveform images of [kʷ] tokens are provided in Figures 2.31 and 2.32 with additional notes on voicing and release features.

Table 2.2.11 – Contrastive pairs, /kʷ/

a.	/ekʷen/	[ekʷen]	‘one’	cf. [eken]	‘what’
b.	/kʷæn/	[kʷæn]	‘sun, fruit’	cf. [kæn]	‘again’
c.	/kʷiɟ/	[kʷiɟ]	‘lie, fib’	cf. [kiɟ]	‘rinse’
d.	/ɟekʷo/	[ɟekʷo]	‘afternoon’	cf. [eko]	‘no, nothing’
e.	/mʲakʷæ/	[mʲɐkʷæ]	Name of a cave in Nauru	cf. [mʲɐgɐ]	‘cooked, ready’

[28] Nathan (1973a: 483) proposes the phoneme /gʷ/ but provides no examples of its occurrence. The present study has not identified any instances of [gʷ] so far, including before front vowels where secondary labialization would be expected to surface. This suggests that the phoneme /gʷ/ does not exist in the Nauruan inventory. Furthermore, Nauruan /kʷ/ appears to result from a relatively late-stage sound change in pre-Nauruan; *wː > kʷ. From a diachronic perspective, it is unsurprising that /kʷ/ has no voiced counterpart in the inventory.

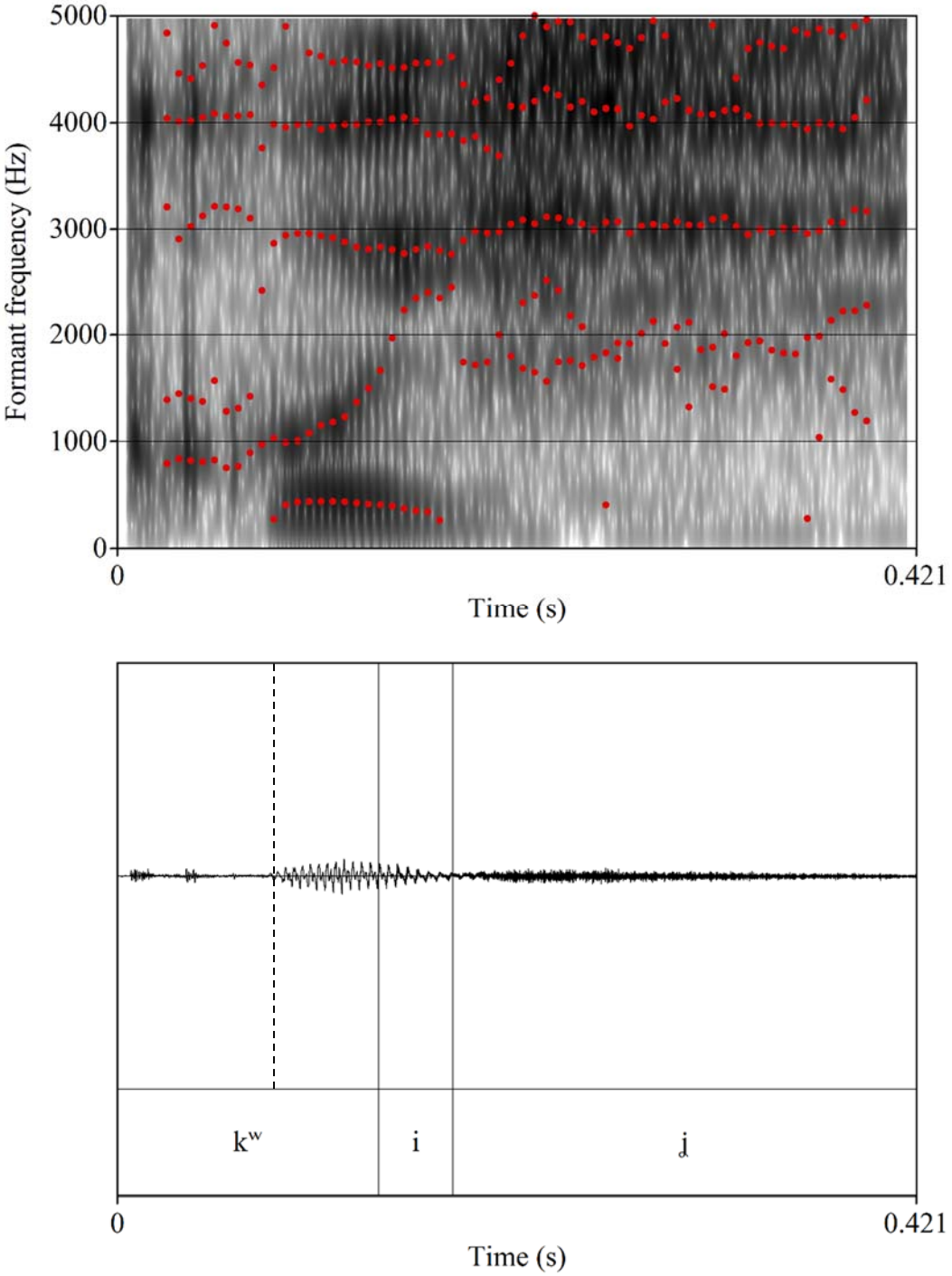

Figure 2.31 – Spectrogram and waveform: [kʷ] in [kʷij] ‘lie’

- VOT 0 ms
- Diffuse release burst

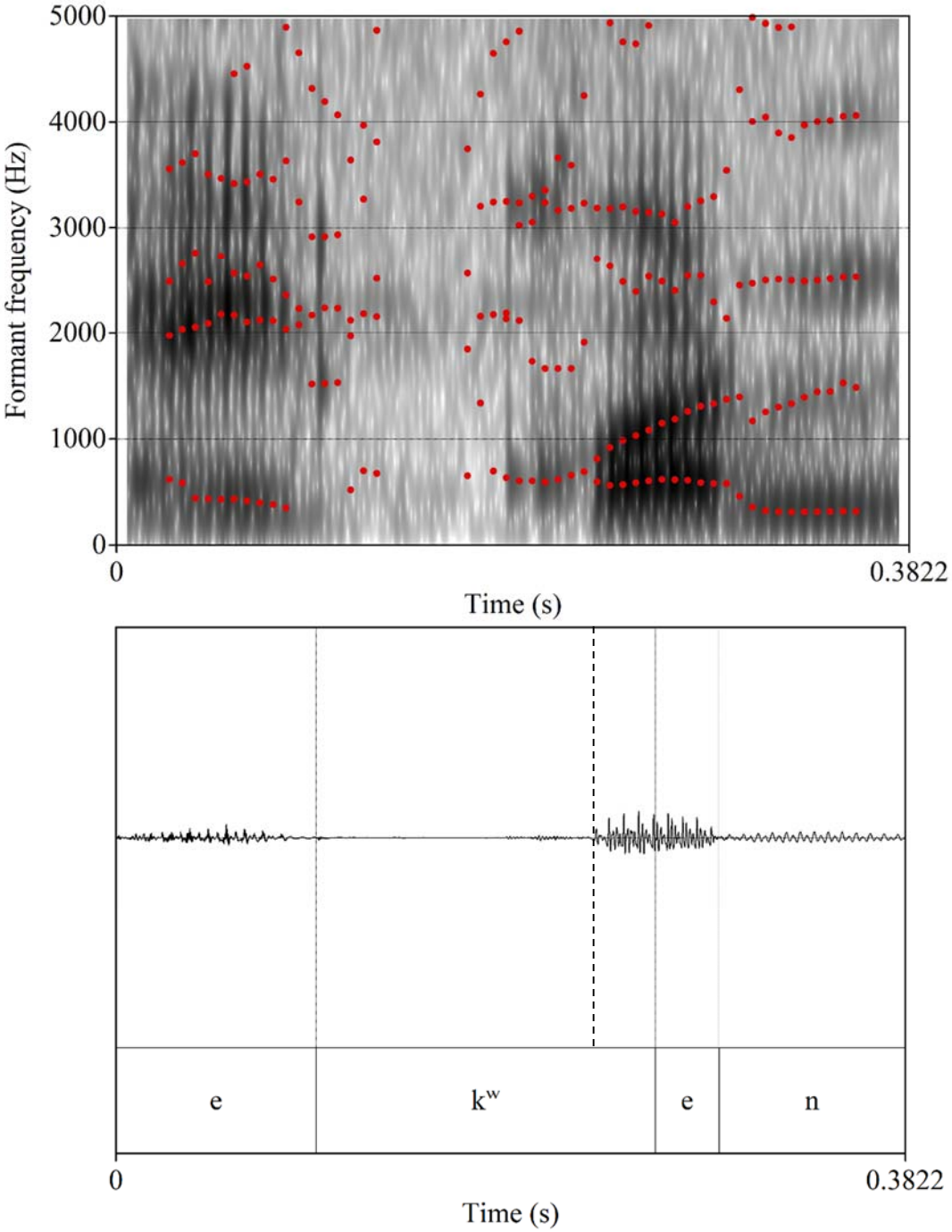

Figure 2.32 – Spectrogram and waveform: [kʷ] in [ekʷen] ‘one’

- VOT 0 ms
- Diffuse release burst
- Closure duration 90 ms

2.2.4 Nasals

Nauruan has palatalized and velarized bilabial nasals and lacks underlyingly plain bilabials, much like the oral stops.[29] Nauruan has both singleton and geminate bilabial nasals, so that length is a contrastive feature for these segments. The coronal nasal /n/ and the velar nasal /ŋ/ occur only as singletons.

2.2.4.1 /mʲ/

Phonological processes:

a. $m^j \rightarrow m$ / ___ i, e Table 2.1.5(a)

b. $m^j \rightarrow m$ / ___ # Table 2.1.5(d)

The Nauruan phoneme /mʲ/ is a palatalized bilabial nasal. It is pronounced [m] in environments where palatalization is phonetically absent, including before non-low front vowels and word-finally. Length is a contrastive feature for this phoneme, comparing /mːʲ/. This phoneme also contrasts minimally with velarized /mˠ/.

Table 2.2.12 is a list of minimal and near-minimal pairs showing that /mʲ/ is a contrastive speech sound in Nauruan. Figure 2.33 is an ultrasound image of [mʲ] showing the position of the tongue during palatalization. The body of the tongue is raised close to the palate at its highest point. Spectrogram and waveform images of [mʲ] tokens are provided in Figure 2.34. The length of intervocalic [mʲ] is noted for comparison to geminate [mːʲ] (§2.2.4.2).

[29] The same is true of Marshallese (Choi 1995: 326).

Table 2.2.12 – Contrastive pairs, /mʲ/

a.	/mʲæmʲæ/	[mʲæmʲæ]	‘chew’	cf. [mʷæmʷe]	‘cold’ (sensation)
b.	/mʲio/	[mio]	‘fear’	cf. [mʷijow]	‘separate’
c.	/mʲe/	[me]	‘and, but’	cf. [mʷej]	‘face, confront’
d.	/emʲæn/	[emʲæn]	‘dead’	cf. [emʷæn]	‘knowledge’
e.	/imʲe/	[ime]	‘ensnare’	cf. [imʷem]	‘hut, shed’

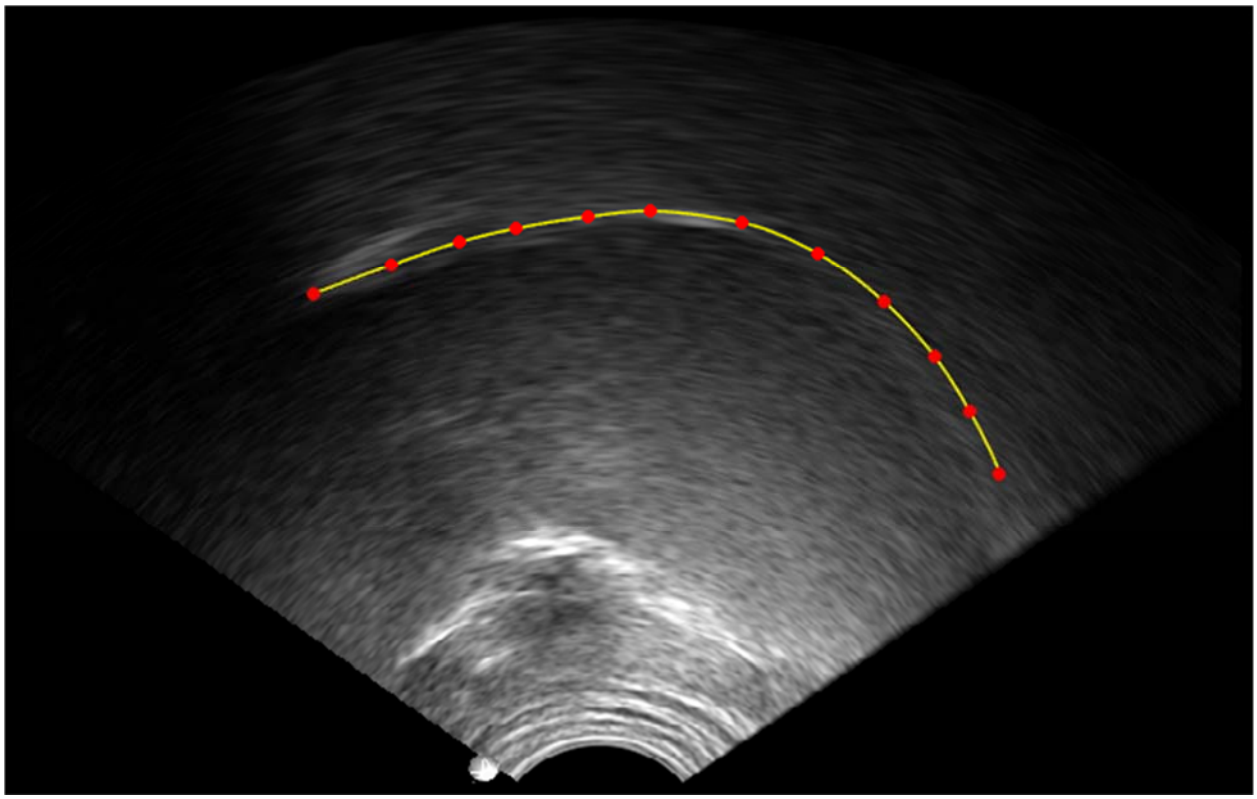

Figure 2.33 – Ultrasound image of palatalization: [mʲ] in [mʲæmʲæ] ‘chew’

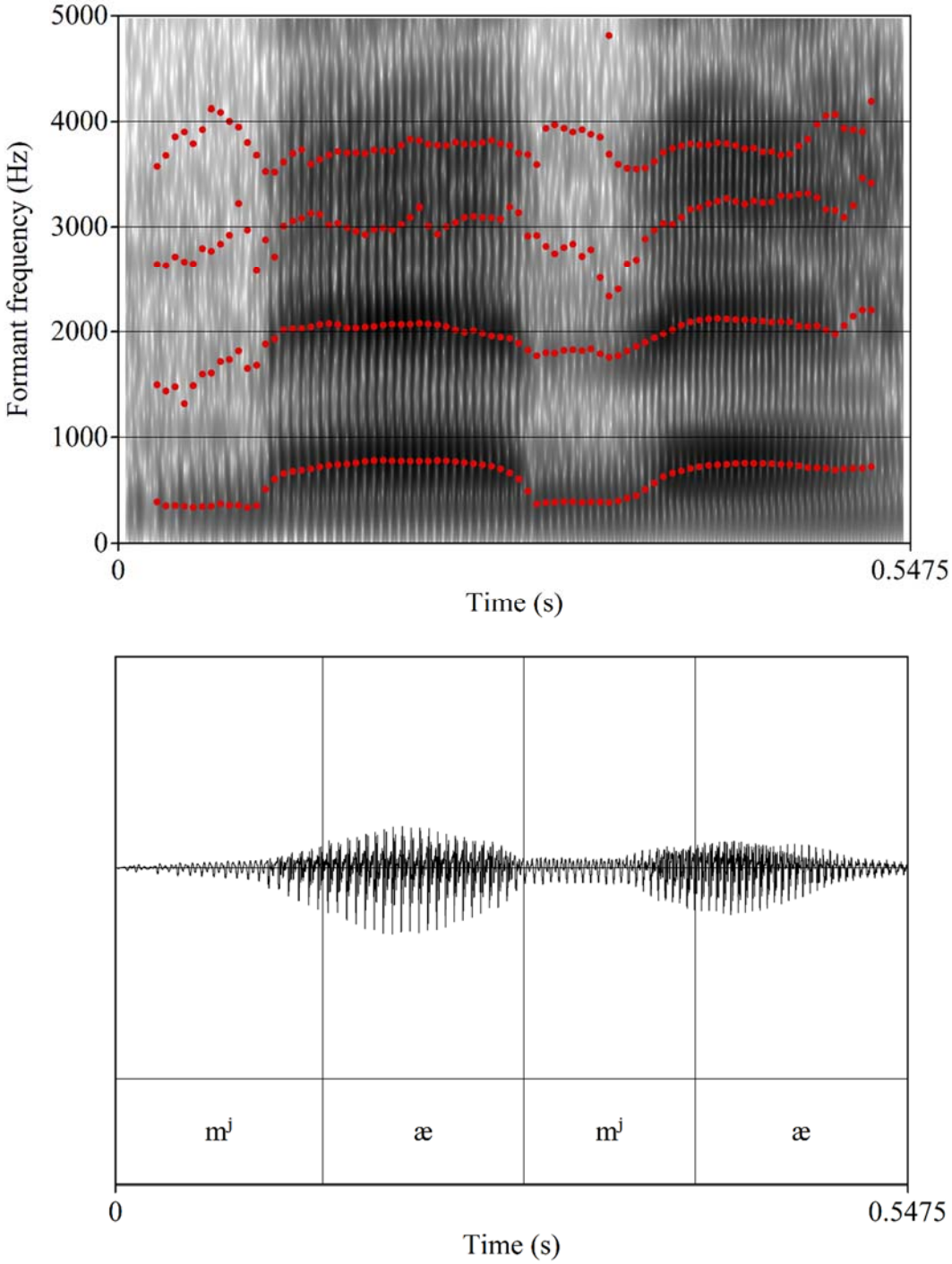

Figure 2.34 – Spectrogram and waveform: [mʲ] in [mʲæmʲæ] ‘chew’

- Intervocalic closure duration: 74 ms

2.2.4.2 /mːʲ/

Phonological processes:

a. mːʲ → mː / ___ i, e Table 2.1.5(a)

The Nauruan phoneme /mːʲ/ is a geminate palatalized bilabial nasal. It is pronounced [mː] before non-low front vowels. Length is a contrastive feature for this phoneme, comparing its minimally contrastive counterpart /mʲ/. So far there are no clear cases of a phonetically long bilabial nasal in word-final position. In the absence of any evidence to the contrary, it is hypothesized that the length contrast among bilabial nasals is neutralized in word-final positions.

Table 2.2.13 is a list of minimal and near-minimal pairs showing that /mːʲ/ is a contrastive speech sound in Nauruan. Spectrogram and waveform images of [mːʲ] tokens are provided in Figure 2.35. The length of intervocalic [mːʲ] is noted for comparison to singleton [mʲ] (§2.2.4.1).

Table 2.2.13 – Contrastive pairs, /mːʲ/

a.	/æmːʲæ/	[æmːʲæ]	‘we’ (pl. ex.)	cf. [emːʸæn]	‘man, male’
b.	/demːʲe/	[demːe]	‘breadfruit’	cf. [dəmeniner]	‘mosquito’
c.	/kamːʲe/	[kɐmːe]	‘stalk, peep’	cf. [kɐmʲæ]	‘pester, bother’
d.	/emːʲet/	[emːet]	‘saltbush’	cf. [emeta]	‘exit, go out’
e.	/remːʲæe/	[remʲːæe]	‘slippery’	cf. [emʲæmoŋ]	‘warm’

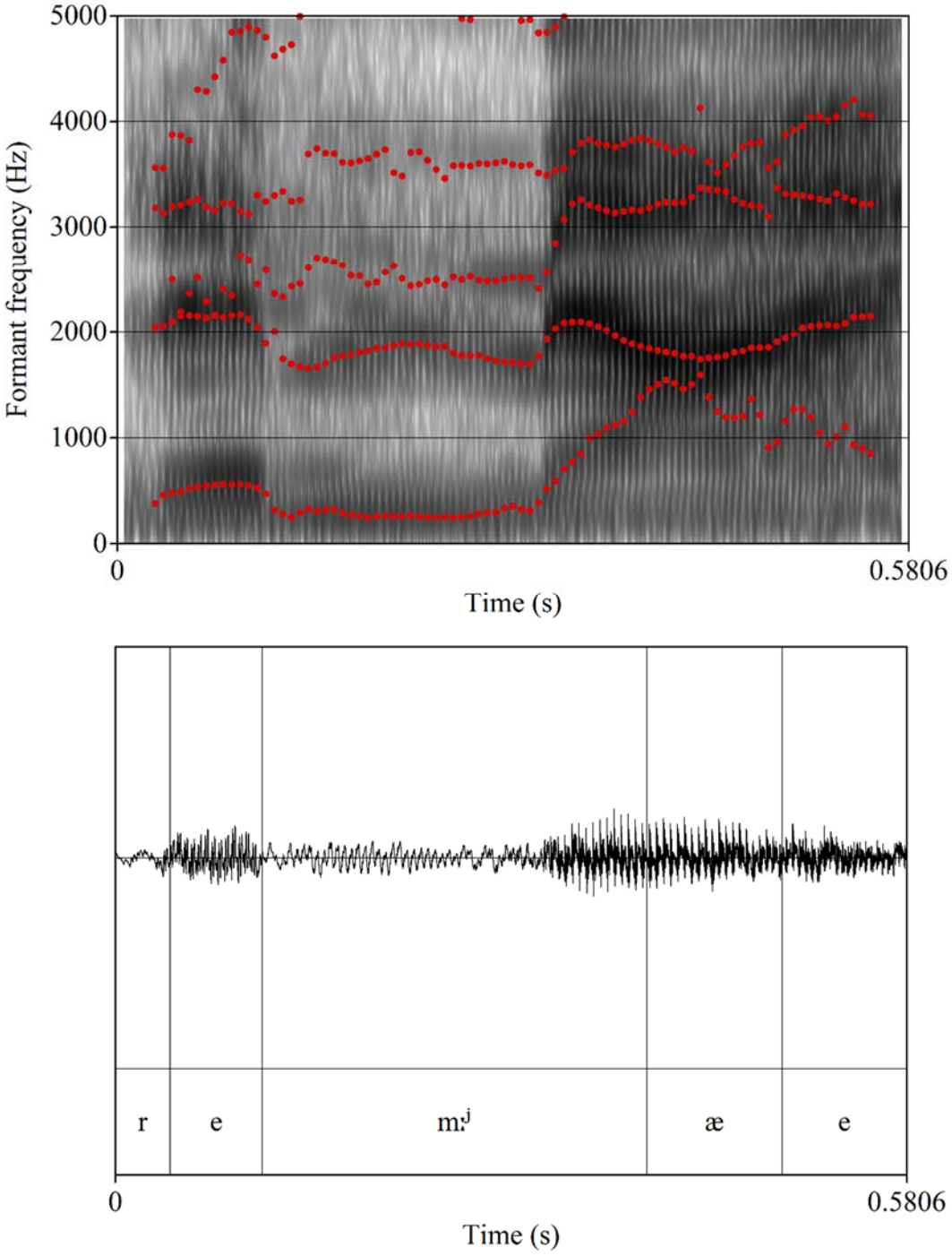

Figure 2.35 – Spectrogram and waveform: [mːʲ] in [remːʲæe] ‘slimy’

- Intervocalic closure duration: 205 ms

2.2.4.3 /mˠ/

Phonological processes:

a. mˠ → m / ___ o, u Table 2.1.5(b)

b. mˠ → m / ___i̶, a (variable) Table 2.1.5(c)

c. mˠ → m / ___# Table 2.1.5(d)

The Nauruan phoneme /mˠ/ is a velarized bilabial nasal. It is pronounced [m] before rounded back vowels and word-finally. Length is a contrastive feature for this phoneme, comparing /mːˠ/. This phoneme contrasts minimally with palatalized /mʲ/.

Table 2.2.14 is a list of minimal and near-minimal pairs showing that /mˠ/ is a contrastive speech sound in Nauruan. Figure 2.36 is an ultrasound image of [mˠ] showing the position of the tongue during velarization. The body of the tongue is raised close to the velum at its highest point. Spectrogram and waveform images of [mˠ] tokens are provided in Figure 2.37. The length of intervocalic [mˠ] is noted for comparison to geminate [mːˠ] (§2.2.4.4).

Table 2.2.14 – Contrastive pairs, /mˠ/

a.	/emˠæn/	[emˠæn]	‘knowledge’	cf. [emːˠæn]	‘man, male’
b.	/imˠi/	[imˠi]	‘tooth’	cf. [imin]	‘thing’
c.	/mˠamˠo/	[mamo]	‘make’	cf. [mʲɐgo]	‘deep sea’
d.	/æmˠo/	[æmo]	‘first, leading’	cf. [æmʲæ]	‘we’ (pl. ex.)
e.	/mˠiraro/	[mˠiraro]	‘pink’	cf. [merɐp]	‘lightning’

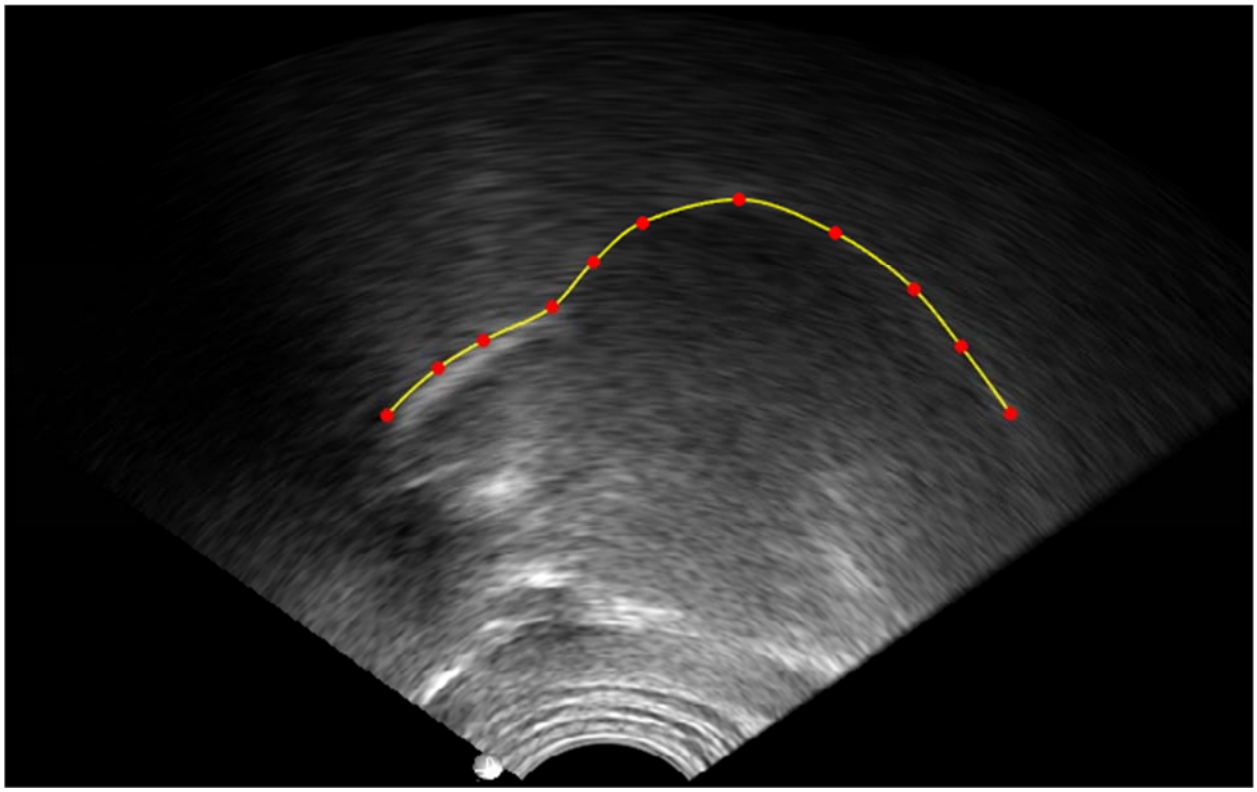

Figure 2.36 – Ultrasound image of velarization: [mˠ] in [mˠæn] ‘knowledge’

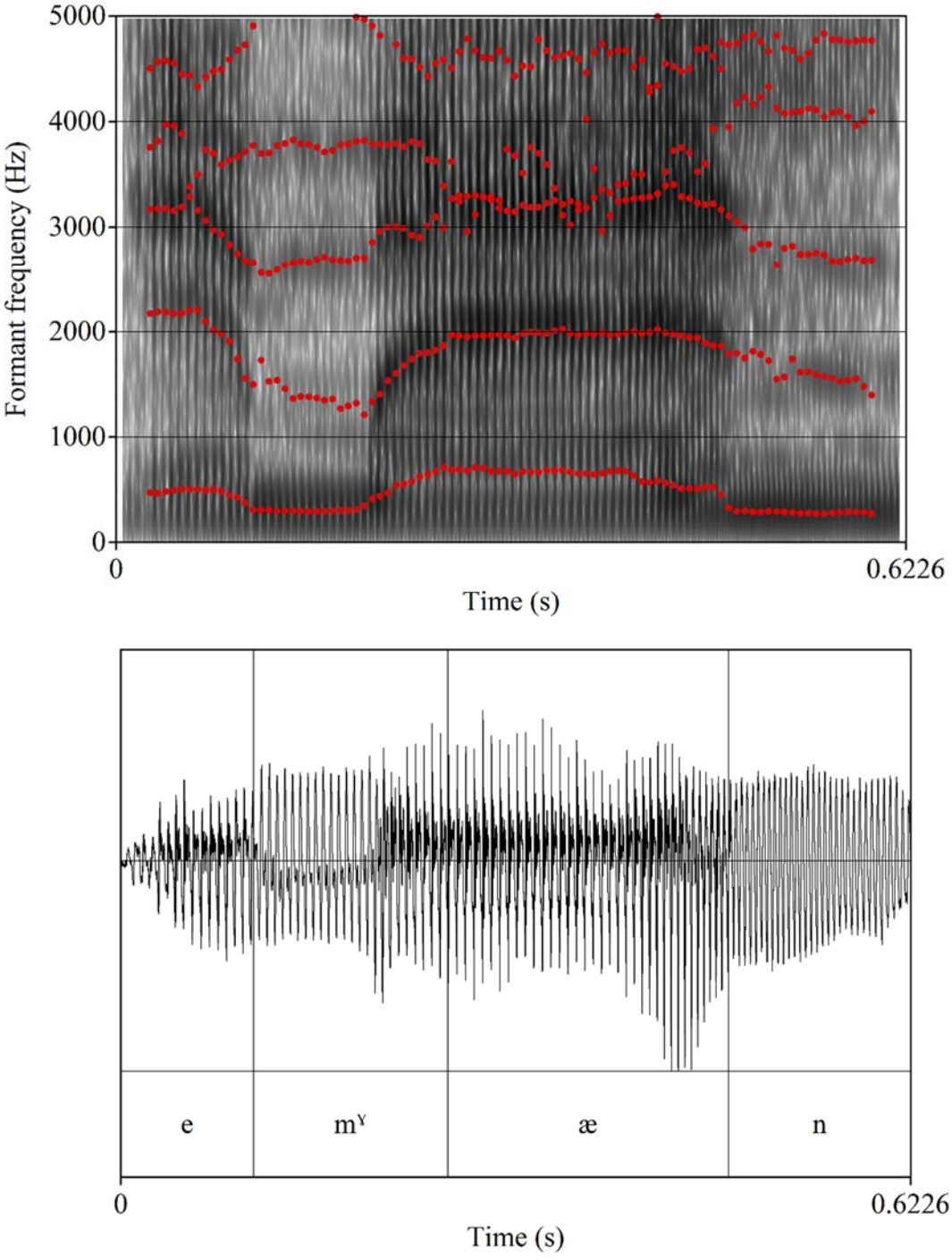

Figure 2.37 – Spectrogram and waveform: [mʸ] in [emʸæn] ‘knowledge’

- Intervocalic closure duration: 98 ms

2.2.4.4 /mːˠ/

Phonological processes:

a. mːˠ → mː / ___ o, u Table 2.1.5(b)

b. mːˠ → mː / ___~~i~~, a (variable) Table 2.1.5(c)

c. mːˠ → mː / ___# Table 2.1.5(d)

The Nauruan phoneme /mːˠ/ is a geminate velarized bilabial nasal. It is pronounced [mː] before rounded back vowels. Length is a contrastive feature for this phoneme, comparing its minimally contrastive counterpart /mˠ/. So far there are no clear cases of a long bilabial nasal in word-final position. In the absence of any evidence to the contrary, it is hypothesized that the length contrast among bilabial nasals is neutralized word-finally.

Table 2.2.15 is a list of minimal and near-minimal pairs showing that /mːˠ/ is a contrastive speech sound in Nauruan. Spectrogram and waveform images of [mːˠ] tokens are provided in Figure 2.34. The length of intervocalic [mːˠ] is noted for comparison to singleton [mˠ] (§2.2.4.3).

Table 2.2.15 – Contrastive pairs, /mːˠ/

a.	/emːˠæn/	[emːˠæn]	‘man, male’	cf. [emˠæn]	‘knowledge’
b.	/omːˠo/	[omːo]	‘good’	cf. [omu]	‘destroy’
c.	/emːˠo/	[emːo]	‘she who is good’	cf. [emˠe]	‘worm’
d.	/emːˠɐr/	[emːˠɐr]	‘necklace, lei’	cf. [amamɐr]	‘chase’
e.	/enomːˠo/	[enomːo]	‘still, calm’	cf. [inemˠin]	‘edge, end (of)’

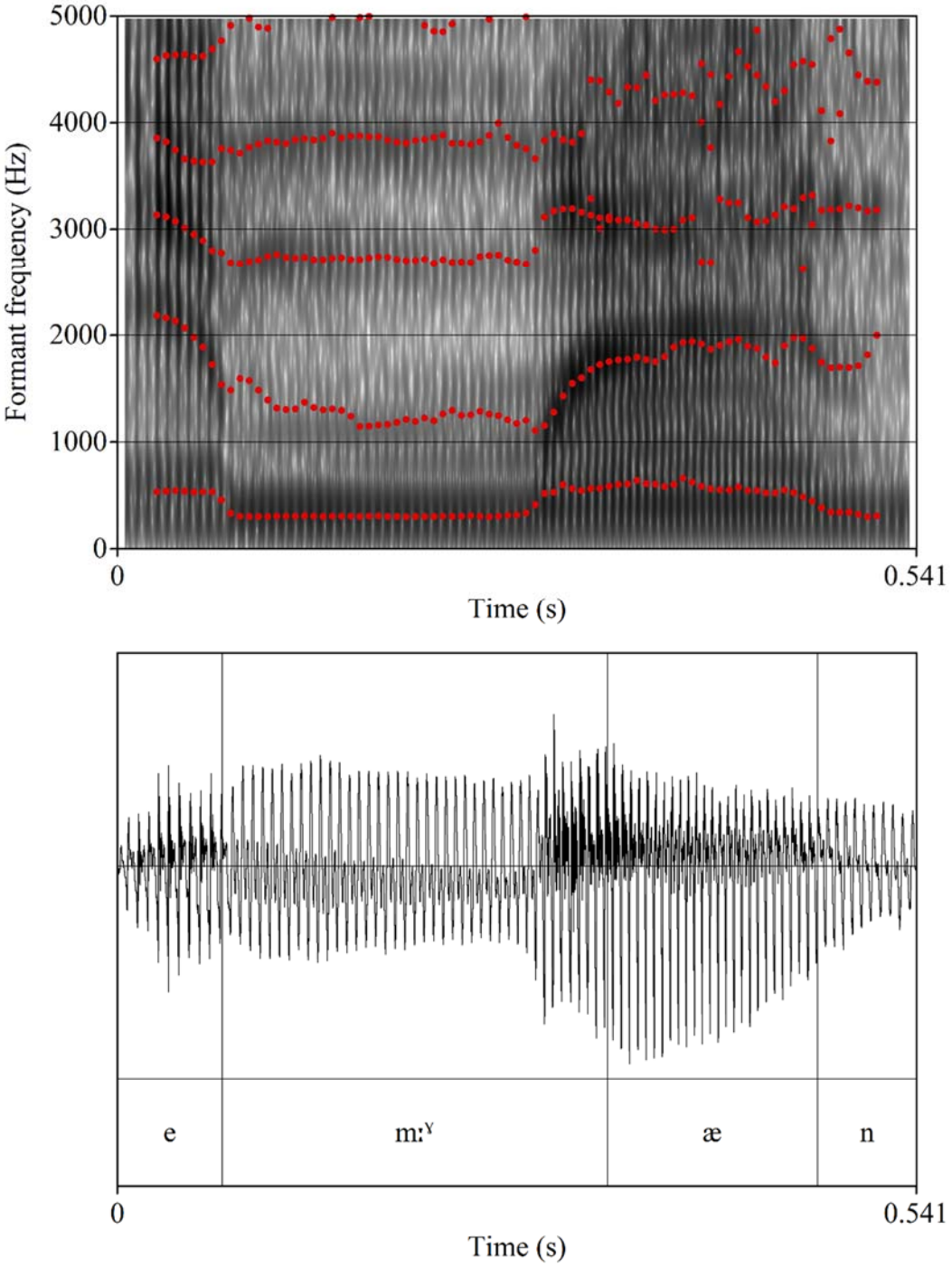

Figure 2.38 – Spectrogram and waveform: [mːʏ] in [emːʏæn] ‘man, male’

- Intervocalic closure duration: 217 ms

2.2.4.5 /n/

The Nauruan phoneme /n/ is an apical alveolar nasal. It is realized as [n] in all environments, though it may freely vary with the voiceless stop [t] where it occurs as one of several word-final suffixes of the shape /-n/, including the 3sg possessive suffix, the genitive (or 'construct') suffix, and the passive verb suffix. Speakers appear unable to identify what, if anything, determines the choice between word-final [n] and [t] in the relevant words.[30] Though the precise origin of this synchronic variation remains unclear, it is notable that geminate pre-Nauruan *nː is continued as Nauruan /t/, typically at morpheme boundaries. This process might have had something to do with the development of this otherwise unusual free variation.

Table 2.2.16 is a list of minimal and near-minimal pairs showing that /n/ is a contrastive speech sound in Nauruan. Spectrogram and waveform images of [n] tokens are provided in Figure 2.39. The length of the intervocalic [n] token is noted.

Table 2.2.16 – Contrastive pairs, /n/

a.	/nænæn/	[nænæn]	'his/her leg, foot'	cf. [dæŋæŋ]	'black'
b.	/nene/	[nene]	'yesterday'	cf. [eɐ]#[meme]	'not shy, crude'
c.	/ini/	[ini]	'coconut tree'	cf. [imiɟ]	'dream'
d.	/tenaŋə-n/	[tenɐŋən]	'his/her ear'	cf. [edetɐŋ]	'star'
e.	/tʃi-n bʲe/	[tʃinəbe]	'finger'	cf. [tʃimine]	'is, are'

[30] Though some consultants have suggested that one or the other seems more or less correct in a given context, these opinions vary from speaker to speaker.

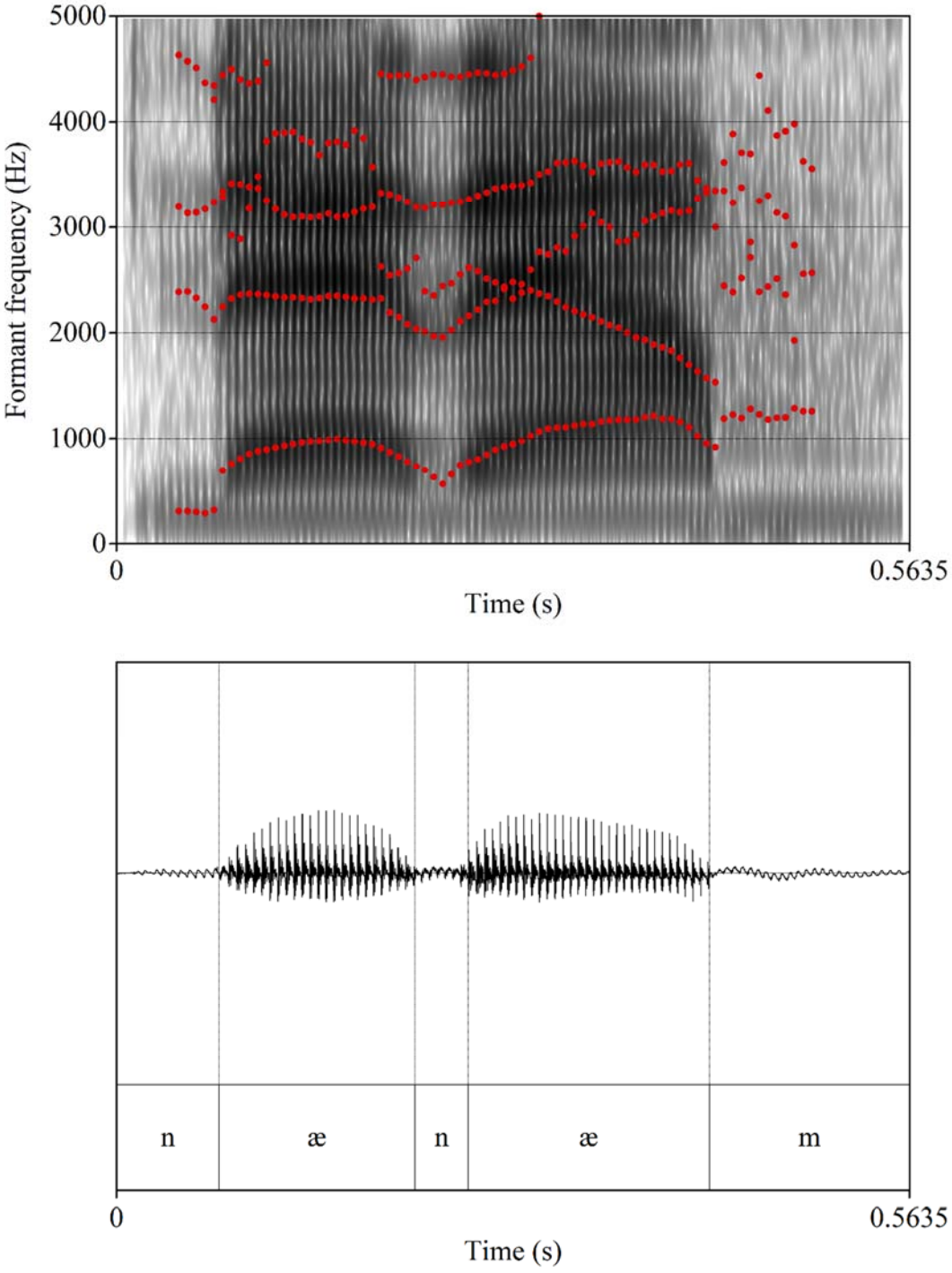

Figure 2.39 – Spectrogram and waveform: [n] in [nænæm] ‘your leg(s)’

- Intervocalic closure duration: 38 ms

2.2.4.6 /ŋ/

The Nauruan phoneme /ŋ/ is velar nasal which always surfaces as [ŋ]. Table 2.2.17 is a list of minimal and near-minimal pairs showing that /ŋ/ is a contrastive speech sound in Nauruan. Figure 2.40 is an ultrasound image of [ŋ] showing the tongue position at the point of greatest constriction. Spectrogram and waveform images of [ŋ] tokens are provided in Figure 2.41, which also notes the length of the intervocalic [ŋ] token.

Table 2.2.17 – Contrastive pairs, /ŋ/

a.	/aŋe/	[aŋe]	‘on the ground’	cf. [aneʝ]	‘eat something’
b.	/eæŋ/	[eæŋ]	‘jealousy, envy’	cf. [ean]	‘vomit’
c.	/iŋa/	[iŋa]	‘where’	cf. [ina]	‘there’ (medial)
d.	/eŋomˠ/	[eŋom]	‘housefly’	cf. [anom]	‘cook by earth oven’
e.	/epˠaŋ/	[epˠɐŋ]	‘hole, pit’	cf. [apˠan]	‘say, speak’

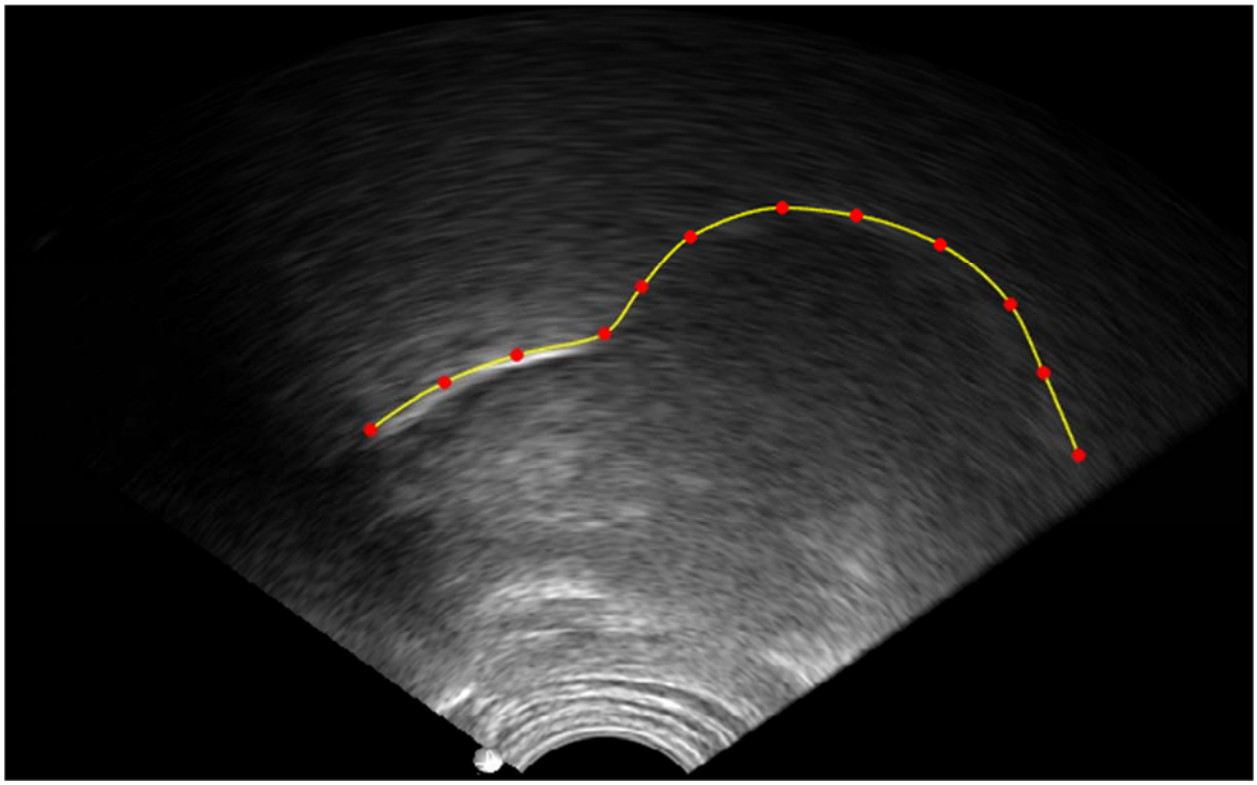

Figure 2.40 – Ultrasound image of velar closure: [ŋ] in [waŋa]

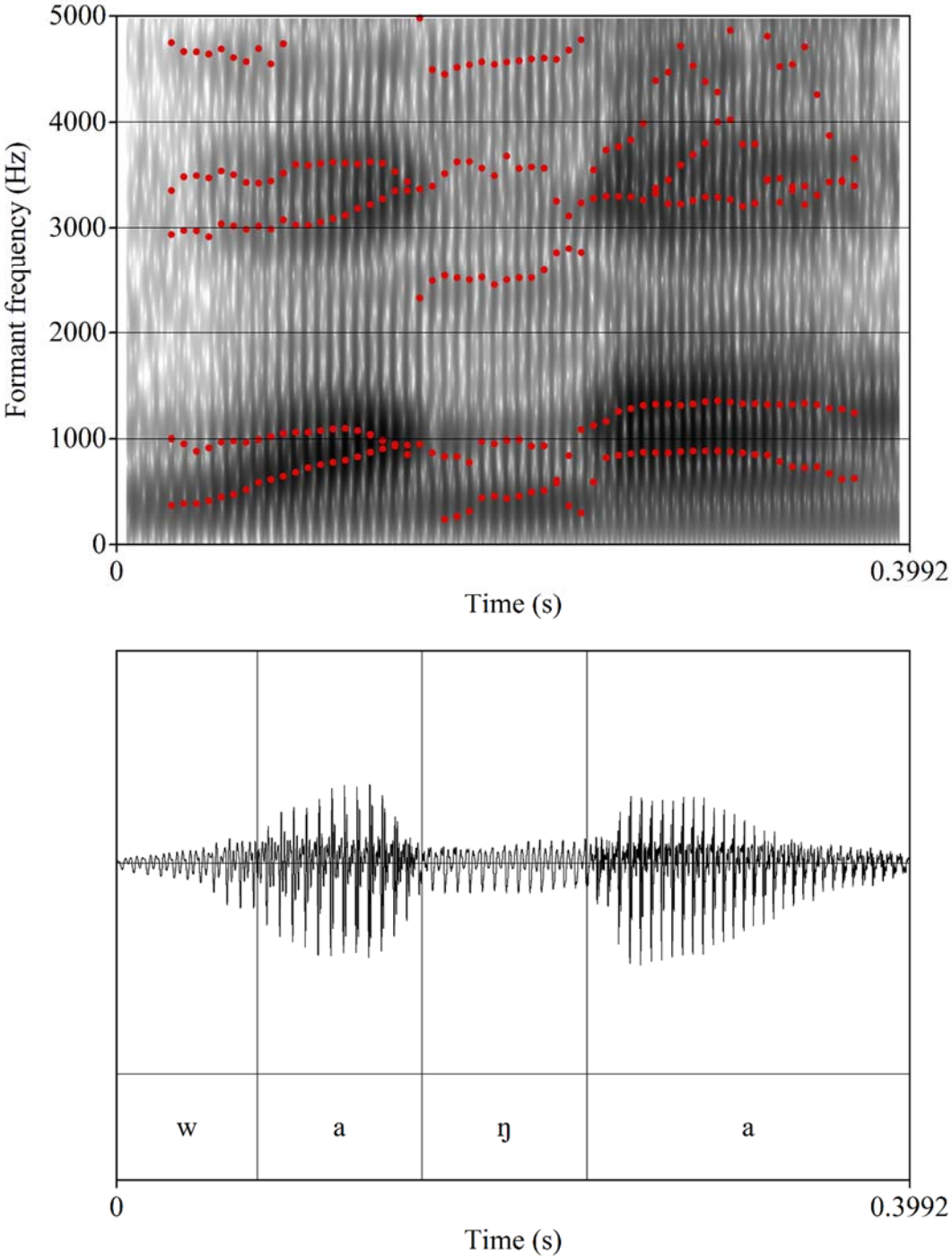

Figure 2.41 – Spectrogram and waveform: [ŋ] in [waŋa] ‘my, mine’

- Intervocalic closure duration: 83 ms

2.2.5 Glides

Nauruan has three glides, /w/, /ɟ/ and /j/. Though the symbol /ɟ/ is traditionally reserved for palatal fricatives, the Nauruan phoneme it represents here is considered an approximant with light to moderate frication, with frication being variably absent (§2.2.5.2). The phoneme /j/, which has been identified in only a few words so far, is never fricated. It invariably surfaces as [j].

2.2.5.1 /w/

The Nauruan phoneme /w/ is a rounded labiovelar glide which always surfaces as [w]. Table 2.2.18 is a list of minimal and near-minimal pairs showing that /w/ is a contrastive speech sound in Nauruan. Spectrogram and waveform images of [w] tokens are provided in Figures 2.42 and 2.43.

Table 2.2.18 – Contrastive pairs, /w/

a.	/weɟo/	[weɟo]	‘stand, remain’	cf. [iɟo]	‘tamano tree’
b.	/wiwi/	[wiwi]	‘scrape, grate’	cf. [kiwi]	‘scrape coconut’
c.	/wea/	[weɐ]	‘do not, will not’	cf. [iɐ]	‘is not’
d.	/tow tow/	[tow]#[tow]	‘cut up’	cf. [totʉ]	‘set down’
e.	/ɟiw/	[ɟiw]	‘blow’	cf. [ɟir]	‘sew, stitch’

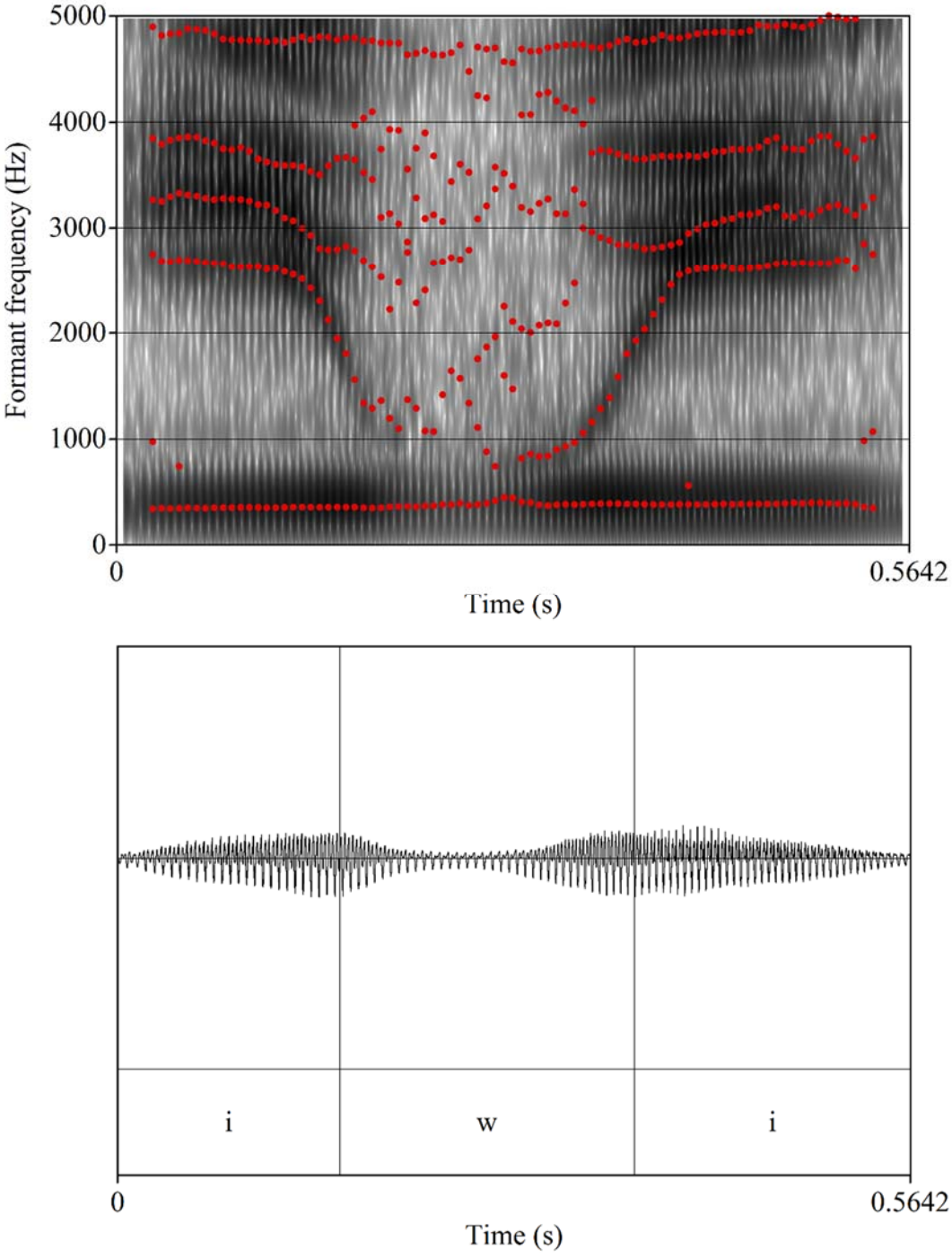

Figure 2.42 – Spectrogram and waveform: [w] in [iwi] ‘louse’

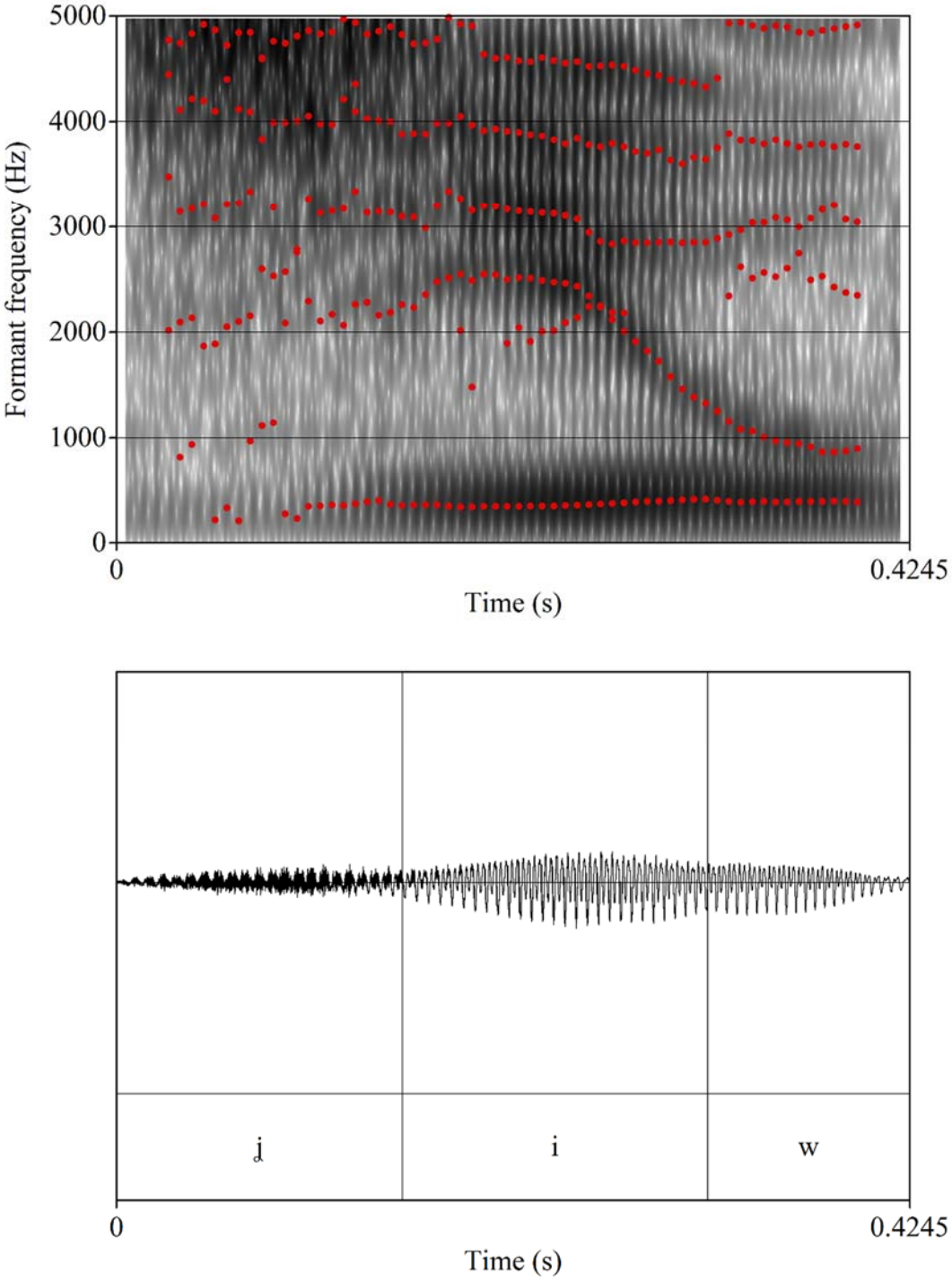

Figure 2.43 – Spectrogram and waveform: [w] in [jiw] ‘blow’

2.2.5.2 /j̟/

The Nauruan phoneme /j̟/ is a palatal consonant with light to moderate frication which is variably absent; [j̟] ~ [j]. Though it might be classified as a fricative, it has been included among the glides in the Nauruan phoneme inventory proposed here, as it is not consistently fricated (Table 2.1.1). Frication in /j̟/ appears to be an underlying feature of the phoneme, as no specific phonological environment predicts its presence or absence.

Table 2.2.19 is a list of minimal and near-minimal pairs showing that /j̟/ is a contrastive speech sound in Nauruan. Spectrogram and waveform images of [j̟] are provided in Figure 2.44.

Table 2.2.19 – Contrastive pairs, /j̟/

a.	/ej̟u/	[ej̟ʉ]	‘three’	cf. [eijʉ]	‘seven’
b.	/j̟aŋ/	[j̟ɐŋ]	‘below, lower’	cf. [ijɐŋ]	‘cry, weep’
c.	/ej̟æn/	[ej̟æn]	‘busy’	cf. [eræn]	‘one, single’
d.	/ej̟æ/	[ej̟æ]	‘difficult’	cf. [eæ]	‘forever’
e.	/j̟ow/	[j̟ow]	‘push’	cf. [iow]	‘peace, calm’

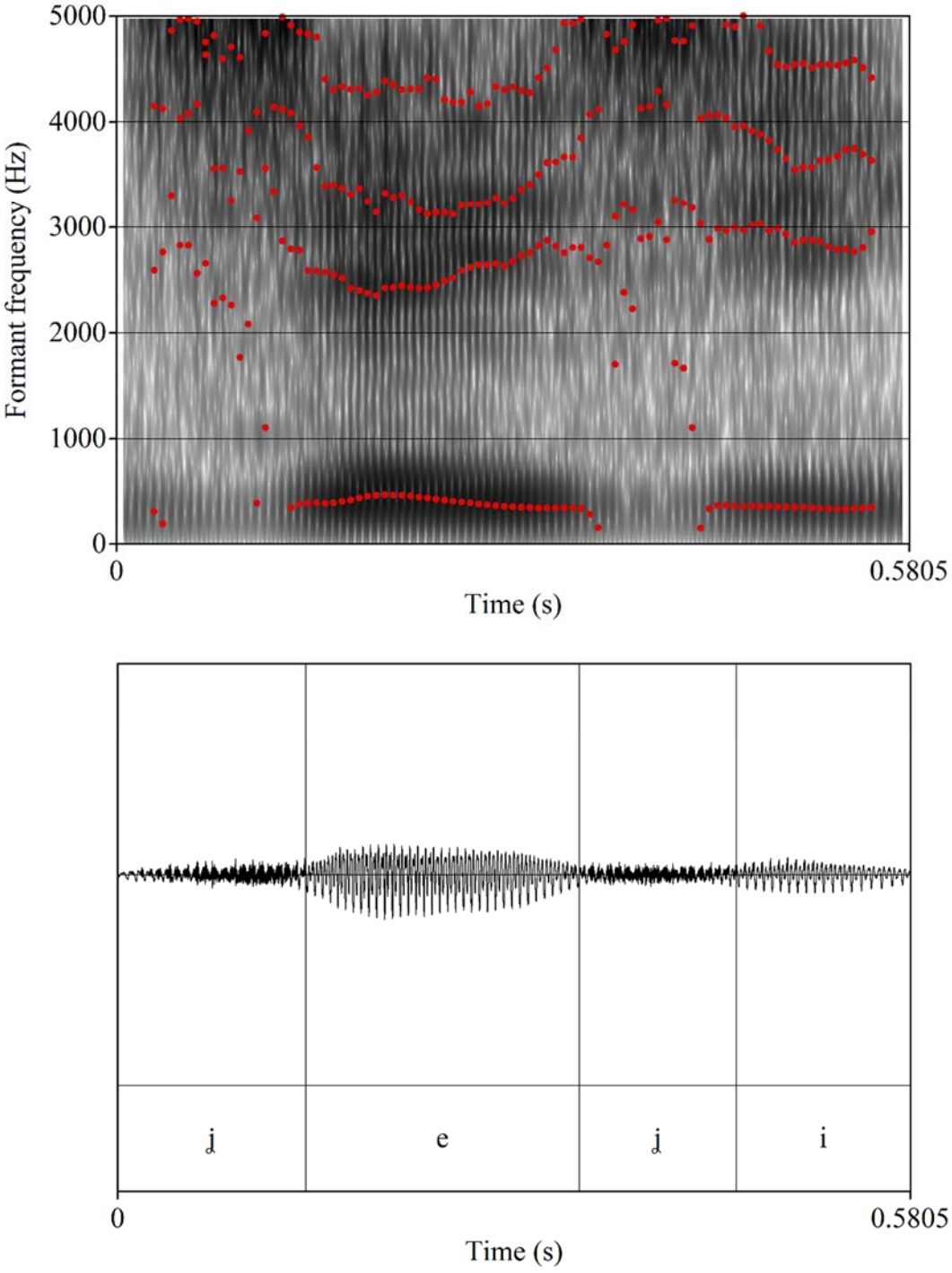

Figure 2.44 – Spectrogram and waveform: [j] in [jeji] ‘food, eat’

2.2.5.3 /j/

The Nauruan phoneme /j/ is a palatal approximant. Unlike /j/ this phoneme never surfaces with any degree of frication. As discussed in §4.1.10, this phoneme appears to have been conditioned historically after stem-initial pre-Nauruan *j; e.g. *pitu-ua > *iju > e-/iju ‘seven’. Figure 2.45 provides spectrogram and waveform images of [j].

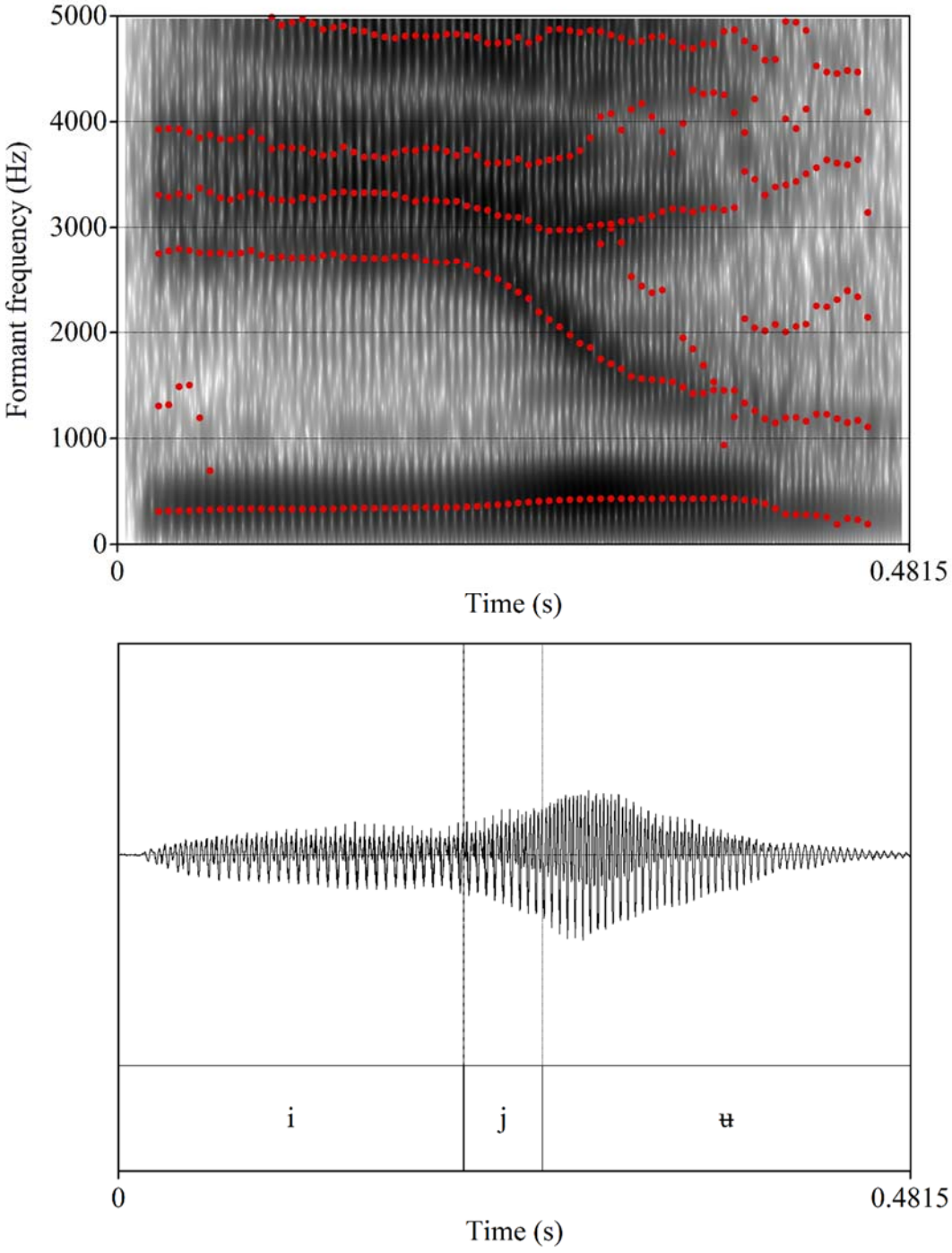

Figure 2.45 – Spectrogram and waveform: [j] in [ijʉ] ‘fish, sea creature’

2.2.6 Rhotics

Nauruan has two distinct rhotic phonemes. The first is an alveolar trill, /r/. The second is also an alveolar trill, but one which is articulated with greater obstruction of airflow. These two phonemes are represented here as a plain trill /r/ and a fortis trill /ř/.

Other authors have noted the existence of these two rhotics as well, beginning with Kayser (1936: 2), who describes both an *r* with an "ordinary pronunciation" and one with a pronunciation "peculiar to the Nauruan language". Regarding the articulation of the latter, Kayser states that "the tip of the tongue is raised towards the fore-part of the palate." Nathan (1973a: 482) also describes two distinct *r* sounds in Nauruan. One is described as having trill and flap allophones, and the other is called the "barred r", [ɾ̶], "a kind of r whose exact nature is unknown." Nathan suggests the latter is possibly palatalized, and that it is partly devoiced and fortis. In agreement with Nathan, Blumenfeld (2017) suggest that the two trills contrast in the presence or absence of palatalization.[31] This view was also adopted in earlier stages of the present research program (Hughes 2017), but has since been abandoned. There are apparent differences in palatalization as it is generally conceived (e.g. in the bilabial consonants [pʲ], [bʲ], [mʲ]) and in the articulation observed for [ř]. In terms of acoustics, the most salient contrast between /r/ and /ř/ appears to be the degree of vocal tract constriction rather than palatal secondary articulation. The phonological distinction between the two has been attributed here to the feature [±consonantal] (Table 2.1.2), though the true phonological nature of the distinction remains unclear.

Furthermore, there is some evidence to suggest that /r/ and /ř/ are merging into a single

[31] Blumenfeld also proposes that both rhotics contrast phonemically for length, suggesting four rhotic phonemes /r/, /rː/, /rʲ/, /rːʲ/. The present study finds no contrastive length differences between the rhotics.

phoneme for at least some Nauruan speakers. The difference between these phonemes can be difficult to perceive, and it is not certain that it is being consistently articulated by all speakers, nor that all speakers recognize a difference. Both rhotic phonemes are variably realized as flaps, which might be contributing to a loss of contrast. There is little doubt that Nauruan has, or has had, two distinct rhotics even if there is an ongoing merger. Some consultants have on occasion pointed out the difference between the two phonemes, and there is also evidence that the two phonemes developed independent of one another historically (§4.1.13, §4.1.14).

Additionally, either rhotic can sometimes be realized with a fully or partly devoiced articulation, which is fricated rather than trilled. This phonetic variant might be transcribed [r̝̊], a devoiced, non-trilled obstruent articulated at the alveolar ridge. Occurrence of this speech sound is unpredictable. One consultant, a woman in her 30s, has a strong tendency towards this articulation of the rhotics. Her case appears to be atypical in the frequency with which this variant is used, and this does not appear to be due to pathological speech. She is perfectly capable of articulating voiced trills, and the same kinds voiceless articulations do occur with other speakers with less frequency. This variant may have a sociolinguistic function, or some other function which has not yet been identified.

2.2.6.1 /r/

The Nauruan phoneme /r/ is a plain alveolar trill. The phonetic length of /r/ varies, and it is sometimes realized as a flap [ɾ] or as the devoiced variant [r̝̊] discussed in the preceding section. Table 2.2.20 is a list of minimal and near-minimal pairs showing that /r/ is a contrastive speech sound in Nauruan. Figure 2.46 is an ultrasound image of the tongue position during the articulation of [r]. Spectrogram and waveform images of [r] tokens are provided in Figures 2.47 and 2.48.

Table 2.2.20 – Contrastive pairs, /r/

a.	/ri-n/	[rin]	‘droplets of’	cf. [řin]	‘backbone (of)’
b.	/e-or/	[eor]	‘lobster’	cf. [eoř]	‘reef’
c.	/eri/	[eri]	‘dig’	cf. [eři]	‘jump, leap’
d.	/a-re/	[are]	‘come, arrive’	cf. [aře]	‘steal’
e.	/a-ro/	[aro]	‘two’	cf. [ado]	‘nine’

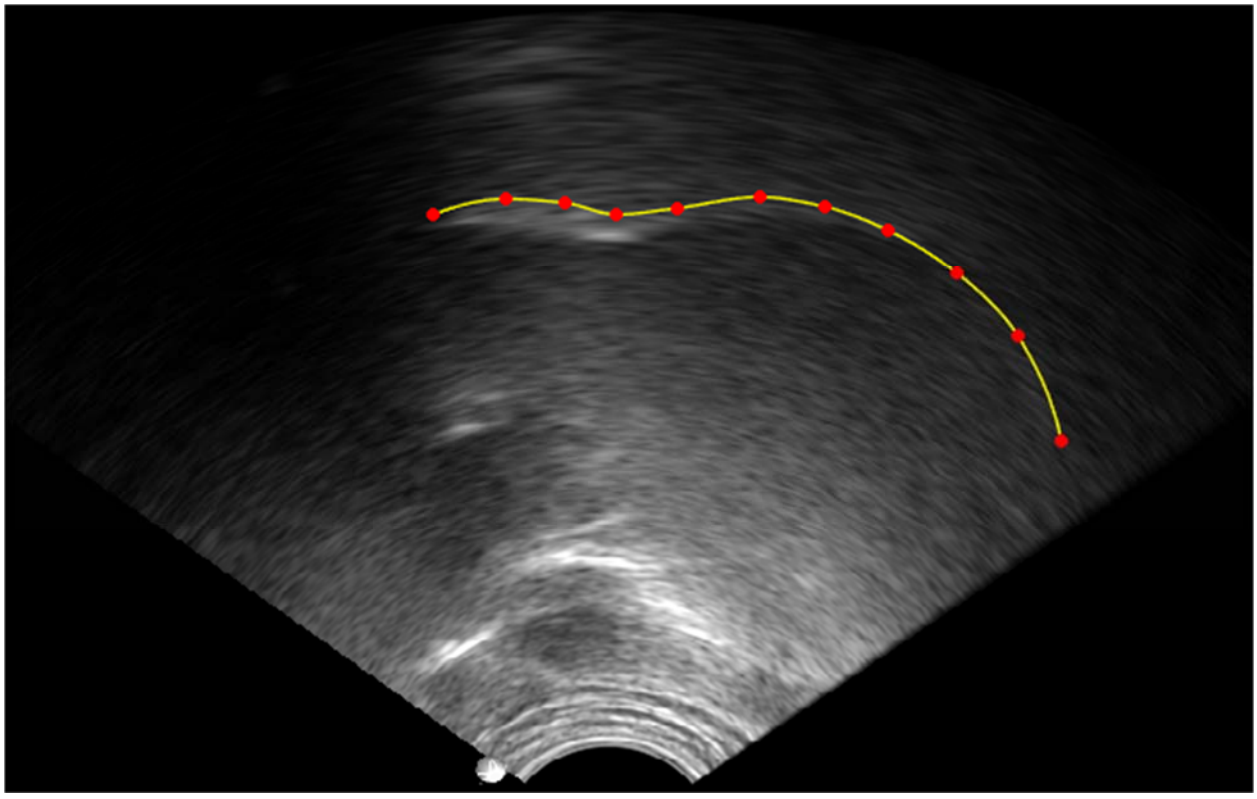

Figure 2.46 – Ultrasound image of trill articulation: [r] in [dɪræ] ‘sin, debt’

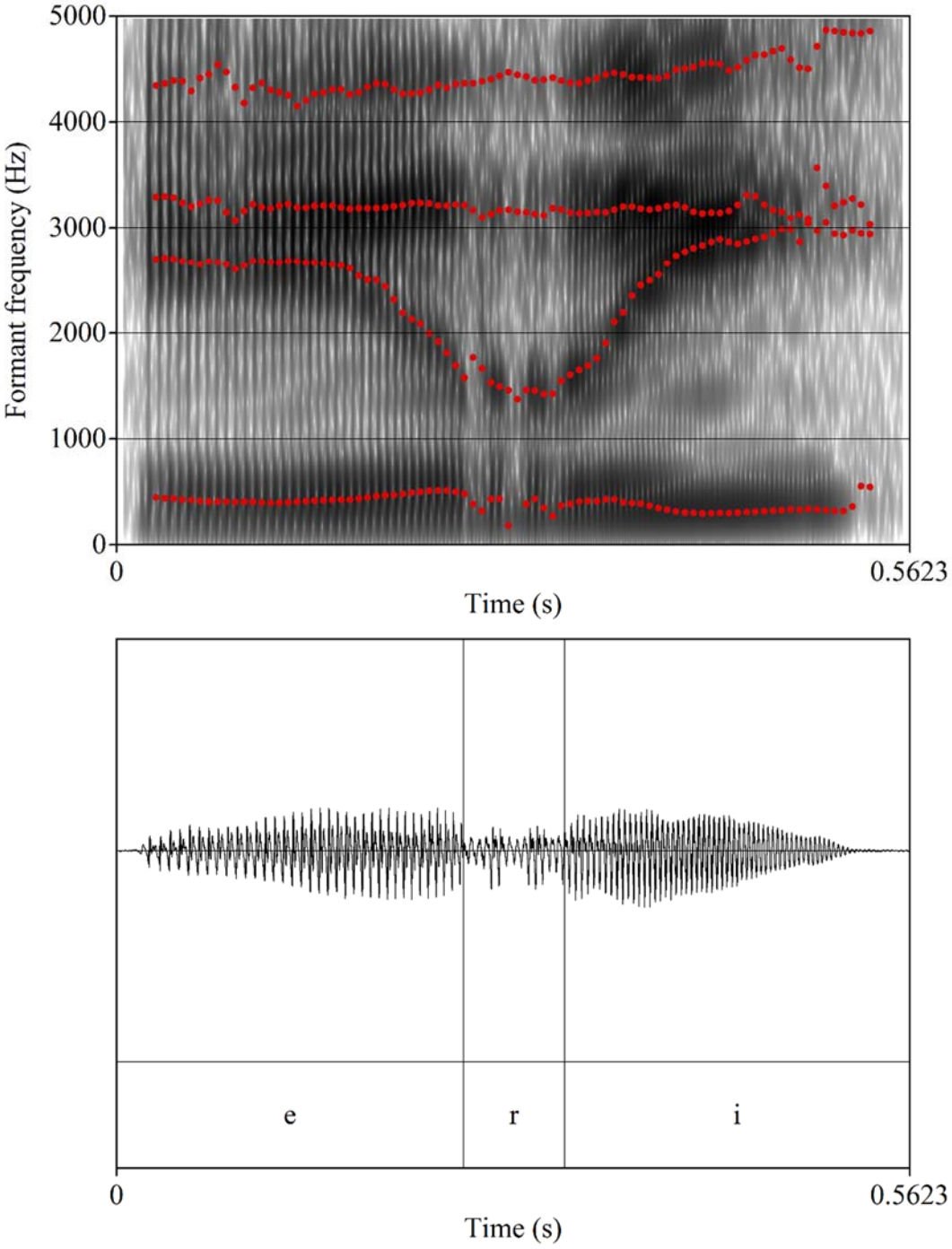

Figure 2.47 – Spectrogram and waveform: [r] in [eri] ‘dig’

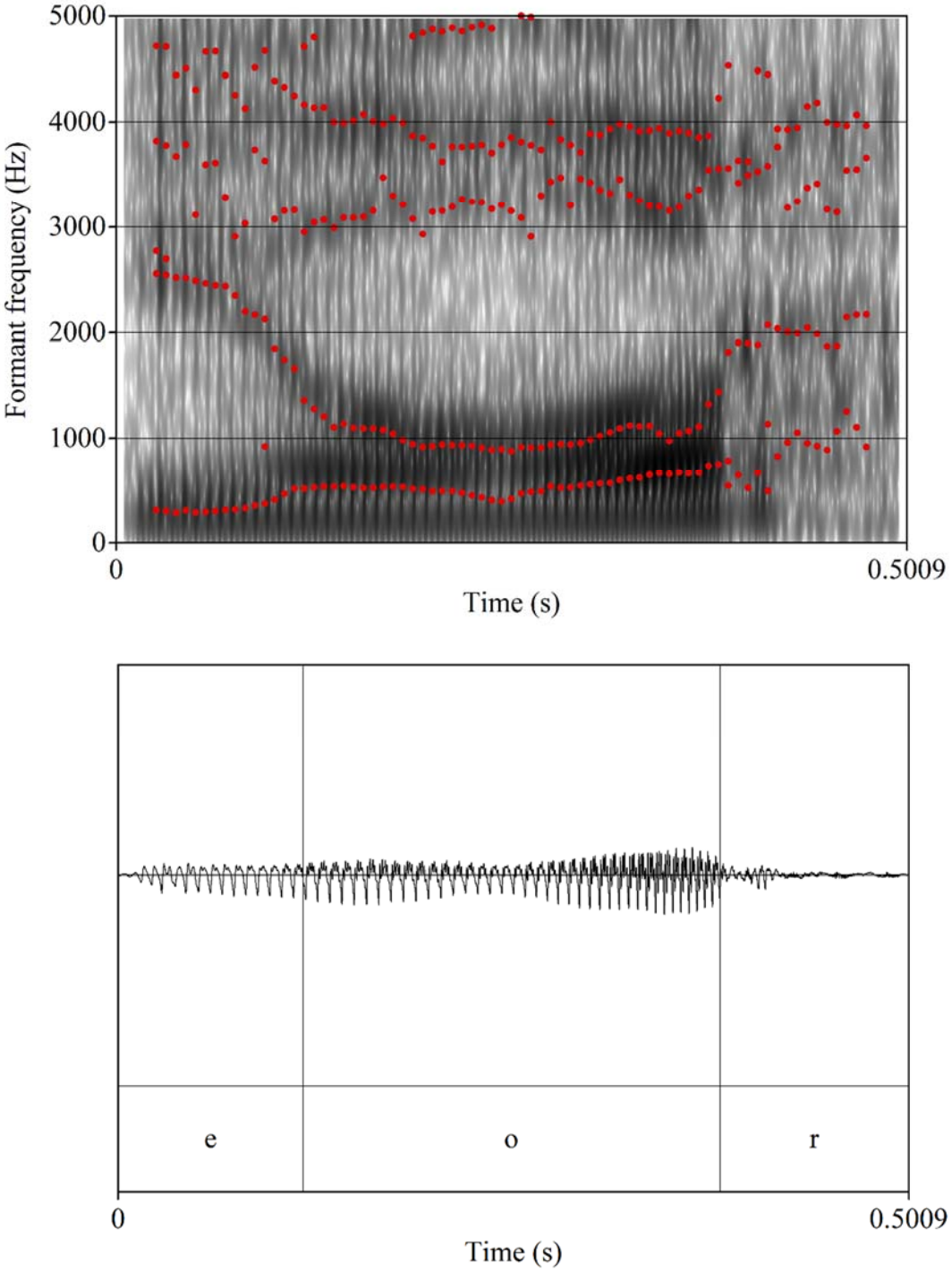

Figure 2.48 – Spectrogram and waveform: [r] in [eor] ‘lobster’

2.2.6.2 /ř/

The Nauruan phoneme /ř/ is an alveolar trill which has a greater degree of airflow obstruction than /r/. Earlier work has described this phoneme as being possibly palatalized (Hughes 2017, Blumenfeld 2017, Nathan 1973a), though this characterization is abandoned under the present analysis. As with /r/, the phonetic length of /ř/ varies, and it is sometimes realized as a flap [ɾ] or as the devoiced variant [r̝̊] which is discussed in the introduction of the present section (§2.2.6). Table 2.2.21 is a list of minimal and near-minimal pairs showing that /ř/ is a contrastive speech sound in Nauruan. Figure 2.49 is an ultrasound image of the tongue position during the articulation of [ř]. Spectrogram and waveform images of [ř] tokens are provided in Figures 2.50 and 2.51.

Table 2.2.21 – Contrastive pairs, /ř/

a.	/ře-n/	[řæn]	‘blood of’	cf. [ræn]	‘branch of’
b.	/ře-n/	[řen]	‘leaf of’	cf. [ret]	progressive aspect marker
c.	/řamʸ-n/	[řɐmʸən]	‘his/her forehead’	cf. [rɐmʸit]	‘pick fruit’
d.	/ænoř/	[ænoř]	‘reef, at the reef’	cf. [ænor]	‘throat’
e.	/e-řɨ/	[eřɨ]	‘a bone’	cf. [erɐ]	‘grow’

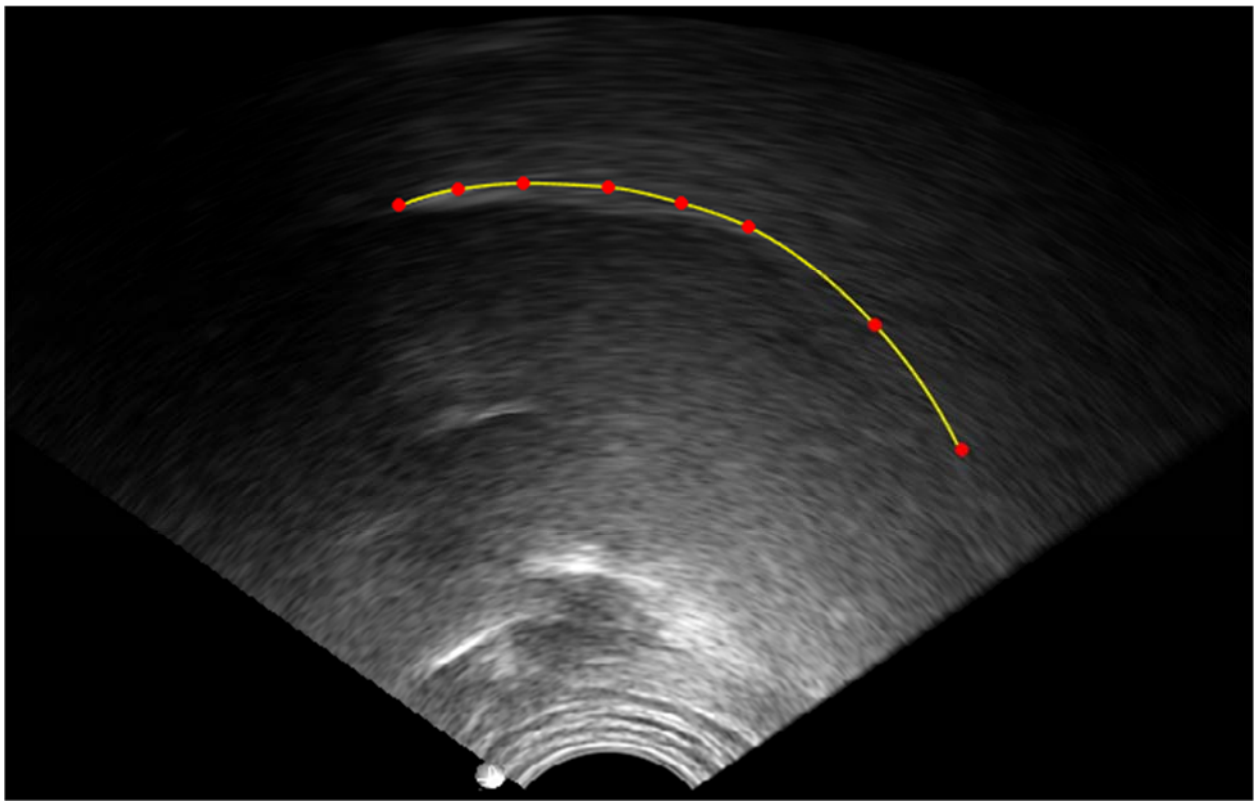

Figure 2.49 – Ultrasound image of trill articulation: [ř] in [ræn] ‘blood (of)’

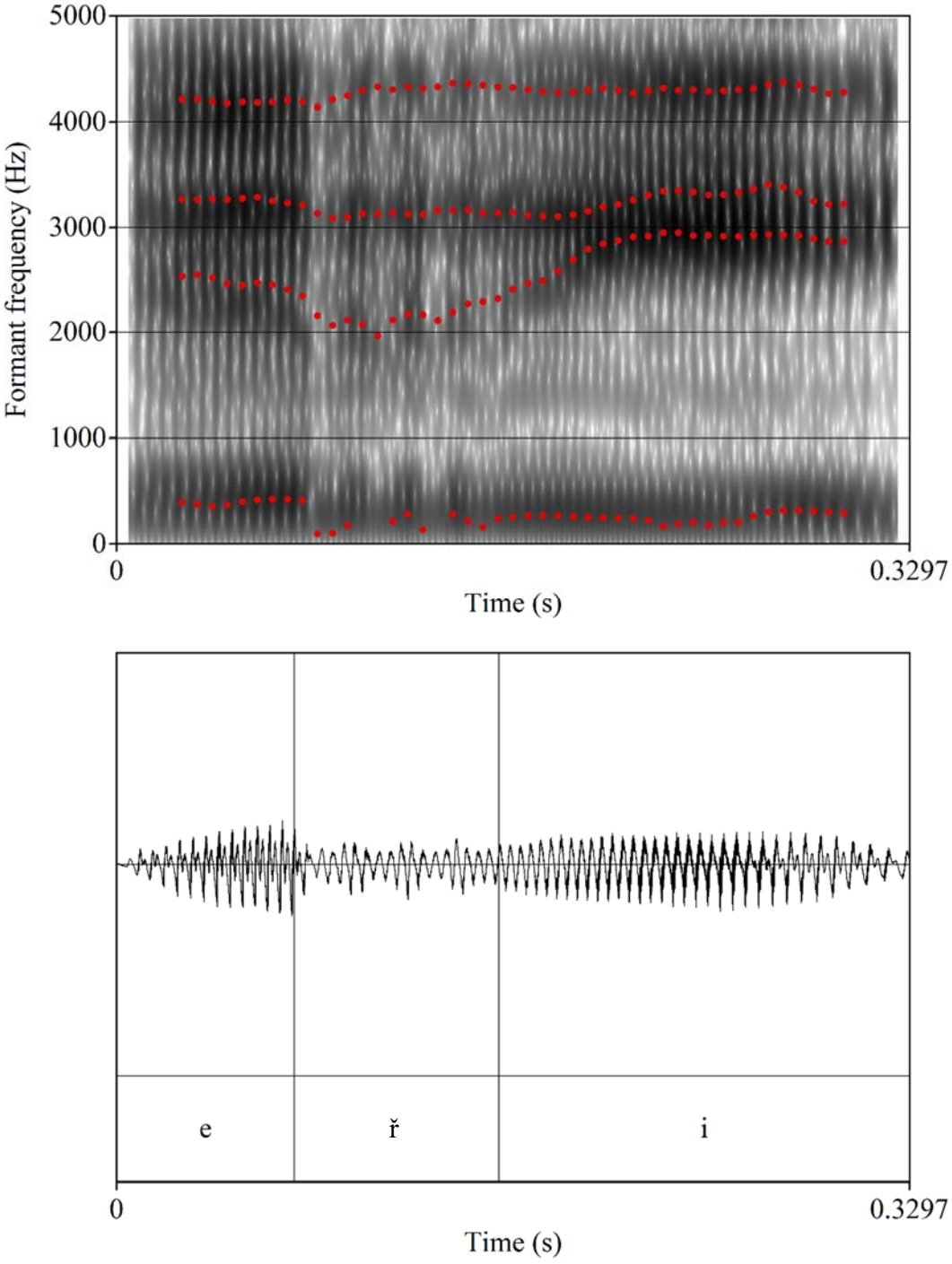

Figure 2.50 – Spectrogram and waveform: [ř] in [eři] ‘jump, leap’

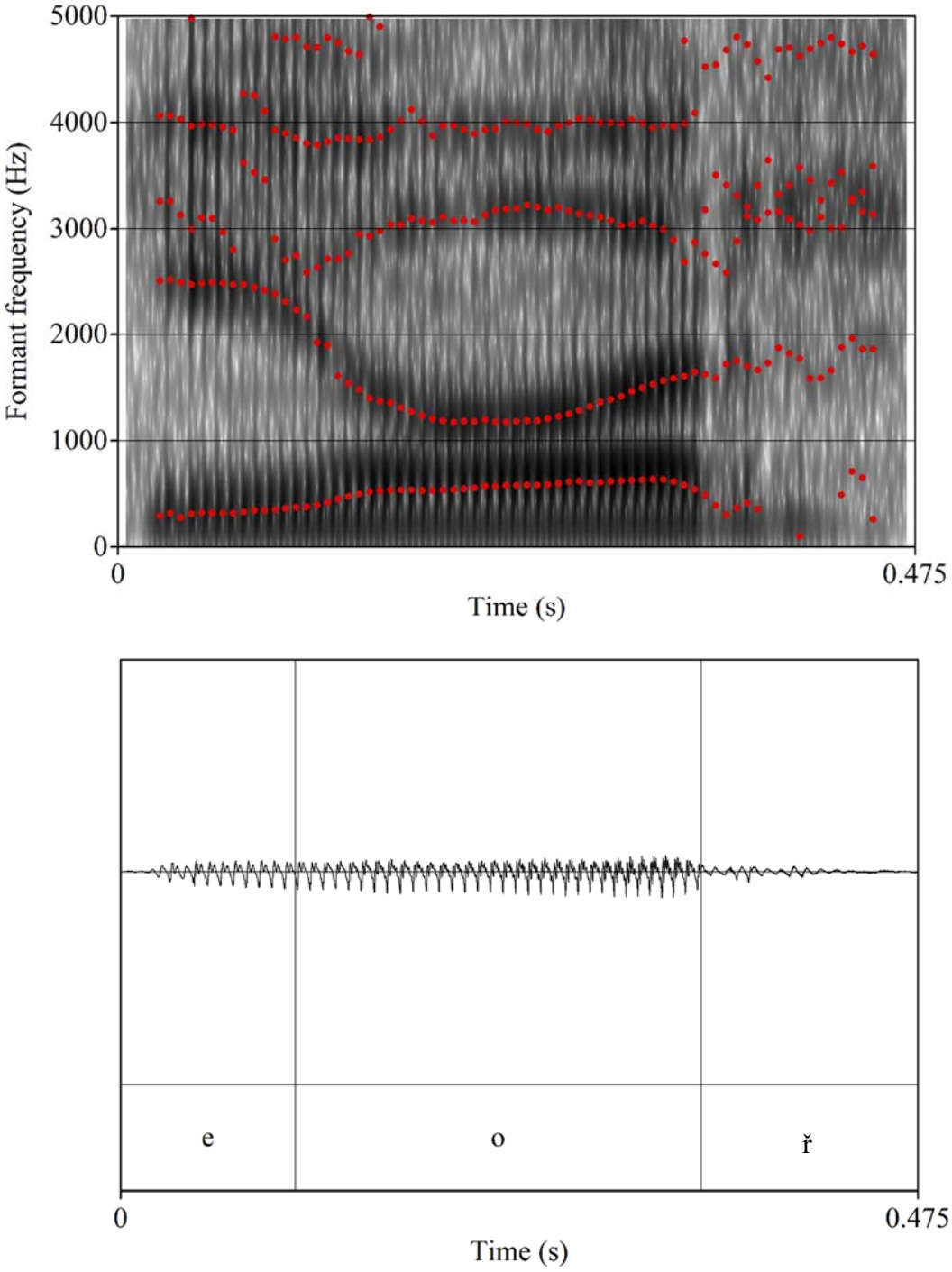

Figure 2.51 – Spectrogram and waveform: [ř] in [eoř] ‘reef’

2.2.7 Nauruan and Other Micronesian Consonant Inventories

The Nauruan consonant inventory parallels other consonant inventories in the Micronesian family. It has a series of velarized bilabials, as occurs in nearly all Micronesian languages, and additionally has a series of palatalized bilabials like that which occurs in at least Marshallese (Choi 1995, 1992). Nauruan has lenited reflexes of PMc *t, as occurs in many of the Micronesian languages.[32] The voiceless Nauruan stops appear to continue pre-Nauruan obstruent geminates, which in turn result from vowel syncope between like consonants, a diachronic process which is observed across the family (§4.2.3.5). In Nauruan and Marshallese, this has also resulted in phonemically long bilabial nasals. Chapter 4 details additional parallels between the Nauruan consonants and those of other Micronesian languages, and provides evidence for Nauruan's classification within the Micronesian family.

2.3 Nauruan Vowels

This section describes the Nauruan vowels, and includes discussion of their phonological representation and their phonetic characteristics. The Nauruan vowels have proven to be challenging for phonological analysis. There has been difficulty in precisely determining the vowel phoneme inventory (Nathan 1973a: 481), particularly in relation to the central vowels [ɨ] and [ɐ].[33] Blumenfeld (2017) has suggested that both central vowels are phonemes,[34] while Nathan's (1973a) analysis considers both to be phonetic variants. The phonemic status of [ɨ] and [ɐ] under the present analysis is discussed further in §2.3.2, though for now it will suffice to say

[32] In Nauruan the lenited reflex is /j̰/, and it is variously *j*, *s*, or *h* in other Micronesian languages. Micronesian *t lenition is generally associated with adjacent non-low vowels, including *i, *e, and in Pohnpeic languages also *u (Bender et al. 2003: 5).

[33] The symbol [ɐ] is equivalent to [ʌ] where it is used by other authors (Nathan 1973a; Blumenfeld 2015, 2017).

[34] Though Blumenfeld also suggests they lack contrast in certain phonological environments.

that the Nauruan central vowels do not fit neatly into the traditional categories of phoneme and allophone.

In the current section each vowel phoneme is given its own subsection describing its acoustic properties (§2.3.2 – §2.3.4). In each subsection, the phonological processes which target the phoneme are listed and sets of contrastive word pairs are presented.

To illustrate the acoustic space of the Nauruan vowel inventory, vowel plots are presented in Figures 2.52 – 2.55 below. Figure 2.52 – 2.54 are normalized vowel plots generated using 25 tokens of each vowel.[35] Figure 2.52 includes plots for each individual token, while Figure 2.53 shows only ellipses denoting one standard deviation from the mean values for each vowel. Figure 2.53 also divides the vowel plot into sections associated with the dorsal features that define each vowel (see Table 2.1.4), indicated by the dashed lines. Figures 2.54 – 2.55 provide charts using the raw, non-normalized data. Vowel tokens are taken from recorded fieldwork sessions with 5 different speakers, including two men in their 40s, a woman in her 20s, a woman in her 30s, and a woman in her 60s. Normalization and plotting was carried out with the Vowel Normalization and Plotting Suite (NORM), using the Bark Difference Metric method (Thomas and Tyler 2015). Note that schwa [ə] is not considered a phoneme and is not included in these vowel plots. It occurs in place of reduced vowels or epenthetically across word and morpheme boundaries.

[35] Normalization is a process which filters out variations in vowel measurements caused by physiological differences between speakers. This allows for the generation of a vowel plot using data from multiple speakers that will not be distorted by individual differences in fundamental frequency (F_0).

Key for plots in figures 2.52 – 2.55 [36]

Plot text	i	e	a	I	uh	ah	u	o
IPA	[i]	[e]	[æ]	[ɪ]	[ɐ]	[a]	[u]	[o]

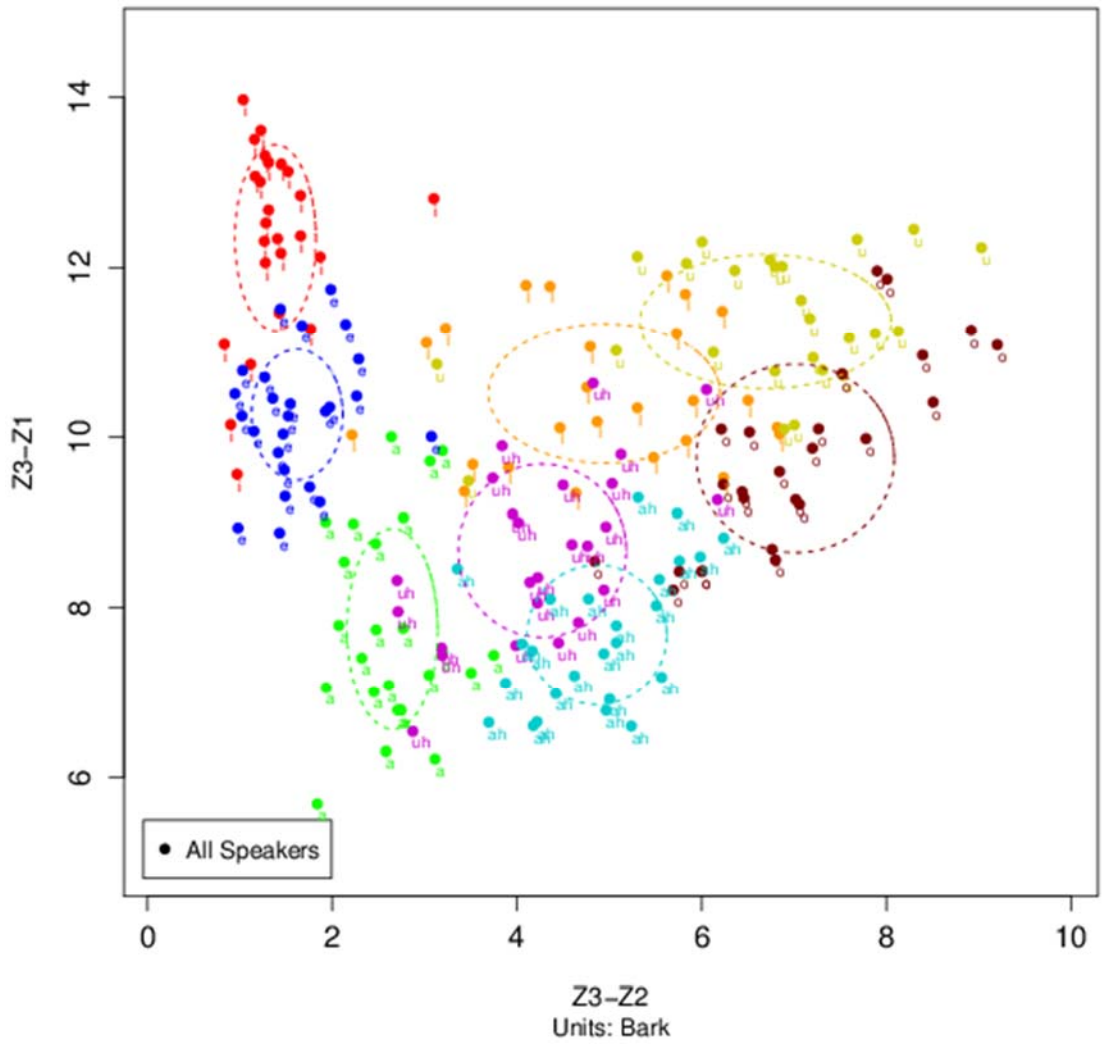

Figure 2.52 – Nauruan Vowel Plot: Normalized (Bark difference metric)

- 25 tokens of each vowel

[36] Non-IPA characters are used in the plot due to font limitations in NORM.

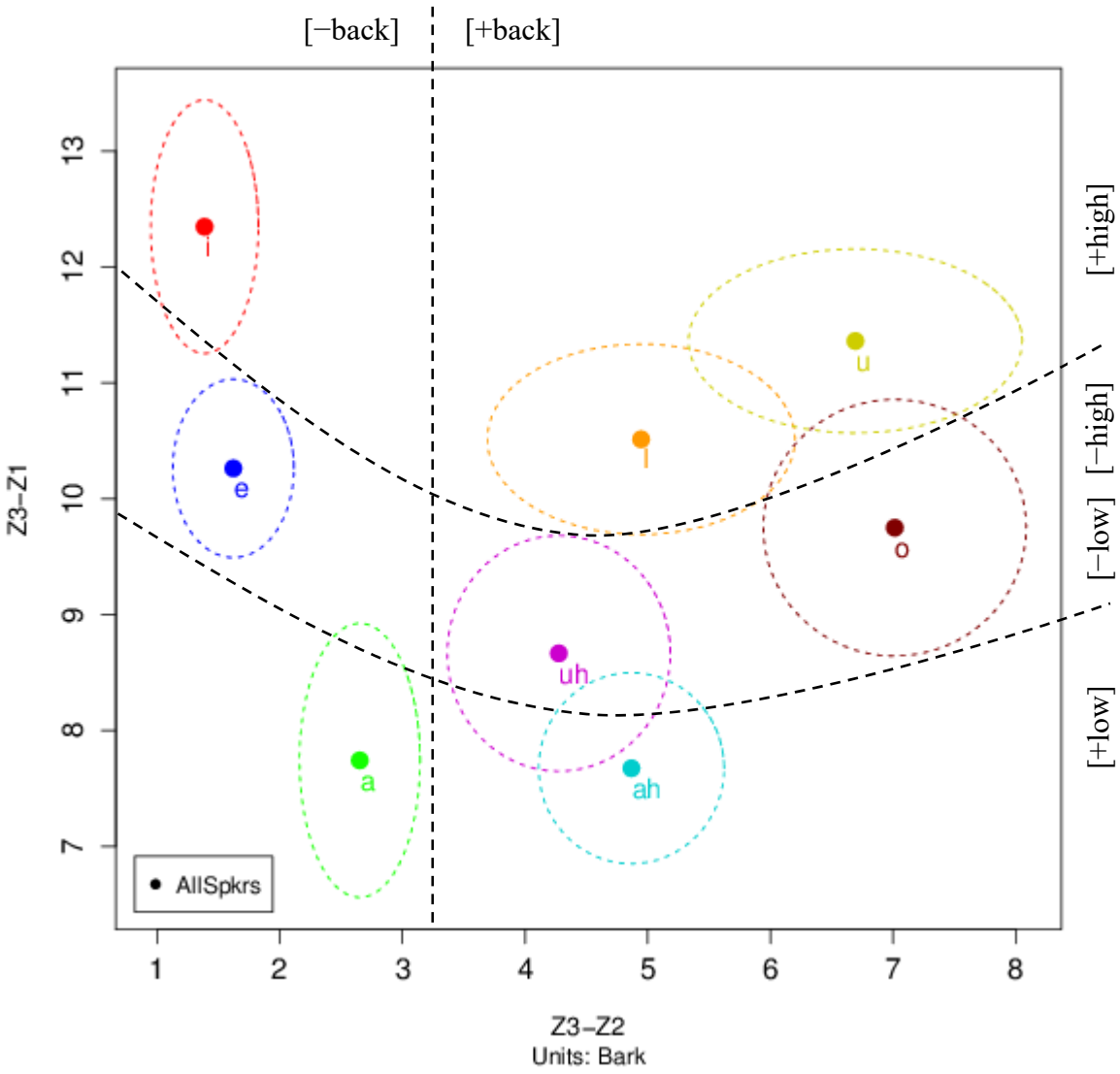

Figure 2.53 – Nauruan Vowel Plot: Mean formant values, normalized

- Ellipses indicate one standard deviation from the mean across 25 tokens
- Dashed lines indicate boundaries for distinctive features
- [u] and [o] are additionally [+round]

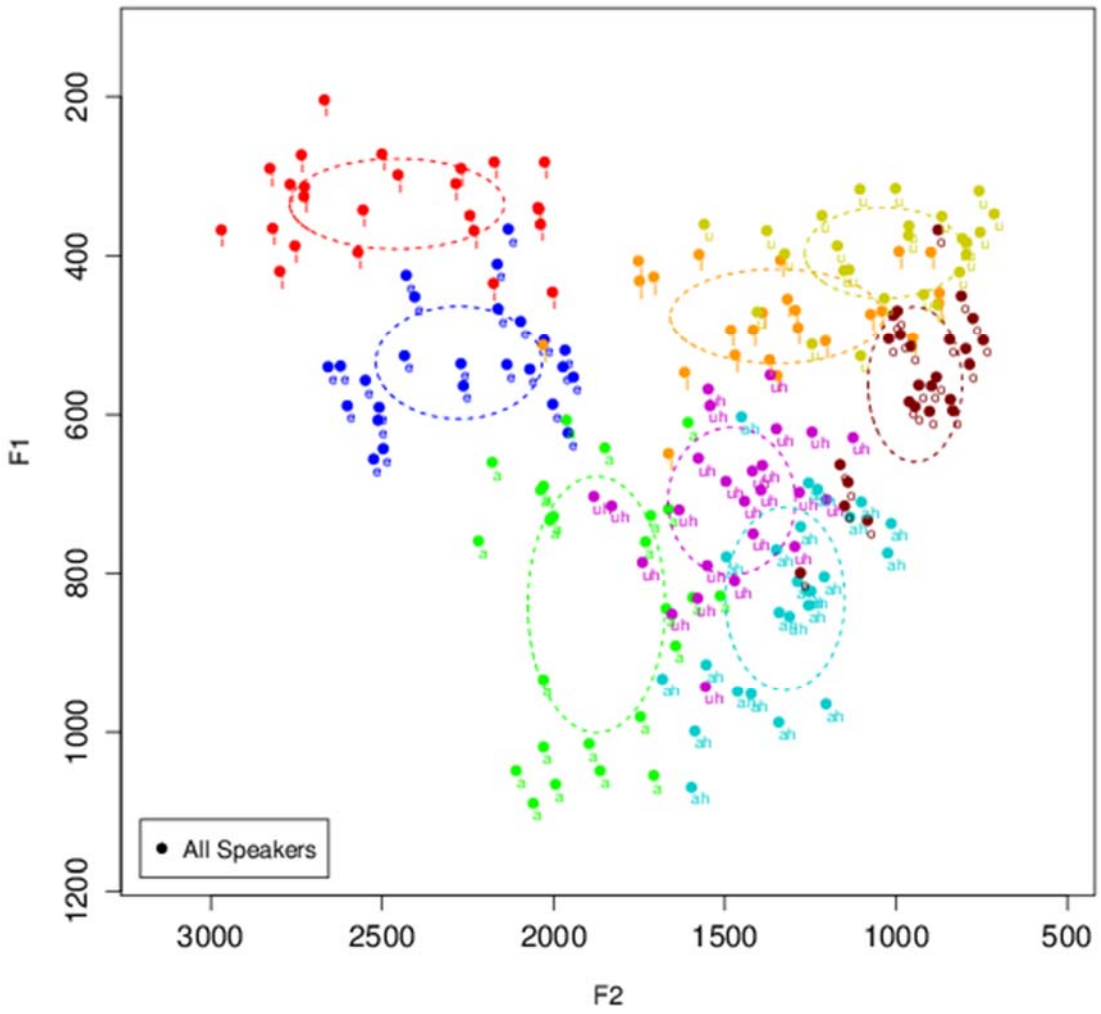

Figure 2.54 – Nauruan Vowel Plot: Non-normalized

- 25 tokens of each vowel

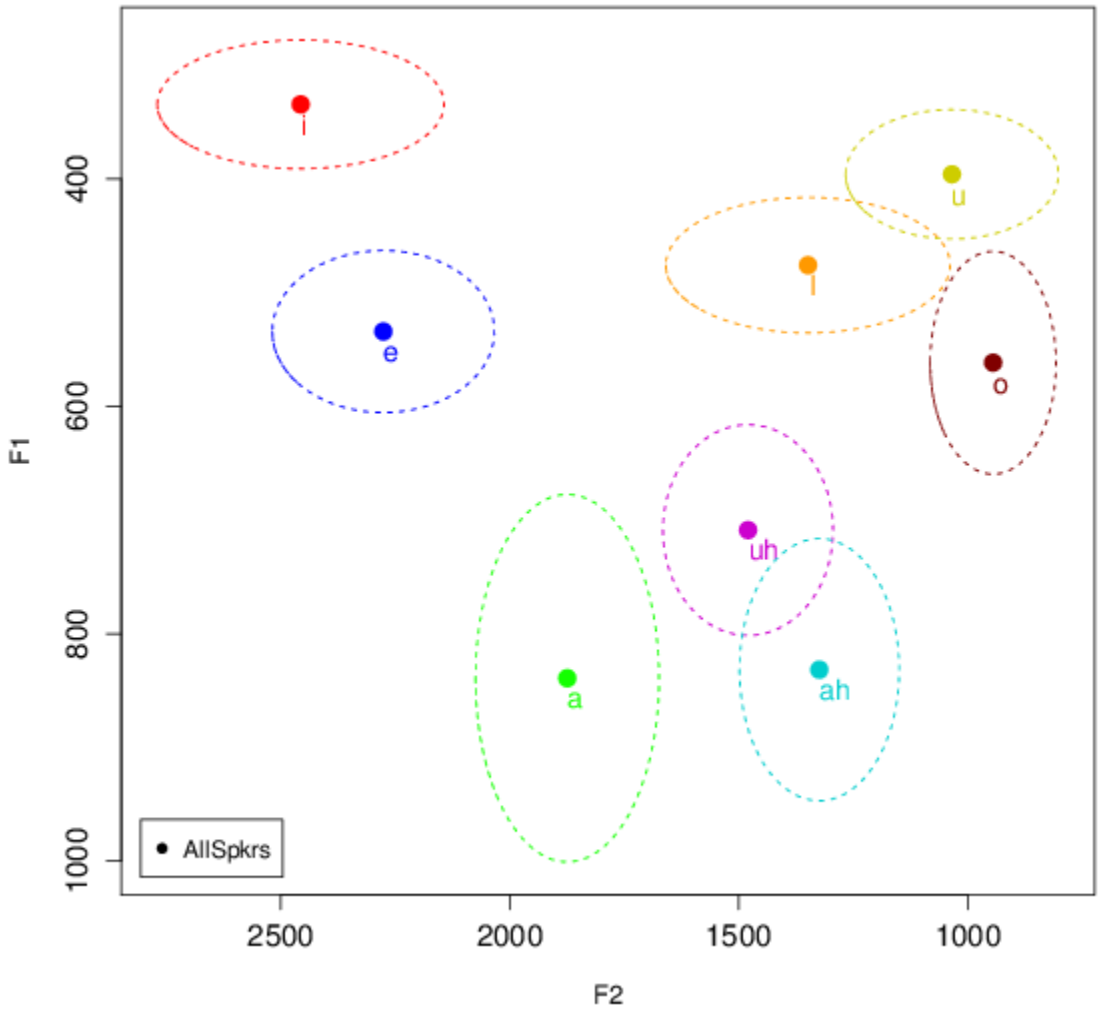

Figure 2.55 – Nauruan vowel plot: Mean formant values, non-normalized

- Ellipses indicate one standard deviation from the mean

2.3.1 Vowel Length

In the present research program no minimal pairs have been identified that would suggest length is a phonologically contrastive feature for Nauruan vowels.[37] The claim that vowel length is not contrastive in Nauruan goes against Nathan's (1973a) analysis, though it is in agreement with Blumenfeld (2017).

The Nauruan vowels are generally shorter in unstressed positions and longer in stressed positions, as would be expected, though there are exceptions depending upon syllable structure and the presence of certain coda consonants. This is discussed in more detail in the following sections. Chapter 3 provides a full treatment of Nauruan syllable structure and stress, including description of the phonetic correlates of stress.

2.3.2 Central vowels

The Nauruan central vowels do not fit neatly into the traditional categories of phoneme and allophone, where these are defined in terms of predictability. The central vowels are predictable in some environments, in which case they behave like allophones; but they are unpredictable in other environments, in which case they are either phonemes or free variants. This phonological pattern is difficult to capture using a binary categorization. Phones like the Nauruan central vowels, which are neither fully predictable nor fully unpredictable, might instead be described as quasi-allophones.[38] This situation is not unique to Nauruan, as described in the work of Hall (2009, 2013), who argues that phonological contrast can be conceptualized as probabilistic rather than exclusively binary. Traditionally, segments are allophones of the same

[37] Though it is hypothesized that Nauruan had long vowels historically (§4.1.24).

[38] Other terms have been used for the same phenomenon, including "semi-phoneme" and "marginal contrast" (Hall 2009).

phoneme if their respective distributions are entirely non-overlapping (Hall 2009: 12, 30). However, there are attested cases where two segments are in complementary distribution most of the time, yet they appear to be contrastive in one or more phonological environments. For example, Hall (2009: 17-18) points out that in Canadian English there are roughly 66 different segments before which [ɑi] and [ʌi] can occur, but they only appear to be contrastive before [ɾ]; [ɹʌiɾɻ] 'writer', [ɹaiɾɻ] 'rider'. Under Hall's account, Canadian English [ai] and [ʌi] are quasi-phonemic (or quasi-allophonic).

Consider also cases of free variation. The Nauruan central vowels freely vary with non-central vowels in certain phonological environments, as discussed in the following sections. Free variation is also a kind of unpredictable distribution, though it does not contribute to phonological contrast. For reference, Table 2.3.1 defines the concepts of phoneme, allophone, free variant, and quasi-allophone in terms of contrast and predictability.

Table 2.3.1 – Phonological contrast and predictability

	Contrastive	Predictable		
Phoneme	Yes	No		
Allophone	No	Yes		
Free variant	No	No		
Quasi-allophone [39]	Yes	No	*environment α*	(phonological contrast)
	No	Yes	*environment β*	(allophonic conditioning)
	No	No	*environment γ*	(free variation)

[39] Quasi-allophones are contrastive (phonemes) in one or more phonological environments, but are simultaneously conditioned (allophones) or free variants in other environments.

2.3.2.1 /a/

Phonological processes:

a. a → ɐ / {Cʲ, j, j, i} ___ Table 2.1.5(f)

b. a → ɐ / (Cα) ___Cβ]σ Table 2.1.5(g)

Cα ≠ w, Cβ ≠ w r n

c. a → ɐ / ___]σ (variable) Table 2.1.5(h)

Nauruan /a/ is a low central vowel. It is realized as [ɐ] in the environments specified in 2.3.2.1a-b above and can vary between [a] and [ɐ] in open syllables (2.3.2.1c). The non-low variant [ɐ] occupies the vowel space immediately above [a], somewhat overlapping its acoustic range, and is generally shorter in duration. The phonemic status of [ɐ] is discussed further in the following section. The extent to which [ɐ] behaves like allophone of /a/ is discussed presently.

There appear to be two environments where /a/ is predictably realized as [ɐ]. The first is following palatalized consonants and high front vowels. This can be viewed as a process of height assimilation. Because the resulting allophone [ɐ] is neither high nor low (it is a mid vowel), this process can be modeled as the progressive spreading of the feature [–low], as illustrated in Figure 2.56 below.

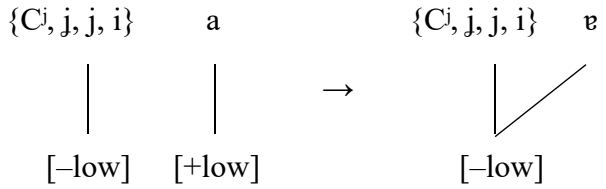

Figure 2.56 – /a/ raising, height assimilation

/a/ raising also appears to occur in certain closed syllables. So far, the relevant syllables appear to be those that do not have a /w/ in onset position, and which do not have any of the sonorant consonants /w/, /r/ or /n/ in coda position.[40] The class of coda consonants that condition /a/ raising appears to be the set of Nauruan non-sonorant consonants with the addition of the nasals [m] and [ŋ].

The process of Nauruan /a/ raising in the relevant closed syllables may result from formant undershoot (Lindblom 1963; Fourakis 1991). The phonetic shortening of vowels is associated with undershoot of acoustic targets, and by extension an overall shrinkage of the vowel space (Padgett and Tabian 2005: 16). This can cause shortened vowels to shift toward the center of the vowel space, as is commonly observed in reduced syllables across languages. In the case of a low vowel like /a/, shrinkage of the vowel space effectively results in raising, as illustrated in Figure 2.57.[41] On average, F_1 values do not quite reach the target range for /a/ when they occur in shortened tokens.[42] There is evidence for this in Lindblom's (1963) study of formant undershoot phenomena, where it is shown that F_1 tends to stay true to the acoustic target of the vowel regardless of duration, with the exception of [a]. The F_1 values of [a] tokens lower

[40] In earlier stages of the present research program, the consonant /j/ was included among those that fail to condition /a/ raising in coda positions. This appears to to have resulted from misperception and incorrect analysis of the relevant words. Consider, for example, the word /ara-ej/ → [ɐ.ra.ˈej] 'throw (at)', which was earlier analyzed as /araj/ → [ɐ.ˈraj] 'throw'. There are at present no clear examples of underlying tautosyllabic /aj/ or /aj/ sequences. This apparent distributional restriction may result from historic vowel changes *a > *æ or *a > *e, which were conditioned by following instances of *e or *i (allowing for an intervening consonant; §4.1.23). Those two vowels also conditioned the change *t > *j where they were adjacent to *t, which is the only known source for Nauruan /j/.

[41] Formant undershoot often involves the shifting of vowels towards the center of the vowel space, as illustrated here, but it does not exclusively involve vowel centralization. As Fourakis (1991: 17) and Lindblom (1963: 1780) point out, vowel reduction does not necessarily lead to a realization which is central. For example, Fourakis notes that the F_2 value of a low front vowel [æ] after a velar stop [g] would be greater (more front) in a very short token as compared to a less reduced token, since the "velar pinch" of F_2 and F_3 keeps the F_2 value high nearer the velar stop release point. Shortness, in this case, is correlated with distance further away from the center of the vowel space. The outcome of formant undershoot can depend in part on phonetic context, though this seems to be more significant for F_2 than for F_1 (Fourakis 1991: 1776).

[42] Though there is a degree of overlap in the acoustic ranges of [a] and [ɐ], as shown in Figures 2.52 – 2.55.

as the duration shortens (Lindblom 1963: 1778-1779), as observed in Nauruan. This suggests that cutting short the duration of a vowel with an acoustically low target may be particularly likely to cause formant undershoot (raising).

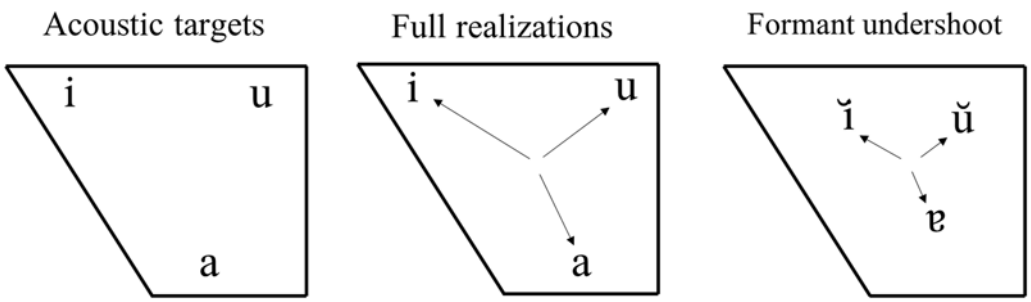

Figure 2.57 – Formant undershoot

The lower mid central vowel [ɐ] is not only higher than [a], but generally has a shorter duration. This would be an expected result of formant undershoot, where /a/ stays nearer to the center of the vowel space when phonetically shorter, resulting in [ɐ].

Figure 2.59 displays the length in milliseconds of 21 tokens of [ɐ] and 25 tokens of [a]. The token are the same as those that appear in vowel plots in Figures 2.52 – 2.55, though tokens of [ɐ] that resulted from raising after palatalized consonants or high front vowels are excluded. This is considered to result from an assimilatory raising process (2.3.2.1a), which does not involve formant undershoot from phonetic shortening. As the graph shows, individual tokens of [ɐ] can sometimes be longer than tokens of [a], and vice versa, but the length correlation bears out on average.

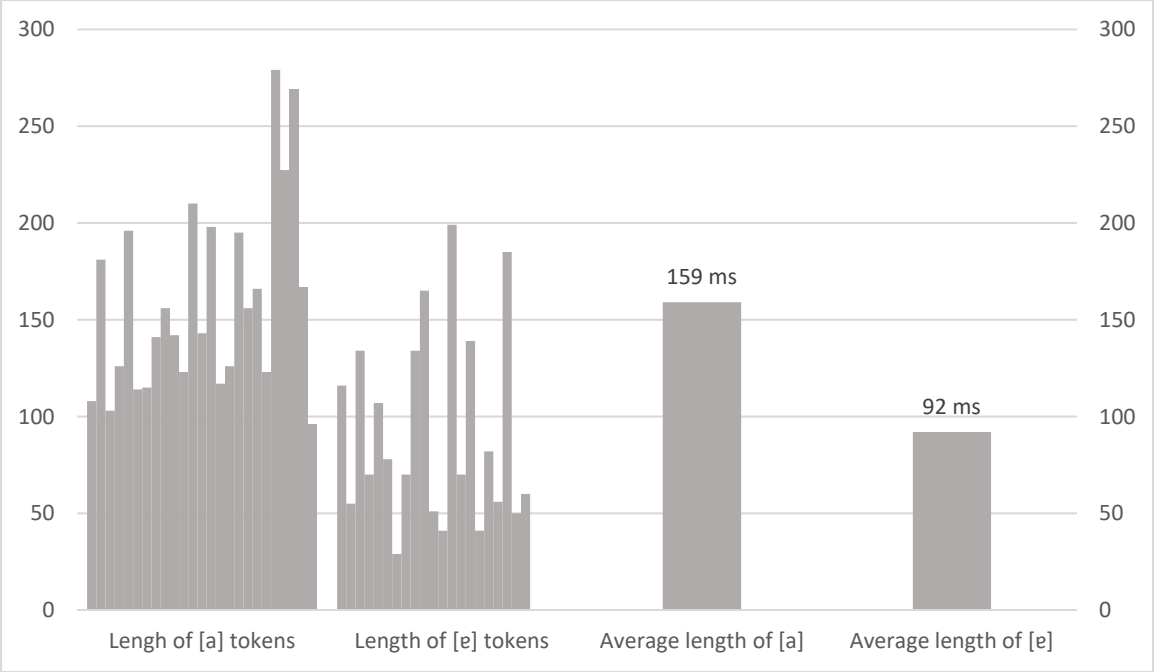

Figure 2.58 – [a] vs. [ɐ] length in milliseconds

Whether /a/ is shortened and raised is determined in part by the onset and coda consonants that accompany it. In open syllables, /a/ can vary freely between [a] and [ɐ], except that [w] onsets appear to inhibit [ɐ]. Among closed syllables, where an /a/ nucleus occurs with one of /w/, /r/, or /n/ in coda position no shortening appears to occur. It is plausible that /w/ and /r/ restrict airflow less than other coda consonants, and therefore have been less prone to shortening preceding tokens of /a/. The reason for the exclusion of /n/ from the conditioning class of codas has not yet been investigated, though it is possible that /n/ is on average shorter than the other nasals, making it less likely to condition shortening in preceding vowels.

Table 2.3.2 describes the syllables that condition /a/ shortening and raising. This table is only intended to illustrate how surrounding sounds can be grouped according to the role they play in /a/ shortening and raising. It remains difficult to say what distinctive features could be responsible for distinguishing /w/, /r/, and /n/ from the class of codas that seem to condition /a/

raising. If it were not for the exclusion of /n/ from the conditioning class, it might be argued that the class is defined by the features [−syllabic, +consonantal] (presuming the distinction between /r/ and /ř/ is in the feature [±consonantal]). The difficulty in defining the class of conditioning codas in terms of features suggests that the present assessment may eventually require revision, or that Nauruan contains a class of sounds that cannot be defined with the generally accepted set of distinctive features, at least not without recourse to a disjunction.

Table 2.3.2 – Phonetic variation of /a/ in CaC syllables

Onset	Nucleus	Codas
w	[a]	(C)
C	[a]	w n r
C≠w	[ɐ]	m ŋ ř b d g p t k [43]

Tables 2.3.3 and 2.3.4 list some contrastive pairs for /a/ and some words containing its allophone [ɐ], respectively.

Table 2.3.3 – Contrastive pairs, /a/

a.	/adan/	[adan]	‘go through’	cf. [edon]	‘pour (into)’
b.	/ŋan/	[ŋan]	‘come from’	cf. [ŋæm]	‘in case, lest’
c.	/d-arar/	[darar]	‘black noddy bird’	cf. [dorer]	‘speech, language’
d.	/ean/	[ean]	‘vomit’	cf. [eon]	‘cover, bury’
e.	/ear-n/	[earən]	‘straightened’	cf. [eærʉm]	‘dogtooth tuna’

[43] Secondary articulations are lost in word-final positions, and so are not included here.

Table 2.3.4 – Allophonic [ɐ]

a.	/ibʲibʲagi/	[ibibʲɐgi]	‘happy’
b.	/iaku/	[iɐku]	‘poison’
c.	/e-ŋab/	[eŋɐp]	‘elder, leader’
d.	/eař/	[eɐř]	‘manner, behavior’

2.3.2.2 [ɐ]

An account of [ɐ] as an allophone of /a/ is provided in the preceding section. The present section goes into some additional detail regarding the phonological status of [ɐ].

In open syllables, [ɐ] and [a] occur in free variation, with [ɐ] occurring commonly in shorter tokens. In closed syllables, onset and coda consonants condition the realization of /a/ as described in the preceding section. It follows that in closed syllables both [a] and [ɐ] fit the traditional definition of an allophone, in that they are predictable variants. Even so, free variation between [a] and [ɐ] in some cases makes [ɐ] unpredictable.

One might consider free variation to be a type of allophony but to the extent that allophones are defined by predictability, free variants must be considered fundamentally different. Free variants are unpredictable by definition. Here, [ɐ] is considered to be a quasi-allophone, being predictable in some environments but not others. The phones [a] and [ɐ] do not appear to contrast phonologically in any environment, however, so there is no proposed phoneme /ɐ/ in the language.[44]

Blumenfeld (2017) has a different analysis of Nauruan [a]/[ɐ] contrast before rhotic codas

[44] Blumenfeld (2017) suggests that /ɐ/ is contrastive with /a/ before /g/, /ŋ/ and /r/, though the present analysis has not identified any examples of [a] immediately preceding [g] or [ŋ] where there is not also an accompanying [w] onset.

which highlights an interesting point of divergence in our interpretation of the data. Our analyses differ in which segments carry the contrast in the relevant words. It is proposed here that /a/ is realized as [ɐ] before coda /ř/, while coda /r/ does not condition the same change; e.g. /gar/ [gar] 'copy' vs. /gař/ [gɐř] 'go, travel by'.[45] There is phonetic evidence to support this interpretation, in line with the description of the rhotics in §2.2.6, though it should be reiterated that determining the phonetic difference between [r] and [ř] can sometimes be difficult. For reference, several minimal and near-minimal pairs showing phonemic contrast between /r/ and /ř/ are provided in Tables 2.2.20 and 2.2.21 (§2.2.6), as interpreted under the present analysis. Alternately, Blumenfeld's analysis places the contrast on the vowel, proposing that /ɐ/ is phonemic before coda /r/; e.g. /gar/ [gar] 'copy' vs. /gɐr/ [gɐr] 'go, travel (by)'.[46] The former analysis is adopted here because there is independent evidence that /r/ and /ř/ contrast in Nauruan, including in coda position, e.g. /eor/ 'lobster', /eoř/ 'reef', and because there is no clear evidence that [ɐ] is contrastive under the current analysis.

2.3.2.3 /ɨ/

The high central vowel /ɨ/ is a phoneme, an observation supported by the existence of minimal pairs as shown in Table 2.3.5 below, and by historical and comparative evidence for its independent development (§4.1.19, §4.1.21).

It is notable that [ɨ] occurs as a variant of both /ɨ/ and /u/, which makes it quasi-allophonic; it is unpredictable where it reflects underlying /ɨ/, but predictable in some environments where it is an allophone of /u/. As described in §2.3.4.1, [ɨ] can occur as either a free variant of /u/ or as a conditioned allophone of /u/.

[45] This word pair was used by one consultant to illustrate the difference between /r/ and /ř/.

[46] Blumenfeld interprets the rhotic coda in these two words as the same phoneme.

Table 2.3.5 – Contrastive pairs, /ɨ/

a.	/ɨræ/	[ɨræ]	‘they, them’ (pl.)	cf. [uræ]	‘spit’ (v.)
b.	/ɨga/	[ɨga]	‘yes’	cf. [ugo]	‘bathe’
c.	/iwɨ/	[iwɨ]	‘tail, end’	cf. [iwi]	‘louse’
d.	/ɨne/	[ɨne]	‘wound’	cf. [ine]	‘here’

The phoneme /ɨ/ appears to be realized as [ɐ] in some tokens of the first person singular possessive suffix, /-ɨ/. For example, there appear to be tokens of both [oŋɐ] and [oŋɨ], from /oŋ-ɨ/ meal-1SG.POSS ‘my meal’; and similarly [beɐ] and [beɨ], from /bʲe-ɨ/ hand.arm-1SG.POSS ‘my hand or arm’. These appear to be cases of phonetic variation. In the morphological structure of Nauruan words, possessive suffixes like /-ɨ/ always occur in word-final open syllables. These syllables are unstressed and can be significantly reduced in some tokens, which may contribute to this kind of variation; [ɨ̆], [ɐ̆].

Additionally, Blumenfeld (2017) has proposed that [i] is an allophone of /ɨ/, though the present study has not found a pattern of complementary distribution which supports this analysis.[47]

[47] Blumenfeld specifically argues that /ɨ/ surfaces as [i] before coronals. He points to the word for ‘skin’, stating that third person singular ‘his skin’ is ‘wíts-in’ while the second person singular ‘your skin’ is ‘wít-im’. This is presented as evidence for underlying suffixes of the shape /-in/ ‘3SG.POSS’ and /-im/ ‘2SG.POSS’ and is cited in support of the view that /ɨ/ is realized as [i] before coronals, in this case [n]. The present analysis considers these possessive suffixes as underlyingly /-n/ and /-m/ respectively. These suffixes may accompany recovered (thematic) vowels that surface at the ends of consonant-final stems when consonant-initial suffixes are attached; e.g. /wɨʧi-/ ‘skin (possessed)’, cf. /i-wɨt/ ‘a skin, hide’. Specific recovered vowels for specific lexical stems are supported by historical and comparative evidence (e.g. PMc *kuli ‘skin’, **PMc** *kuli-ni ‘skin of’). There is also evidence that the possessive suffixes developed independent of any preceding vowels, including /ɨ/ (§4.2.3.7). Blumenfeld notes the existence of phonetic forms for ‘skin’ that include *wíts-in* ‘skin-3SG’ and *wít-im* ‘skin-2SG’, but his view of the precise phonetics of such tokens differ from the present analysis. Blumenfeld’s argument for [i] being an allophone of /ɨ/ is dependent on the words for ‘his skin’ and ‘your skin’ having consistent realizations in which ‘his skin’ contains [i] while ‘your skin’ contains [ɨ]. However, the present analysis finds variations including tokens of [wiˈʧim] ‘your skin’ and [ˈwitəm] ‘your skin’ (in the tokens available in this study, the vowel in the second syllable appears to be [ə] rather than [ɨ]). This variation is attributed here to variability in whether the stem-final thematic vowel is recovered by the speaker or not; one hears both /wiʧi-m/ and /witə-m/ for ‘your skin’ depending upon whether /i/ is “recovered” or if [ə] is inserted at the morpheme boundary instead. In either case, the would-be C.C

2.3.3 Front Vowels

The Nauruan front vowels include three phonemes; /i/, /e/ and /æ/. Descriptions of each are provided in the following subsections.

2.3.3.1 /i/

The Nauruan phoneme /i/ is a high front vowel. It is generally realized as [i] but can be realized as phonetically shortened [ĭ] or [ǐ] in reduced tokens. Such reduction is observed in unstressed syllables but can also occurs in other syllables which have relatively shorter vowel durations. Table 2.3.6 provides a set of contrastive pairs showing that /i/ is a phoneme in Nauruan.

Table 2.3.6 – Contrastive pairs, /i/

a.	/bʸi-m/	[bʸim]	'your home'	cf. [bɨm]	'night'
b.	/i-bʲi/	[ibi]	'placenta'	cf. [ibɨ]	'my grandchild' [48]
c.	/kiɟ/	[kiɟ]	'rinse, wash off'	cf. [keɟ]	'build (v. trans.)'
d.	/iɟo/	[iɟo]	'tamano tree'	cf. [eɟo]	'stand (v.)'
e.	/ieŋ/	[ieŋ]	'like, admire'	cf. [ɟeŋ]	'pregnant'

2.3.3.2 /e/

The Nauruan phoneme /e/ is a mid front vowel. It is generally realized as [e], though it can occur as phonetically shortened [ĕ] or [ə] in reduced syllables. Such reduction is observed

cluster at the morpheme boundary is separated by an epenthetic V. It should also be noted that Blumenfeld considers that *wíts-in* 'his skin' (here [wi.ˈʧin]) has initial stress, while the present analysis suggests that stress is on the second syllable.

[48] Also 'my grandparent'.

commonly in unstressed syllables but can also occurs in syllables which have relatively shorter vowel durations. Table 2.3.7 provides a set of contrastive pairs showing that /e/ is a phoneme in Nauruan.

Table 2.3.7 – Contrastive pairs, /e/

a.	/bʸe-n/	[bʸen]	‘his/her pencil, stick’	cf. [bʸin]	‘his/her home’
b.	/der der/	[derəder]	‘clean, clear’	cf. [dʒirədʒir]	‘restless’
c.	/eja/	[eja]	‘difficult’	cf. [ija]	‘spew out’
d.	/a-pʸe/	[apʸe]	‘swell’	cf. [apʸi]	‘turn on’
e.	/were-n/	[weren]	‘string, fiber (of)’	cf. [wɨrin]	‘scratched’

2.3.3.3 /æ/

The Nauruan phoneme /æ/ is a low front vowel which always surfaces as [æ]. Like the other vowels, /æ/ can be shorted in unstressed syllables; [ǽ]. This vowel is notable for failing to condition the loss of any secondary articulations. Both the palatalized bilabials (/pʲ/, /bʲ/, /mʲ/) and the velarized bilabials (/pʸ/, /bʸ/, /mʸ/) are realized with their respective secondary articulations before [æ]. Table 2.3.8 provides a set of contrastive pairs showing that /æ/ is a phoneme in Nauruan.

Table 2.3.8 – Contrastive pairs, /æ/

a.	/dedæn/	[dedæn]	‘often, frequently’	cf. [deden]	‘behavior of’
b.	/bʸæ/	[bʸæ]	‘break’	cf. [bʸe]	‘for, because’
c.	/bʲækæ/	[bʲækæ]	‘bad’	cf. [bʲɐgən]	‘fresh water of’
d.	/mʲæg-n/	[mʲægən]	‘his/her plant’	cf. [mʲɐgən]	‘has become dry’
e.	/e-wæg/	[ewæg]	‘house’	cf. [owag]	‘warn, alert’

2.3.4 Back Vowels

The Nauruan back vowels include two phonemes, /u/ and /o/. Phonological descriptions of each are provided in the following subsections.

2.3.4.1 /u/

Phonological processes:

a. u → ɨ / Cʸ___ (variable) Table 2.1.5(i)

b. u → ɨ / {kʷ, w} ___ Table 2.1.5(j)

c. u → ʉ / $C_{[-back]}$ ___(C) Table 2.1.5(k)

The Nauruan phoneme /u/ is a rounded high back vowel. The present section describes phonological processes involving /u/, including dissimilation and fronting. Table 2.3.9 provides a set of contrastive pairs showing that /u/ is a phoneme in Nauruan.

Table 2.3.9 – Contrastive pairs, /u/

a.	/ægu/	[ægu]	‘kiss, lean in’	cf. [æge]	‘spouse’
b.	/amamʸur/	[amamur]	‘follow, chase’	cf. [amamɐt]	‘squeeze’
c.	/bʸuř bʸuř/	[buřəbuř]	‘white’	cf. [birəbir]	‘sprout’ (v.)
d.	/eædu/	[eædʉ]	‘gift’	cf. [eæda]	‘upwards’
e.	/ibʲu/	[ibʲʉ]	‘some’	cf. [ibi]	‘placenta’

Nauruan /u/ surfaces variably as [u] or [ɨ] after velarized consonants, as described by the rule in 2.3.4.1a above. The conditioning consonants include any of /pʸ/, /bʸ/, /mʸ/. Consider for example the word for ‘white’; /bʸuř bʸuř/ → [buřəbuř] ~ [bʸɨřəbʸɨř] ~ [bɨřəbɨř]. Following /w/ or /kʷ/, /u/ invariably surfaces as [ɨ], as shown in rule 2.3.4.1b above.

Nauruan /u/ surfaces as [ʉ] after “front” consonants, as described in rule 2.3.4.1c above. The conditioning consonants are coronals or palatals, including [t], [d], [r], [ř], [n], [ɲ], [j], [bʲ], [pʲ], [mʲ]. This set of sounds can be defined by the features [−syllabic, −back]. As discussed in §4.2.3.6, this parallels the process of PMc *u centralization proposed by Marck (1975), in which PMc *u became [ʉ] after the “front” consonants *t, *d, *l, *n, and *ñ, which are proposed to spread a [−back] feature (Rehg 1991: 396).[49] The processes was apparently continued and expanded in Nauruan, as it was in Pohnpeian (Rehg 1981: 43-46), Marshallese (Bender 1968) and possibly Kosraean.

Variable vowel length may also affect the phonetic quality of /u/. Shortened /u/ tokens, as in unstressed or otherwise reduced syllables, can be somewhat centralized; /u/ → [u] ~ [ŭ] ~ [ʉ̆].

[49] However, this account seems problematic if both back vowels like [u] and central vowels like [ʉ] are considered to have the feature [+back], as is generally proposed. It remains unclear what feature changes are involved in the change /u/ → [ʉ] if [ʉ] does not have the feature [−back]. Whatever the correct phonological analysis is, the result is a phonetically more front vowel.

This might be characterized as a formant undershoot process like that observed in /a/ → [ɐ] alternations (§2.3.2.1), though occurring in the high-central to high-back area of the vowel space.

2.3.4.2 /o/

The Nauruan phoneme /o/ is a rounded mid back vowel. It generally surfaces as [o]. However, in shortened tokens it may sometimes be reduced; [ŏ] ~ [ɐ]. Where it surfaces as [ɐ], this might be characterized as a formant undershoot process like that observed in /a/ → [ɐ] alternations (§2.3.2.1), though with the loss of phonetically salient lip rounding and occurring in the mid-central to mid-back area of the vowel space. Table 2.3.10 provides a set of contrastive pairs showing that /o/ is a phoneme in Nauruan.

Table 2.3.10 – Contrastive pairs, /o/

a.	/ado/	[ado]	'nine'	cf. [adʉ]	'count'
b.	/æmʸo/	[æmo]	'first, ahead'	cf. [æmːʲæ]	'we (pl. ex.)'
c.	/æton/	[æton]	'outside'	cf. [ætʃin]	'from'
d.	/bʸo/	[bo]	'fight, match'	cf. [bʸæ]	'break, split'
e.	/ɐjo-n/	[ɐjon]	'stood up, jutted'	cf. [ɐjan]	'busy'

There is additionally an orthographic convention that may cause some confusion with respect to /o/ and /a/ phonemes in Nauruan. Nauruan [ɐ] is typically written *õ* despite a complete lack of lip rounding, and even though it is most commonly an allophone of /a/ (§2.3.2.1).[50]

[50] The tilde above *õ* is a writing convention particular to Nauruan orthographies, and does not represent nasalization as it does in the IPA.

Where orthographic *o* appears without the tilde, it represents Nauruan [o].

2.4 Language Contact and Loanword Phonology

Nauruan has been in contact with several other languages, including at least Kiribati, Chuukese, German, English, and Chinese Pidgin English.[51] Nauruan likely had contact with Kiribati long before the first European contact was established, as people from Kiribati are mentioned in Nauruan narratives.[52] Nauruan has also had contact with Kiribati speakers in more recent times. It is known, for example, that a pastor from Tarawa settled on Nauru in 1887 and preached to the people in Kiribati (Gilbertese) – though most people on Nauru did not understand the language (Rensch 1993: ii-iii). Given the apparent extent of contact between the two languages there are likely to be Kiribati loanwords in the Nauruan lexicon. However, research so far has failed to uncover any definite examples of Kiribati loans in Nauruan. Kiribati loanwords could be identified by the absence of an expected Nauruan sound change and the presence of a corresponding sound in Kiribati. For example, if Nauruan reflected /mʸ/ in place of an expected /ŋ/ (§4.1.3), or /r/ in place of an expected /d/ or /g/ (§4.1.12), this might be indicative of a Kiribati loanword. At the same time, other loans might be indistinguishable from an inherited Nauruan word. Considering the evidence for historical contact between I-Kiribati and Nauruan peoples, it may be useful to compare place names or personal names in particular, but this avenue of research has yet to uncover any clear cases of Kiribati loanwords in Nauruan.

It is not known if Nauruan had contact with Chuukese or other Chuukic languages earlier in its history, though Nauruan did at least have contact with Chuukese during World War II

[51] And possibly Chuukic languages other than Chuukese.

[52] For example, one such narrative relates a story in which two Nauruan women perpetuate the idea that children must be born via an incision in the abdomen, and that it is inevitable the mother will not survive. A visitor from Kiribati arrives and teaches the Nauruans that mothers can survive natural childbirth. In the narrative, the two Nauruan women are killed once the community learns about this from the I-Kiribati visitor.

(Rensch 1993: xi-xii). Japanese forces occupied Nauru in 1943 and deported 1200 Nauruans to Chuuk Lagoon in the Caroline Islands, where they were used for forced labor. Australian military forces gained control of Nauru in September of 1945 and soon after a ship from the British Phosphate Commission was sent to Chuuk state to return the deported Nauruans. Only 737 had survived. The extent to which the returning Nauruans were influenced by the Chuukese language is not known, though lexical borrowings seem at least possible.

German was the first European language to have sustained contact with Nauruan. Germany annexed Nauru in 1888 and governed it through the end of World War I (Firth 1978: 37). As a result, there are German loanwords Nauruan, some of which are listed in Table 2.4.1 below.

Table 2.4.1 – Some German loanwords in Nauruan

	Nauruan	German		Gloss
a.	[mondak]	*Montag*	[moːntaːk]	'Monday' [53]
b.	[pretak]	*Freitag*	[fʀaɪ̯taːk]	'Friday'
c.	[dondagdure]	*Sonntagsschule*	[zɔntaːksʃuːlə]	'Sunday school'
d.	[bibel]	*Bibel*	[biːbəl]	'Bible'
e.	[tʃape]	*Schafe*	[ʃaːfə]	'sheep'
f.	[iku]	*Kuh*	[kuː]	'cow'
g.	[tʃiraŋe]	*Schlange*	[ʃlaŋə]	'snake' [54]
h.	[mak]	*Mark*	[maɐ̯k]	'money'

[53] Note the presence of /d/ where we might expect /t/, as occurs in the German source. Voicing might be attributable to the adjacent /n/.

[54] The insertion of Nauruan [i] is unexpected here because an equivalent vowel does not occur in the German source, though note that *t → tʃ / __ i is a regular sound change in inherited Nauruan words.

English has had extensive contact with Nauruan and has become a language of daily use for almost all Nauruan speakers.[55] As discussed in §1.1.1, the British Phosphate Commission became involved in mining operations on Nauru after the end of World War I which dramatically increased the presence of English in Nauruan society. Certainly, the most dominant languages on Nauru today are English and Nauruan, though other minority languages are present, such as Chinese English Pidgin and Kiribati. English codeswitching is prevalent among Nauruan speakers and there is a proliferation of English loanwords in the language. Speakers readily incorporate English words into their speech.

The prefix /də-/ occurs in many English loanwords, but also occurs as an inherited form which is cognate with the Kiribati article *te-* and the fossilized Marshallese prefix *jV-*.[56] It appears that the English article *the* has been interpreted as equivalent to /də-/, just because they happen to be similar in form, function, and morphosyntactic position. In many cases English loans may be used even where equivalent Nauruan words are known to the speaker. Table 2.4.2 lists several English loanwords as examples.

[55] Some consultants have said there are still a few elderly Nauruans living on the island who do not speak English well, but so far health concerns have made conducting interviews with these individuals impossible.

[56] Nauruan /də-/ is also a doublet of the nominal prefix /e-/, /i-/.

Table 2.4.2 – Some English loanwords in Nauruan

a.	[dəmaŋko]	'mango' [57]	i.	[jero]	'yellow'
b.	[pentɐr]	'pencil'	j.	[tærære]	'Saturday'
c.	[prak]	'frog'	k.	[oben]	'oven'
d.	[prum]	'broom'	l.	[tʃabɐr]	'shovel'
e.	[dəpun]	'spoon'	m.	[riŋ]	'ring'
f.	[dəbak]	'refrigerator' [58]	n.	[bæderi]	'battery'
g.	[mæts]	'maths'	o.	[win]	'win'
h.	[tut]	'shoe(s)'	p.	[dəkapa]	'pot' [59]

The most recent contact language for Nauruan is probably Chinese Pidgin English (ISO 639-3: cpi),[60] which is spoken by the ethnic Chinese population who have lived on Nauru for several generations, and by Nauruans who frequent Chinese operated stores and restaurants on Nauru. The extent of influence this language has had on Nauruan is not well studied. The language is described as having features of both Chinese pidgins and Melanesian pidgins (Siegel 1990). Consultants have stated that the language contains words from English, Nauruan, and Chinese. According to Ethnologue, the language is being superseded by English (Eberhard, Simons and Fennig 2019).

[57] This word might alternately be a loan from Kiribati *mangko* 'mango tree, mango' (Trussel and Groves 1978), which itself appears to be a loanword. Evidence for this is in the presence of word-medial [k] in the Nauruan loanword rather than [g], as might be expected if the source were English. In that case, the /də-/ prefix might relate to the Kiribati article *te-*, which occurs on singular nouns; *te-maŋko* 'a mango'.

[58] From English 'box'.

[59] From English 'copper'.

[60] Also known as Nauruan Pidgin English or Melanesian-Chinese Mixed Pidgin English (Eberhard, Simons and Fennig 2019).

2.4.1 Loanword Phonology

Nauruan loanwords generally employ a one-to-one correspondence between speech sounds in the borrowed word and the Nauruan phonemes which are most phonetically similar, though there are inconsistencies in voicing and in the treatment of consonant clusters. Perhaps most noticeably, borrowed words are realized with stops in place of fricatives, though still having the same major place of articulation. Table 2.4.3 describes sound correspondences for words borrowed into Nauruan which are phonetically dissimilar from the source, including those just mentioned as well as glide and liquid correspondences; j >> j̡, l >> r. Examples of relevant English loans from Table 2.4.2 above are cross-referenced. Note that stress placement in Nauruan loanwords generally follows the expected pattern for inherited words, described in Chapter 3.

There tend to be more consonant clusters in Nauruan loanwords than in inherited words, where they are generally limited to nasal+stop sequences in reduced word forms (§3.1.2).[61] As is apparent in Tables 2.4.2 and 2.4.3b, the way in which consonant clusters in loanwords are resolved appears to be somewhat unpredictable. Additional research will be required to better understand patterns of voicing and the handling of consonant clusters in Nauruan loanwords.

Vowels are generally equated to the most phonetically similar Nauruan vowel in the inventory, though there are occasional exceptions. For example, /mere/ ‘marry’, from Australian English [mæɹi], might have been expected to be Nauruan /mæri/.

English /ɹ/ is not reflected in Nauruan loans where it would occur after a vowel and is not followed by another vowel (e.g. Table 2.4.2p). This reflects the pattern evident in non-rhotic dialects of English, which is unsurprising because the varieties of English Nauruan has most

[61] For example, /æmeta/ → [æmtɐ] ‘that man, some man’.

been in contact with are non-rhotic varieties. These include British English, New Zealand English, and especially Australian English. Nauruan also appears to reflect the flapping of intervocalic /t/ in English words, another feature of Australian English (Table 2.4.2j, n)

Table 2.4.3 – Phonetically dissimilar sound correspondences in Nauruan loanwords

	Correspondence	Examples (Table 2.4.2)
a. Fricatives are reflected as stops or affricates	s, z >> t, d f, v >> p, b ʃ >> tʃ	(b) (g) (h) (c) (k) (l)
b. Consonant clusters reflect equivalent places of articulation, but voicing varies	ŋg >> ŋk ns >> nt #br >> #pr	(a) (b) (d)
Some would-be stop clusters are simplified or altered	#sp >> #p ks# >> k# θs >> ts#	(e) (f) (g)
c. The front glide [j] is reflected as Nauruan [ɟ] or [j]	j >> ɟ, j	(i)
d. The liquid /l/ is reflected as the Nauruan trill /r/	l >> r	(i) (l)

3 Nauruan Prosodic Structure

This chapter describes Nauruan syllables, phonotactics, stress, and phrase prosody. Figure 3.1 illustrates the proposed prosodic hierarchy for Nauruan.

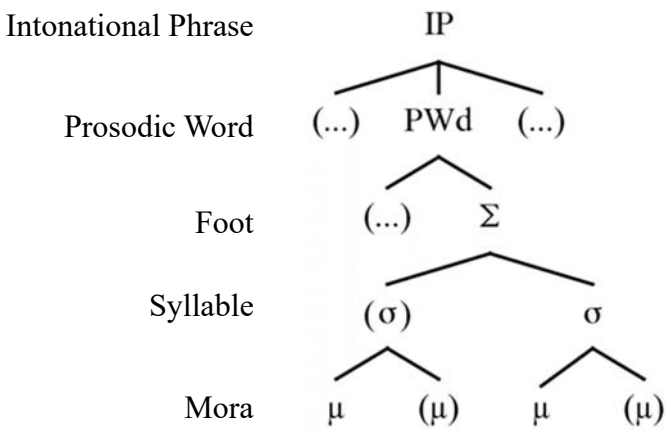

Figure 3.1 – Nauruan Prosodic Hierarchy

Syllables are discussed in §3.1, including subsections on allowable syllable shapes (§3.1.1), distribution of syllables within the prosodic word (§3.1.2), and reduplications (§3.1.3). This is followed by description and analysis of Nauruan stress (§3.2), including a stress rule and subsections on the prosodic word and the foot as the domain of stress (§3.2.2 – §3.2.3). The phonetic correlates of stress are discussed in §3.3 and intonational phrases are discussed in §3.4. Lastly, §3.5 compares the Nauruan stress systems to stress systems in other Micronesian languages.

3.1 Nauruan Syllables

Native speaker intuition provides some evidence for syllables as constituents in Nauruan. Nauruan speakers can readily count or tap out syllables in a given word or phrase. In doing so

speakers are identifying the sonority peaks of each syllable in a given word. For reference, several words are listed in Table 3.1.1 with syllable boundaries and stress placement indicated in the phonetic transcription.

Table 3.1.1 – Syllable boundaries and stress placement in some Nauruan words

Syllable count			Gloss
2 σ	a. /abʲe/	[ˈa.be]	‘rely’
2 σ	b. /pʸoe/	[ˈpo.e]	‘inland’
2 σ	c. /æton/	[æ.ˈton]	‘outside’
3 σ	d. /amʸamʸo/	[a.ˈma.mo]	‘make, prepare’
3 σ	e. /apʸapʸe/	[a.ˈpa.pʸe]	‘spin around’
3 σ	f. /bʸorodan/	[bo.ro.ˈdan]	‘bring to boil, foaming’
4 σ	g. /amʲeata/	[a.me.ˈa.ta]	‘show, display’
4 σ	h. /də-remʲinu/	[də.re.ˈmi.nʉ]	‘insect’
4 σ	i. /ædæmʸonin/	[æ.dæ.mo.ˈnin]	‘first’
5 σ	j. /bʲařebʲařawa/	[bɐ.řə.bɐ.ˈřa.wa]	‘stingray’
5 σ	k. /ekekerebʲen/	[e.ke.ke.re.ˈben]	‘throw’ (antiquated)

Additional evidence for syllable constituency comes from the phonetic correlation of stress and relative high pitch (F_0) within the prosodic word. Prosodic differences between syllables contribute to the demarcation of syllable boundaries, which supports syllable constituency. Syllables are also evidenced from partial reduplications, which depend on the repetition of syllables from the point of a syllable boundary to a word edge. Nauruan reduplications are discussed in §3.1.3 below.

Phonological rules or constraints that require reference to the syllable further demonstrate syllable constituency. Two such rules have been described previously in this dissertation (Table 3.1.2a-b). Additional cases are discussed in the present chapter. All the relevant rules or

constraints are listed in Table 3.1.2 below. Each of these are discussed briefly immediately below. Additional discussion can be found in the cited subsections.

Table 3.1.2 – Syllable-sensitive rules and constraints in Nauruan

a.	/a/ raising	a → ɐ / (C_α) ___$C_\beta]_\sigma$ $C_\alpha \neq$ w, $C_\beta \neq$ w r n
b.	/a/ raising (open syllables, variable)	a → ɐ / ___ $]_\sigma$
c.	Post-nasal vowel syncope (optional)	(C)V.NV.C(V) → (C)VN.C(V)
d.	[ə] and thematic vowel epenthesis	VC.+C → V.C{V,ə}+C [62]
e.	Stress assignment	σσ# → σ́σ# σσ# → σσ́# (final σ is heavy)

Rule (a) in Table 3.1.2 occurs only in syllables closed by consonants other than [w], [r], [n]. This process is discussed in §2.3.2.1.

Rule (b) applies variably in open syllables, with apparent correlation to vowel length. Shorter tokens of /a/ tend to be raised to [ɐ], as discussed in §2.3.2.1.

Rule (c) describes an optional pronunciation of certain words in Nauruan. In the relevant words, a word-medial vowel accompanied by a nasal syllable onset is deleted. The result is a word-medial N.C consonant cluster that straddles a syllable boundary. This process always results in the reduction of the overall syllable count of a word by one syllable. This process is discussed further in §3.1.3 below, with examples listed in Table 3.1.6.

Rule (d) describes a general restriction on consonant clusters in syllable codas in inherited Nauruan words, as discussed in §3.1.1. Where a consonant-initial suffix attaches to a

[62] In this formalization "+" represents a morpheme boundary and "." represents a syllable boundary.

consonant-final stem, one of two things happens. First, the word may surface with a lexically specified epenthetic vowel between the word-final consonant and the suffix, what is called a thematic or recovered vowel. Alternately, the word may occur with an epenthetic schwa, [ə], in that same position.[63]

Rule (e) is the general rule for stress assignment in Nauruan prosodic words. Nauruan has a stress system that is weight-sensitive. Where a heavy syllable (a syllable with two morae) occurs in word-final position it is stressed. Otherwise, the penultimate syllable is stressed. Nauruan stress is discussed further in §3.2.

3.1.1 Syllable Structure and Phonotactics

Every Nauruan syllable has an obligatory vowel, which is optionally accompanied by an onset consonant, a coda consonant, or both. No vowels appear to be phonemically long (cf. Nathan 1973). This results in the possible syllable shapes listed in Table 3.1.3. Tautosyllabic consonant clusters are so far only observed in some loanwords. Except in loanwords, syllables with more than one consonant in the onset or coda are unattested. Table 3.1.4 provides some examples of syllable-internal consonant clusters found in loanwords.

[63] A schwa is also inserted between words that end in a consonant where a following word begins with a consonant, though this is a process that occurs within the domain of the prosodic phrase (at word boundaries), rather than within words (at morpheme boundaries). Phrase-level schwa epenthesis is discussed in §3.2.1.

Table 3.1.3 – Nauruan syllable shapes, Inherited [64]

Syllable shape			Gloss
V	a. /eædu/	[e.ˈæ.dʉ]	‘gift’
	b. /bʸoe/	[ˈbo.e]	‘Boe’ (a district in Nauru)
	c. /ine-n/	[i.ˈnen]	‘his/her mother’
CV	d. /rida/	[ˈri.dɐ]	‘awake, alert’
	e. /mʲio/	[ˈmi.o]	‘fear’
	f. /pʸæpʸe/	[ˈpʸæ.pʸe]	‘muscular’
VC	g. /aŋ/	[ɐŋ]	‘burnt, get burnt’
	h. /id/	[id]	‘weave, braid’
	i. /eæd/	[e.ˈæd]	‘forgive’
CVC	j. /dab/	[dɐb]	‘straight, true’
	k. /jæ-n/	[jæn]	‘inside of’
	l. /tægæg/	[tæ.ˈgæg]	‘stuck’

Table 3.1.4 – Syllable initial and syllable final consonant clusters in some English loanwords

			Gloss	Syllable Shape
a.	/prag/	[prag]	‘frog’	CCVC
b.	/prum/	[prum]	‘broom’	CCVC
c.	/proa/	[ˈpro.ɐ]	‘floor’	CCVC
d.	/mæts/	[mæts] [65]	‘maths’	CVCC

Allowable syllable onsets include any of the consonants in the Nauruan inventory (Table 2.1). There also appear to be no restrictions on allowable coda consonants, though processes that apply at the word or phrase level might also apply to codas that happen to be in one of those

[64] Relevant syllables in example words have been underlined.

[65] This [ts] consonant cluster is distinct from Nauruan [tʃ]. The latter does not occur in this loanword.

positions; e.g. neutralization of secondary articulations word-finally or neutralization of voicing in phrase-final oral stops. Chapter 2 discusses these and other synchronic phonological processes in Nauruan.

Some Nauruan syllables can be analyzed as containing diphthongs, such as the underlined syllables in /iei/ [i.ˈej] ‘fire’, /mʸæe/ [ˈmʸæe] ‘broken’, or /æewak/ [æe.ˈwak] ‘shout’, but it is not certain if these are phonologically diphthongs. In VV sequences where the second V is stressed or where the second V is more sonorous than the first, it is perceptually clear that the two Vs are in separate syllables; but in VV sequences where the second V is unstressed and less sonorous than the first, it becomes difficult to distinguish between a diphthong (V͡V or V́͡V#) and two independent syllables (V.V or V́.V#). In these cases there appears to be a lack of phonetic cues that would distinguish between the two possible syllables structures: [i.ˈej] vs. [i.ˈe.i], [ˈmʸæe̯] vs [ˈmʸæ.e] , [æe̯.ˈwak] vs. [æ.e.ˈwak]. Additional work with Nauruan speakers may shed light on this issue. One possibility is to further investigate speaker intuition of syllable structure. Speakers could be asked to tap out or count the syllables in words with relevant VV sequences, thereby indicating their perception of a VV sequence as either a diphthong or two separate syllables. A systematic study of this type has yet to be carried out, but preliminary investigation suggests variability in how such VV sequences are syllabified by speakers.

3.1.2 Syllable Distribution in Prosodic Words

Open syllables in Nauruan (V, CV) may occur in all positions within prosodic words. Closed syllables (VC, CVC) occur commonly in word-final positions, as in the examples in Table 3.1.5 below.

Table 3.1.5 – Word-final CVC syllable in some Nauruan words

a.	/æmːʲær/	[æ.ˈmːʲær]	‘we’ (dual exclusive)
b.	/eden/	[e.ˈden]	‘rain heavily’
c.	/tæræwoŋ/	[tæ.ræ.ˈwoŋ]	‘goodbye’
d.	/abʸabʲit/	[a.ba.ˈbit]	‘rubbing’
e.	/æredoan/	[æ.re.do.ˈan]	‘return’
f.	/agapʸoræŋ/	[ɐ.gɐ.po.ˈræŋ]	‘crash, clash’

Word-medial closed syllables may also occur in Nauruan, though only in certain words. They can appear in reduced forms that result from processes of post-nasal vowel syncope and subsequent resyllabification, or they may appear in loanwords.

Turning first to word-medial closed syllables that result from vowel syncope, consider the examples in Table 3.1.6 below. In each example, the full phonetic form has no word-medial closed syllables while the reduced phonetic form contains a nasal+consonant cluster that straddles a syllable boundary, the result of vowel syncope and subsequent resyllabification. This reduction results in a word-medial closed syllable with a nasal coda. Syncope only occurs where the affected vowel is preceded by a nasal consonant and followed by a non-nasal obstruent. This means that vowels which undergo syncope are in open syllables with nasal onsets. After syncope, the nasal becomes the coda of the preceding syllable and stress is distributed regularly, as specified by the rule given at the beginning of §3.2.

Table 3.1.6 – Post-nasal vowel syncope and syllabification in some Nauruan words

		Full phonetic form	Reduced phonetic form	Gloss
a.	/æmʲet-a/	[æ.ˈme.tɐ]	[ˈæm.tɐ]	‘a man’, ‘that man’ (medial)
		V.CV.CV	V**C.C**V	
b.	/æmʲetun-e/	[æ.me.ˈtʉ.ne]	[æm.ˈtʉ.ne]	‘this man’ (proximal)
		V.CV.CV.CV	V**C.C**V.CV	
c.	/æmʲetun-o/	[æ.me.ˈtʉ.no]	[æm.ˈtʉ.no]	‘that man’ (distal)
		V.CV.CV.CV	V**C.C**V.CV	
d.	/anukʷe-ɨ/	[a.nʉ.ˈkʷe.ɨ]	[an.ˈkʷe.ɨ]	‘my shoulder’
		V.CV.CV.V	V**C.C**V.V	
e.	/gægænado/	[gæ.gæ.ˈna.do]	[gæ.ˈgæn.do]	‘important, crucial’
		CV.CV.CV.CV	CV.CV**C.C**V	
f.	/aŋag-n/	[a.ˈŋa.gən]	[ˈaŋ.gən]	‘words of’, ‘story’
		V.CV.CVC	V**C.C**VC	

Post-nasal vowel syncope is not a regular phonological process in Nauruan. It occurs optionally, though frequently, in some words. One example is the word for ‘some guy’ or ‘that guy’, which is very frequently pronounced [ˈæm.tɐ], but can also be pronounced [æ.ˈme.tɐ] (Table 3.1.6a).

For some words, it might be argued that the reduced form has been phonologized. This might be the case where the original full phonetic forms appears to be no longer used by speakers. For example, the word for ‘hot, sunny’ is almost invariably pronounced [ˈkin.jo], which looks very much like an instance of post-nasal vowel syncope, possibly from the phonemic form /kʷinijo/. This word is always pronounced [ˈkin.jo] among speakers consulted for this research, but the pronunciation has been recorded as [kʷɨ.ˈni.jo] in at least one case.[66]

[66] Blumenfeld has recorded tokens of many words found in the Nauruan dictionary (Curriculum Center Press 1994, Jacob 1996), of which this is one. Alternate spellings *kûñijow* and *kiniow* appear in the Nauruan dictionary (Curriculum Center Press 1994: 39; Jacob 1996: 131, 167, 173).

Borrowings that contain consonant clusters generally retain them in Nauruan, both at word edges (see Table 3.1.4) and word-medially. Several loanwords containing word-medial consonant clusters are shown in Table 3.1.7 below. Word-medial consonant clusters in loanwords may be N.C clusters, as occur in words that have undergone post-nasal vowel syncope, though other clusters are apparently possible. For example, the word for 'Sunday School', which is a loan from German, contains a word-medial [g.d] cluster (Table 3.1.7d).

Table 3.1.7 – Nauruan loanwords: Consonant clusters across syllable boundaries

	Syllables	Gloss	Source
a. [də.ˈmaŋ.ko]	CV.CV**C.C**V	'mango'	English
b. [ˈpen.tɐr]	CV**C.C**VC	'pencil'	English
c. [ˈmʸon.dak]	CV**C.C**VC	'Monday'	German, *Montag*
d. [don.dag.ˈdʉ.re]	CV**C.C**V**C.C**V.CV	'Sunday School'	German, *Sonntagsschule*

3.1.3 Reduplication

Nauruan syllables are also evidenced by the presence of reduplication. Nauruan has both full and partial reduplication. Partial reduplication involves the repetition of syllables beginning at a syllable boundary and extending to a word edge. Partially reduplicated words place stress on either the last or the penultimate syllable of the final foot, following the stress rule given in §3.2. Partial reduplication occurs at both initial and final word edges, as shown in Table 3.1.8f-i.

It is not certain why partial reduplication occurs word-initially in some words and word-finally in others. One possibility is that reduplication proceeds regressively but has targeted particular morphemes within words. Consider, for example, the partial reduplications listed in Table 3.1.8f-i below. The word [i.wi.wi] 'full of lice' (f) is a reduplicated form of /i-wi/ 'louse,

lice'. Here, the initial /i-/ is a nominal prefix. If we consider the reduplication to have applied to the stem /wi/ and not the prefix, the result would be [i.wi.wi] regardless of the direction of reduplication. Consider also [bi.tʉ.no.no] (g), which is a reduplication of /bʲitun-o/, a demonstrative pronoun with the distal suffix [-o]. This word was historically composed of several morphemes; *bʲun-n-u-n-o (§4.2.3.9). If at any point the final *-no was interpreted as a unified suffix, it might have been reduplicated for emphasis; *-no 'far', *-nono 'very far'. However, there is no definitive evidence of this. Note also that the examples in Table 3.1.8h-i show regressive reduplication of the initial syllable in two stems which lack prefixes. Taken together, these examples could suggest that partially reduplicated words reflect historic reduplication of constituent morphemes, and/or that partial reduplication applied regressively, but additional research is needed before any such claims can be made.

Full reduplications in Nauruan appear to result in successive, independent phonological words. In cases where a multi-syllabic word is fully reduplicated the reduplicant maintains its own primary stress independent of the base, following the expected stress pattern for an independent phonological word (§3.2). Where a monosyllable is reduplicated, variations in stress distribution can be observed which generally correspond to intonation patterns at the phrase level, as might be expected of successive single-syllable words (§3.4). In full reduplications of words with word-final coda consonants, an epenthetic [ə] is frequently inserted at the resulting word boundary; C#[ə]#C. Note that epenthetic [ə] may be absent in careful speech, which suggests that schwa epenthesis between word-edge consonants could be a phonetic effect in running speech.

Table 3.1.8 provides several examples of Nauruan reduplications, including full and partial reduplications of both monosyllabic and multisyllabic bases. In terms of semantics,

Nauruan reduplication appears to signal intensity of action, sensation, or state (a, b, d, g); actions that occur over the course of time (c, e); or a scattered multitude of small objects (f, h, i).

Table 3.1.8 – Nauruan reduplications

	Base [67]	Full Reduplications [68]	Gloss
a.	mʲaŋ	[ˈmʲɐŋ]#[ˈmʲɐŋ], [ˈmʲɐ.ŋə]#[ˈmʲɐŋ]	‘bitter, sour’
b.	/ger/	[ˈger]#[ˈger], [ˈge.rə]#[ˈger]	‘very thin, transparent’
c.	/bᵛaŋ/	[ˈbɐŋ]#[ˈbɐŋ], [ˈbɐ.ŋə]#[ˈbɐŋ]	‘tame, get to know’
d.	/bᵛuro/	[ˈbu.ro]#[ˈbu.ro]	‘bubbling, boiling, foaming up’
e.	/eæw/	[e.ˈæw]#[e.ˈæw]	‘always, often, daily’
		Partial Reduplications	
f.	/iwi/	[i.ˈwi.wi]	‘full of lice’
g.	/bʲitun-o/	[bi.tʉ.ˈno.no]	‘that thing (distal, very far)’
h.	/dʒipᵛo/	[dʒi.ˈdʒi.po]	‘spotted’
i.	/bᵛæreo/	[bᵛæ.bᵛæ.ˈre.o]	‘scattered about’

3.2 Nauruan Stress

Nauruan stress is weight-sensitive. Within each prosodic word the final syllable is stressed only when it is a heavy syllable, or when it is the only syllable in the prosodic word. Otherwise the penultimate syllable is stressed. Nauruan heavy syllables are those that are closed and do not contain either of the central vowels [ɨ] or [ɐ], nor epenthetic [ə]. Heavy and light

[67] For examples (a-d) and (h-i), the base is not attested except in reduplications. Example (e) may relate to /eæ/ ‘forever, always’, though in that case the origin of the final [w] is unclear. The base of (f) /iwi/ means ‘louse, lice’, and (g) /bʲitun-o/ is the demonstrative pronoun meaning ‘that thing (distal)’.

[68] In these transcriptions “#” represents a phonological word boundary.

syllables are formally defined in §3.2.3, which provides an analysis of Nauruan stress based upon syllable weight. A descriptive rule for Nauruan stress is given below.

Nauruan Stress Rule

Heavy syllables are (C)VC syllables where V is not [ɨ], [ɐ] *or* [ə]

1. Stress the final syllable if it is heavy
2. Otherwise, stress the penultimate syllable
3. If there is no penultimate syllable, stress the only syllable in the word

Tables 3.2.1 and 3.2.2 illustrate stress distribution across different prosodic word structures. The data is organized by number of syllables in both tables. Table 3.2.1 lists examples with a final light syllable, and Table 3.2.2 lists examples of words with final heavy syllables.

Table 3.2.1 – Stress in some Nauruan words with final light syllables

Light final syllable
ˈ(C)V(C).(C)V#
ˈ(C)V(C).(C){ɐ,ɨ,ə}C#

Example words			Gloss	Syllable count
a.	/ařu/	[ˈa.řʉ]	‘fishing line’	2 σ
b.	/nene/	[ˈne.ne]	‘yesterday’	2 σ
c.	/atař/	[ˈa.tɐř]	‘boil food’	2 σ
d.	/eʝimʲo/	[e.ˈʝi.mʲo]	‘five’	3 σ
e.	/mʲægædæ/	[mʲæ.ˈgæ.dæ]	‘please’	3 σ
f.	/adʒitɨr/	[a.ˈdʒi.tɨr]	‘green’	3 σ
g.	/ænækiwi/	[æ.næ.ˈki.wi]	‘coconut’	4 σ
h.	/kumˠododo/	[ku.mo.ˈdo.do]	‘mouse’	4 σ
i.	/kamˠadoniŋ/	[ka.ma.ˈdo.niŋ]	‘impressive’	4 σ
j.	/ækebʲerere/	[æ.ke.be.ˈre.re]	‘wrestle’	5 σ
k.	/æmʲerumʲena/	[æ.me.rʉ.ˈme.na]	‘two men’	5 σ
l.	/egaturæe/	[e.ga.tʉ.ˈræ.e]	‘danger’	5 σ

Table 3.2.2 – Stress in some Nauruan words with final heavy syllables

Heavy final syllable (C)V(C).ˈ(C)VC#			
Example words		Gloss	Syllable count
a. /arar/	[a.ˈrar]	‘scratch’	2 σ
b. /owag/	[o.ˈwag]	‘warn’	2 σ
c. /æbʲæp/	[æ.ˈbʲæp]	‘kill’	2 σ
d. /mʸinoŋan/	[mʸi.no.ˈŋan]	‘waves’	3 σ
e. /æmʲæmʲæg/	[æ.mæ.ˈmæg]	‘scattered’	3 σ
f. /dædorer/	[dæ.do.ˈrer]	‘converse’	3 σ
g. /ædæmʸonin/	[æ.dæ.mo.ˈnin]	‘first’	4 σ
h. /aredoan/	[a.re.do.ˈan]	‘return’	4 σ
i. /iribʸæŋæŋ/	[i.ri.bʸæ.ˈŋæŋ]	‘haste’	4 σ
j. /eæeækor/	[e.æ.e.æ.ˈkor]	‘oil fish’	5 σ
k. /ekekerebʲen/	[e.ke.ke.re.ˈben]	‘throw’	5 σ

3.2.1 The Prosodic Word

Within each prosodic word there is one syllable that carries primary stress. In Nauruan, this stressed syllable generally coincides with the highest pitch (F_0) peak within the domain of the word, which is usually also the loudest syllable (see §3.3). The prosodic word domain aligns with a single lexical item and any accompanying affixes, but may also include adjacent syntactic

words, such as complementizers, conjunctions, prepositions, or other short function words (Selkirk 2014: 453). Some relevant examples are given in Table 3.2.3. In each case there is a preceding syntactic word that is part of the same prosodic word as the following lexical item. The preceding word does not contain an independent prominence peak.

Table 3.2.3 – Nauruan prosodic words in some syntactic phrases

Syntactic phrase	Prosodic Words [69]	Gloss
a. /bʸe ŋæm æbi-ɨræ/ *for lest kill-3PL*	[bʸe.ˈŋæm]#[æ.bi.ˈɨ.ræ]	… 'for lest they are killed'
b. /obʸer nɨm ɟeji/ *wait must eat*	[oˈbʸe.rə]#[nɨm.ˈɟe.ɟi]	… 'wait (for they) must eat'
c. /mʲe riæŋ a ɨræ/ *and sing to them (pl.)*	[me.ri.ˈæŋ]#[a ˈɨ.ræ]	… 'and sing to them'

There are phonological processes other than stress assignment which operate within the domain of the prosodic word. Partial reduplications, for example, repeat syllables at the edge of a base, which results in a single phonological word composed of the reduplicant and the base combined. Stress distribution follows the expected pattern within a single phonological word, as described in the rule at the beginning of §3.2.

Another phonological process in Nauruan that applies at the level of the prosodic word is [n] ~ [t] variation. This appears to be a case of free variation that occurs only at the ends of words. This variation, however, appears to be morphophonological in nature. The alternating /-n/ is always a suffix; e.g. /ririŋ-n/ → [ri.ˈri.ŋən] ~ [ri.ˈri.ŋət], make.do-PSV, 'did, made';

[69] In these transcriptions "#" represents a prosodic word boundary.

/iruwɨ-n/ → [i.ˈrʉ.wɨn] ~ [i.ˈrʉ.wɨt], back-3SG.POSS, ‘back of, behind (something)’.

3.2.2 The Foot

Stress in Nauruan is always assigned to one of the final two syllables in a given prosodic word.[70] This is illustrated, for example, in Table 3.2.3 above. This suggests that in addition to the entire prosodic word being a domain for stress, the final two syllables form a foot within the prosodic word.

As described in §3.3, the final two syllables of a given prosodic word exhibit one of two phonetic patterns, depending on how stress is assigned. In the case of penultimate stress (a trochaic foot), the pattern is one of falling pitch (F_0) on the final syllable relative to the penultimate syllable. In the case of final stress (an iambic foot), the pattern is flat or rising F_0 on the final syllable relative to the penultimate syllable. In the case of a monosyllable that forms an independent prosodic word, the only syllable in the word is stressed. This is illustrated in figure 3.2 below.

Trochaic foot (penultimate stress)	Iambic foot (final stress)	Monosyllabic foot
σ́ σ	σ σ́	σ́
s w	w s	s

Figure 3.2 – Three types of prosodic feet in Nauruan

[70] Blumenfeld (et al. 2015) propose a different analysis in which antepenultimate stress is assigned where the final two syllables are monomoraic.

3.2.3 Stress Analysis

The rule given at the beginning of this section (§3.2) describes the current analysis of Nauruan stress. To summarize, in any given prosodic word the final syllable is stressed if it is heavy (bimoraic), else the penultimate syllable is stressed; in case of a monosyllabic prosodic word, the only syllable in the word is stressed.

It is difficult to account for Nauruan stress distribution without reference to syllable weight. Syllable weight can be formalized using a sub-syllabic unit of weight, the mora (μ). Heavy syllables are defined as having two morae, while light syllables have one. A vowel may project more than one mora if it is a long vowel, though under the present analysis Nauruan does not have any long vowels. Syllable codas can also add weight to a syllable by projecting a mora. Under the present analysis, all Nauruan codas project a mora.

In a language where codas contribute to syllable weight, open syllables are generally light while closed syllables are heavy. Nauruan follows this pattern, but with one important exception. Syllable weight in closed syllables depends in part on the vowel quality of the nucleus. Closed syllables are heavy unless the nucleus is a non-low central vowel, [ɨ], [ɐ] or epenthetic [ə], in which case it is light. Notably, the vowels [ɨ], [ɐ] and [ə] are often shorter and more reduced than other vowels in Nauruan, which may provide phonetic motivation for their apparent lack of weight. Figure 3.3 illustrates the distribution of morae within each identified syllable type: (a) heavy, (b) light open, and (c) light closed.

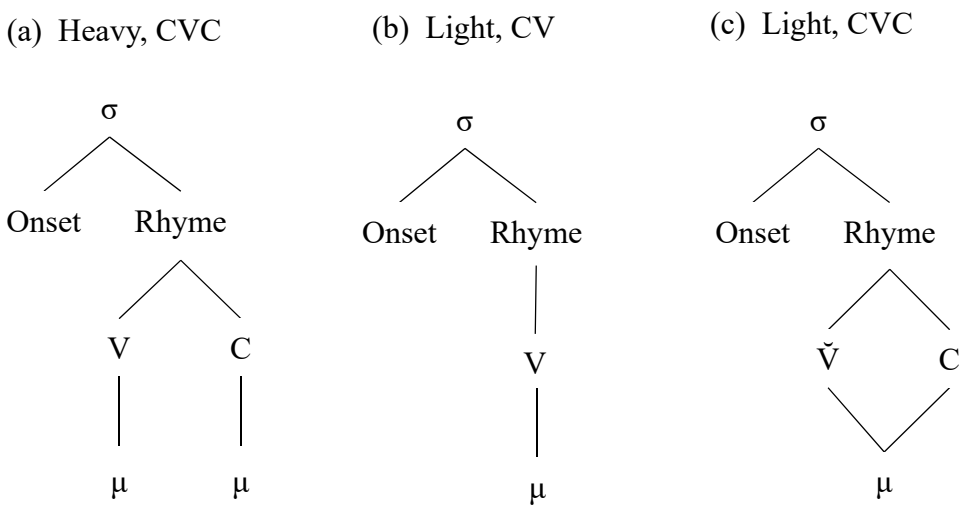

Figure 3.3 – Nauruan syllable weight

As illustrated in Figure 3.3c, under the present analysis closed light syllables share a single mora across the rhyme of the syllable. This is one possible solution to the problem posed by closed light syllables: If every vowel projects a mora and every coda consonant projects a mora, then every word-final closed syllable should be heavy (bimoraic), yet there appears to be a class of closed syllables that do not carry stress in word-final position.

Proposing that a mora is shared across the rhyme in closed light syllables allows for an analysis under which some vowel nuclei project less weight than others. An alternate possibility would be to propose extrametrical codas, which do not contribute to syllable weight, but there is no apparent categorical difference between codas in closed heavy syllables and codas in closed light syllables. The weight difference between closed syllables appears to lie with the vowel rather than the coda. Furthermore, it does not seem coincidental that the vowels which tend to be intrinsically shorter in Nauruan are the same ones that occur in light closed syllables; [ɨ], [ɐ] or epenthetic [ə]. It follows that a phonetically weaker vowel could contribute less weight than a

more robust vowel. On the view that every syllable must carry some weight, the proposal that a single unit of weight is shared across the rhyme of closed light syllables is one possible solution.

It is also possible that the vowels in Nauruan closed light syllables are somehow ignored at the stage of derivation that is responsible for stress assignment, such that a syllable that is expected to be bimoraic or heavy is derived as monomoraic or light. The idea that certain syllables or vowels are ignored by weight-sensitive phonological processes has been proposed for other languages, such as Mohawk (Piggot 1995, Michelson 1989), though in that case the analysis has been limited to epenthetic vowels, and only one of the three possible nuclei in Nauruan closed light syllables appears to be epenthetic; [ə]. Note further that as in Mohawk, whether a Nauruan vowel projects a mora is partly dependent on its environment. In Nauruan, the relevant vowels would only fail to contribute to syllable weight where they occur in word-final closed syllables, and in Mohawk whether or not epenthetic vowels contribute to syllable weight depends on a range of segmental and morphological contexts. Additional research is required to determine if the Nauruan facts can be accounted for by an analysis in which the relevant vowels are invisible to weight-sensitive phonological derivations.

Blumenfeld et al. (2015) present an alternate analysis of Nauruan stress in which every non-central vowel is bimoraic and every final mora is extrametrical.[71] This analysis is mostly successful in predicting stress distribution, though it seems unintuitive to consider all vowels except two, [ɐ] and [ɨ], to be bimoraic. This is particularly true for Nauruan, because there are no phonemically long vowels. It is notable, though, that the central vowels have half the weight of their non-central counterparts in the analysis by Blumenfeld et al. as well as in the one suggested

[71] Blumenfeld et al.'s analysis and the present analysis mostly make the same predictions, though Blumenfeld et al. propose antepenultimate stress where the final two syllables both contain only one mora. The present research program has found no clear cases of antepenultimate stress in any Nauruan words.

here. The analysis by Blumenfeld et al. is summarized below.

Nauruan stress rule (Blumenfeld et al. 2015)

1. Stress the final syllable if it contains a diphthong
2. Else stress the final syllable if it is closed AND contains a non-central vowel
3. Else stress the penultimate syllable if it is closed OR contains a non-central vowel
4. Else stress the antepenultimate syllable

coda = μ
ɨ = central vowel, μ
a = non-central vowel, μμ
aj = diphthong, μμμ

Heavy syllables	Light syllables
(C)aj# = μμ<μ>	(C)a# = μ<μ>
(C)aC# = μμ<μ>	(C)ɨC# = μ<μ>
(C)a. = μμ	(C)ɨ. = μ

3.3 Phonetic Correlates of Stress

Stress is generally correlated with relative syllable prominence, though the manifestation of syllable prominence varies from language to language (Lehiste 1976: 235). Prominence is typically achieved by expending more energy in the articulation of one syllable relative to others in the same prosodic word or phrase. This manifests as some combination of increased relative pitch (F_0), loudness, or duration (Ladefoged 2006: 243-245; Lehiste 1976: 233). The extra articulatory energy put into the stressed syllable usually results in an increase in airflow over the

vocal folds, which can naturally increase pitch and loudness. Pitch can also be manipulated independently using the laryngeal muscles, which appears to occur in several Micronesian languages, as evidenced by independent pitch and stress patterns (§3.5). The additional articulatory activity associated with increased airflow from the lungs, or manipulation of the larynx to raise F_0, can also lengthen a stressed syllable, so that duration becomes a phonetic correlate of stress as well (Ladefoged 2006: 243-245). F_0, loudness and duration all have phonetically natural correlations to the increased energy expenditure characteristic of stressed syllables, though any given language may employ each phonetic correlate of stress to differing degrees.

In attempting to identify correlates of stress in a language it is important to take into consideration other possible sources for relative pitch, loudness or duration. For example, research has shown that high vowels have intrinsically higher F_0 values than low vowels across languages (Lehiste 1976: 230; Whalen and Levitt 1995); and low vowels tend to be louder while high vowels tend to have lower intensity (Lehiste 1976: 234-235). Consonantal context is another potential factor. Voiced onsets are associated with lower pitch in vowels, while voiceless onsets are associated with higher pitch (Lehiste 1976: 230). These kinds of intrinsic differences in F_0 and intensity can in some cases make identifying stress placement via acoustic measurement difficult.

Relevant to this, Lehiste finds that in running speech intrinsic pitch does not seem to affect speakers' perception of stress placement (1976: 235).[72] Based on this observation, we can imagine situations where the analyst could be misled regarding the phonological placement of stress. For example, an established penultimate stress pattern could predict CV́.CV#, but a foot

[72] Though intrinsic differences in the F_0 of vowels were noticeable when they were presented as isolated tones.

containing a low vowel followed by a high vowel, CáCi# for example, may result in a relatively flat or even slightly reversed phonetic pitch contour. In this example, the intrinsic low pitch of [a] makes for a relatively lower pitch in the stressed syllable, while the intrinsic high pitch of [i] makes for a relatively higher pitch in the unstressed syllable. The resulting stress placement could be difficult to pinpoint from acoustic measurement alone and may have to rely at least in part on speaker intuition.

3.3.1 The Phonetics of Nauruan Stress

This subsection describes the primary acoustic correlates of stress in Nauruan, which include F_0 (pitch) and duration. Relatively high F_0 appears to be the most consistent correlate of stress in Nauruan. The present section does not discuss F_0 manipulation unrelated to stress, as occurs with final raising for pragmatic effect, at the ends of interrogative phrases, or in lists of words recited in succession. These are considered prosodic features at the level of the intonational phrase and are discussed in §3.4. Regarding loudness, intensity peaks generally align with pitch peaks, though there are occasional exceptions, as discussed below.

Nauruan stress is realized primarily as relative differences in F_0 across the final two syllables in a given prosodic word. As described in §3.2.3, stress placement is determined by syllable weight, with word-final stress occurring where there is a final heavy syllable and penultimate stress occurring otherwise. The penultimate stress pattern is characterized by falling F_0 on the final syllable, which gives the penultimate syllable relatively higher pitch and greater prominence. Final stress, as occurs with heavy CVC# syllables, is characterized by flat or rising F_0 on the final syllable relative to the penultimate syllable. These phonetic patterns are illustrated in Figures 3.4 – 3.6 below. In these and other illustrations in this section, the green contour line represents F_0 and the red contour line represents intensity, or loudness.

Increased duration can also be correlated with stress, though in Nauruan this seems to occur mostly where the stressed vowel does not precede a voiceless stop consonant. Consider, for example, the spectrograms shown in Figures 3.4 – 3.5. Figure 3.4, showing [e.ˈbɐ.ke] ‘turtle’, demonstrates the falling F_0 consistent with penultimate stress, but the penultimate syllable is significantly shorter than the final syllable in this token. The nucleus of the penultimate syllable immediately precedes [k], a voiceless consonant, which may reduce the relative length of the preceding vowel. The opposite situation is illustrated in Figure 3.5, showing [a.ba.ˈbit] ‘rub, rubbing’. This example demonstrates a rising F_0 in the final stressed syllable, but the penultimate syllable is significantly longer than the final syllable. Here, the nucleus of the penultimate syllable is immediately followed by [b], a voiced stop, so that the vowel may be longer than it would be preceding a voiceless consonant, as in Figure 3.4. Additionally, the vowel in the final closed syllable of [a.ba.ˈbit] is relatively short, as might be expected for a vowel preceding a voiceless stop.

Figure 3.6, showing [e.ˈwæk] ‘house’, presents a case where the final stressed syllable is relatively longer, but it is not certain if this is conditioned by the final consonant. On the one hand, the final consonant of the stressed syllable in this token is phonetically voiceless, so that we might expect a shorter vowel duration, which is not observed. Underlyingly, however, the final consonant is voiced; /e.wæg/ ‘house’. If the vowel is longer because the coda consonant is underlyingly voiced, then this suggests a phonological process which deserves further investigation. On the other hand, this word has an onset [w] which could potentially affect the relative length of the nuclear vowel, being a highly sonorant consonant. Additional research is needed to work out what conditions the relatively greater vowel length observed in examples like the one in Figure 3.6.

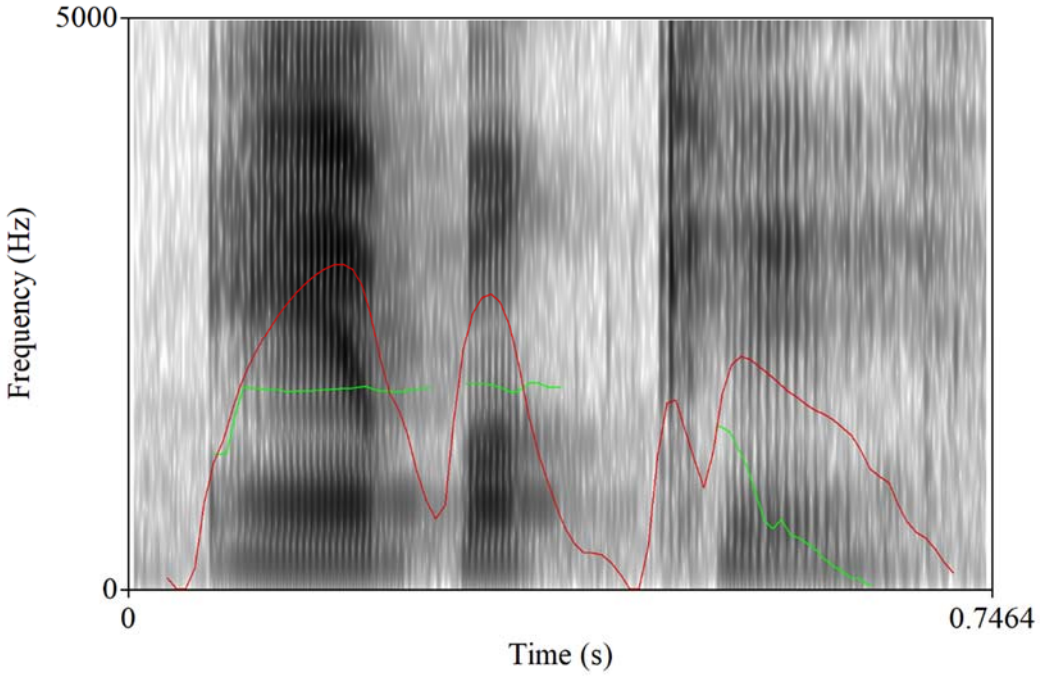

Figure 3.5 – Phonetic correlate of penultimate stress: [e.ˈbɐ.ke] ‘turtle’

- Falling F_0 on final syllable

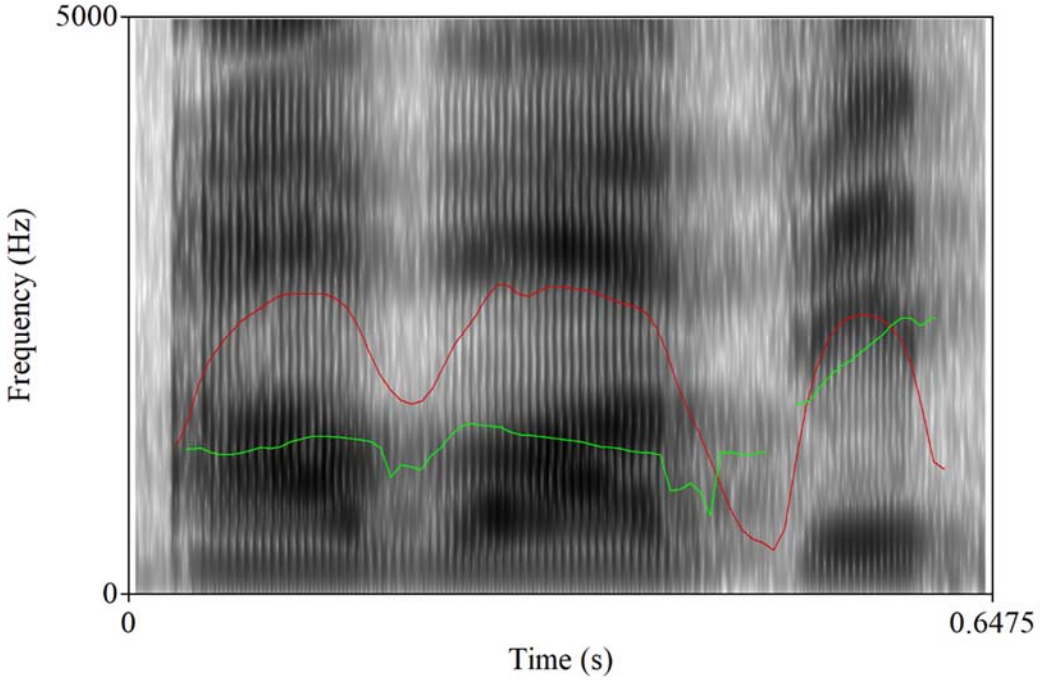

Figure 3.4 – Phonetic correlate of final stress: [a.ba.ˈbit] ‘rub, rubbing’

- Relatively high F_0 on final syllable

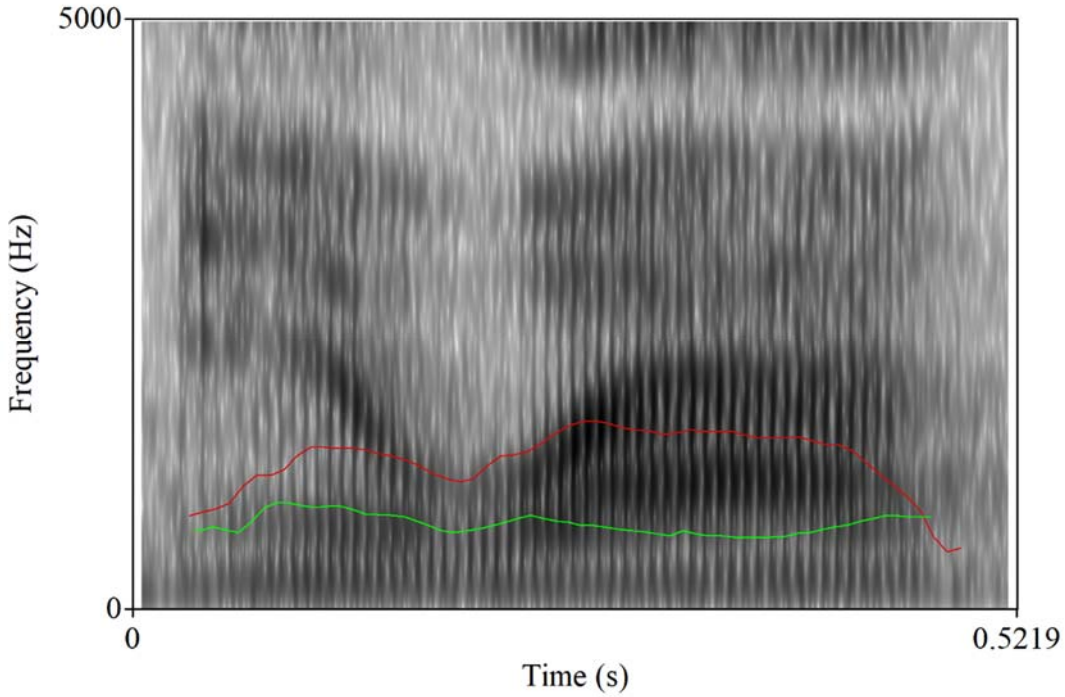

Figure 3.6 – Phonetic correlate of final stress: [e.ˈwæk] ‘house’

- Flat F_0 on final syllable, relative to penultimate syllable

Occasionally there are tokens in which intensity and pitch peaks occur over different syllables. Where separation of pitch and intensity is observable, it generally involves a low vowel followed by a high vowel at the end of a word. This situation can cause ambiguity when using phonetic measurement to determine stress distribution, since a pitch-raised low vowel and a pitch-lowered high vowel may have similar, or slightly reversed, F_0 peaks relative to one another. This could have to do with the intrinsic prosodic qualities of low vowels as compared to high vowels. All else being equal, high vowels tend to have an intrinsically higher pitch than low vowels, and this may result in even or reversed pitch peaks in $V_{low}V_{high}$ syllable sequences which would otherwise be expected to have a penultimate F_0 peak. To the same effect, low vowels tend to be louder than high vowels, hence a penultimate low vowel may be intrinsically louder than a

final high vowel, such that the loudness peak remains penultimate. The cumulative effect of a low-high vowel sequence within the foot, then, can be a reversal of the expected location of the F_0 peak, with the loudness peak remaining on the initial low vowel. The phonetics of this phenomenon are shown in Figure 3.6 below, which provides spectrograms for the word [ˈæ.bi] ‘kill, stop’ with pitch and loudness contours. Stress is analyzed as being on the first syllable rather than the second in this token, because of speaker intuition regarding stress placement in this word, and because the first vowel is relatively longer than it might otherwise be if it were unstressed.

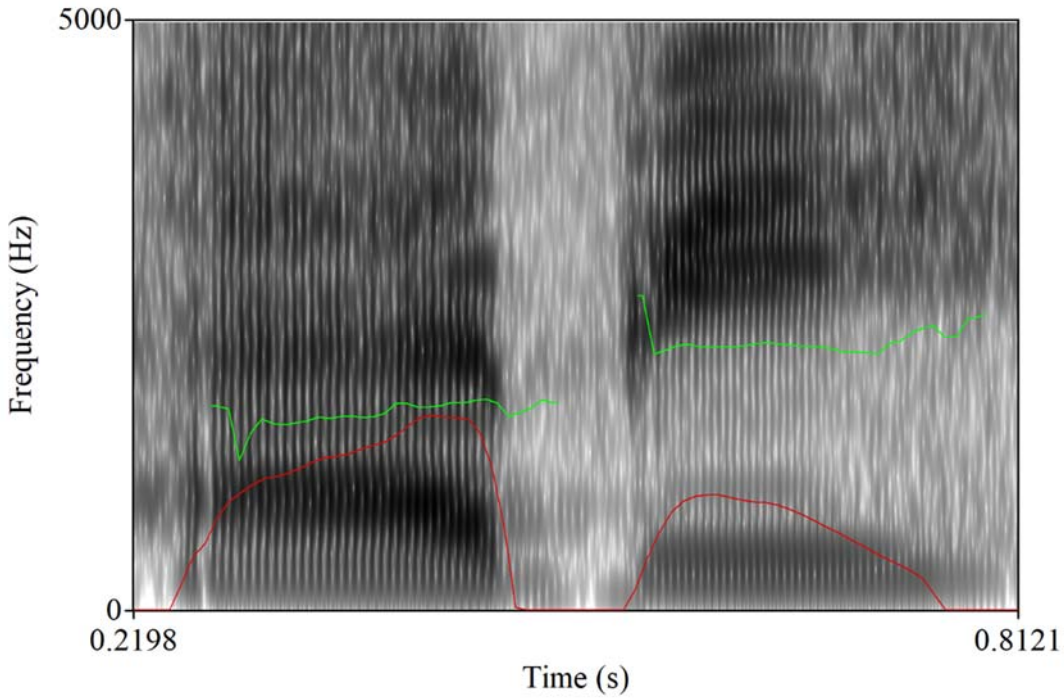

Figure 3.7 – Independent pitch and intensity peaks: [ˈæ.bi] ‘kill, stop’

- Stress is placed on the first syllable

3.4 Nauruan Intonational Phrases

Nauruan phrase prosody has only received preliminary investigation as part of this research program, and there is little in the literature on this topic.[73] A basic description is presented here, but a more detailed and broader examination of the topic will be needed for a more comprehensive understanding. An examination of phrase prosody in conversational speech is needed in particular, as examination of phrase prosody is so far limited to elicited phrases and narratives.

The figures in this section employ a system of symbols to denote intonational (F_0) patterns across phrases which is similar to tone and break indices used for English (ToBI), but which is not that system. The symbols that appear above pitch contours should be interpreted as labels which represent categorical phonetic targets whose phonological status awaits further study. Each H represents an F_0 peak and each L represents an F_0 valley. An H marked with a star, H*, represents the highest F_0 peak within an intonational phrase. Where H or L is followed by the symbol %, this marks the final pitch within an intonational phrase; that is, the pitch at the final phrase boundary.

The pitch contour pattern across an intonational phrase is generally such that F_0, and to a lesser degree loudness, peaks near the beginning of the phrase and gradually decreases towards the end. The highest F_0 peak coincides with the stressed syllable of the first prosodic word in the phrase. Relative syllable prominence is maintained within each successive prosodic word, even as F_0 peak values decline across the entire phrase.[74] This is the general pattern for terminal

[73] Kayser (1936: 4) provides the only published description of Nauruan prosody, comprising a single paragraph under the heading “accent of sentences”. He notes that rules governing prosody are difficult to define because the “rising and falling of the sounds follow the actual emotional feelings of the speaker”.

[74] Note that Praat (Boersma and Weenink 2017) sometimes draws the release bursts of stop consonants as part of the pitch contour. This should not be confused for pitch correlated with syllable nuclei, which is what is examined here.

intonational phrases, such as declarative phrases. Two such examples are illustrated in Figures 3.8 and 3.9 below.

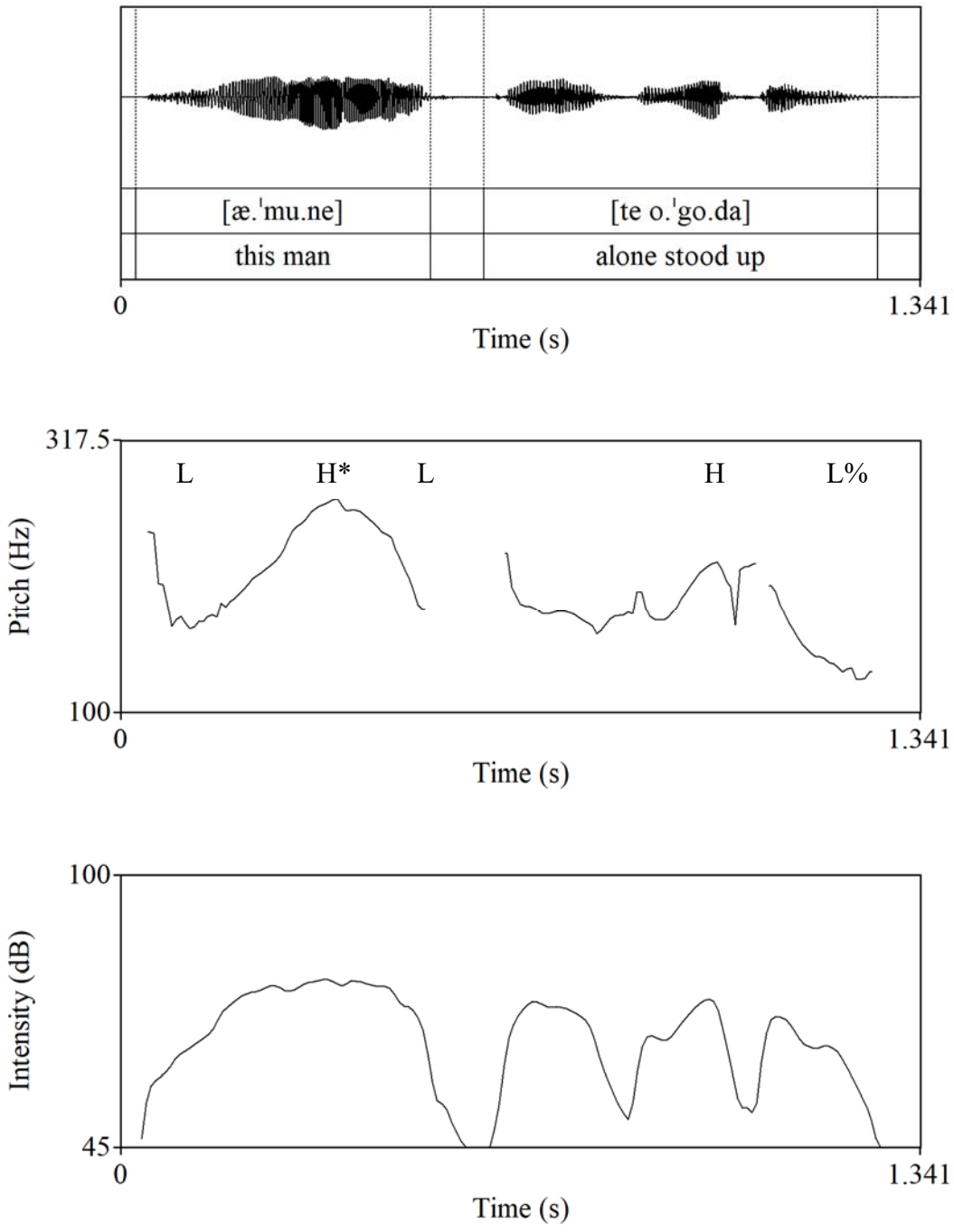

Figure 3.8 – Phrase prosody: [æ.ˈmʸu.ne]#[te.o.ˈgo.da] ‘this man alone stood up’

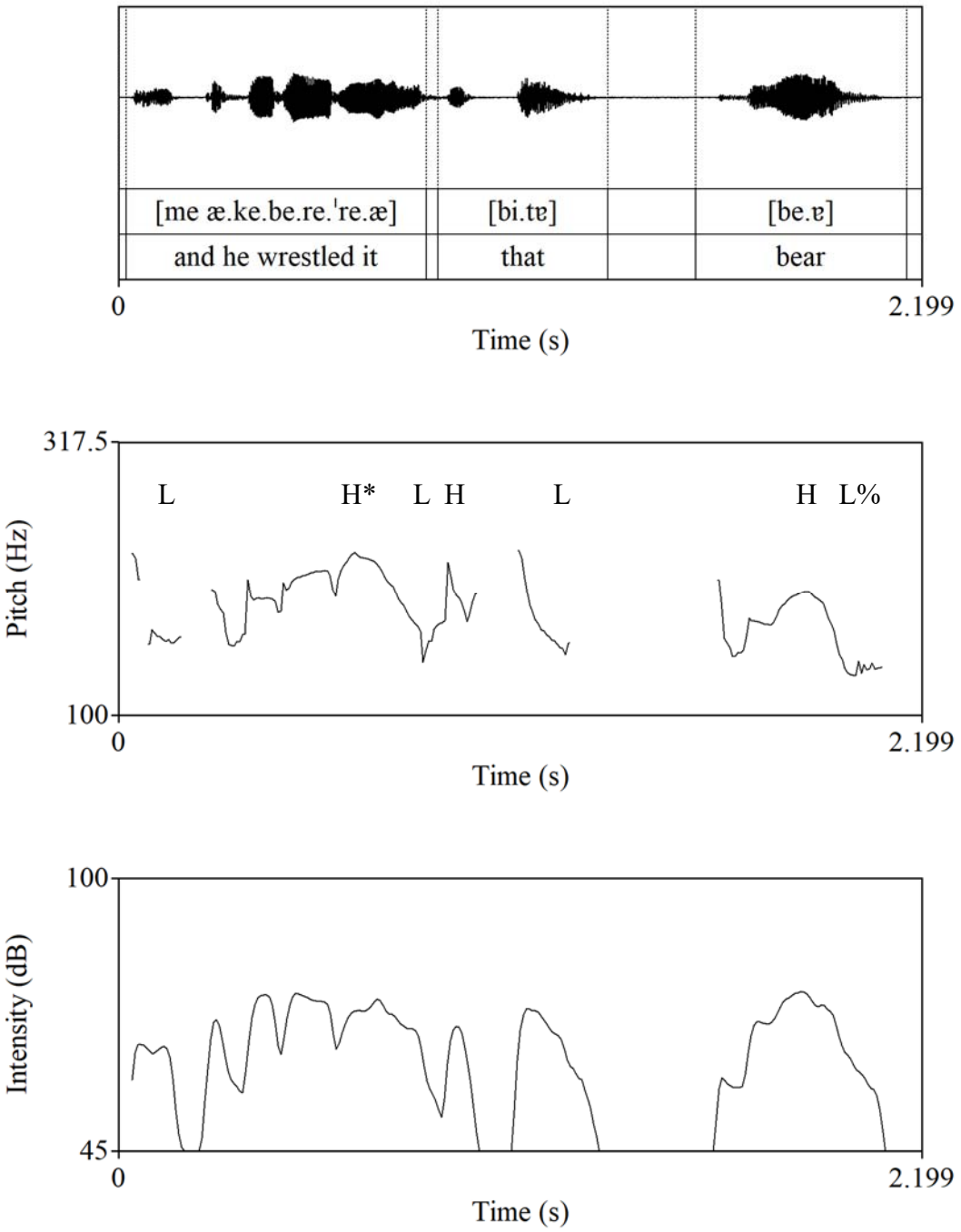

Figure 3.9 – Phrase prosody: [mʲe.æ.ke.be.re.ˈre.æ]#[ˈbi.ta]#[ˈb.ea]
'and he wrestled that bear'

Nauruan also makes use of non-terminal phrase contours for pragmatic effect, which involves raising the F_0 of the final syllable of the intonational phrase. This occurs, for example, in word lists (spoken in succession), questions, and in discourse to signal that additional information should be anticipated by the listener. Examples of such prosodic contours are provided in Figures 3.10 – 3.12 below.

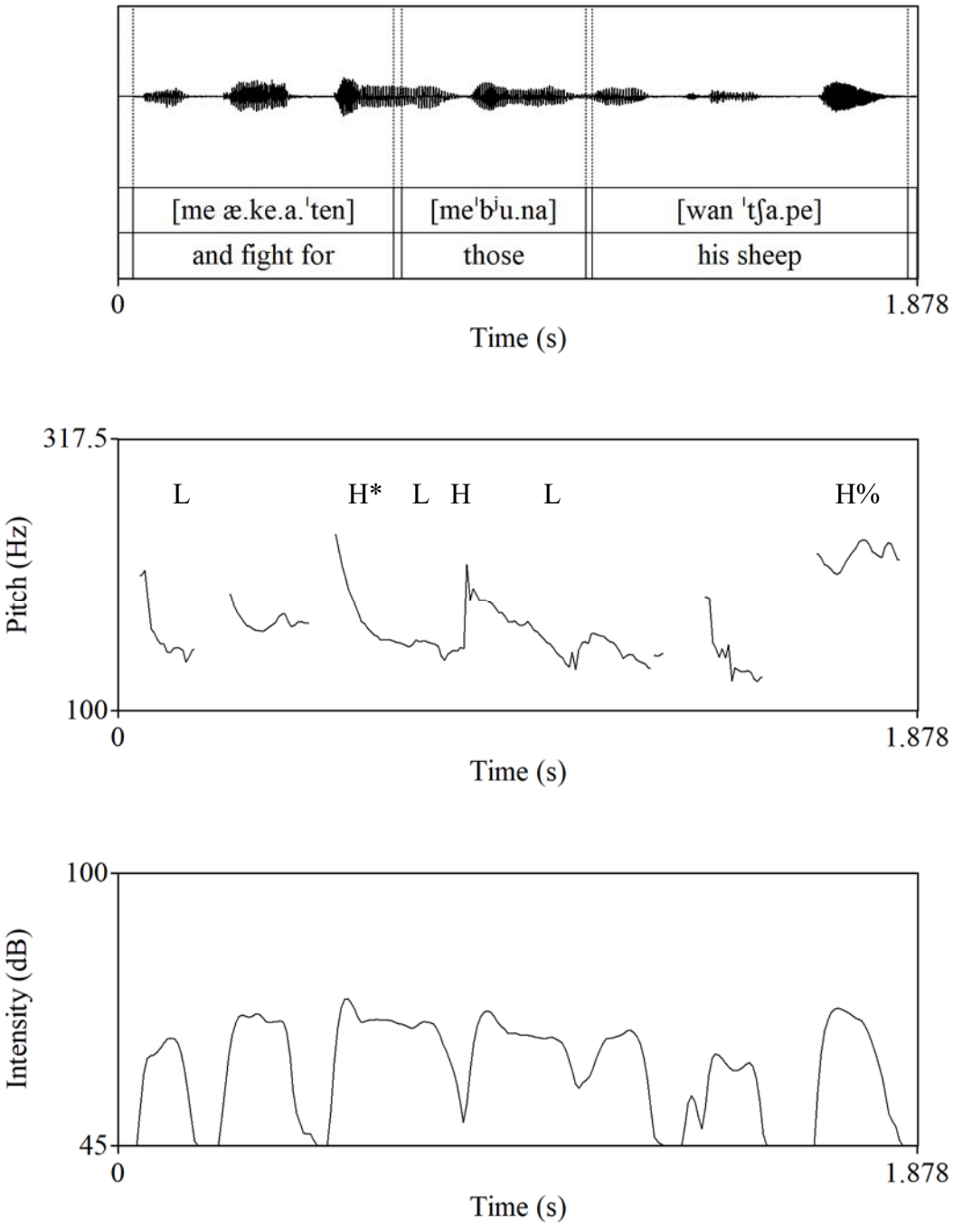

Figure 3.10 – Non-terminal phrase contour, cue for additional information

[me.æ.ke.a.ˈten]#[me.ˈbʲu.na]#[wanˈtʃa.pe]

'and he fought for his sheep'

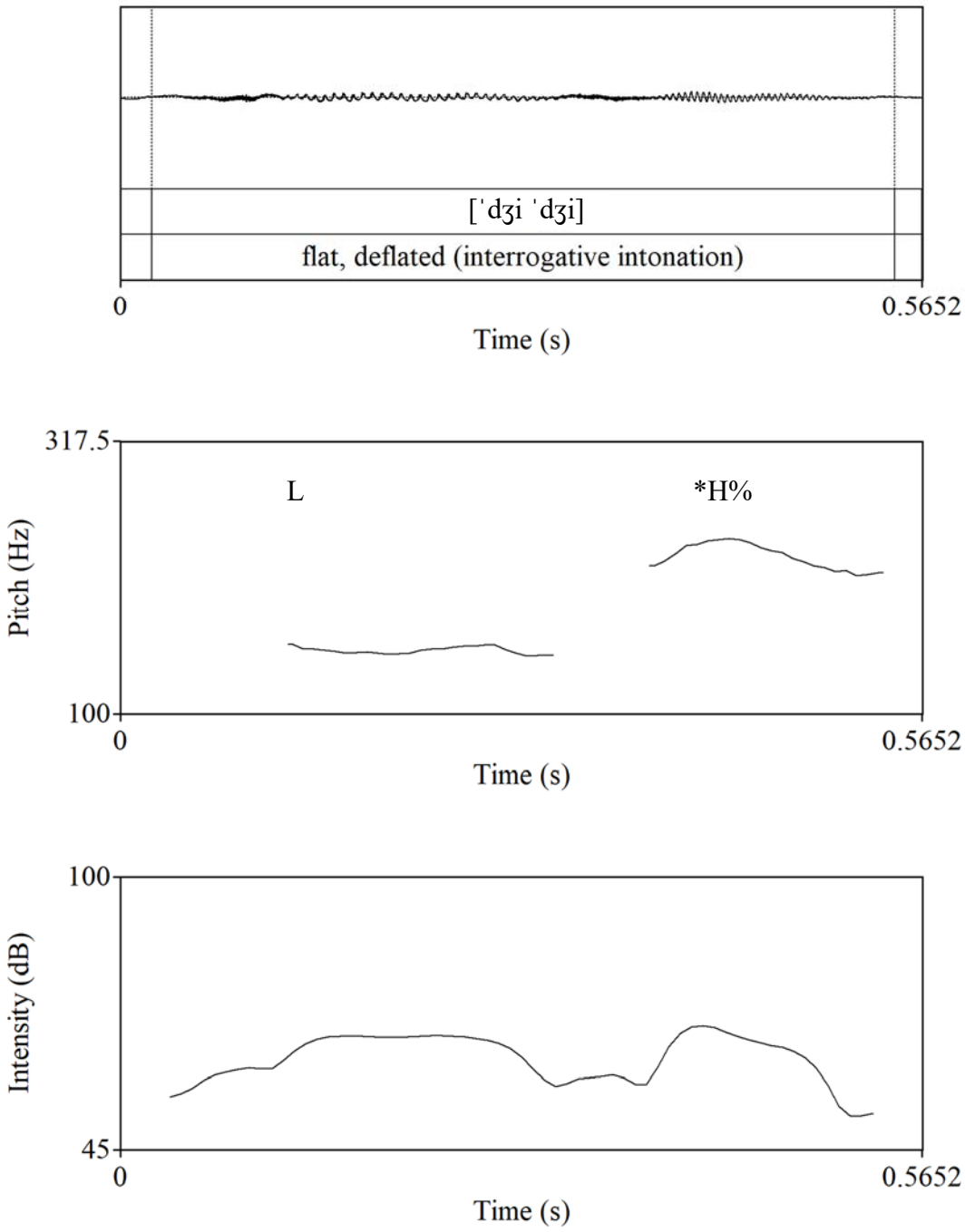

Figure 3.11 – Non-terminal phrase contour, interrogative intonation [ˈdʒi]#[ˈdʒi] ‘flat, deflated’

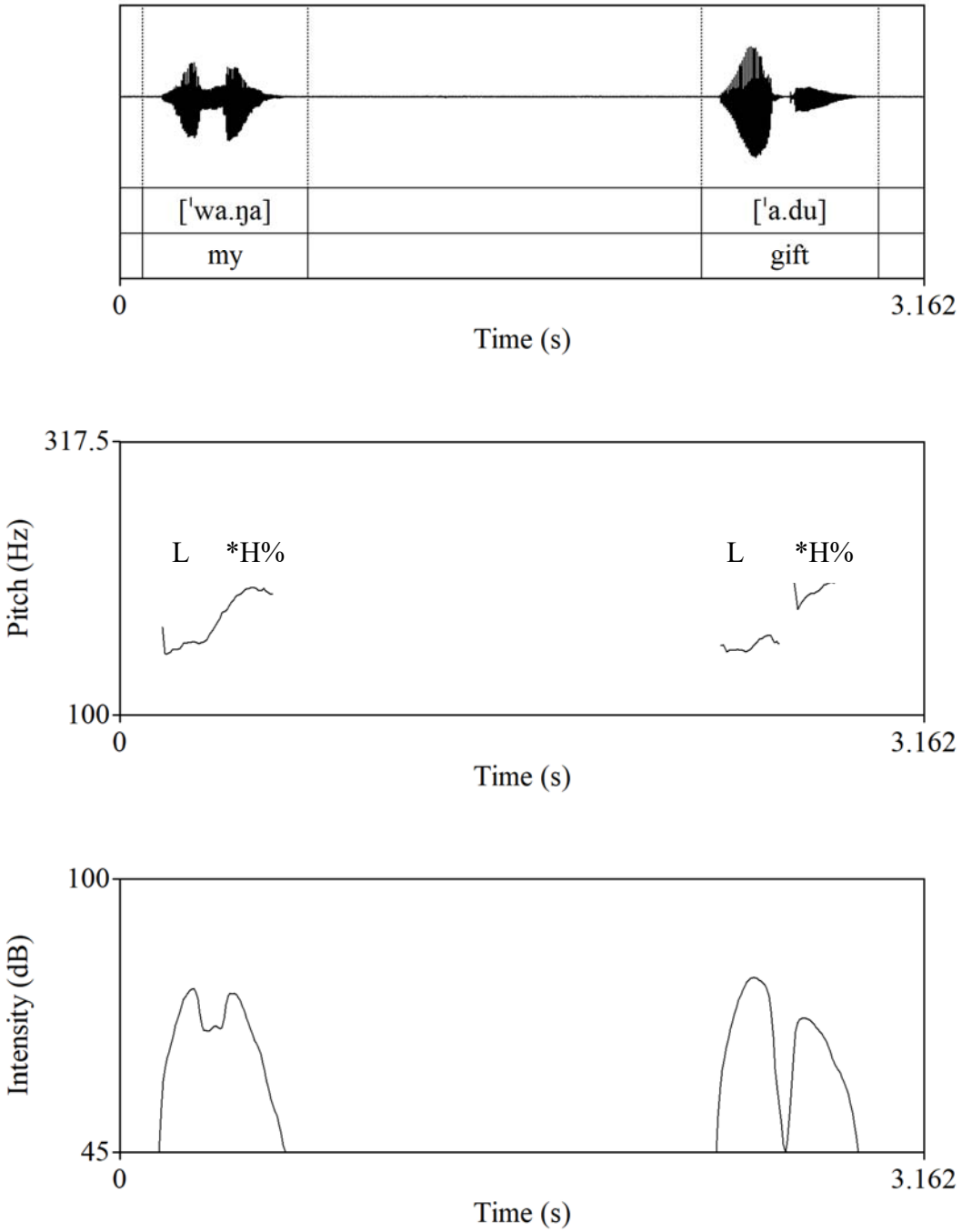

Figure 3.12 – Non-terminal phrase contour, listing intonation
[ˈwa.ŋa] ‘my’, [ˈa.du] ‘gift’

Aside from the phrase-level pitch patterns described above, there are at least two phonological processes that appear to take the intonational phrase as their phonological domain.

First, oral stops are devoiced in phrase-final position, as per the phrase-final devoicing rule given in Chapter 2, Table 2.1.5(e). This phenomenon does not occur in phrase-medial prosodic words, and so is taken to apply at the level of the intonational phrase.

Second, an epenthetic [ə] is frequently inserted between consonants across prosodic word boundaries in a phonological phrase. Consider for example the phrase /ijaŋ bʸodʒi-n/ 'he/she snores', which in running speech is realized as [ˈi.jɐŋ]#[ə]#[bo.ˈdʒin].[75] Notably, [ə] epenthesis across word boundaries is not a completely regular phonological process. In careful speech a brief pause may be observed instead of epenthetic [ə].

The insertion of [ə] across word boundaries may seem comparable to the insertion of recovered (thematic) vowels or [ə] observed at some morpheme boundaries (§4.2.3.1). They are both processes that break up a consonant cluster across a domain boundary. However, there are some important differences to note. First is the observation that these processes operate within different phonological domains. Epenthetic [ə] occurs at word boundaries in a phonological phrase, while recovered vowels occur at morpheme boundaries within words. Second, [ə] epenthesis may be absent in careful speech, while recovered vowels are consistently realized at morpheme boundaries. Furthermore, recovered vowels include vowels that have clear historic origins, while word-boundary vowel epenthesis invariably employs [ə]. Consider, for example, the word for 'wind', which may continue historic *i from PMc *aŋi 'wind' upon suffixation: /eŋ/ 'wind', /eŋi-n oeo/ 'strong wind'. If word-boundary vowel epenthesis were the result of historic word-final vowel loss, as is apparent for recovered vowels, then we would expect vowels other

[75] Literally 'his/her nose cries out'.

than [ə] to surface.

3.5 Micronesian Stress and Prosody

As discussed in Chapter 4, there is good evidence that Nauruan is a Micronesian language. As such, it will be useful to compare the Nauruan stress system to other systems in the Micronesian family. Synchronically, most Micronesian stress systems are based upon syllable weight and have a penultimate stress pattern, though there is variability in both stress placement and in the relation between stress and pitch. Nauruan generally aligns stress and high pitch, as do Kosraean and Marshallese; but in other Micronesian languages, such as Kiribati and Pohnpeian, stress and pitch are independent. Considering the known Micronesian stress systems, Rehg (1993) reconstructs Proto-Micronesian with a penultimate stress pattern which is independent of pitch. In PMc, high pitch is assigned to the antepenultimate mora and low pitch is assigned to the penultimate and final morae in each terminal prosodic contour.[76] Rehg's reconstruction is illustrated in Figure 3.13 below, where each V represents a single mora.

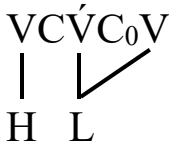

Figure 3.13 – PMc stress and pitch (Rehg 1993)

Several Micronesian languages are described as having pitch peaks that do not coincide with stress, as reconstructed for PMc. In these cases, the phonetic correlates of stress must involve some relative difference in intensity and/or length, independent of pitch. Unfortunately,

[76] Rehg defines terminal prosodic contours as final phonological phrases in declarative sentences.

there is no detailed discussion on the phonetic correlates of stress in Rehg's description and reconstruction. He states plainly that "precisely what the acoustic correlates of stress are in each of these languages remains to be determined" (Rehg 1993: 28). The phonetic realization of stress in Pohnpeian, for example, is described by saying that "… stressed morae clearly carry the *beat*." (Rehg 1993: 43). One thing that has been noted regarding the phonetics of Micronesian stress is that intensity plays only a marginal role in determining relative prominence (Rehg 1993: 28), something which may be a more general tendency across languages (Lehiste 1976: 235).

Table 3.5.1 provides a summary of the stress and prosody systems described in the literature on several Micronesian languages. The segmental structures in the 'stress and pitch' column (e.g. VCVCV#) are not intended to describe phonotactic constraints for each language, but just serve to exemplify the placement of stress and pitch in a typical word-final environment. For mora-based analyses the placement of stress could change where there are weight-bearing codas, for example. Each "V" in the table may be accompanied by either the symbol μ representing a mora, or the symbol σ representing a syllable, depending on how the stress system is described in the literature.[77] Where these are absent, stress is described in terms of the vowels themselves rather than syllables or morae. An acute accent over one of these symbols indicates primary stress. Grave accents, if present, indicate secondary stress. The symbols H and L represent high and low pitch respectively, and M represents a medium pitch.[78] An underlined <u>H</u> represents extra-high pitch.

The entry for Nauruan in Table 3.5.1 is based on the description of the stress system presented in §3.2 of this dissertation. To summarize, Nauruan stress is assigned to the syllable

[77] Though Rehg assumes all Micronesian languages have the mora as their prosody-bearing unit (1993: 28).

[78] "M" corresponds to "2" in a "2 3 1" pitch pattern, for example.

which projects the penultimate mora, such that stress is placed on the final syllable if it is heavy and is otherwise placed on the penultimate syllable. As noted above, stress and high pitch generally coincide in Nauruan.

Table 3.5.1 – Stress and Pitch in Micronesian Languages

Language	Stress and Pitch	References	Notes
Proto-Micronesian	μ μ́ μ V.CV.CV# | | H L	Rehg 1993: 37	The penultimate stress hypothesis is supported by evidence of subsequent final vowel weakening and loss
Nauruan [79]	μ μ́ μ V.CV.CV(C)# | | | L H L μ μ μ́ μ V.CV.CVC# | | L H		Nauruan stress is assigned to the syllable that contains the penultimate mora. The final syllable is stressed if it is heavy (bimoraic), otherwise the penultimate syllable is stressed (§3.2.3). High pitch and stress generally align.
Kosraean	σ σ́ σ V.CV.CV# | | | M H L	Rehg 1993: 34 Lee 1975: 32-39	High pitch always coincides with the stressed syllable

[79] Note that the upper illustration shows a monomoraic word-final syllable, and the lower illustration shows a bimoraic (heavy) word-final syllable. The latter shows two morae over the final syllable, one for the nucleus and one for the coda consonant.

Kiribati [80] (Gilbertese)	μ μ́ μ V.CV.CV# | | H L	Blevins and Harrison 1999 Rehg 1993: 34	Gilbertese is proposed to have trimoraic feet (Blevins and Harrison)
Marshallese	μ μ́ μ V.CV.CV# | | | M H L	Wilson 2003: 8 Rehg 1993: 34 Bender (n.d.)	The pitch pattern is proposed tentatively by Rehg Wilson suggests a mora-based analysis, though Bender's description is in terms of syllables
Puluwatese (Chuukic)	σ̀ σ σ́ V.CV.CV | | | M H L	Rehg 1993: 33 Elbert 1974: 13-14	The stress and pitch account is partially inferred by Rehg from Elbert's description Elbert describes pitch within simple declarative sentences
Woleaian (Chuukic)	V.CV.CV | | H L V.CV.C̥V | | H L	Rehg 1993: 33 Sohn 1975	Sohn states that vowels have generally equal intensity. Stress is not explicitly described. Sohn's describes a 331 (HHL) pitch pattern within simple declarative sentences. Voiceless final vowels are excluded.

[80] Kiribati is apparently the most conservative of the Nuclear Micronesian languages in terms of prosody. It matches the PMc stress and pitch pattern closely (Rehg 1993: 35-36), and like PMc, Kiribati has minimally tri-moraic prosodic words (Blevins and Harrison 1999: 205).

Pulo Annian (Chuukic)	V.CV́.CV | | | M H L V́.CV.CV̥ | | | M H L	Rehg 1993: 32 Oda 1977: 20-21	Pitch assignment is inferred from examples in Oda 1977, which gives no explicit rule Examples suggest pitch is assigned to voiceless vowels, while stress assignment disregards them
Ulithian (Chuukic) [81]	V́: V́C:V(C)# M H L	Rehg 1993: 31 Sohn and Bender 1973	Stress is described as not clearly recognizable, but "subphonemically" accompanied by a long vowel or a short vowel preceded by a long consonant; a short vowel is not stressed if it precedes a long consonant followed by a long vowel Rehg notes that it is impossible to tell from the description if this applies to terminal prosodic contours Four pitch levels are recognized (1 2 3 4), but the pattern 2 3 1 (M H L) is most typical of statements and questions

[81] Association lines are omitted from the illustrations here because it is unclear where they should be placed based on the description in the literature.

Pohnpeian / Mokilese (Pohnpeic)	μ̀ μ μ́ CV.CV.CV ‖ M H L μ̀ μ μ́ CV.CV.CV | M H H	Rehg 1993: 29	Rehg's analysis is based on Pohnpeian, but is partially inferred from Mokilese data, a language which borders on mutual intelligibility with Pohnpeian. A prosodic phrase has the pattern 2 3 1 (M H L) in final position, but 2 3 4 (M H H) in non-final positions, where H is extra high

Nauruan is like most of the Micronesian languages in having a penultimate and weight-sensitive stress pattern. Exceptions are found with the Pohnpeic languages and Puluwatese, which consistently stress the final syllable according to descriptions in the literature. As described above, final stress only occurs in Nauruan where the final syllable is a heavy CVC syllable, such that the penultimate mora is within the final syllable. Further discussion on the historical development of Micronesian stress can be found in Lynch (2002), who traces the development of various prosodic systems within Oceanic.

The goal of this chapter has been to provide an overview of Nauruan prosodic structure and stress based on data from original fieldwork, and to contextualize this within the greater body of research on Micronesians prosody. This chapter also represents some of the only work on Micronesian prosody since Blevins and Harrison's (1999) account of trimoraic feet in Gilbertese. Additional work is needed to better understand Micronesian stress and prosody, particularly with regard to the relationship between stress and pitch, and how these systems might have developed from the reconstructed PMc system.

4 Nauruan Historical Phonology

Previous work on Nauruan historical phonology has been presented as highly tentative, both for lack of data and for difficulty in analysis (Jackson 1986: 211, Nathan 1973a: 481). This chapter aims to present a more confident analysis of Nauruan sound change and classification than has been possible previously. The present study has benefited from original fieldwork, which has provided much needed data to establish regular sound correspondences between Nauruan and the other Micronesian language. This study has also benefited from advancements made in Austronesian comparative linguistics in the time since Nathan's (1973a) and Jackson's (1986) work on Nauruan. The Austronesian Comparative Dictionary (Blust and Trussel; ACD) and Bender et al.'s (2003) Micronesian data and reconstructions have been indispensable resources for this work.

Nauruan has been considered a Micronesian language that is independent from the nuclear Micronesian group, forming a separate branch of the family (Lynch et al. 2011: 65, 117; Jackson 1986: 211-214; Marck 1975: 28-30).[82] However, the present study finds no compelling evidence for classifying Nauruan apart from the nuclear Micronesian group. On the contrary, evidence is presented for classifying Nauruan within this group, suggesting that all Micronesian languages, including Nauruan, are daughters of PMc.

§4.1 identifies and discusses the regular sound correspondences between Proto-Oceanic (POc), Proto-Micronesian (PMc) and Nauruan. Internal sound changes have required the reconstruction of several intermediary stages between PMc and contemporary Nauruan. This

[82] Preceding Marck (1975), Bender (1971: 434-435) briefly discusses Nauruan in a section dedicated to "questionably nuclear languages", alongside Yapese. Bender notes that Dyen's (1965) lexicostatistical study of Austronesian languages includes Nauruan on an independent branch of the Austronesian linkage, though it is notable that Dyen nonetheless assessed Nauruan as sharing 16.1% of cognates with the Carolinian languages, which are Micronesian (1965: 41).

includes at least three pre-Nauruan stages, as well as Old Nauruan, which represents the earliest stage of the language which is still distinct from PMc. Also included is an adapted version of the Micronesian consonant correspondence charts from Bender et al. (2003: 4-5), found in Tables 4.1.6 and 4.1.7, to which Nauruan sound correspondences have been added. A series of subsections follow which discuss the sound changes associated with each correspondence set. A selection of supporting comparative data is provided in each subsection. The body of comparative data supporting the correspondences can be found in the appendix. Unless otherwise noted, Nauruan data is from original fieldwork, POc reconstructions are taken from the ACD, and PMc reconstructions are from Bender et al. (2003) or Trussel's online adaptation of the same work (Trussel (a); MCD).[83] Proto-Eastern Oceanic (PEOc) reconstructions are from Geraghty (1983, 1990) or Jackson (1983: 342-348), as cited in Bender et al. (2003). Data from individual Micronesian languages is from Bender et al. (2003), unless another source is cited.

§4.2 reviews the evidence for including Nauruan in the Micronesian family. The phonological innovations that define the family are reviewed and Nauruan is shown to have participated in each of them. Jackson's (1986) arguments for including Nauruan in the Micronesian family are also reviewed and remain well supported by the data. A large body of additional evidence is presented, including a range of phonological processes and morphological paradigms which are characteristic of Micronesian languages and which also occur in Nauruan.

§4.3 presents evidence that the prevailing view on Nauruan classification should be revised. Jackson (1986) agrees that Nauruan is a Micronesian language, but he also argues for Nauruan's exclusion from the nuclear Micronesian group on the grounds that Nauruan fails to

[83] In the literature, Proto-Micronesian (PMc) refers to the proto-language from which the nuclear Micronesian languages descended. Up to this point, Nauruan has not been considered part of the nuclear Micronesian group, but rather the closest (and only) sister of this group under a proposed Greater Micronesian subgrouping of Oceanic (Jackson 1986; Lynch et al. 2011).

reflect certain innovations that all other members of the Micronesian family share (1986: 212). Each of Jackson's arguments for excluding Nauruan from the nuclear group are reviewed and are found to be poorly supported by the data.

§4.4 argues for a revised classification for Nauruan which places it within the nuclear Micronesian group. Furthermore, among the Micronesian languages only Nauruan and Kosraean appear not to merge PMc *s and *S. This suggests that Nauruan and Kosraean belong on independent branches apart from the Central Micronesian subgroup, which includes all other members of the family. Excluding Nauruan from Central Micronesian is preliminary, as evidence could come to light that would suggest an alternate classification for Nauruan. The evidence that would support an alternate classification is reviewed.

§4.5 presents a small subset of Nauruan words whose origins are uncertain. Some of these words appear phonologically and semantically similar to Austronesian etyma older than POc and have no identified Micronesian cognates other than those in Nauruan. This implies one of two possibilities: 1) these words continue PMc forms, but cognates either have not yet been identified or do not exist in Micronesian languages other than Nauruan, or 2) these words entered Nauruan via historic language contact.

4.1 Sound Correspondences and Sound Change

This section presents regular sound correspondences between Nauruan, POc, PMc, and individual Micronesian languages, including correspondences for intermediary stages of pre-Nauruan. The subsections that follow discuss the sound changes implied by these correspondence sets.

Before presentation of the comparative data, a brief note on the representation of POc proto-phonemes is in order. The sound correspondences presented in this chapter use the POc

inventory of Ross (1988) rather than the older traditional POc phoneme inventory (Biggs 1969, Proto-Eastern Oceanic; Grace 1969, Proto-Oceanic; Blust 1978 for POc *j, *ñ). Ross revised the POc inventory to better fit observed Oceanic phoneme inventories and to emphasize the reinterpretation of nasal grade palatal obstruents (Lynch et al. 2011: 66). This is noted because some of the works cited here make use of the traditional POc representations, including Jackson (1986: 201-204) and Bender et al. (2003: 4-5, Tables 2 and 3). To maintain consistency, where data from these works is reproduced here, POc proto-phonemes from Ross (1988) are used instead of the older representations. POc reconstructions in the lexical comparisons from Bender et al. (2003) follow Ross, as do reconstructions in the ACD (Blust and Trussel) in most cases.[84]

Table 4.1.1 shows the orthographic correspondences between the traditional POc inventory and Ross's (1988) revision (adapted from Lynch et al. 2011: 66). The rows labeled "traditional" contain POc representations used by Grace (1969) and Biggs (1969), and two proposed by Blust (1978) which appear in parentheses. The most significant differences include the change from representing the nasal grade phonemes as homorganic nasal-obstruent sequences to representing them as voiced obstruents; the reinterpretation of Blust's (1978) POc oral grade *j as *c; and the claim that the nasal grade of pre-POc *s and *c had merged as *j (traditionally *nj) in POc. This last point resulted in the elimination of *ns from the POc inventory by Ross.

[84] Some reconstructions in the ACD imply they are continued in POc without change, even though they contain phonemes that Ross does not explicitly reconstruct for POc, including *C, *L, *N, or *h.

Table 4.1.1 – Orthographic correspondences in POc (adapted from Lynch et al. 2011: 66)

Oral Grade	Traditional	*p	*pw	*t	*d/*r	*s	(*j)	*k
Obstruents	Ross (1988)	*p	*p^{w}	*t	*r	*s	*c	*k
Nasal Grade	Traditional	*mp	*ŋp/*mpw	*nt	*nd/*nr	*ns	*nj	*ŋk
Obstruents	Ross (1988)	*b	*b^{w}	*d	*dr		*j	*g
Other	Traditional	*m	*ŋm/*mw	*n	(*ñ)	*ŋ	*w	*y	*l	*q	*R
Consonants	Ross (1988)	*m	*m^{w}	*n	*ñ	*ŋ	*w	*y	*l	*q	*R

Tables 4.1.2 – 4.1.5 show regular sound correspondences between POc, PMc, and Nauruan, as well as several intermediary stages internal to Nauruan. Three stages of pre-Nauruan are reconstructed, as well as Old Nauruan, which represents the earliest reconstructed stage of the language which is distinct from PMc. The pre-Nauruan stages appear in columns headed by P-Nau$_1$, P-Nau$_2$, and P-Nau$_3$ accordingly. These columns follow those for Old Nauruan, which are headed by the abbreviation ON.

Rows are grouped into correspondence sets, e.g. Cr1, Cr2, Cr3, etc. The rows in each set are additionally assigned roman numerals for reference, e.g. Cr1i, Cr1ii, Criii, etc. Unless otherwise indicated, the Nauruan reflexes occur in all positions within words (initial, medial, and final). The use of curly brackets indicates any of the sounds within the brackets; e.g. *{o,u} means either *o or *u. The use of a slash without an accompanying underscore indicates a position either immediately following or immediately preceding the sound after the slash; e.g. *g/{o,u} means *g immediately preceding or following *o or *u.

Geminate consonants are written using the IPA length diacritic, e.g. *pː, though this somewhat obscures the history of these sounds. Most geminates appear to result from reduplication and subsequent vowel syncope, *#CV >> *#CVCV (REDUPLICATION) >> #CCV

(SYNCOPE), and so might otherwise be written using double-consonant notation, e.g. *pp. Micronesian geminate consonants are discussed in more detail in the relevant subsections that follow.

Table 4.1.2 – POc, PMc and Nauruan sound correspondences: Labials, Velars and Glides

Corr. #	POc	PMc	ON	P-Nau $_1$	P-Nau $_2$	P-Nau $_3$	Nau
Cr1i				*pːʲ < *pʲVpʲ	*pʲ	*pʲ	pʲ
Cr1ii	*b	*p	*pʲ	*pʲ	*bʲ	*bʲ	bʲ
Cr1iii				*pːʸ < *pʸVpʸ	*pʸ	*pʸ	pʸ
Cr1iv	*b{o,u}, *bʷ	*pʷ	*pʸ	*pʸ	*bʸ	*bʸ	bʸ
Cr2i	*p	*f	*Ø	*Ø	*Ø	*Ø	Ø
Cr3i				*mːʲ < *mʲVmʲ	*mːʲ	*mːʲ	mːʲ
Cr3ii	*m	*m	*mʲ	*mʲ	*mʲ	*mʲ	mʲ
Cr3iii				*mːʸ < *mʸVmʸ	*mːʸ	*mːʸ	mːʸ
Cr3iv				*mʸ/__#	*ŋʷ	*ŋʷ	ŋ
Cr3v	*m{o,u}, *mʷ	*mʷ	*mʸ	*mʸ	*mʸ	*mʸ	mʸ
Cr4i		*k/__i	*tʃ	*tʃ	*tʃ	*tʃ	tʃ
Cr4ii				*gː < *gVg	*k	*k	k
Cr4iii				*g/#__a	*Ø	*Ø	Ø
Cr4iv					*g/{o,u}	*w	w
Cr4v	*k	*k	*g	*g	*g	*g	g
Cr5i	*q	*Ø	*Ø	*Ø	*Ø	*Ø	Ø
Cr6i	*g	*x	*Ø	*Ø	*Ø	*Ø	Ø
Cr7i			*ŋ/(V){o,u,w}	*ŋʷ	*ŋʷ	*ŋʷ	ŋ
Cr7ii				*ŋʷ/#__a	*Ø	*Ø	Ø
Cr7iii					*ŋʷ/__#	*g	g
Cr7iv						*ŋʷ/#__	mʸ
Cr7v						*ŋʷ/{o,u}__#	mʸ
Cr7vi	*ŋ	*ŋ	*ŋ	*ŋ	*ŋ	*ŋ	ŋ
Cr8i	*y	*y	*Ø	*Ø	*Ø	*Ø	Ø
Cr9i				*w/#__	*Ø	*Ø	Ø
Cr9ii						*wː	kʷ
Cr9iii	*w	*w	*w	*w	*w	*w	w

Table 4.1.3 – POc, PMc and Nauruan sound correspondences: Coronals

Corr. #	POc	PMc	ON	P-Nau $_1$	P-Nau $_2$	P-Nau $_3$	Nau
Cr10i				*t/{i,e}	*ʲ	*ʲ	ʲ
Cr10ii						*ʲ/#	Ø
Cr10iii						*ʲ/#i__	j
Cr10iv						*t/__i	ʧ
Cr10vi	*t	*t	*t	*t	*t	*t	t
Cr11i		*T/__i	*ʧ	*ʧ/__# (?)	*ř	*ř	ř
Cr11ii		*T [85]	*t	*t	*t	*t	t
Cr12i					*d: < *dVd	*t	t
Cr12ii						*d/__i	ʤ
Cr12iii	*c	*S	*D	*D	*D/o	*g	g
Cr12iv	*c	*S	*D	*D	*D	*d	d
Cr12v	*s, *j	*s [86]	*d	*d	*d	*d	d
	*c	*Z [87]					
Cr13i				*ř: (?)	*d	*d	d
Cr13ii	*d, *dr	*c	*ř	*ř	*ř	*ř	ř
Cr14i	*R	*Ø	*Ø	*Ø	*Ø	*Ø	Ø
Cr14ii	*R, *r	*r	*r	*r	*r	*r	r
Cr15i				*l/{i,e}	*ʲ	*ʲ	ʲ
Cr15ii					*l /__(V){o,u,w}	*r	r
Cr15iii	*l	*l	*l	*l	*l (> *n) [88]	*n	n
Cr16i					*n/(V){o,u,w}	*ŋ^{w}	ŋ
Cr16ii					*n:	*t	t
Cr16iii	*n	*n	*n	*n	*n	*n	n
Cr17i				*ñ/{i,e}	*ʲ	*ʲ	ʲ
Cr17ii					*ñ:, *ñ/n	*t	t
Cr17iii	*ñ	*ñ	*ñ	*ñ	*ñ	*ñ	n

[85] PMc *T is reconstructed only before *i, *e, or *u (Jackson 1986: 203, footnote 23).

[86] Though Bender et al. (2003) show PMc *s as a regular correspondence of POc *s, some etymologies seem to suggest that POc *s might continue either PMc *s or *S; e.g. POc *qasu > PMc *a{s,S}u ‘smoke’.

[87] PMc *Z occurs in only two reconstructions, *kiaZo ‘outrigger boom’ and *laZe ‘a kind of coral’. No Nauruan cognates for either of these reconstructions have yet been identified.

[88] The unconditioned sound change *l > *n was complete sometime before P-Nau$_3$.

Table 4.1.4 – Glide accretion [89]

Corr. #	ON	P-Nau
Cr18i	Ø/#__{a,i}	*w

Table 4.1.5 – POc, PMc, and Nauruan sound correspondences: Vowels

Corr. #	POc	PMc	ON	Pre-Nau $_1$	Pre-Nau $_2$	Pre-Nau $_3$	Nau
Cr19i				*i/w__	*ɨ	*ɨ	ɨ
Cr19ii					*i/__w	*u	u
Cr19iii	*i	*i	*i	*i	*i	*i	i
Cr20i				*e/{o,u,w}	*o	*o	o
Cr20ii					*e/__ñ	*i	i
Cr20iii	*e	*e	*e	*e	*e	*e	e
Cr21i						*u/__{t,j}	i
Cr21ii						*u/{w,w:}__	ɨ
Cr21iii	*u	*u	*u	*u	*u	*u	u
Cr22i						*ou	o
Cr22ii	*o	*o	*o	*o	*o	*o	o
Cr23i			*a/__(C)a	*e	*e	*e	e
Cr23ii			*a/__(C){u,w,ŋ^{w}}	*e	*e	*e	e
Cr23iii				*a/(C){i,e}	*æ	*æ	æ
Cr23iv					*æ/__(C)i	*e	e
Cr23v					*eæ	*æ	æ
Cr23vi	*a	*a	*a	*a	*a	*a	a
Cr24vii				*V:	*V	*V	V

[89] The term “glide accretion” refers to a recurrent sound change in Oceanic languages in which a glide is inserted at the beginnings of words that begin with a vowel, including after the loss of initial consonants (Blust 1990: 10-17). Strictly speaking this is not a sound correspondence but a sound change, though it can be conceptualized as a correspondence between Old Nauruan *Ø and pre-Nauruan *w. Pre-Nauruan *w was inserted word-initially before *a or *i.

Tables 4.1.6 – 4.1.7 present consonant correspondences between POc, PMc and individual Micronesian languages, adapted from Bender et al. (2003: 4-5) with the addition of Nauruan correspondences.

Table 4.1.6 – Micronesian consonant correspondences: Labials, Velars and Glides

POc	*b	*b, *b^{w}	*p	*m	*m, *m^{w}	*k	*q	*g	*ŋ	*y	*w
PMc	*p	*p^{w}	*f	*m	*m^{w}	*k	*Ø	*x	*ŋ	*y	*w
Kosraean	p	f	Ø	m	w, m	k		k, Ø	ŋ	Ø	Ø
Nauruan [90]	**b**	**b^{ɣ}**	**Ø**	**m^{j}**	**m^{ɣ}, ŋ**	**g, w, tʃ**		**Ø**	**ŋ, m^{ɣ}, g, Ø**	**Ø**	**w, Ø**
PCMc	*p	*p^{w}	*f	*m	*m^{w}	*k		*x	*ŋ	*y	*w
Kiribati	b	b^{w}	Ø	m	m^{w}	k, Ø		Ø	ŋ	Ø	w
PWMc	*p	*p^{w}	*f	*m	*m^{w}	*k		*x	*ŋ	*y	*w
Marshallese	p	b^{w}	y	m, m:	m^{w}, m:^{w}	k, k^{w}		Ø	ŋ, ŋ^{w}	y	w
PPC	*p	*p^{w}	*f	*m	*m^{w}	*k		*r, *Ø	*ŋ	*y	*w
PPn	*p	*p^{w}	*p, *Ø	*m	*m^{w}	*k		*r, *Ø	*ŋ	*Ø, *y	*w
Pohnpeian	p	p^{w}	p, Ø	m	m^{w}	k		r, Ø	ŋ	Ø, y	w
Mokilese	p	p^{w}	p, Ø	m	m^{w}	k		r, Ø	ŋ	Ø, y	w
Pingelapese	p	p^{w}	p, Ø	m	m^{w}	k		r, Ø	ŋ	Ø, y	w
PCk	*p	*p^{w}	*f	*m	*m^{w}	*k		*Ø	*ŋ	*Ø, *y	*w
Mortlockese	p	p^{w}	f	m	m^{w}	k, Ø		Ø	ŋ	y	w
Chuukese	p	p^{w}	f	m	m^{w}	k, s{_i}, Ø		Ø	ŋ	Ø, y	w
Puluwatese	p	p^{w}	f	m	m^{w}	k, Ø		Ø	ŋ	Ø, y	w
S.Carolinian	p	b^{w}	f	m	m^{w}	g, Ø		Ø	ŋ	Ø, y	w
S.C.Tanapag	p	b^{w}	f	m	m^{w}	gh, Ø		Ø	ŋ	Ø, y	w
Satawalese	p	p^{w}	f	m	m^{w}	k, Ø		Ø	ŋ	Ø, y	w
Woleaian	p	b	f	m	m^{w}	g		Ø	ŋ	Ø, y	w
Pulo-Annan	p	p^{w}	d [ð]	m	m^{w}	k		Ø	ŋ	Ø, y	w
Sonsorolese	p	b^{w}	f	m	m^{w}	k		Ø	ŋ	Ø, y	w
Ulithian	p	b	f	m	m^{w}	g		Ø	ŋ	Ø, y	w

[90] The Nauruan voiceless oral stops and bilabial geminates, /p/, /k/, /k^{w}/, /m:^{j}/, and /m:^{ɣ}/, continue geminates that resulted from internal processes of reduplication and vowel syncope: p < *bb < *bVb; k < *gg < *gVg; k^{w} < *ww < *wVw; m:^{j} < *mm^{j} < *m^{j}Vm^{j}; m:^{ɣ} < *mm^{ɣ} < *m^{ɣ}Vm^{ɣ}.

Table 4.1.7 – Micronesian consonant correspondences: Coronals

POc	*t		*s, *j [91]	*c [92]	*c [93]	*d, *dr	*r, *R	*l	*n	*ñ
PMc	*t	*T	*s	*S	*Z	*c	*r [94]	*l	*n	*ñ
Kosraean	t, s	s	t, s	Ø	s	sr	l	l	n	ñ
Nauruan [95]	**t, ɟ**	**t**	**d**	**d, g**	**?** [96]	**ř**	**r**	**n, ɟ, r**	**n, ŋ**	**n, ɟ**
PCMc	*t	*T	*s	*s	*z	*c	*r	*l	*n	*ñ
Kiribati	t, Ø	t	r	r	r	r	Ø	n	n	n
PWMc	*t	*T	*s	*s	*Ø	*c	*r	*l	*n	*ñ
Marshallese	j	j	t	t	Ø	d [ɾʲ]	r, rʷ	l, l̩, l̩ʷ	n, n̩, n̩ʷ	n
PPC	*t	*T	*d	*d	*Ø	*c	*r	*l	*n	*ñ
PPOn	*j, *Ø	*j	*d	*d	*Ø	*c	*r	*l	*n	*Ø, *n
Pohnpeian	s, Ø	s	d	d	Ø	t	r	l	n	Ø
Mokilese	j, Ø	j	d	d	Ø	s	r	l	n	Ø, n
Pingelapese	s, Ø	s	d	d	Ø	s	r	l	n	Ø, n
PCk	*t	*t	*d	*d	*Ø	*c	*r	*l	*n	*ñ
Mortlockese	s, Ø	s	t	t	Ø	sh; shsh	r	l	n	n
Chuukese	s, Ø	s	t	t	Ø	ch; chch	r	n	n	n
Puluwatese	h, Ø	h	t	t	Ø	R; cch	r	l	n	n
S.Carolinian	h, Ø	h	t	t	Ø	R; tch	r	l	n	n
S.C.Tanapag	s, Ø	s	t	t	Ø	sh; tch	r	l	l	l
Satawalese	s, Ø	s	t	t	Ø	R; chch	r	l ~ n; nn	n ~ l; nn	n
Woleaian	s, t, Ø	s	t	t	Ø	sh; cch	r	n	n	l
Pulo-Annan	d, t, Ø	d	t	t	Ø	s; ss	l	r; nn	r; nn	n
Sonsorolese	d, t, Ø	d	t	t	Ø	s; ss	l	r; nn	r; nn	r
Ulithian	s, t, Ø	s	th	th	Ø	c; cc	r	l	l	l

[91] Originally reconstructed as Proto-Eastern Oceanic *nj (Jackson 1983: 342-348; Geraghty 1983).

[92] Ross (1988) eliminates *ns from the POc inventory, though Bender et al. include it here. POc *c was originally reconstructed as Proto-Eastern Oceanic *j (Jackson 1983: 342-348; Geraghty 1983).

[93] Originally reconstructed as Proto-Eastern Oceanic *j (Geraghty 1983: 149-153).

[94] POc *R is continued as *r or is lost in PMc under unknown conditions (Bender et al. 2003: 5, footnote 3).

[95] Nauruan /t/ also continues pre-Nauruan *d: or *n:. Nauruan /d/ may also continue pre-Nauruan *ř:.

[96] PMc *Z is only reconstructed in two etyma, PMc *kiaZo ‘outrigger boom’ and PMc *laZe ‘a kind of coral’, neither of which have identified Nauruan cognates.

Table 4.1.8 below shows the relative time depth for each proposed sound change from PMc to contemporary Nauruan. In the listed sound changes, the absence of an underscore in the phonological environment indicates that the sound change occurred either before or after the conditioning segments. The use of curly brackets indicates any of the included segments. For example *l > *j /{i,e} means that *l became *j adjacent to either *i or *e.

Every effort has been made to present an accurate account of the relative time depth for each change, though it must be stated that this is a first attempt. As work in Nauruan historical phonology continues, the order of some of these changes may need to be revised.

Table 4.1.8 – Relative time depth of Nauruan internal sound changes

Time Depth [97]	Sound Changes
PMc >> ON	a. *p > *bʲ b. *pʷ > *bʸ c. *f > Ø d. *m > *mʲ e. *mʷ > *mʸ f. *k > *tʃ / __i g. *k > *g h. *x > Ø i. *y > Ø j. *T > *t k. *T > *tʃ / __i l. *S > *D m. *s > *d n. *c > *ř

[97] Though glide accretion (u., Table 4.1.4) took place as early as pre-Nauruan, there appear to have been later instances that occurred after the loss of word-initial consonants. This suggests it was an ongoing process in pre-Nauruan.

ON >> P-Nau$_1$	o. *pʲVpʲ > *pːʲ p. *pʸVpʸ > pːʸ q. *mʲVmʲ > mːʲ r. *mʸVmʸ > mːʸ s. *gVg > *gː t. *ŋ > ŋʷ / (V){o,u,w} u. *Ø > *w / #__{a, i} v. *a > *e /__(C)a w. *a > *e /__(C){u,w,ŋʷ}
P-Nau$_1$ >> P-Nau$_2$	x. *pːʲ > *pʲ y. *pʲ > *bʲ z. *pːʸ > *pʸ aa. *pʸ > *bʸ bb. *mʸ > *ŋʷ /__# cc. *gː > *k dd. *g > Ø / #__a ee. *ŋʷ> Ø / #__a ff. *w > Ø /#__ gg. *t > *ʝ /{i,e} hh. *tʃ > *ř /__# (?) ii. *dVd > *dː jj. *řː > *d (?) kk. *l > *ʝ /{i,e} ll. *ñ > *ʝ /{i,e} mm. *i > *ɨ / w nn. *e > *o /{o,u,w} oo. *a > *æ / (C){i,e} pp. *Vː > V

P-Nau$_2$ >> P-Nau$_3$	qq. *g > *w /{o,u} rr. *ŋ^w > *g /__# ss. *D > *g / o tt. *D > *d uu. *d: > *t vv. *n > *ŋ^w /(V){o,u,w} ww. *n: > *t xx. *ñ: > t ; *ñ > *t / n yy. *i > *u /__w zz. *e > *i /__ñ aaa. *æ > *e / __(C)i bbb. *eæ > *æ ccc. *l > *r / __(V){o,u,w} ddd. *l > *n [98]
P-Nau$_3$ >> Nauruan	eee. *ŋ^w > ŋ fff. *ŋ^w > m^ɣ / #__ ggg. *ŋ^w > m^ɣ /{o,u}__# hhh. *w: > k^w iii. *ʝ > Ø / # (sporadic) jjj. *ʝ > j / #i__ kkk. *t > tʃ /__i lll. *d > dʒ /__i mmm. *ñ > n nnn. *u > i /__{t, ʝ} ooo. *u > ɨ /{w, w:}__ ppp. *ou > o

[98] This sound change was completed sometime before P-Nau$_3$.

The following subsections (§4.1.1 – §4.1.24) describe the sound changes implied by each correspondence set in Tables 4.1.2 – 4.1.5 and provide commentary to the analysis. Each subsection is headed by an abbreviated correspondence set. Tables 4.1.2 – 4.1.5 show the full correspondence sets. Below each heading is a list of the relevant sound changes.

Subsections include selected comparative data for illustration. This data is reproduced from entries in the accompanying appendix and numbered accordingly. Footnotes in the equivalent appendix entry may contain additional information regarding any proposed cognate set. Note that PMc reconstructions proposed here are indicated by bold type face; e.g. **PMc** *tam^{w}a ‘father’ (Cf. PMc *tama ‘father’). Other reconstructions are from Bender et al. (2003) unless otherwise noted. Reconstructions that are not original to this work are presented as they appear in the source unless otherwise noted.

4.1.1 Correspondence Set 1 (Table 4.1.2 Cr1i-iv)

i. P-Nau *p:ʲ : pʲ

Sound changes:

ON *pʲVpʲ > *p:ʲ

P-Nau *p:ʲ > pʲ

Nauruan /pʲ/ is a reflex of pre-Nauruan *p:ʲ, which results from vowel syncope between like consonants in Old Nauruan, typically following reduplication; *pʲVpʲV > *ppʲV > *p:ʲV. Evidence for this includes the presence of corresponding geminate consonants in other Micronesian languages or proto-languages, and word-initial reduplications in corresponding PMc reconstructions.

A176	PMc	*peti, pepeti	to float
	Nauruan	pʲi < *pepeti	float
	Nauruan	e-pʲi	float, hang, suspend
	Kiribati	beti, beibeti	to float
	Marshallese	ppéj	to float
	Pohnpeian	pey	float
	PCk	*peti, ppeti	to float
	Chuukese	pi (or) pii, ppii	to float

ii. PMc *p : ON *p^{j} : b^{j}

Sound Changes:

PMc *p > *p^{j}

ON *p^{j} > b^{j}

Outside of any conditioning environment, PMc *p is continued as a voiced palatalized bilabial stop /b^{j}/.

A20	PEOc	*baRu	hand, arm, wing	(Geraghty 1990)
	PMc	*pau	hand, arm, wing	
	Nauruan	b^{j}e-	hand, arm, wing	
	Kosraean	po, pæo-(l)	hand, arm, wing	
	Kiribati	bai, bai-(na)	hand, arm, wing	
	Marshallese	pay, peyi-	hand, arm, wing	

iii. P-Nau *p$^{:ɣ}$: p^{ɣ}

Sound changes:

ON *p^{ɣ}Vp^{ɣ} > *p$^{:ɣ}$

P-Nau *p$^{:ɣ}$ > p^{ɣ}

Nauruan /p^{ɣ}/ is a reflex of pre-Nauruan *p$^{:ɣ}$, which results from vowel syncope between like consonants in Old Nauruan, often following reduplication; *p^{w}Vp^{w}V > *pp^{ɣ}V > *p$^{:ɣ}$V. Evidence for this includes the presence of corresponding geminate consonants in other Micronesian languages or proto-languages, and word-initial reduplications in corresponding PMc reconstructions.

A30	PEOc	*bʷula	to flame, flare
	PMc	*pʷupʷula	to flame, flare
	Nauruan	pʸij < *pːʸij	light, shine, aflame
	Nauruan	pʸij pʸij	to shine, sparkle, flare
	Nauruan	pʸij/-ari	fiery, raging
	Marshallese	bbōl	lights on
	Marshallese	ka-bōlbōl	glow, shine in the distance
	Marshallese	bʷil	burn, hot, fever
	PCk	*pʷpʷula	to flame, flare
	Woleaian	bbule	burn, light up
	Woleaian	bulobulo	shiny, flaming
	Woleaian	bbubbule	flame, light
	Chuukese	pʷpʷun, pʷpʷuna-(n)	blaze, flash, flame, its blaze
	Satawalese	pʷpʷun	be alight

iv. PMc *pʷ : ON *pʸ : bʸ

Sound changes:

PMc *pʷ > *pʸ

ON *pʸ > bʸ

Outside of any conditioning environment, PMc *pʷ is continued as a voiced velarized bilabial stop /bʸ/ in Nauruan.

A23	POc	*boi, bou, bona	smell, odor, scent
	PMc	*pʷoi, pʷoa	odor, smell
	Nauruan	bʸo/-n	smell of
	Kosraean	fo	to smell, have odor
	Kosraean	fɔlɔ-(l), foli-(n)	its smell, smell of
	Kiribati	bʷoi	scent, odor, smell
	Marshallese	bʷiyi-, bʷi-	odor, smell
	Mokilese	pʷo, pʷɔɔ	smell, its smell

4.1.2 Correspondence Set 2 (Table 4.1.2 Cr2i)

i. PMc *f : Ø

Sound changes:

PMc *f > Ø

POc *p is continued as PMc *f, except before round vowels where it was lost. PMc *f is lost in Nauruan, as it is in Kosraean and Kiribati.

A183	POc	*pitu	seven
	PMc	*fitu-ua	seven (general)
	Nauruan	e-/iju	seven
	Kosraean	it	seven
	Kiribati	itu-ua	seven

4.1.3 Correspondence Set 3 (Table 4.1.2 Cr3i-v)

i. P-Nau *$m{:}^{j}$: $m{:}^{j}$

Sound changes:

ON *$m^{j}Vm^{j}$ > $m{:}^{j}$

Nauruan geminate bilabials are proposed to result from reduplication and subsequent vowel syncope, a process that parallels the development of the Nauruan voiceless stops /p^{j}/, /$p^{ɣ}$/, /k/, /k^{w}/; *$m^{j}Vm^{j}V$ > *$mm^{j}V$ > *$m{:}^{j}V$. In some cases, Marshallese appears to have applied a parallel process and reflects a long bilabial nasal in the same position as the Nauruan cognate.

A82	POc	*kamami, *k-ami	we (exclusive), us (ACD)	
	PMc	*(ka)ka-amami	we (exclusive), us	
	Nauruan	k-æmːʲ/-æ < *gga- < *kaka-	we (ex.), us (in predicate VPs)	
	Nauruan	æmːʲ/-æ < *ga- < *ka-	we (ex.), us (in subject NPs)	
	Nauruan	æmːʲ/-ær	we (dual, ex.), us	
	Nauruan	æmːʲ/-ej̨	we (trial, ex.), us	
	PWMc	*ka{a,Ø}mami, *kami	we (exclusive)	
	Marshallese	kémmém	we (ex.), us	Eastern dialect
	Chuukese	áám	we (ex.), us	
	S.C.(T)	áám	we (ex.), us	
	Woleaian	gaamami, -gemami	we (ex.)	
	Satawalese	yáámem, káámem	we (ex.), us	

ii. PMc *m : mʲ

Sound changes:

PMc *m > mʲ

Outside of any conditioning environment, PMc *m is continued as a palatalized bilabial stop /mʲ/ in Nauruan.

A135	POc	*mata	eye, face
	PMc	*mata	eye, face
	Nauruan	mʲe- < *mʲej̨	eye, face
	Marshallese	maj, meja-	eye, face
	Mokilese	maj̨, mijɔ, miije-(n)	eye, face

iii. P-Nau$_1$ *m:ʸ : m:ʸ

Sound changes:

ON *mʸVmʸ > m:ʸ

As described for /m:ʲ/, Nauruan geminate bilabials are proposed to result from reduplication and subsequent vowel syncope, a process that parallels the development of the Nauruan voiceless stops /pʲ/, /pʸ/, /k/, /kʷ/; *mʸVmʸV > *mmʸV > *m:ʸV.

A147	PMc	*mʷaau	good, healthy	
	Kosraean	wo	good, agreeable	
	Nauruan	m:ʸo < *mʸamʸeu	good, beautiful	RED
	Marshallese	ṃṃa-n	good	(Abo et al. 1976)
	Pohnpeian	mʷaaw	good	
	Mokilese	mʷeew	good, pretty, nice	

iv. P-Nau *mʸ : *ŋʷ : ŋ

Sound changes:

PMc *mʷ > *mʸ

Pre-Nau *mʸ > *ŋʷ /__#

Pre-Nau *ŋʷ > ŋ

It is proposed that early Pre-Nauruan *mʸ was continued as *ŋʷ where it was in word-final position; that is, at the ends of stems in words that were never suffixed.[99] Consider, for example, words for ‘house’ and ‘father’. The word ‘house’ is an alienable noun in Nauruan, and

[99] Later pre-Nauruan *ŋʷ is continued as Nauruan /ŋ/, /mʸ/, or /g/ under different conditions (§4.1.7).

therefore it remains unsuffixed. To show possession one must use a classifier, as in /wa-m e-wæg/ ‘your house’, which is the general pattern for alienable noun possession. Presuming the same was true in early Nauruan, this word consistently placed *mʸ in word-final position, thereby conditioning the change *mʸ > *ŋʷ under the current hypothesis. This sound has remained in word-final position in this word in contemporary Nauruan, conditioning the later change from *ŋʷ to /g/ (§4.1.7).

It is proposed that the word for ‘father’ was also an alienable noun in early pre-Nauruan, but that it became inalienable sometime later. This would explain the apparent nominal prefix /e-/ in this word as well as the final /ŋ/. This is the only identified noun in Nauruan which appears to have the nominal prefix /e-/, /i-/ while also taking possessive suffixes, e.g. /etaŋə-n/ ‘his/her father’.[100] The nominal prefix and possessive suffixes generally do not occur on the same stem. It seems that the nominal prefix was incorporated into the stem, so that it remained in the stem when it became inalienable, and regularly suffixed.[101] Note that the reflex of *ŋʷ in this word is /ŋ/ because it became word-medial in later stages of Nauruan (by suffixation), unlike /e-wæg/ ‘house’, where *ŋʷ remained word-final, and was subsequently continued as /g/ (§4.1.7).

The word for ‘earth oven’ further supports an account based on the regularity of word-final position for early pre-Nauruan *mʸ; PMc *wumʷu, wumʷu-ni- ‘earth oven, bake in an oven’ > Nauruan /omʸ/ ‘earth oven’, /omʸi-/ ‘bake in an oven’. Under this analysis, the change from *mʸ > *ŋʷ is not observed in this word because it was commonly suffixed where it occurred as a verb; the nominal form apparently retained the final /mʸ/ by analogy with the verb stem. This

[100] An alternate possibility is that the initial /e-/ in the word for ‘father’ does not continue the nominal prefix, but it is not known what other prefix it could be, nor are there any identified phonological processes that could explain its presence.

[101] PMc *tamʸa >> *e-tamʸ (nominal prefix) > *e-taŋʷ >> *etaŋʷ- (reanalysis) > etaŋ- ‘father’ (inalienable, suffixed).

contrasts with words such as ‘house’ and (early Nauruan) ‘father’, which were not suffixed.

There is also evidence of the change PMc *mʸ > *ŋʷ > ŋ in Old Mapian, a now extinct Chuukic language, as shown in the comparison for ‘house’ below.

A224	POc	*Rumʷaq	house	
	PMc	*umʷa	house	
	Nauruan [102]	e-/wæg	house	MET
	Kosraean	yuwe-	house	
	Kiribati	uumʷa	house	
	Marshallese	yémʷ	house	
	Old Mapian	yuŋ, uŋ	house	

v. PMc *mʷ : mʸ

Sound changes:

PMc *mʷ > *mʸ

Outside of any conditioning environment PMc *mʷ is continued in Nauruan as /mʸ/, a velarized bilabial nasal.

A146	PEOc	*muqa	ahead, going before
	PMc	*mʷ{o,u}a	ahead, going before
	Nauruan	æ-/mʸo	first, ahead
	Kiribati	mʷoa	first
	Marshallese	mʷaha-	ahead, before, place in front of
	Pohnpeian	mʷowɛ	ahead of him, to offer as a first fruit
	PCk	*mʷmʷa-, mʷua-	ahead, going before

[102] PMc *umʷa >> *amʸu (MET) > *wamʸu > *wamʸ > *waŋʷ > e-/wæg

4.1.4 Correspondence Set 4 (Table 4.1.2 Cr4i-v)

i. PMc *k : tʃ

Sound changes:

PMc *k > tʃ /__i

PMc *k is continued as Nauruan /tʃ/ before *i.

A93	POc	*kilala	to know (a person), recognize, be acquainted with; to feel, perceive (ACD)
	POc	*kilala	sign, symbol
	PMc	*kilala	sign, symbol
	Nauruan	tʃit < *tʃinna	to know, to understand
	PCk	*killa	sign, symbol

ii. P-Nau *gː : k

Sound changes:

ON *gVg > *gː

P-Nau *gː > k

It is proposed that Nauruan *k continues geminate pre-Nauruan *gː, which resulted from reduplication and vowel syncope in Old Nauruan. The Nauruan prefix /k-/, /ka-/, continuing PMc *kaka, occurs quite frequently in Nauruan and accounts for many instances of initial /k/ in the language.

A80	**PMc**	*kakaŋV	sharp
	Nauruan	ea-/kaŋ	sharp
	PCMc	*kakaŋi	sharp
	Kiribati	kakaŋ	sharp
	Marshallese	kkaŋ	sharp

iii. PMc *k : P-Nau *g : Ø

Sound changes:

PMc *k > *g

P-Nau$_1$ *g > Ø /#__a

Pre-Nauruan *g (< PMc *k) is lost word-initially before *a. Compare the change in Chuukic languages in which PMc *k is lost before low and mid vowels when not preceded by a high vowel (Bender et al. 2003: 4, footnote 12).

A83	PMc	*kana	food, eat (something)
	Nauruan	an < *gan	eat
	Marshallese	kan	eat (something)
	Marshallese	#kkan	food
	Puluwatese	yana-(n)	food, eat (something)
	Trukese	ana-(n)	his cooked food (to eat)
	Saipan Carolinian	ala-(l)	food, eat (something)

iv. PMc *k : P-Nau *g : w

Sound changes:

PMc *k > *g

P-Nau *g > w/{o,u}

Pre-Nauruan *g is continued as Nauruan /w/ where it was adjacent to *u or *o.

A104	POc	*kutu	louse
	PMc	*kutu	louse
	Nauruan	i-/wi < *wiɟ	louse
	Kosraean	kut	louse
	Kiribati	uti	louse
	Marshallese	kij	louse, bacterium, bug, flea

v. PMc *k : g

Sound changes:

PMc *k > g

Unless conditioned at some later stage, PMc *k is continued as Nauruan /g/. Saipan Carolinian, Woleaian and Ulithian also show this correspondence.

A76	PMc	*kai	to inform
	Nauruan [103]	i-/ge < *wi-/kai	say, announce
	Kosraean	kai	to warn, advise, admonish (someone)
	Marshallese	key-yaŋ	announcement
	Pohnpeian	kai-r	news
	Pohnpeian	kai-reeki	to inform
	Pingilapese	kai-reki-n	to notify

4.1.5 Correspondence Set 5 (Table 4.1.2 Cr5i)

i. POc *q : PMc *Ø : Ø

Sound changes:

POc *q > *Ø

POc *q is lost in all Micronesian languages. Loss of POc *q can result in vowel-initial stems which can acquire a prothetic glide in Micronesian languages, including Nauruan (§4.1.18). This process, known as glide accretion, is a recurrent sound change in the Oceanic family. It has developed independently in a number of Oceanic languages (Blust 1990: 10-17).

A219	POc	*raqani	day
	PMc	*raani	day
	Nauruan	a-/ræn	day
	Nauruan	ɟo-/ræn	morning
	Nauruan	i-ɟæ-/ræn	tomorrow
	Marshallese	rahan, rahani-	day
	Pohnpeian	raani	day
	Mokilese	raan	day
	Pingilapese	reen	day
	PCk	*raan	day

[103] From *i-kai (?).

4.1.6 Correspondence Set 6 (Table 4.1.2 Cr6i)

i. PMc *x : Ø

Sound changes:

PMc *x > Ø

PMc *x is lost in most of the Micronesian languages (Bender et al. 2003: 4).[104] This proto-phoneme is also relatively uncommon in the available Micronesian reconstructions. So far, there is only one comparison showing a correspondence for PMc *x in Nauruan, and it suggests *x > Ø with subsequent glide prothesis (§4.1.18).

A57	POc	*-gu	my, of me (suffixed possessive pronoun)
	PMc [105]	*-x{u,i}	1sg. poss.
	Nauruan	-ɨ	1sg. poss.
	Kosraean	-k	1sg. poss.
	Kiribati	-u	1sg. poss.
	Marshallese	-hi	1sg. poss.
	PCk	*yi-	1sg. poss.
	Pohnpeian	-y	1sg. possessive

[104] It is continued in Kosraean and in the Pohnpeic languages, conditionally.

[105] Bender et al. (2003) reconstruct only *xu. See the footnotes in the appendix entry.

4.1.7 Correspondence Set 7 (Table 4.1.2 Cr7i-vi)

i. PMc *ŋ : ON *ŋ^{w} : ŋ

Sound changes:

PMc *ŋ > *ŋ^{w} / (V){o,u,w}

P-Nau *ŋ^{w} > ŋ

It is hypothesized that Old Nauruan *ŋ became velarized adjacent to or preceding [+back, +round] segments, resulting in *ŋ^{w}. Where Old Nauruan *ŋ preceded one of the conditioning segments, a vowel may intervene. Word-medially, *ŋ is continued as Nauruan /ŋ/. Additional changes occurred at word edges, as described in the subsections that follow.

A165	POc	*ŋipo	tooth
	PMc	*ŋio	tooth
	Nauruan	m^{y}i- < *ŋ^{w}i < *ŋio	mouth, tooth
	PCMc	*ŋii	tooth
	Marshallese	ŋiy	tooth
	Chuukese	-ŋú	tooth (in some compounds)

ii. PMc *ŋ : *ŋ^{w} : Ø

Sound changes:

PMc *ŋ > *ŋ^{w} / V$_{0}${o,u,w}

P-Nau *ŋ^{w} > Ø / #__a

In at least one case, pre-Nauruan *ŋ^{w} appears to be lost word-initially before *a, but the relevant comparison is problematic. The comparison in question, for ‘kiss, lean in’, is shown below. Note the parallel change P-Nau *g > Ø, which occurs in the same environment, and also

that P-Nau *ŋʷ is continued as /g/ word-finally. Precisely how these sound changes relate to one another historically is not yet certain. Additional research will be required to sort out the details. It will be particularly helpful if additional comparisons showing loss of word-initial *ŋʷ in Nauruan can be identified.

A2	POc	*acok	to sniff, kiss	
	PMc [106]	*ŋa-aSok (?)	to sniff, kiss	
	Nauruan [107]	ægu < *ŋʷa-/aDow (?)	kiss, lean in, sniff	
	Kosraean	ngok	smell, scent, sniff, find out by smelling	
	Kosraean	angok-mweti	kiss, greet each other by rubbing one's nose against another's cheek, nuzzle	(Lee 1976)

iii. ON *ŋʷ : g

Sound changes:

P-Nau *ŋʷ > g / __#

Pre-Nauruan *ŋʷ is continued as /g/ at the ends of words.

[106] Compare also Kiribati *aro-ki* ‘to smell or scent an odor’, *aro-boi* ‘smell, scent, the sense of smell’.

[107] There appears to have been a sound change *ŋ > *ŋʷ > *Ø word initially. However, it remains unclear how the apparent *o > u change was conditioned in this word. The final *w is not expected to condition *o > u, and it is unclear how else this change might have happened. **PMc** *ŋa-aSok > *ŋʷa-aDow > *ga-aDow > *a-aDow > (?) ægu ‘kiss, lean in’.

A120	**PMc**	*maaŋu	pandanus leaf	
	Nauruan [108]	mʲæg	dry, dry up	
	Nauruan	mʲæmʲæg	dry, dry up	RED
	Kiribati	maeke	dry, crisp	(Trussel and Groves 1978)
	Marshallese	mahaŋ	pandanus leaf	
	Pulo-Annan	maaŋú	dry pandanus leaf	
	Chuukese	#mééŋ	cured pandanus leaf	
	Pohnpeian	mɛŋ	withered, dry, dead vegetation (Sohl et al.)	
	Mokilese	meŋ, meŋmeŋ	dried up, dried (of leaves)	

iv. ON *ŋʷ : mʸ

Sound changes:

P-Nau *ŋʷ > mʸ / #__

Pre-Nauruan *ŋʷ is continued as *mʸ word-initially.

A165	POc	*ŋipo	tooth
	PMc	*ŋio	tooth
	Nauruan	mʸi- < *ŋʷi < *ŋio	mouth, tooth
	PCMc	*ŋii	tooth
	Marshallese	ŋiy	tooth
	Chuukese	-ŋú	tooth (in some compounds)

[108] **PMc** *maaŋu > *mʲaeŋʷ > *mʲæŋʷ > mʲæg; Compare PMc *maŋu ‘pandanus leaf’.

v. ON *ŋʷ : mʸ

Sound changes:

P-Nau *ŋʷ > mʸ /{o,u}__#

Pre-Nauruan *ŋʷ is continued as /mʸ/ word-finally where it followed a [+back, +round] segment.

A24	POc	*buŋi	night
	PMc [109]	*pʷuŋi	night, 24 hour day
	Nauruan	bʸumʸ	night, 24 hour day
	Marshallese	bʷéŋʷ	night

vi. PMc *ŋ : ŋ

Sound changes:

PMc *ŋ > ŋ

Unless conditioned at some later stage, PMc *ŋ is continued as Nauruan /ŋ/.

A163	**PMc** [110]	*ŋa	I, 1sg
	Nauruan	ŋa	I, 1sg
	Kosraean	ŋa	I, 1sg

[109] Compare also POc *pʷoŋi 'night', PMc *pʷoŋi 'night', Kiribati *boŋ, bʷoŋi-* 'night'. Bender et al. (2003) reconstruct only PMc *poŋi (from POc *boŋi), but the Nauruan form suggests that POc *buŋi was continued in PMc as well.

[110] Bender et al. (2003) reconstruct *ŋaa, *ŋau, which are possibly suffixed forms (*ŋa-a, *ŋa-u).

4.1.8 Correspondence Set 8 (Table 4.1.2 Cr8i)

i. PMc *y : Ø

Sound changes:

PMc *y > Ø

PMc *y appears to have been lost in Nauruan, as is common among the Micronesian languages.

A158	PMc	*ney{a,e}	leg
	Nauruan	nænæ- < *nea nea	foot, leg
	Kosraean	niyɛ-(l), niye-(n)	his leg, leg of
	Marshallese	ney, neye-(n)	leg, leg of
	Pohnpeian	nɛɛ	his leg

4.1.9 Correspondence Set 9 (Table 4.1.2 Cr9i-iii)

i. P-Nau *w : Ø

Sound changes:

ON *w > Ø / #__

Pre-Nauruan *w is lost word-initially. Loss of *w must have taken place sometime after Old Nauruan, otherwise we should expect *w to have been added back where the loss resulted in stem-initial *a (see §4.1.18 on Nauruan glide accretion). The comparisons below show this not to be the case. Kosraean is the only other Micronesian language that loses PMc *w in any context.

A280	POc	*wa(n)se	distribute, as food at a feast	
	PEOc	*wase	divide	(Geraghty 1983)
	PMc	*waSe, waSe-ki	to count	
	Nauruan	adu < *aS-u (?)	count, enumerate objects	
	Kiribati	ware-ka	count or read (something)	
	Marshallese	wate-k	count up (something)	
	Pohnpeian	wadɛ-k	read or count (something)	

ii. P-Nau *w: : k^w

Sound changes:

P-Nau *w: > k^w

Pre-Nauruan *w: is continued as Nauruan /k^w/. This appears to have been a later change in the history of Nauruan. It is fed by processes that result in earlier pre-Nauruan *w, including glide prothesis and pre-Nauruan *g > *w /{u,o}.

A185	POc	*puaq	fruit; seed; blossom; egg; nut; testicle; numeral classifier for roundish objects; to fruit, bear fruit; show first signs of pregnancy; to swell, of the sea	
	PMc	*wuaa	fruit	
	Nauruan	k^{w}æ- < *wuwaa	fruit, flower	RED
	Kiribati	uaa	fruit	
	Marshallese	kwōle	fruit	(Abo et al. 1976)
	Marshallese	wiwaa	bear much fruit or many flowers	
	PCk	*wuwaa	fruit	
	Saipan Carolinian	wwa, uwa, uwaa-	fruit, flower, it's fruit	
	Puluwatese	wuwa	fruit, flower, bur	

iii. PMc *w : w

Unless it occurs in some conditioning environment, PMc *w is continued as Nauruan /w/. There are few known cases where *w is not conditioned in some way in pre-Nauruan.

A285	**PMc** [111]	*lii-w{e,o}li	be changed, change
	Nauruan	iwit < *ji-win/-ni	change, turn over
	Saipan Carolinian	(lii)-weli	to change (something)
	Woleaian	(lii)-wen-(ne)	its replacement, its substitute

[111] Compare PMc *w{e,o}li 'be changed, change'.

4.1.10 Correspondence Set 10 (Table 4.1.3 Cr10i-v)

i. P-Nau *t : j̨

Sound changes:

P-Nau *t > j̨ / {i,e}

Pre-Nauruan *t is continued as Nauruan /j̨/ where it was adjacent to *i or *e.

A246	**PMc**	*talia	side dish of meat, fish, or sauce
	Nauruan	i-/jeji < *te-/talia	food, meal
	Nauruan	j̨eji	eat
	PCMc	*talia	side dish of meat, fish, or sauce
	Kiribati	tanna	sauce, relish, appetizer
	Marshallese	jaléyléy	meat course, sauce, gravy
	Pohnpeian	sali	eat meat or fish, the meat or fish part of a meal

ii. P-Nau *j̨ : Ø

Sound changes:

P-Nau *t > *j̨ / {i,e}

P-Nau *j̨ > Ø / #

Pre-Nauruan *j̨ is sporadically lost at word edges. Compare Pohnpeian, which has the correspondence PMc *t : j, Ø (Bender et al. 2003: 4).

A135	POc	*mata	eye, face
	PMc	*mata	eye, face
	Nauruan	mʲe- < *mʲeɟ	eye, face
	Marshallese	maj, meja-	eye, face
	Mokilese	maj, mijɔ, miije-(n)	eye, face

There is one Nauruan word, /ɨda/ ‘ask’ (< PMc *tiSaki), that suggests PMc *t may have been lost in some words that also contained PMc *k. Precisely the same process is observed in Kiribati (Bender et al. 2003: 4-5, footnote 7).

A264	PMc	*tiSaki	to ask
	Nauruan	ɨda	ask, question
	Kosraean	si-yʌk	to ask, requestion, interrogate (someone)
	Pohnpeian	(pe)-ydɛk	to ask a question
	Pohnpeian	(ke)-ydɛk	to ask (someone, honorific)

iii. P-Nau *ɟ : j

Sound changes:

P-Nau *t > *ɟ / {i,e}

P-Nau *ɟ > j / #i__

Pre-Nauruan *ɟ is continued as /j/ where it occurs immediately after stem-initial *i. In such cases the stem-initial *i may be subsequently lost, perhaps due to phonetic similarity with the following *j.

A182	POc [112]	*pilu	a large marine fish, the jackfish or trevally	
	PMc	*filu	fish, a type of fish	
	Nauruan	iju < *ilu-V	fish, sea creature(s)	
	Kosraean	folfol	a kind of fish	(Lee 1976)
	Kosraean	olwol	a kind of fish, tuna	
	Kosraean	ohlohl [ɔlɔl]	a kind of fish	

iv. P-Nau *t : tʃ

Sound changes:

P-Nau *t > tʃ / __i

Pre-Nauruan *ti is continued as Nauruan /tʃi/. This is hypothesized to be a late-stage change in pre-Nauruan. Where this occurs, the /ti/ sequence generally resulted from regressive vowel assimilation. Otherwise the earlier *t > j sound change adjacent to *i would be observed.

A274	PEOc	*tuRi	to thread, string (fish)	(Geraghty 1990)
	PMc	*turi	to string	
	Nauruan	tʃir	fish strung on a line	
	Pohnpeian	iir	string of something (as of flowers or fish)	
	Mokilese	ir	string for stringing things, to work at stringing	
	PCk	*turi	to string	

[112] Compare also POc *pilu pilu ‘small trevally varieties’, POc *piRu piRu ‘sailfish’.

v. PMc *t : t

Unless it occurs in some conditioning environment, PMc *t is continued as Nauruan /t/.

A270	POc	*tubuŋa	crown of head	
	PMc [113]	*tubu-ŋa	head, hair of head	
	Nauruan	tubʸu-	head, hair of head	
	Kiribati	átubúngubung	having long hair	(Trussel and Groves 1978)
	Pohnpeian	tahpw	head	(Sohl et al.)

4.1.11 Correspondence Set 11 (Table 4.1.3 Cr11i-ii)

i. PMc *T : P-Nau *tʃ : ř

Sound changes:

PMc *T > *tʃ / __i

P-Nau *tʃ > ř / __#

The Nauruan word for ‘sneeze’ appears to result from a series of two sound changes, which are listed above. This is the only identified example of a correspondence between PMc *T and Nauruan /ř/, if this is in fact a regular correspondence. Alternately, this word could be a loan or it could continue some other etymon, but in the latter case the source is not known. This correspondence is tentatively proposed.

A151	**PMc**	*mʷaTie	to sneeze
	Nauruan	mʸeř < *mʸetʃi (?)	to sneeze
	PCMc	*mʷaTie	to sneeze
	Chuukese	mʷesi	to sneeze
	Mortlockese	mʷasey	to sneeze

[113] Nauruan and Pohnpeian apparently do not continue the *-ŋa suffix.

ii. PMc *T : *t

Sound changes:

PMc *T > *t

PMc *T is otherwise continued as Nauruan /t/. PMc *T is reconstructed only before *i, *e and *u (Bender et al. 2003). It may not have been distinct from PMc *t earlier than Proto-Pohnpeic-Chuukic (Jackson 1986: 203, footnote 23). This phoneme is uncommon in the PMc lexicon. So far there are only two Nauruan words that might continue PMc *T. One is 'jump', shown below, where PMc *T is hypothesized to have changed in precisely the way PMc *t would be expected to, hence the proposal PMc *T > t. The other is the word for 'sneeze', /mᵛeř/ (< PMc *mʷaTie 'to sneeze'), which is discussed above.

A119	**PMc** [114]	*luTu-ŋi	to jump on something	
	Nauruan [115]	iři	jump, leap (v)	RED, MET (see footnote)
	Pohnpeian	lusi-(da)	to jump up, be surprised	
	PCk	*l{u,ú}T{u,ú}	to jump	
	Pulo-Annan	nútú-(ŋi)	to jump or leap on it	
	Woleaian	lútú-(ŋi-i)	jump or leap on it	
	Saipan Carolinian	llus, lullus	to jump	

[114] Compare PMc *luTu 'to jump'.

[115] PMc *luTu/-ŋi > *luti >> luluti (RED) > ruruti > ririji >> irrij (MET) > iři

4.1.12 Correspondence Set 12 (Table 4.1.3 Cr12i-v)

i. P-Nau *d: : t

Sound changes:

PMc *s > *d

PMc *S > *D

P-Nau *D > *d

P-Nau *dVd > *d:

P-Nau *d: > t

It is hypothesized that geminate pre-Nauruan *d: is continued as Nauruan /t/. As in other Nauruan voiceless stop consonants, it is proposed that reduplication and vowel syncope resulted in a geminate that was later devoiced.

A230	PMc [116]	*Sali	in a line or row	
	Nauruan	a-tate	align, line up, put in a row	RED
	Woleaian	ttali	line up, form a line	
	Chuukese	tetten	line, rank, row, list, grade, generation, lineage	

[116] Old Nauruan *SaSali (RED) > *dadali > *ddaji > *taji >> *tataji (RED) > *tatej > a-/tate

ii. P-Nau *d : dʒ

Sound changes:

PMc *s > *d

PMc *S > *D

ON *D > d

P-Nau *d > dʒ / __i

Pre-Nauruan *d is continued as Nauruan /dʒ/ where it preceded *i. As with *ti > tʃi, this is hypothesized to be a late-stage sound change in pre-Nauruan.

A292	PEOc	*zili-fi	inserted, penetrated
	PMc [117]	*{s,S}ili-fi	inserted, penetrated
	Nauruan [118]	dʒir	sew, lace
	Nauruan	dʒiri/-da	sew up, lace up, stitch
	PCk	*dili, dili-fi-	inserted, penetrated
	Puluwatese [119]	ti (faaR)	sew thatch (pandanus)

[117] Compare also PMc *{s,S}i-, {s,S}i-ki, {s,S}i-ka 'sew, stick through' and PEOc *si-ka 'net needle' (Geraghty 1983).

[118] PMc *{s,S}ili-fi > *dili-i > *dili-wi > diriw > dʒir ‘sew, lace’

[119] Bender et al. (2003) list this as a continuation of PMc *{s,S}i- 'sew, stick through’.

iii. PMc *S : P-Nau *D : g

Sound changes:

PMc *S > D

P-Nau *D > *g / o

It is hypothesized that PMc *S is continued in Old Nauruan and pre-Nauruan as *D. Where pre-Nauruan *D was adjacent to *o, it is continued as Nauruan /g/. This sound change suggests that PMc *S and *s continued separate phonemes in Nauruan. In all cases identified so far, PMc *s is continued in Nauruan as /d/. However, PMc *S is only continued as /d/ where it was not conditioned by an adjacent pre-Nauruan *o. To account for this, a distinct phoneme *D (< PMc *S) is reconstructed to show the hypothesized independent development of these sounds: PMc *s > *d > d; PMc *S > *D > d; PMc *S > *D/o > g.

Notably, Bender et al. (2003) show that all Micronesian languages other than Kosraean merge PMc *S and *s as a single sound. If Nauruan also failed to merge these sounds, this means that Nauruan and Kosraean must be excluded from the Central Micronesian group, which is characterized by the merger of PMc *S and *s. However, it is still possible that Nauruan did participate in this merger. So far, no etymologies have been identified which clearly show pre-Nauruan *d adjacent to *o at the stage where *D became *g in that same environment. If PMc *S and *s developed independently in Nauruan, then PMc *s should correspond to /d/ even where it was continued adjacent to pre-Nauruan *o. If PMc *S and *s merged, then *s is expected to correspond to /g/ where it was continued adjacent to pre-Nauruan *o.

A134	PMc	*ma{s,S}o	cooked
	Nauruan	mʲag/ə-n < *mʲaDo	cooked, ready to eat
	Kiribati	maro-(a)	food, refreshment
	Marshallese	mat	cooked
	PCk	*mado, maddo	cooked

iv. PMc *S : p-Nau *D : d

Sound changes:

PMc *S > D

ON *D > d

Unless conditioned at a later stage, PMc *S is continued as Nauruan /d/. PMc *S is hypothesized to have first become pre-Nauruan *D to account for the correspondence between PMc *S and /g/ in some words, as discussed above.

A234	PEOc	*si{q,Ø}u-v	wash	(Geraghty 1983)
	PMc	*SuuSuu	dive, bathe	
	Nauruan	dudu	soak, wash, make wet, splash	

v. PMc *s : d

Sound changes:

PMc *s > d

PMc *s is continued as Nauruan /d/ in all cases identified so far.

A237	PMc	*siwo	down, westward
	Nauruan	-du < *diw	down, downward
	Kosraean	tu-(fokfok)	keep on coming down
	Kiribati	-rio	down, westward
	Marshallese	téw	disembark, climb down, westward
	Pohnpeian	-di	downward

4.1.13 Correspondence Set 13 (Table 4.1.3 Cr13i-ii)

i. P-Nau *řː : d

Sound changes:

P-Nau *řː > d (?)

It is hypothesized that Pre-Nauruan *řː is continued as Nauruan /d/. This offers explanation for two cases where PMc *c appears to correspond to Nauruan /d/; the words for ‘laugh’ and ‘small’ shown below. This hypothesis reflects the general pattern of geminate fortition which occurs elsewhere in Nauruan phonology.

In both cases, however, PMc *c is inferred from a Kosraean cognate containing *sr*, which is phonetically a palatal fricative (Lee 1976: 20). According to Bender et al. (2003), Kosraean *sr*

continues PMc *c. Alternately, Kosraean *sr* in these two comparisons might correspond to PMc *s, which is continued in Nauruan as /d/. In that case, there was some internal sound change in Kosraean that caused **s* > *sr* in these words, perhaps related to the adjacent *i* in both cases. If so, the reconstructions should be *isaV 'laugh' and *siku 'small, little' rather than *icaV and *ciku, respectively. Additional research is required to determine which PMc reconstruction is correct.

A62	**PMc**	*i{s,c}aV (?)	laugh	
	Nauruan [120]	idada	laugh	RED
	Kosraean	isracsr	laugh	

A232	**PMc**	*{s,c}iku (?)	small, little	
	Nauruan [121]	kæ-/dudu	small	RED
	Kosraean	srihk	small	(Lee 1976)
	Kosraean	srihsrihk	rather small	(Lee 1976)

[120] If the PMc reconstruction contains *s, then the etymology is proposed to be PMc *isaV > *ida >> idada (RED). In that case, there was an internal sound change in Kosraean in this word, **s* > *sr*. If the PMc reconstruction contains *c, then the etymology is proposed to be PMc *icaV >> *icaca (RED) > *iřřa > *ida >> idada (RED).

[121] If the PMc reconstruction contains *s, then the proposed etymology is PMc *siku > *diw > *duw > *du >> kæ-/dudu (RED). In that case, there was an internal sound change in Kosraean **s* > *sr*. If the PMc reconstruction contains *c, then the proposed etymology is *ciku >> *ciciku (RED) > *řiřiku > *řřuw > *du >> kæ-/dudu (RED).

ii. PMc *c : ř

Sound changes:

PMc *c > ř

PMc *c is continued as Nauruan /ř/.[122]

A41	POc	*draRaq	blood
	PMc	*caa, cacaa	blood
	Nauruan	ræ-, ræřæ-	blood
	Kosraean	sræ	blood
	Kiribati	raraa	blood

4.1.14 Correspondence Set 14 (Table 4.1.3 Cr14i-ii)

i. POc *R : PMc *Ø : Ø

Sound changes:

POc *R > Ø (variable)

POc *R is lost variably in PMc. POc *R may be continued as PMc *r where it merged with POc *r, as described in the following section. All Micronesian languages appear to agree in the loss or retention of *R, including Nauruan.

[122] The only known case where Nauruan /ř/ might continue a sound other than *c is found in the word for 'jump', /eři/ or /iři/, though this etymology is uncertain. This word is hypothesized to continue pre-Nauruan *rr as /ř/. PMc *luTu/-ŋi > *luti >> luluti (RED) > ruruti > ririji >> irrij (MET) > iři

A20	PEOc	*baRu	hand, arm, wing	(Geraghty 1990)
	PMc	*pau	hand, arm, wing	
	Nauruan	bʲe-	hand, arm, wing	
	Kosraean	po, pæo-(l)	hand, arm, wing	
	Kiribati	bai, bai-(na)	hand, arm, wing	
	Marshallese	pay, peyi-	hand, arm, wing	

ii. PMc *r : r

POc *R and *r merge as PMc *r in some words. The conditions under which POc *R was either lost or merged with PMc *r remain unclear (Bender et al. 2003: 5, footnote 3). PMc *r is continued as Nauruan /r/.

A55	PEOc	*fuRu	drag, pull	(Geraghty 1990)
	PMc	*uruuru	drag, haul, tow	
	Nauruan	urur/-ej	drag, pull (something)	RED
	Kosraean	ulul	pull, tug, stretch	

4.1.15 Correspondence Set 15 (Table 4.1.3 Cr15i-iii)

i. P-Nau *l : j̨

Sound changes:

P-Nau *l > j̨ / {i,e}

Pre-Nauruan *l is continued as /j̨/ where it was adjacent to *i or *e. The same environment conditions pre-Nauruan *t > j̨.

A118	POc	*lisa	nit, louse egg	
	PMc	*sili	nit, louse egg	
	Nauruan	i-/dij	nit, louse egg	
	PWMc	*sili	nit, louse egg	
	Marshallese	tél	nit, larvae of lice	
	Mokilese	dil	small lice	

ii. P-Nau *l : r

Sound changes:

P-Nau *l > r / __(V){o,u,w}

PMc *l is continued as /r/ where it preceded a [+back, +round] segment.

A18	POc	*bali	answer, oppose, opposite side or part; partner, friend, enemy	
	PMc [123]	*pa-li-y{a,i}	side, enemy, counterpart	
	Nauruan	bʲaru < *bʲari-wa	enemy, adversary	
	PWMc	*pali-a	side	
	Marshallese	paleye-	spouse	
	Pohnpeian	pali	part, side; division, section	
	Mokilese	uh-pal	side with	
	Puluwatese	páliy, peliy	side, as in a game or war; half-section	(ACD)
	Woleaian	paliy	side, flank	(ACD)

[123] Cf. PMc *pa- 'side'

iii. PMc *l : n

Sound change:

PMc *l > n

PMc *l is continued as pre-Nauruan *l, and in a later unconditioned sound change pre-Nauruan *l is continued as *n.

In one case, *l > n appears to predate *l > j, the latter of which occurs adjacent to *i or *e. This apparent exception is shown in the comparison for ‘ear’ below. This is the only identified exception to the suggested ordering of the *l > n and *l > j sound changes. The explanation may lie in an additional *l > n sound change that predates the *l > j change, and which is conditioned by some unidentified environment. One might consider that this occurred where there was a following *ŋ, though other comparisons, such as **PMc** *faa-i-laŋi ‘lower region of sky’ > Nauruan ijaŋ ‘lower, below’ may contradict this. Additional research is required to determine if an *l > n sound change which predates *l > j can be established, or if something about the ordering of *l > n and *l > j as presented here should be revised. Alternately, this word could be a loan, perhaps from Kiribati, though ‘ear’ is a Swadesh list item and is unlikely to be a loanword.

A247	POc	*taliŋa	ear, tree fungus, pectoral fin	
	PEOc	*taliŋa	ear, mushroom, fungus	(Geraghty 1983)
	PMc	*taliŋa	ear, mushroom, fungus	
	Nauruan	teniŋa-	ear	
	Kiribati	taniŋa	ear, mushroom, fungus	
	Pohnpeian	salɛŋɛ-	ear	
	PCk	*taliŋa	ear, mushroom, fungus	

A208	POc	*qalo	sun
	PMc	*alo	sun
	Nauruan [124]	kʷæn	sun
	Nauruan [125]	kʷin/iɟo	hot, sunny
	Marshallese	haḷ	sun
	PCk	*yalo	sun
	Mortlockese	yóól, Wóól	sun

4.1.16 Correspondence Set 16 (Table 4.1.3 Cr16i-iii)

i. PMc *n : ŋ

Sound changes:

P-Nau *n > *ŋʷ / (V){o,u,w}

P-Nau *ŋʷ > ŋ

Where pre-Nauruan *n was adjacent to or preceded a [+back, +round] segment it takes on a velar place of articulation.

[124] Pre-Nauruan *e-wæn (?) > *owæn (?) > *w:æn > kʷæn; Compare Nauruan /ɟekʷo/ 'afternoon'.

[125] Frequently pronounced [kinɟo]. The origin of the /iɟo/ portion of the word remains unclear. It may relate to POc *silak ‘to shine’ or POc *silaq ‘outpouring of light’. Compare also POc *qalejaw ‘day’.

A157	POc	*natu	child, classifier for cherished possessions
	PMc	*natu	child, classifier for cherished possessions
	Nauruan	ŋe-	child (of)
	Kosraean	nætʌ-(l)	his child
	Kiribati	naati, nati-na, natinati	child; classifier for cherished possessions
	Marshallese	naji-, néji-	child; of, possessive classifier for children, pets, money, watches, or ones Bible
	Pohnpeian	naay, nɛy-, naa	child; possessive classifier for children, pets, toys
	Mokilese	nɔynɔy	have many children

ii. P-Nau *nː : t

Sound changes:

P-Nau *nː > t

Pre-Nauruan *nː (or *n-n) is continued as Nauruan /t/. This occurs at historic morpheme boundaries, as is evident in the development of the Nauruan demonstratives. Consider, for example, pre-Nauruan *bʲun-n-u-n-e, which becomes /bʲitune/ ‘this one here’; or pre-Nauruan *bʲun-n-a, which becomes /bʲita/ ‘that one there’. The full set of etymologies for the Nauruan demonstratives is provided in (§4.2.3.9).

A285	**PMc** [126]	*lii-w{e,o}li	be changed, change
	Nauruan	iwit < *ji-win/-ni	change, turn over
	Saipan Carolinian	(lii)-weli	to change (something)
	Woleaian	(lii)-wen-(ne)	its replacement, its substitute

iii. PMc *n : n

Unless conditioned at some later stage, PMc *n is continued as Nauruan /n/. In some words, word-final /n/ varies synchronically between [n] and [t]. This appears to be a case of free variation, though speakers occasionally express that one variant sounds more or less correct than the other in particular instances. None have stated any change in meaning resulting from this variation. Furthermore, this appears to be a morphophonemic variation. The words in which it varies are generally those that end in one of the suffixes of the shape /-n/, such as the 3sg possessive suffix or the genitive suffix. The origin of this variation remains unclear, though compare the sound change *n: > *t in pre-Nauruan. This may be related in some way.

A66	PMc	*(i)nu-m{i,a}	drink
	Nauruan	nim	drink (n.), drink (v.)
	Kosraean	ni-m	drink (something)
	Kiribati	ni-ma	drink (something)

[126] Compare PMc *w{e,o}li ‘be changed, change’.

4.1.17 Correspondence Set 17 (Table 4.1.3 Cr17i-iii)

i. P-Nau *ñ : ɟ

Sound changes:

P-Nau *ñ > ɟ / {i,e}

In at least one case, pre-Nauruan *ñ appears to be conditioned by an adjacent *i or *e, becoming *ɟ. The same sound change is observed for pre-Nauruan *t and *l. It is possible that *ñ became *l, and then subsequently became *ɟ via the same regular sound change that conditions *l in this environment.

A154	**PMc** [127]	*ña-Sa	when?	
	Nauruan [128]	i-/ɟet	when (future)	RED
	Pohnpeian	y-aa-d	when	
	Saipan Carolinian	(i)-lee-t, (i)-lee-ta	when	

ii. P-Nau *ñː, ñ/n : t

Sound changes:

P-Nau *ñː > t, P-Nau *ñ/n > t

Pre-Nauruan *ñː or *n immediately adjacent to *ñ (e.g. ñn or nñ) became *t. The same change is observed for pre-Nauruan *nː, and it is not certain if this is a separate change or if the change from *ñ to /n/ preceded the development of nasal geminates. In that case all such changes

[127] Cf. PMc *ñai-Sa 'when?'

[128] PMc *ña-Sa > *ñe-Sa >> *ñe-SaSa (RED) > *ñe-dː > i-/ɟet

are actually *n: > t.

A155	PMc [129]	*ñaña, ñañaña	taste, flavor
	Nauruan	i-/tæ < *e-ññaV	tasty, delicious
	Nauruan	ne-n < *ñaña	taste, flavor of
	Kiribati	nana-ma	to taste or test the taste of food
	Marshallese	nnan	musty taste, moldy taste
	PCk	*nna-	taste, flavor

iii. PMc *ñ : n

Sound changes:

PMc *ñ > n

Unless conditioned at some later stage, PMc *ñ is continued as Nauruan /n/.

A141	PMc	*meña	thing
	Nauruan	i-/mʲin	thing
	Nauruan	tʃi-/mʲin/e < *ki-/meña/-ee	(there) is, (there) are
	Kosraean	mee-(n)	one of, thing of or for
	Kiribati	mena	thing
	Marshallese	men	thing, matter, object; a person, unnamed
	Pohnpeian	mɛɛ, mɛɛ-(n)	thing, one of, thing of
	Mokilese	mii-(n)	thing of

[129] Compare also PMc *ñañau ‘delicious, taste good’.

4.1.18 Correspondence Set 18 (Table 4.1.4 Cr18i) – Glide accretion

i. ON Ø : *w

Sound changes:

ON *Ø > w / #__{a,i}

Blust (1990) describes a process of *y*-accretion in Oceanic languages in which *y is inserted at the beginnings of words that begin with *a.[130] Such processes of glide accretion are recurrent in the Oceanic family and developed independently in Oceanic subgroups both within and outside of the Micronesian group. In a number of these language groups prothetic *y is inserted exclusively before initial *a, sometimes following loss of POc *q or *R. Blust describes this for Fijian, Motu, and Gedaged, and argues that *y*-accretion developed independently in each of these languages.

Blust also describes processes of glide accretion in Oceanic languages which must have developed independent of *y*-accretion. Blust discusses Chuukic in particular, a language group within the Micronesian family. In addition to the prothesis of *y before initial *a, Chuukic languages add prothetic *w to words inherited from POc that began with *(q)o or *(q)u, and prothetic *y to words that began with *(q)i or *(q)e. At some point the backness of prothetic glides became dependent upon the quality of the initial vowel of the stem. As Blust notes, because the earlier process of *y accretion before *a appears to have no phonetic basis in the stem-initial vowel, *y*-accretion before *a was probably a separate process from the later vowel-dependent process.

Nauruan also reflects a process of glide accretion which must be separate from both

[130] Blust's *y* seems equivalent to IPA /j/.

y-accretion and the vowel-conditioned glide accretion in the Chuukic languages. In Nauruan the prothetic glide appears to have been [w] rather than *y*. The Nauruan process is similar to *y*-accretion in that it occurred before stem-initial [a] and is not conditioned by the quality of the vowel, though in Nauruan the glide was also added to stems beginning with [i].[131] Compare also Blust's discussion of theta-accretion in Cristobal-Malatian languages (1990: 13), which is similar to *y*-accretion and Nauruan *w*-accretion. These languages add prothetic consonants before *a, one of ð, θ, r, s, or l, depending on the language, with no apparent phonetic connection between the consonant and the vowel.

It is also evident that Nauruan *w*-accretion is separate from other processes of glide accretion that occurred during or preceding PMc. Consider, for example, that *w was added to stems beginning with *u in PMc, but that Nauruan did not retain this prothetic *w in stages later than Old Nauruan, nor other instances of word-initial PMc *w. Consider POc *qum^{w}u 'earth oven, bake in an oven' > PMc *wum^{w}u/-ni > Old Nauruan *wum^{ɣ}i- > pre-Nauruan *e-/um^{ɣ} (loss of word-initial *w), which is then continued as Nauruan /om^{ɣ}/ 'earth oven', /om^{ɣ}i-n/ 'baked, roasted'. This shows that prothetic *w before *u in PMc and prothetic *w before *a in Nauruan are distinct. Additionally, *w*-accretion must have taken place in Nauruan sometime between PMc and early pre-Nauruan, that is, in Old Nauruan. It is evident that Nauruan *w*-accretion had run its course by the time that initial *w was lost in Nauruan, which is why *w is not epenthesized to *a-initial stems resulting from PMc *w loss. Consider PMc *waSe/-ua 'count' which is continued as Nauruan /adu/ 'count, enumerate' (not /wadu/); or PMc *watu 'toward or in a direction' > *atu, which his continued as Nauruan /-ej/ 'transitive verb suffix' (not /-wej/). Nauruan *w*-accretion only occurs where a stem-initial *a or *i was inherited directly from PMc

[131] The quality of the vowel did not affect the glide at the time of prothesis, though there was evidently a later change from *i to pre-Nauruan *ɨ where *i followed *w.

into Old Nauruan, or where some other sound change resulted in one of these stem-initial vowels in Old Nauruan. The latter case occurs, for example, in the word for ‘house’, where metathesis results in initial *a, and prothetic *w is subsequently inserted; PMc *um^{w}a >> *am^{w}u (MET) > *wam^{ɣ} > *e-/wæŋ^{w} > e-/wæg ‘house’.

A6	PMc	*ala	path, road
	Nauruan	də-/wan	path, road, way, route of
	Kiribati	ka-wai	road, way, route, path, street
	PCk	*yala	path, road
	Pohnpeian	aal	path, road, trail
	Pingilapese	al	path, road
	Mokilese	al	path, road

4.1.19 Correspondence Set 19 (Table 4.1.5 Cr19i-iii)

i. P-Nau *i : ɨ

Sound changes:

P-Nau *i > ɨ / w__

Pre-Nauruan *i is continued as Nauruan /ɨ/ where it followed *w. This change appears to have occurred after glide accretion (§4.1.18).

A235	POc	*sira	they, them (ACD)
	PEOc	*ira	they, them
	PMc [132]	*ira	they, them
	Nauruan	ɨræ < *wira-a	they, them
	Kiribati	(ŋa)-iia	they, them
	Marshallese	yér	they, them
	Satawalese	yiir	they, them
	Puluwatese	yiir	they, them
	Pulo-Annan	iila	they, them

ii. P-Nau *i : u

Sound changes:

P-Nau *i > u / __w

Pre-Nauruan *i is continued as Nauruan /u/ where it preceded *w.

A180	POc	*pijiko	flesh
	PMc	*fiSiko	flesh
	Nauruan [133]	duw- < *i-diw	flesh, meat, muscle
	Pohnpeian	uduk	flesh
	PCk	*fidiko	flesh
	Chuukese	futuk	flesh

[132] This occurs as an independent pronoun, a suffixed object pronoun, and a suffixed possessive pronoun in all of these Micronesian languages.

[133] The initial *i in this word appears to have been reanalyzed as the nominal prefix /i-/. Cf. Nauruan /duw-n/, [duwən] ‘body of; his/her body’.

iii. PMc *i : i

Unless conditioned at some later stage, PMc *i is continued as Nauruan /i/.

A117	PMc	*lip^{w}a	ditch, hole (in ground)
	Nauruan	i-/ɟib	hole, pit
	Kosraean	lʌf	hole
	Kiribati	nib^{w}a	post hole, small pit or bed for Cyrtosperma
	Marshallese	léb^{w}, lib^{w}i-, lib^{w}e-	grave, tomb
	PCk	*lip^{w}a	ditch, hole (in ground)
	Pohnpeian	liip^{w}	large hole in the ground
	Mokilese	lip^{w}	hole, crater, scar
	Pingilapese	lip^{w}	hole

4.1.20 Correspondence Set 20 (Table 4.1.5 Cr20i-iii)

i. P-Nau *e : o

Sound changes:

P-Nau *e > o / {o,u,w}

Pre-Nauruan *e is continued as Nauruan /o/ where it was adjacent to a [+round, +back] segment.

A115	PMc	*lewe	tongue
	Nauruan	jo-	tongue
	Kosraean	lɔ, lɔɔ-(l)	tongue, his tongue
	Marshallese	lew, lewe-	tongue
	Kiribati	newe	tongue
	Pohnpeian	loo-	tongue

ii. P-Nau *e : i

Sound changes:

P-Nau *e > i / __ ñ

Pre-Nauruan *e is continued as Nauruan /i/ where it preceded *ñ.

A141	PMc	*meña	thing
	Nauruan	i-/mʲin	thing
	Nauruan	tʃi-/mʲin/e < *ki-/meña/-ee	(there) is, (there) are
	Kosraean	mee-(n)	one of, thing of or for
	Kiribati	mena	thing
	Marshallese	men	thing, matter, object; a person, unnamed
	Pohnpeian	mɛɛ, mɛɛ-(n)	thing, one of, thing of
	Mokilese	mii-(n)	thing of

iii. PMc *e : e

Unless conditioned at some later stage, PMc *e is continued as Nauruan /e/.

A42	PMc	*ee	here, this near speaker
	Nauruan	-e	proximal distance
	Marshallese	yéy	this
	Mokilese	-e, -i	this
	PCk	*yee	here, this near speaker

4.1.21 Correspondence Set 21 (Table 4.1.5 Cr21i-iii)

i. P-Nau *u : i

Sound changes:

P-Nau *u > i / __{t,ɟ}

Pre-Nauruan *u is continued as Nauruan /i/ where it immediately preceded *t or *ɟ.

A26	POc	*buto	navel
	PMc	*pʷuto	navel
	Nauruan	mʲe-n/ bᵛi-	navel, belly button
	Kiribati	bʷuto, bʷuto-(na)	navel
	Marshallese	bʷije-	navel
	PCk	*pʷut{e,o}	navel

ii. P-Nau *u : ɨ

Sound changes:

P-Nau *u > ɨ /{w,wː}

Pre-Nauruan *u is continued as Nauruan /ɨ/ where it followed *w.

A64	PEOc	*ikuR	tail (Ross 1988)
	PMc	*iku	tail
	Nauruan	iwɨ	tail
	Mokilese	ik, iki-(n)	tail
	Woleaian	úúgú, úgú-	tail

iii. PMc *u : u

Unless conditioned at some later stage, PMc *u is continued as Nauruan /u/.

A55	PEOc	*fuRu	drag, pull	(Geraghty 1990)
	PMc	*uruuru	drag, haul, tow	
	Nauruan	urur/-ej	drag, pull (something)	RED
	Kosraean	ulul	pull, tug, stretch	

4.1.22 Correspondence Set 22 (Table 4.1.5 Cr22i-ii)

i. P-Nau *ou : o

Sound changes:

P-Nau *ou > o

Pre-Nauruan *ou is continued as Nauruan /o/.

A116	POc	*lima	five
	PMc	*lima-ua	five (general)
	Nauruan	e-/jimʲo < *a-/jimʲeu	five
	Kiribati	nima-ua	five
	Pohnpeian	lima-w	five (general)
	PCk	*lima-ua	five (general)

ii. PMc *o : o

PMc *o is continued as Nauruan /o/.

A286	**PMc**	*woca	coral reef
	Nauruan	e-/oř	reef
	Nauruan	e-n-/oř	waters near shore, around reef
	PCMc	*woca	coral reef
	Kiribati	oora, (te)-ora	coral reef
	Marshallese	wed, wede-(n)	coral reef
	PCk	*woca	coral reef
	Pohnpeian	oot	coral reef
	Mokilese	wos	coral reef

4.1.23 Correspondence Set 23 (Table 4.1.5 Cr23i-vi)

i. ON *a : e $_1$

Sound changes:

ON *a > e / __(C)a

Old Nauruan *a is continued as *e where it preceded *a. This is a case of low vowel dissimilation. Processes of low vowel dissimilation occur across the Oceanic family, and elsewhere, and may be independent developments grounded in phonetically natural sound change (Blust 1996b; Blevins 2009: 477-478). This is further discussed in §4.2.3.4.

A150	PEOc	*mʷata	snake	
	PMc	*mʷata	worm	
	Nauruan	e-/mʸe < *mʸeɟ	worm, maggot	
	Nauruan	eæ/mʸat < *mʸatt (?) < *mʸateta (?)	eel, eel tribe	RED
	Nauruan	eæ/mʸatəmʸat	a Nauruan tribe [134]	
	Kosraean	wet	worms	
	Kiribati	mʷata	worm	
	Marshallese	mʷaj	eel, intestinal worm	

ii. ON *a : e 2

Sound changes:

ON *a > e / (C){u,w,ŋʷ}

Old Nauruan *a is continued as Nauruan /e/ where it precedes [+back, +round] segments including *u, *w, or ŋʷ.

A254	PMc	*tau	who?
	Nauruan	ɟe/-n	who?
	Kosraean	sə	who?
	Kiribati	(an)-tai	who?
	Pingilapese [135]	(?) (i)-saa	who?
	PCk	*yau, -t[ae]ú	who?

[134] Some consultants have stated this tribe name refers to eels, but other sources have suggested it refers to worm-like larva in the water.

[135] Question mark appears in Bender et al. (2003)

iii. P-Nau *a : æ

Sound changes:

P-Nau *a > æ / (C){i,e}

Pre-Nauruan *a is fronted to /æ/ where it was adjacent to a syllable containing *i or *e.

A137	PMc	*mate	die, lose consciousness
	Nauruan	i-/mʲæ	dead one
	Nauruan	mʲæ/-n	dead, died
	Kosraean	mʷet	to die
	Kiribati	mate	die, lose consciousness
	Marshallese	méj	die, lose consciousness

iv. P-Nau *a : e

Sound changes:

P-Nau *a > æ / (C){i,e}

P-Nau *æ > e / __(C)i

Pre-Nauruan *æ is continued as Nauruan /e/ before a syllable containing *i.

A173	POc	*papine, *pai-p<in>ai	woman, female
	PMc	*faifine	woman
	Nauruan	i-/en < *i-/æin	woman
	Kosraean	ɛn	woman
	Kiribati	aiine	woman
	PPhn	*peine	woman

v. P-Nau *eæ : æ

Sound changes:

P-Nau *eæ > æ

Pre-Nauruan *eæ is continued as Nauruan /æ/.

A41	POc	*draRaq	blood
	PMc	*caa, cacaa	blood
	Nauruan	řæ-, řæřæ-	blood
	Kosraean	sræ	blood
	Kiribati	raraa	blood

vi. PMc *a : a

Unless it occurs in a conditioning environment at some later stage, PMc *a is continued as Nauruan /a/.

A80	**PMc**	*kakaŋV	sharp
	Nauruan	ea-/kaŋ	sharp
	PCMc	*kakaŋi	sharp
	Kiribati	kakaŋ	sharp
	Marshallese	kkaŋ	sharp

4.1.24 Correspondence Set 24 (Table 4.1.5 Cr24i)

i. Pre-Nauruan *V: : V

Contemporary Nauruan does not have contrastive vowel length. No minimal pairs based on vowel length have been identified, but there is evidence that Nauruan had long vowels historically. For example, *a: (**aa*) is reconstructed for PMc. At later stages, pre-Nauruan *aa is

subject to a series of vowel changes which ultimately result in Nauruan /æ/; e.g. PMc *raani ‘day’ > *rean > *ræn > ɟo-/ræn ‘morning’, a-/ræn ‘daytime’. Other pre-Nauruan vowels appear to simply shorten while maintaining their vowel quality. Consider, for example, PMc *SuuSuu ‘dive, bath’ which becomes Nauruan /dudu/ ‘soak, wash, splash’; PMc *ee ‘here, this near speaker’ which becomes Nauruan /-e/ proximal suffix; PMc *kamii ‘you (pl.)’ > *kamii > æmi/-ej ‘you (pl.)’. Note also that PMc long vowels and VV sequences are shortened word-finally as part of the more general process of final vowel lenition in Micronesian languages (§4.2.3.1; Rehg 1991).

4.2 Nauruan as a Micronesian Language

This section reviews the evidence for classifying Nauruan as a Micronesian language, as has been argued for in earlier work (Nathan 1973a, Jackson 1986). New data and comparative evidence leave little doubt that Nauruan is a Micronesian language. The question of where Nauruan should be classified within the Micronesian family is a separate one that is taken up in §4.2.3 – §4.2.4.

4.2.1 Micronesian Phonological Innovations (Jackson 1986)

All phonological innovations identified by Jackson as defining the Micronesian group appear to be shared by Nauruan. Each of Jackson’s identified innovations are listed in this section along with discussion of their relevance to Nauruan. Jackson’s innovations are listed in the order he gives them. Jackson’s claims are reproduced precisely as they appear in the original article, except that POc proto-phonemes are represented with equivalents from Ross (1988) for consistency. Jackson lists 11 innovations in all.

4.2.1.1 Innovation (1)

> "Split of POc *b into PMc *p and *p^{w}, with PMc*p^{w} occurring before round vowels regularly and before non-round vowels in certain forms."

Nauruan has regular reflexes of both PMc *p and *p^{w}, as described in §4.1.1. This is also noted by Jackson (1986: 212, §2.2(1)).

4.2.1.2 Innovation (2)

> "Split of POc *m into PMc *m and *m^{w}, with a pattern of reflexes similar to that for POc *b (see (1) above)."

Nauruan has regular reflexes of both PMc *m and *m^{w}, as described in §4.1.3. This is also noted by Jackson (1986: 212).

4.2.1.3 Innovation (3)

> "Loss of POc *p before round vowels."

Nauruan reflects the loss of *p in PMc before round vowels, and in all environments by way of POc *p > PMc *f > *Ø (§4.1.2). Loss of PMc *f also occurs in Kosraean and Kiribati.

4.2.1.4 Innovation (4)

> "Split of POc *R into PMc *r and Ø under unidentified conditions."

Nauruan reflects the loss or retention of POc *R in agreement with the other Micronesian languages, as described in §4.1.14. Jackson specifically cites a set of 10 Nauruan words that agree with the loss or retention of POc *R in PMc (1986: 212-213).

4.2.1.5 Innovation (5)

> "Merger of POc *d and *dr as PMc *c, which was almost certainly a retroflex obstruent."

Nauruan continues PMc *c as /ř/, as described in §4.1.13. Jackson's most compelling

argument for excluding Nauruan from the nuclear Micronesian group is his claim that Nauruan did not share in this merger (1986: 212). However, current comparative work suggests that Nauruan did participate in this merger, just as the other Micronesian languages did (§4.3).

4.2.1.6 Innovation (6)

"Merger of POc *ns and POc *c as PMc *S." [136]

Nauruan continues PMc *S as /d/, or as /g/ by way of PMc *S > *D/o > g, as described in §4.1.12.

4.2.1.7 Innovation (7)

"Merger of POc *s and PEOc *j as PMc *s."

Nauruan continues PMc *s as /d/. The same is true of PMc *S except where pre-Nauruan *D (< *S) was adjacent to pre-Nauruan *o. According to Bender et al. (2003), all Micronesian languages reflect a merger of PMc *s and *S as some alveolar obstruent except for Kosraean, which is hypothesized to lose *S in all environments.

4.2.1.8 Innovation (8)

> "Reasonably consistent reflexes of POc *n as PMc *ŋ in the environment /*a___ *i in the following five lexical items: PMc *kaŋi *sharp* (< PEOc *kani); PMC *tapaŋi *help, assist, support* (< PEOc *tabani); PMC *maŋi *think, remember, recall* (< PEOc *mani); PMc *ta(ŋ,n)i *from, source* (< POc *tani); PMc *ka(ŋ,n)i *eat* (vt) (< POc *kani). This change is not attested in any Mc reflexes of the following etyma: PMc *raani *day* (< POc *daqani); PMc *tani *skin disease* (< PEOc *tani); PMc *pani *sea cucumber* (< PEOc *pani); and PMc *wa(a)ni *pumice*."

Nauruan agrees with these sound changes to the degree that the other Micronesian languages do, though this can only be confirmed where there are known Nauruan cognates for

[136] PMc *ns was eliminated from the POc inventory in Ross's (1988) revision.

these etyma. Nauruan cognates have not been identified for PMc *tapaŋi ‘help, assist’, *maŋi ‘think’, PMc *tani ‘skin disease’, PMc *pani ‘sea cucumber’ or PMc *wa(a)ni ‘pumice’. In the first two cases (Jackson’s PMC *kaŋi ‘sharp’ and *tapaŋi ‘help, assist, support’), Kiribati also does not have a direct continuant of the reconstruction as cited, but does share a cognate with Nauruan.[137] In the final three cases (PMc *tani ‘skin disease’, PMc *pani ‘sea cucumber’, PMc *wa(a)ni ‘pumice’), it is possible that there is a Nauruan cognate that has not yet been identified. The known Nauruan cognates are discussed below.

There is some uncertainty regarding Jackson’s assumption that PEOc reconstructions can be extended back to POc. PEOc reconstructions appear in Geraghty (1983), Jackson (1983: 342-348), and have been reproduced in the comparative data in Bender et al. (2003), but do not appear in the ACD (Blust and Trussel). Where Jackson cites a PEOc etymon, it may not actually go back to POc, or at least does not occur in the current set of POc reconstructions in the ACD.

PEOc *kani > PMc *kaŋi ‘sharp’. Bender et al. (2003) reconstruct PCMc *kakaŋi, though not PMc *kaŋi. The authors cite no Oceanic etymon, and the ACD contains no entry similar to PEOc *kani ‘sharp’. Nauruan ea-/kaŋ ‘sharp’ is a likely cognate, and reflects Jackson’s expected *n > *ŋ sound change. This word also shows pre-Nauruan *gː > k (§4.1.4), which may suggest that a reduplicated form *kakaŋi should be reconstructed for PMc.

PEOc *tabani > PMc *tapaŋi ‘help, assist, support’. Bender et al. (2003) reconstruct PMc *{s,t}apa, *{s,t}apa{s,t}apa, *{s,t}apa-ŋi ‘to help’, which appears analogous to Jackson’s *tapaŋi. The authors list no Oceanic reconstruction for this word, but do include PMP *tabaŋ ‘help, assist’, which appears in the ACD (Blust and Trussel). Nauruan has no known continuation of this form, though clearly shares a cognate with Kiribati; Nauruan /buag/ ‘help, assist’, Kiribati

[137] Nauruan ea-/kaŋ ‘sharp’, Kiribati *kakaŋi*; Nauruan bʷuag ‘help, assist’, Kiribati *búoka* ‘help, aid, assistance’.

buoka ‘help, assistance, succor, support, protection, cooperation, collaboration, aid, relief’ (Trussel and Groves 1978). The Nauruan and Kiribati words are probably not reflexes of PMP *tabaŋ, but may suggest PMc *puaka ‘help, assist’.

PEOc *mani > PMc *maŋi ‘think, remember, recall’. Bender et al. (2003) reconstruct PMc *maŋi, as Jackson does, though no Oceanic etymon appears in their comparative data. POc *mani does not occur in the ACD (Blust and Trussel), though it was reconstructed for PEOc. Nauruan has no identified continuation of PMc *maŋi. The Nauruan words used for ‘think’ and ‘remember’ are typically /nimen/ ‘think, reckon’, /kæmʲærær/ ‘think, ponder’ or /amʷar-/ ‘remember, recall’.

POc *tani > PMc *ta(n,ŋ)i ‘from, source’. Bender et al. (2003) reconstruct PCMc *taŋi ‘from (something), away from (usually suffixed to verbs)’. No PMc reconstruction is suggested and the authors list no Oceanic reconstruction in their comparison, though the ACD does contain POc *tani ‘go away from’ which likely corresponds. Jackson’s PMc *ta(n,ŋ)i is a reasonable reconstruction, given cognates that contain either *n or *ŋ. The Marshallese cognate is *tani ‘from (something), away from (usually suffixed to verbs)’, though Bender et al. note that the *n* is unexpected. The Nauruan cognate /a-tʃɪn/ also contains /n/, as Marshallese does.[138] All other known reflexes reflect /ŋ/.

POc *kani > PMc *ka(ŋ,n)i ‘eat (vt)’. Bender et al. (2003) reconstruct PMc *kaŋi ‘eat something’ as well as PMc *kana, *kani ‘food, eat something’, but there is no corresponding POc reconstruction containing *ŋ. Bender et al. suggest a POc reconstruction of precisely the same shape as the PMc reconstruction, POc *kani, kana ‘food, eat (something)’. The ACD includes POc *kana ‘food’, *kana- ‘classifier for edible possession’, and POc *kani ‘to eat’ as

[138] The Nauruan continuation underwent regressive vowel assimilation in pre-Nauruan.

separate etyma (Blust and Trussel). Nauruan *ka- ‘eat, consume’ may or may not continue one of these reconstructions, but in any case reduplication would be necessary to derive the Nauruan form; *kaka- > *gaga- > *gːa- > ka- ‘eat, consume’. Compare also Nauruan /an/ ‘eat, feed’ and /wa-ŋa/ ‘possessive classifier for food’ (general noun classifier /wa-/).[139] These reflexes, continuing both *n and *ŋ, suggests that *ka- might have been a prefix, perhaps **PMc** *ka-, *kaka- ‘plural prefix for demonstrative pronouns’.[140] The reduplicated reconstruction is relevant to Nauruan, since /k/ always continues geminate pre-Nauruan *gː.

Nauruan /wa-ŋa/ appears to continue a form *-ŋa ‘food, eat’, in which case PMc *(ka)ka-ŋa might be reconstructed in addition to PMc *kaŋi. If both *-ŋa and *-ŋi existed in PMc, this undermines Jackson’s assertion that POc *n > PMc *ŋ / __i in these words. In that case, something other than the environment *a__i must have conditioned the change from *n to *ŋ.

4.2.1.9 Innovation (9)

“Spirantization of POc *t before *i.”

Nauruan reflects spirantization of *t adjacent to *i, as is characteristic of the Micronesian family. The coronal consonant chart in Bender et al. (2003: 5) shows spirantization of PMc *t across the Micronesian family (though not in Kiribati). In Nauruan, *t became *ȷ when adjacent to *e or *i (§4.1.10).

[139] And also Saipan Carolinian *ala-(l)* ‘food, eat (something)’, Puluwatese *yana-(n)* ‘food, eat (something)’, and Chuukese *ana-(n)* ‘his cooked food (to eat)’ (Bender et al. 2003).

[140] Reconstructed for PCMc by Bender et al. (2003).

4.2.1.10 Innovation (10)

"Loss of POc *q."

Nauruan reflects the unconditioned loss of POc *q, as do all Micronesian languages. This is discussed in §4.1.5.

4.2.1.11 Innovation (11)

"Loss of POc *y."

Rather than proposing loss of POc *y in PMc, Bender et al. (2003) reconstruct PMc *y, which is subsequently lost in Kosraean and Kiribati, as well as in Nauruan; §4.1.8. The Pohnpeic and Chuukic languages show variable loss or retention of PMc *y.

4.2.2 Subgrouping Nauruan and Micronesian (Jackson 1986)

Jackson (1986) presents 12 pieces of evidence for subgrouping Nauruan and the Micronesian languages, under the heading *Evidence for a Greater Micronesian Subgroup* (1986: 212-213). This section reviews each of Jackson's claims and finds them to be generally well supported. Jackson's arguments for classifying Nauruan apart from the Nuclear Micronesian group are reviewed in the following section (§4.3).

4.2.2.1 Evidence (1)

> "Like the Micronesian languages, Nauruan has developed labiovelar reflexes of both POc *b and *m before round vowels."

This is clearly the case, as described in §4.1.1 and §4.1.3. Jackson cites Nauruan *mmʌr* 'string of beads' as an exception, though it does not appear to be exceptional. Nauruan continues the velarized bilabial PMc *m^w as /m^y/ in this word; PMc *$m^w$are 'shoulder garland' > Nauruan

e-/mːʸar ‘necklace, lei’.[141]

4.2.2.2 Evidence (2)

> “PMc and Nauruan agree in showing retention or loss of POc *R in nine of the ten comparisons that have been identified (the exception is noted above).” [142]

Bender et al. (2003: 5) state that POc *R was either lost or was merged with PMc *r, though this occurs sporadically across different lexical items. The conditions under which POc *R is either lost or merged remain unknown. Jackson presents a set of words in which Nauruan and the Micronesian languages agree in the loss or retention of *R. Only one of Jackson’s examples shows an agreement in retention, the word for ‘root’. Jackson’s other examples agree in the loss of POc *R.

Jackson’s set of Nauruan words appear to contain some misrepresentations. For example *giigoo* ‘octopus’ has been recorded here as [də-giga]. Also, the etymology suggested for *tou* ‘cut, stab’ is probably inaccurate, and the word appears to be glossed incorrectly. It is given here separately: Nauruan *tou* ‘cut, stab’ < POc *(n)saRu. Compare Nauruan /tow/ ‘chop, cut down’ from PMc *toka ‘to chop’ < PEOc *toka ‘to chop’.

Jackson’s etymologies are presented here with updated phonological representations and the most recent POc and PMc reconstructions (ACD, Bender et al. 2003). The use of “ < ” to represent sound change in these words is reproduced from Jackson’s original work: Nauruan æworə- ‘root’ < PMc *wakara < POc *wakaR-a; Nauruan řæ- ‘blood’ < PMc *caa < POc *draRaq; PMc *kuyita, Nauruan də-/giga ‘octopus’ < POc *kuRita; PMc *ñañoa, Nauruan nene

[141] Though Nauruan apparently continues a reduplicated form *mʸamʸare.

[142] Jackson’s exception is POc *qaRus(a), continued as Nauruan *aar* ‘current’. Jackson may be referring to Nauruan /æřæ-/ ‘current, rip tide’, though this word does not appear to continue the cited POc form.

‘yesterday’ < PEOc *nañoRa; Nauruan mʲæ-, PMc *maa ‘ashamed’ < PEOc *maqa; *PMc *cuyi, Nauruan řɨ- ‘bone’ < PEOc *duRi;[143] PMc *pau, Nau /bʲe-/ < PEOc *baRu ‘hand, arm, wing’; PMc *pʷauSu,[144] Nauruan /bᵛodʒi-/ ‘nose’ < PEOc *bʷaRucu.

4.2.2.3 Evidence (3)

> “Nauruan has cognates of PMc *-ua ‘counting classifier for general objects’, *-manu ‘counting classifier for animate and human objects’ and *-cau ‘counting classifier for thin flat objects’ in the same meaning and function.”

Nauruan continues PMc *-ua in every numeral used in counting: Nauruan e-kʷen ‘one’ < PMc *te-ko-**ua**-na;[145] Nauruan a-/ro ‘two’ < PMc *rua-**ua**; Nauruan e-/ju ‘three’ < PMc *telu-**ua**; Nauruan æ-/e̯okʷ ‘four’ < PMc *faa-ko-**ua**;[146] Nauruan e-/jimʲo < PMc *lima-**ua**; etc.

PMc *-manu is continued in some Nauruan demonstrative pronouns used for people and animals, as /-mʲen-/ (§4.2.3.9).

The Nauruan noun classifier for flat objects is /-řæ-/, e.g. /a-řæ-n e-jimʲo/ ‘five flat things’. This may appear to continue Jackson’s PMc *cau ‘counting classifier for thin flat objects’, but Nauruan /-ræ-/ should not continue PMc *cau given the established regular sound changes. PMc *cau should instead be continued as /-re-/ (§4.1.23).[147] However, compare **PMc** *ca- (reconstructed by Bender et al. for PCMc), which is glossed ‘state of being’, but which has

[143] See also POc *ruRi, *suRi ‘fish bone’ (ACD).

[144] The present work suggests the PMc form was *pʷau-uS{u,i} ‘nose’ (Appendix, A28).

[145] This reconstruction suggests the PMc doublet *te-ko ‘one (of something)’, supported also by Kosraean *so-ko* ‘one’ (Lee 1976, morpheme break added here). Compare PMc *te ‘one (prefixed to classifiers)’, Kosraean *sie* ‘one’ (Lee 1976), and PMc *ko, which is glossed as ‘you (singular subject marker)’, but which has reflexes glossed as ‘independent pronoun’ (Kiribati, Marshallese, Mokilese, Pohnpeian) or as a ‘vocative’ affix (Kiribati, Woleaian, Puluwatese, Chuukese), with no reference to the second person meaning.

[146] Hypothesized sound change trajectory: *faa-ko-ua > *ea-wo-u > *ee-wu-u > *eo-wu-u (regressive vowel assimilation) > *a-eoww > /æ-e̯okʷ/.

[147] Note also that Bender et al. (2003) do not reconstruct *cau ‘counting classifier for thin flat objects’ for PMc, but instead give *cau ‘leaf’.

several reflexes with meanings related to flatness, wideness, or broadness (Bender et al. 2003).[148] In terms of regular sound change, Nauruan /-řæ-/ should continue *caa, to account for the apparent *a > æ sound change, though no such reconstruction is suggested by Bender et al. (2003). However, several listed continuations of *ca- in Bender et al. show a successive *a as part of a suffix, or occurring before a suffix; e.g. Saipan Carolinian *sha-(apaapa)* 'be very flat (as a board), Woleaian *sha-(apaape)* 'become flat, be flat', Woleaian *chchaa-li* 'exist, be available', Proto-Chuukic *ca-, cca-, cca[a]-ni 'state of being'. This may account for the observed sound change in Nauruan, if *ca(a)- can be reconstructed for Old Nauruan or some earlier stage; e.g. PMc *ca(a)-. Furthermore, the reconstruction should possibly be glossed as 'state of being, flat, be flat' rather than only 'state of being'.

4.2.2.4 Evidence (4)

> "Nauruan *a-* 'general possessive classifier' is cognate with PMc *a- in the same meaning and function."

Jackson claims that PMc *a- is continued in Nauruan as a general possessive classifier, which is a type of stem used in possessive constructions for alienable nouns in Micronesian languages (Harrison 1988). The pattern is for a possessive classifier to take a possessive suffix usually reserved for inalienable nouns, and this is then followed by the alienable noun that is possessed; e.g. Nauruan /**wa**-m odo/, *POSS.CL-2SG car*, 'your car'; Nauruan /**nim**-n e-bʲag/, *drink.CL-3SG.POSS N.PFX-fresh water,* 'his water (to drink)'.

The morpheme that Jackson cites, /æ-/ (*a-*), is a general possessive classifier in Nauruan that appears to be used exclusively in predicate verb phrases: Nauruan /eæd **æ**-i̶ e-di̶ræ/, *forgive POSS.CL-1SG N.PFX-sin*, 'forgive my sin/transgression'. Nauruan /æ-/ likely continues **PMc** *aa-

[148] Bender et al. (2003) reconstruct *ca- for PCMc.

'alienable object' (with possessive suffix).[149] The long vowel in this word accounts for the vowel change in Nauruan: PMc *aa- > *ea- > æ-. Compare also the Nauruan general possessive classifier /wa-/. This form appears to continue *a, with the later addition of a prothetic glide; *a- > wa- (§4.1.18).

4.2.2.5 Evidence (5)

> "Nauruan *nim* 'drink, to drink' and *nima-* 'possessive classifier for drinkable objects' are cognate with PMc *nima and *nima- in the same meaning and functions, and are apparently unattested elsewhere [in the Oceanic family]."

Bender et al. (2003) reconstruct *nima- 'drinkable object', though they list no cognates for this reconstruction. The entry cites Jackson's set of possessive classifiers for comparison (Jackson 1986: 208), and instructs readers to compare PMc *inu, (i)nu-mi, (i)nu-ma 'drink', which is continued in many Micronesian languages. The Nauruan possessive classifier for drinkable objects, /nim-/ (cf. Jackson's *nima-*), appears to be from PMc *nima, though the general verb for drink appears to have its source instead in PMc *(i)nu-mi, given forms such as /nimi-da/ 'drink up'. Nauruan has a cognate possessive classifier for every one of those listed by Jackson, which is good evidence for Nauruan's inclusion in the Micronesian group. This is discussed in §4.2.3 below.

4.2.2.6 Evidence (6)

> "Nauruan *-oo* 'demonstrative root: away from speaker and hearer' is almost certainly cognate with PMc *oe in the same meaning and function, but is also apparently not attested elsewhere [in the Oceanic group]."

Nauruan continues of all the demonstrative morphemes that Jackson reconstructs for PMc (1986: 208): *e 'near speaker', *na 'near addressee', *oe 'away from speaker and addressee;

[149] Reconstructed by Bender et al. (2003) for PCMc.

known referent'. However, the suffix that Jackson cites for Nauruan appears to be /-o/ rather than /-oo/. The Nauruan distal suffix is not a long vowel, nor does there appear to be contrastive vowel length in Nauruan generally. It also appears that Jackson mistakenly includes the construct suffix *-n- in his reconstruction of *na 'near addressee'; the Nauruan distance suffixes include /-e/ 'here (proximal)', /-a/ 'there (medial)', /-o/ 'far away (distal)'. §4.2.3.9 discusses the morphological structure of the Nauruan demonstrative pronouns and contains several examples of these distance markers.

Additionally, the equivalent reconstructions from Bender et al. (2003) are somewhat different from Jackson's in both form and meaning. Compare PMc *ee 'here, this near speaker' and PMc *oo 'that (out of sight or in the past). Bender et al. do not reconstruct a medial distance marker of the shape *a, though we might compare PMc *-a 'him, her, it (object pronoun)' and PMc *aa- 'alienable object (with possessive suffix), which could be cognates.

4.2.2.7 Evidence (7)

> "Nauruan *ji* 'where' is very probably cognate with PMc *ia(a) 'where (to)?', other cognates of which are very rare in Oceanic."

Jackson's representation of the Nauruan word for 'where' appears to be inaccurate. There appears to be no initial consonant in this word, which is phonemically /i/ 'where; locative prefix'. This word likely continues PMc *i- 'at (locative)' (Bender et al. 2003). Compare Nauruan *i-n-e 'here' (LOC-GEN-PROX), *i-n-a 'there' (LOC-GEN-MED), *i-n-o (LOC-GEN-DIST) 'way over there; a location out of sight'. Compare also Nauruan /iŋa/ 'where?'.

4.2.2.8 Evidence (8)

> "Nauruan *eʌːkʌŋ* 'sharp' appears to be cognate with PMc *kaŋi 'sharp', which represents an innovation from PEOc *kani."

Under the current analysis, this Nauruan word is ea-/kaŋ ‘sharp’, continuing **PMc** *kakaŋi ‘sharp’.[150] The authors cite no Oceanic etymon, and the ACD contains no entry analogous to Jackson’s PEOc *kani ‘sharp’. As such, this comparison relies on the PEOc reconstruction *kani and an apparently irregular sound change *n > ŋ. Additional discussion on this point is provided in §4.2.1.8.

4.2.2.9 Evidence (9)

> “Nauruan *e-ɾʌ* ‘bone’ is almost certainly cognate with PMc *cui, reflecting an earlier *duRi which is otherwise only attested in the Admiralties and some non-Oceanic Austronesian languages (Blust 1978).”

Nauruan continues e-/řɨ ‘bone’ from PMc *cuyi (Bender et al. 2003), though Jackson writes the vowel here as ʌ. This word reflects regular sound changes in Nauruan, including PMc *c > ř (§4.1.13), PMc *y > Ø (§4.1.8), and *i > ɨ (§4.1.19).

4.2.2.10 Evidence (10)

> “Nauruan *bwiɾibwiɾ* ‘white’ is cognate with the otherwise apparently innovative PMc *pwece(pwece) ‘coral lime, white’.”

The Nauruan word for ‘white’ appears to be /bʸuř bʸuř/, [bʸɨřəbʸɨř] ~ [buřəbuř]. This word would seem to continue PMc *pʷecepʷece ‘white, powdered lime’ (Bender et al. 2003), though the Nauruan vowel correspondence is irregular. It is possible that PMc *e became Old Nauruan *u in this etymon, comparing the vowel change in Old Nauruan *e > o /{u,w,o}, which occurs elsewhere. However, this doesn’t explain why the reflex of PMc *e is /u/ here rather than the expected /o/. The precise sound changes that took place in this word remain unclear.

[150] Bender et al. (2003) reconstruct PCMc *kakaŋi.

4.2.2.11 Evidence (11)

> "Nauruan *mwi* 'tooth' may reflect the type *ŋii 'tooth' reconstructed in Jackson (1984: 388) only for PCMc because of the absence of a cognate form in Kosraean."

Jackson's etymology for Nauruan /mʸi-/ is essentially the same as that proposed here: Nauruan mʸi- 'tooth' < *ŋʷi < PMc *ŋio < POc *ŋipo 'tooth'.

4.2.2.12 Evidence (12)

> "Nauruan *bwoodi-* 'nose' is cognate with PMc *pwauzu in the same meaning."

Bender et al. (2003) reconstruct PMc *pʷauSu 'nose', though the present work suggests a slightly different reconstruction, *pʷau-uSi > pre-Nauruan *bʸouDi > Nauruan /bʸodi-/ 'nose (possessed)'. The reconstruction of an initial vowel in the PMc suffix, *-uSi, accounts for the failure of PMc *S to correspond to Nauruan /g/, as is expected adjacent to *o, and allows for established regular sound changes. The possibility that the final vowel was *i accounts for several Micronesian cognates that end in *i, including Nauruan; Kiribati *bʷairi*, Marshallese *bʷawat(iy)*, Mokilese *pʷɔɔdi-*, Woleaian *booti*. Compare also POc *isu 'nose', which may have undergone metathesis to result in PMc *-uSi.

4.2.3 Subgrouping Nauruan and Micronesian: Additional Evidence

Nauruan shows several phonological processes that are characteristic of the Micronesian family in addition to those listed by Jackson (§4.2.2). There are also several morphological paradigms in Nauruan that are strikingly similar to those found in other Micronesian languages, and which are very likely the result of shared innovations. These observations further bolster Nauruan's classification as a Micronesian language.

4.2.3.1 Final Vowel Lenition and Recovered Vowels

Nauruan shows evidence of final vowel lenition, a pattern of "erosion from the right"

which is characteristic of Micronesian languages (Blust 2013: 263; Rehg 1991; Jackson 1986: 230, note 9; Jackson 1983: 432 (12); Bender 1969b). This general sound change involves the weakening of word-final PMc short vowels, most often resulting in vowel loss, and the shortening of PMc long vowels. Rehg (1991) has argued that this phenomenon is the result of phonological "drift", in which a constellation of phonological processes ongoing in PMc resulted in natural and independent developments of final vowel weakening and loss in the Micronesian languages. These PMc processes are identified as penultimate stress, devoicing of short vowels and shortening of long vowel in final position, syncope of medial vowels, feature transfer between consonants and vowels, and regressive vowel assimilation (Rehg 1991: 392-396). There is good evidence that Nauruan participated in each of these processes.

Nauruan final vowel lenition manifests as the loss of word-final PMc short vowels and the shortening of final PMc long vowels. This is precisely the pattern that Rehg identifies as "full apocope", which occurs in all Micronesian languages other than Woleaian and Kiribati (1991: 385-387).[151] Nauruan has no phonemically long vowels to shorten, having lost length as a contrastive feature in all vowels (§4.1.24), but word-final vowels are uniformly lost.

Table 4.2.1 summarizes vowel apocope across the Micronesian languages. This table has been adapted from Rehg (1991: 388), with Nauruan cognates added. As in the table from Rehg, a preceding (d) indicates a diachronic change, (o) indicates an optional change, and (?) indicates uncertainty.

[151] Woleaian devoices phrase-final short vowels, rather than deletes them, and shortens phrase-final long vowels. Kiribati only deletes word-final high vowels preceded by nasals, and optionally shortens phrase final long vowels preceded by a nasal.

Table 4.2.1 – Micronesian Vowel Shortening and Loss [152]

Apocope of short and long vowels

		Short Vowels		Long Vowels	
Pohnpeian, Chuukese		$V \rightarrow Ø / VC_1 ___ \#$		$V \rightarrow Ø / V ___ \#$	
Marshallese		$V \rightarrow Ø / VC_1 ___ \#$	(d?)	$V \rightarrow Ø / V ___ \#$	
Kosraean	(d) [153]	$V \rightarrow Ø / VC_1 ___ \#$	(?)	$V \rightarrow Ø / V ___ \#$	
Nauruan	**(d)**	$\mathbf{V \rightarrow Ø / VC_1 ___ \#}$	**(d)**	$\mathbf{V \rightarrow Ø / V ___ \#}$	**(*VV → V)**
Woleaian		---		$V \rightarrow Ø / V ___ \|\|$	
Kiribati		$V_{+hi} \rightarrow Ø / VN ___ \#$	(o)	$V_{+hi} \rightarrow Ø / NV ___ \|\|$	

Devoicing of short vowels (Woleaian and Kiribati only)

		Short Vowels	
Woleaian		$V \rightarrow [-vd] / VC_1 ___ \|\|$	
Kiribati		$V_{+hi} \rightarrow [-vd] / Vt ___ \|\|$	
Kiribati	(o)	$V_{+hi} \rightarrow [-vd] / VC_1 ___ \|\|$	
Kiribati	(o)	$V_{-hi} \rightarrow [-vd] / VNN ___ \|\|$	(especially mid V's)

Where word-final short vowels have been lost in Micronesian languages, they can surface at the end of the stem before a suffix. These "recovered" or "thematic" vowels exist in all Micronesian languages except for Woleaian, where short vowel apocope did not apply in the first place, and in Kosraean which has no recovered vowels at all (Rehg 1991: 390-392).[154] The vowels that surface vary from language to language. Nauruan appears to recover only /i/ and /ɨ/, with epenthetic [ə] occurring where other vowels would be recovered.[155] A list of Nauruan words exhibiting recovered vowels is given in Table 4.2.2 below.

[152] Adapted from Rehg 1991 (388). Nauruan analysis added here.

[153] This process is considered diachronic in Kosraean because this language lacks any recovered vowels, and therefore lacks synchronic evidence of PMc word-final vowels (Rehg 1991: 391; Lee and Wang 1984: 436).

[154] These vowels will be referred to here as "recovered" vowels, though strictly speaking they are associated with their lexical stems synchronically. Clearly they cannot be "recovered" from the historical source synchronicially.

[155] Kiribati recovers only /i/, Pohnpeian recovers only /i/ and /ɛ/, Chuukese recovers only /i/, /ɨ/, /u/, /a/, and Marshallese recovers all of its vowels, /i/, /ê/, /e/, /a/ (Rehg 1991: 390-391).

Table 4.2.2 – Some Nauruan words with recovered vowels or [ə] before a suffix

PMc	*iku	‘tail’
Nauruan	iwɨ-n	‘tail of’
PMc	*aŋi	‘wind’
Nauruan	eŋ, eŋi-n	‘wind’, ‘wind of’
PMc	*(i)nu-mi	‘drink’
Nauruan	nim, nimi-da	‘drink (v.)’, ‘drink up’
PMc	*fiSiko	‘flesh’
Nauruan [156]	duwə-n	‘meat of, body of’
PMc [157]	?	
Nauruan	e-bʲag, bʲagə-n	‘fresh water’, ‘fresh water of’

4.2.3.2 Regressive Vowel Assimilation

Regressive vowel assimilation occurs extensively in all Micronesian languages, either historically or as part of synchronic phonology (Jackson 1986: 230-231, note 9; Jackson 1983: 322). This process can be formalized as follows: $V_\alpha \rightarrow V_\beta$ / __C_0V_β. This pattern has clearly been active in the development of Nauruan phonology. Jackson argues it is very probable that regressive vowel assimilation was an active phonological process in PMc, though Rehg notes that the process is not exploited to an equal degree in all daughter languages (1991: 398). For example, Micronesian languages other than Kiribati, Woleaian, and Nauruan exhibit regressive assimilation of PMc *a in this environment: PMc *a > o / __o.[158] Chuukese, Pohnpeian,

[156] PMc *f was lost in this word by regular sound change, and the resulting stem initial *i was apparently reanalyzed as a nominal prefix and omitted from the unpossessed, unsuffixed form.

[157] Cf. Kiribati *te-bóka* ‘to water, to wash, to bathe, to baptize’, and Chuukese *appúng* ‘fresh water’.

[158] Like Woleaian and Kiribati, Nauruan does not show this change, but does show precisely the change that Rehg notes for Woleaian: *eu > o (1991: 398, footnote 23; Sohn 1984: 181). In Nauruan, there is an intermediary stage where *e > o preceding the collapse of pre-Nauruan *ou > o (§4.1.20).

Marshallese, and Kosraean elaborated regressive vowel assimilation so that non-high vowels assimilated to word-final vowels, though Kiribati and Woleaian did not participate in this process (Rehg 1991: 398). Nauruan clearly shows regressive assimilation conditioned by following high vowels, as has also been observed by Rehg (Jackson 1983: 322).

The evidence so far suggests that Nauruan regressive vowel assimilation was conditioned only by following high vowels. The time depth for each regressive vowel assimilation process is not yet fully understood. At this stage, it is possible to point out that all cases that show regressive assimilation of a penultimate vowel appear to have occurred sometime before final vowel loss (§4.2.3.1). In these cases the penultimate vowel assimilated to the final vowel which was subsequently lost. It is also clear that different regressive vowel assimilations took place at different time depths in Nauruan, based on whether those assimilations fed other phonological processes. For example, the change from *u to /i/ in the word for ‘string of fish’ must have been relatively late, occurring sometimes after *t > j /{i,e}. Otherwise, we would expect /jir/ rather than /tʃir/: PMc *turi ‘to string’ > *tir > tʃir ‘fish strung on a line’. Table 4.2.3 provides some examples of regressive vowel assimilation in Nauruan, and also some examples where this process did not apply.

Table 4.2.3 – Examples of regressive vowel assimilation in Nauruan

Regressive assimilation conditioned by following high vowels		
PMc	*pepeti	‘to float’
Nauruan	e-pʲi < *a-pːʲeti	‘to float, to suspend’ (historic causative prefix)
PMc	*turi	‘to string’
Nauruan	tʃir	‘string of fish’
PMc	*palia	‘side’
Nauruan	bʲij bʲij- (RED)	‘hips’
**a,*o,*e fail to condition regressive assimilation*		
PMc	*lima-ua	‘five’ (with general classifier suffix)
Nauruan	e-/ɟimʲo	‘five’ (*a-ua > *eu > o)
PMc	*mʷulo mʷulo	‘rub together, twist, rumple’
Nauruan	/mˠun mˠun/	‘rub, wipe’
PMc	*mate	‘die, lose consciousness’
Nauruan	i-/mʲæ, mʲæ/-n	‘dead thing’, ‘dead’

4.2.3.3 Low Vowel Raising

Rehg (1991: 392) notes that the Chuukic languages exhibit the raising of short final vowels. In Chuukese final short mid-vowels were raised to high vowels, and in Woleaian /a/ raises to [e] or [o]. Nauruan reflects a similar pattern in which word-final /a/ may be realized as reduced and centralized [ɐ]. This is discussed in §2.3.2.1.

4.2.3.4 Low Vowel Dissimilation

Low vowel dissimilation is a phonological process that can be formalized as follows: *aCa > eCa. This process is known to occur in languages across the Oceanic family, including the Micronesian languages Marshallese (Bender 1969) and Woleaian (Sohn 1971). Blust (1996b: 100-101), citing personal communication with Rehg, notes that PMc may have exhibited low

vowel dissimilation, and that among Micronesian languages that have no synchronic rule of this type (e.g. Pohnpeian) there is evidence that such a rule operated diachronically. Nauruan appears to be like Pohnpeian in this way, as it exhibits diachronic evidence of such a rule (§4.1.23; Nathan 1973a: 493), but there is no evidence that the process is active synchronically.

The likelihood that low vowel dissimilation developed independently in languages across the Oceanic family is suggestive of a phonetically natural sound change (Blust 1996b; Blevins 2009: 477-478). This lowers the relevance of low vowel dissimilation in terms of evidence for Nauruan classification, as this process may be more likely to develop independently than others. Still, considering the entire body of evidence for Nauruan classification, inheritance of low vowel dissimilation from PMc is plausible.

4.2.3.5 Vowel Syncope, Geminates, and Reduplication

Rehg proposes that a rule of medial vowel syncope was active in PMc and resulted in a range of consonant clusters across the Micronesian family (1991: 395). All Micronesian languages allow for geminate nasals, for which there is evidence in Nauruan both synchronically (§4.1.3) and diachronically (§4.1.16), though other types of geminates also occur in the family. Rehg suggests that PMc probably only allowed for geminate nasals and other types of consonant clusters are later developments.[159] He hypothesizes that the Micronesian languages expanded the range of permissible consonant sequences to geminate sonorants, homorganic nasal-obstruent sequences, and geminate obstruents, all of which occur in Micronesian languages that exhibit full apocope. Though synchronically Nauruan only exhibits geminates that are bilabial nasals, there is good evidence that Nauruan went through diachronic stages in which each of the consonant

[159] Rehg suggests that PMc short high vowels were deleted between nasals word-internally and after nasals phrase-finally (Rehg 1991: 395).

sequence types noted by Rehg were permitted: *ww > k^w (§4.1.9); *nn > t (§4.1.16); *řř > d (§4.1.13); *dd > t (§4.1.12); *p^jp^j > p^j (§4.1.1); *p^yp^y > p^y (§4.1.1); *gg > k (§4.1.4). Like the other Micronesian languages that reflect these geminate consonants, Nauruan exhibits full apocope as defined by Rehg (1991: 385-387; §4.3.2.1).

Nauruan continues historic consonant clusters of the type attributed to post-PMc developments, which is good evidence for Nauruan's inclusion in the nuclear Micronesian group.[160] Within this group, the Chuukic languages are characterized by obstruent sequences that resulted from reduplication and subsequent syncope. In this process, reduplication precedes the deletion of a resulting unstressed vowel between like consonants, thereby creating an initial geminate (Jackson 1983: 65-66, Goodenough 1992: 98). This process can be formalized as follows: *C_αÝCV >> C_αV.C_αÝCV (REDUPLICATION) >> $C_\alpha C_\alpha$ÝCV (SYNCOPE). There is some evidence that the same process occurred in Marshallese, as shown in some of the comparisons in Table 4.2.4 below. As noted, there is also good evidence that Nauruan exhibited the same pattern diachronically.

[160] As it is defined by Jackson (1986).

Table 4.2.4 – Reduplication, vowel syncope, and gemination in some Micronesian words

PMc	*ka-	‘causative prefix, prefix forming ordinal numerals’
PMc	*kaka- [161]	‘causative prefix, prefix forming ordinal numerals’
Nauruan	ka- < *gga- [162]	‘causative or nominalizing prefix’
PCk	*ka-, *kka-, *kakka-	‘causative prefix, prefix forming ordinal numerals’
PMc	*pʷupʷula	‘to flame, flare’
Nauruan	pʸiɉ < *pːʸula	‘light, shine, aflame’
Nauruan	pʸiɉ pʸiɉ (RED)	‘to shine, sparkle, flare’
Nauruan	pʸiɉ-ari	‘fiery, raging’
Marshallese	bbōl	‘lights on’ (Abo et al. 1976)
Marshallese	ka-bōlbōl	‘glow, shine in the distance’ (Abo et al. 1976)
PCk	*pʷpʷula	‘to flame, flare’
PMc	*kakaŋi [163]	‘sharp’
Nauruan	ea-/kaŋ < *-ggaŋ	‘sharp’
Kiribati	kakaŋ	‘sharp’
Marshallese	kkaŋ	‘sharp’
PCk	*kkaŋi	‘sharp’
PMc	*ñaña, *ñañaña	‘taste, flavor’
Nauruan	itæ < *e-/ññа < *a-/ññа	‘tastiness, flavor’ (historic causative prefix)
Kiribati	nana-ma	‘to taste or test the taste of food’
Marshallese	nnan	‘musty taste, moldy taste’
PCk	*nna-	‘taste, flavor’
PMc [164]	*wuwuaa	‘fruit’
Nauruan	kʷæ- < *wwea	‘fruit, flower’
Marshallese	kwōle	‘fruit’ (Abo et al. 1976)
Marshallese	wiwaa	‘bear much fruit or many flowers’
PCk	*wuwaa	‘fruit’

[161] Reconstructed for PCMc by Bender et al. (2003).

[162] This Nauruan prefix means something like ‘that which is the source or cause of’, and sometimes functions as a nominalizer.

[163] Reconstructed for PCMc by Bender et al. (2003).

[164] Compare also PMC *wuaa ‘fruit’ and Kiribati *uaa* ‘fruit’.

4.2.3.6 Transfer of Vowel Features to Consonants

The Micronesian family is characterized in part by the spread of features from vowels to adjacent consonants. This is evident in the early history of Micronesian, where velarized bilabial consonants developed in environments preceding round vowels (Jackson 1986: 204, (1, 2)). Nauruan clearly reflects this Micronesian innovation (§4.1.1, §4.1.3).

Additionally, Marck (1975) argues that PMc vowel allophony was conditioned by preceding consonants (Rehg 1991: 396). He suggests that PMc *u was centralized to [ʉ] when preceded by one of the following alveolar consonants; *t, *d, *l, *n, *ñ. Nauruan appears to have a parallel rule synchronically, which is conditioned by a similar set of consonants (§2.3.4.1); e.g. /dur-n/ → [dʉrən] ‘near, beside something’; /tubᵛu-n/ → [tʉbᵛi-n] ‘his/her head, hair of head’. Rehg (1991: 396) notes that derivative processes are also observed in Pohnpeian (Rehg 1981: 43-46), Marshallese (Bender 1968), and possibly Kosraean.

Vowels also influence consonant articulation elsewhere in the family. Marshallese consonants, for example, have taken on secondary articulations which resulted from the transfer of phonological features from vowels to consonants. Vowels in Marshallese are now underspecified for backness, with their phonetic realization dependent upon the secondary articulations of adjacent consonants (Choi 1995, 1992).

4.2.3.7 Pronominals

Jackson (1986: 206) reconstructs four separate sets of pronominal morphemes: focus pronouns, subject pronouns, object pronouns, and possessive pronouns. Jackson’s presentation of the data is reproduced in Table 4.2.5, with the addition of Nauruan cognates. Entries have been updated to match both reconstructed and synchronic forms in Bender et al. (2003). Jackson’s “focus pronouns” are equivalent to subject pronouns in Nauruan, as they are in Kosraean and

Mokilese. In Table 4.2.5 the “focus pronouns” appear under the heading Pronouns, and Jackson’s subject pronoun category is not included. Jackson’s “object pronoun” category consists of accusative pronouns, and his “possessive pronouns” are invariably suffixes. Labels for these categories have been changed accordingly. Mokilese and Proto-Pohnpeic-Chuukic data has been omitted here for space but can be referenced in Jackson’s original work.

Table 4.2.5 – Micronesian pronominal morphemes [165]

Pronouns

	PMc	Ksr	Nau	Kir	Mrs	Pon	PCk
1sg [166]	*ŋa-u *ŋa-a, *ŋa	ŋa	ŋa, a	ŋai	ŋah	ŋɛɛy	*ŋaaŋú
2sg	*ko- *koe	kom [167]	wo- æ-we ŋ-æ-we	ko- ŋ-koe	kʷe- kʷey	kɛ; koo, kowɛ	*koe-ña [168]
3sg	*ia	el [169]	e	(ŋa)-ia	yéy	ii	*ia
1pl. inc.	*ki-ca *ki-ta [170]	--- kʌt kitɛ--(l)	--- æ-tæ [171] < *ka-ta-a [172]	(ŋa)-ira ---	--- kéj	kiit ---	*kica ---
1pl. ex. (PWMc)	*ka{a,Ø}mami	kitacl [173]	æ-mːʲ-æ < *ka-mma-a	---	kémmém kém kémʷ	kiht [174]	*kaamami *kami
2pl [175] (PCMc)	*kamii	---	æ-mʲie < *ka-miia-a	(ŋ)-kamii	kemiy	---	*kaamii *-kamii
3pl	*ira	el-tahl	ɨræ < *wira-a	(ŋa)-iia	yér	iir	*ira

[165] Adapted from Jackson 1986 (206, Table 2)

[166] Morpheme boundaries are proposed here. The Nauruan cognate appears not to have had a suffix.

[167] Reflex of PMc *kamʷu 'you (plural)'.

[168] This is reconstructed by Jackson (1986). No PCk form is reconstructed by Bender et al. (2003).

[169] Jackson proposes that this continues PMc *ira 'they, 3pl'.

[170] The PMc doublet *kita is reconstructed by Bender et al. (2003) to account for apparent reflexes of PMc *t in Kosraean and Marshallese (though compare Kosraean *kʌt*). Nauruan also continues PMc *t in its inclusive pronominals, though like Kosraean *kʌt*, Nauruan may not continue the same preceding vowel in these words. It appears that PMc *-ta can be reconstructed independent of *ki-.

[171] Nauruan continuations of plural pronominals appear only to include the initial /k-/ in accusative forms. The pronouns appear to continue **PMc** *ka-, and the accusative forms **PMc** *kaka-, both glossed 'plural prefix for demonstrative pronouns' (Cf. PCk *ka-, *kka-). Though not noted by Jackson, the Chuukic languages also have forms both including and excluding the initial *k-* of the same pronouns.

[172] The Nauruan plural pronominals are hypothesized to have contained a plural suffix *-a historically: *-ta-a > *-te-a > -tæ '1pl.inc.'. This analysis is further supported by the Nauruan dual and trial possessive suffixes, which reflect number affixes in the same position as *-a historically: /-tær/ '1dl.inc.poss' (Cf. /a-ro/ 'two'); /-tej/ '1tr.inc.poss.' (Cf. /e-ju/ 'three').

[173] Jackson proposes that this continues PMc 1pl. inc. pronoun with a trial suffix.

[174] Jackson proposes that this continues PMc 1pl. inc. form.

[175] See also PMc *kamʷu 'you (plural)' (*kamwu, Jackson 1986), for which Nauruan has no apparent reflex.

Accusative pronominals (suffixes occur on verbs; pronouns occur in predicate VPs)

	PMc	Ksr	Nau	Kir	Mrs	Pon	PCk
1sg	*-a-u	-yʌ	-æmʲe < *a-mia	-au	yéh	-yɛ	*-ai
2sg	*-ko	--- [176]	-w	-ko	-eok [177]	-yuk	*-ko
3sg	*-a	---	-Ø	-a	---	-Ø	*-a
1pl. inc.	*ki-ca *ki-ta	---	--- kæ-tæ < *kka-ta-a	(i)ra	--- [178]	--- [179]	*-kica
1pl. ex.	*-kamami	---	kæ-mːʲæ	---	---		*-kamami *-kami
2pl	*kamii	---	kæ-mʲie	---	---	---	*kamii
3pl	*ira	el-tahl [180]	-iræ < *-wira-a	-ia	yér	iir	*-ira

Possessive suffixes

	PMc	Ksr	Nau	Kir	Mrs	Pon	PCk
1sg	*-xu	-k	-ɨ < *-wi	-u	-hi	-y	*-yi
2sg	*-mʷu	-m	-mʸ → [-m#]	-mʷ -mʷmʷ	-mʷ	-mʷ -mʷi	*-mʷu
3sg	*-ña	-Ø	-n	-na	-n	-Ø	*-ña
1pl. inc.	*-ca, *-ta [181]	-sr	-tæ < *ta-a	-ra	-d	-t	*-ca
1pl. ex.	*-mi [182] *-mami	-k-tacl [183]	-mʲæ < *mʲimʲa-a	---	-m	-t- [184]	*-mi *-mami
2pl	*mii	-m-tacl [185]	-mʲ, [-m]#	-mii	-mi	-mʷ- [186]	*-mii
3pl	*ira	-l-tacl [187]	-iræ < *wira-a	-ia	yér	-Vr- [188]	*-ira

[176] Kosraean uses forms listed under *pronouns* for accusative pronominals other than the first person singular.

[177] Included by Jackson, but not listed as continuing the same etymon by Bender et al. (2003).

[178] Marshallese uses forms listed under *pronouns* for plural accusative pronominals.

[179] Pohnpeian uses forms listed under *pronouns* for plural accusative pronominals. Pohnpeian *-kit* and *kiit* are used in the exclusive meaning, but are reflexes of PMc *kica (Bender et al. 2003).

[180] Kosraean continues a form with a trial suffix.

[181] PMc *-ta is not reconstructed as an independent morpheme by Bender et al. (2003), but it can be interpreted as one. See the discussion in the footnote for *ki-ta in the *pronouns* section of this table above.

[182] All forms in this row are from Jackson (1986). Compare POc *ami 'we' (exclusive) (ACD).

[183] From PMc 1sg form with trial suffix.

[184] From PMc 1pl.inc. form.

[185] From PMc 2sg form with trial suffix.

[186] From PMc 2sg form.

[187] Reflecting PMc 3pl form with trial suffix.

[188] Given by Jackson. Does not occur in Bender et al. (2003).

4.2.3.8 Postverbal Directional Morphemes

Jackson reconstructs seven postverbal directional morphemes (1986: 207; 1983: 43), and each of these appear to be continued in Nauruan. Table 4.2.6 is an adaptation of Jackson's data table. The entries and glosses in the table have been updated to match those given in Bender et al. (2003) and Nauruan cognates have been added.

Table 4.2.6 – Postverbal directional morphemes in Micronesian languages

	PMc	PCk	Pon	Mrs	Kir	Nau	Ksr
'toward or in a direction'	*watu	*wa{tw}u	-wɛy	waj, wéj	wati	-eɟ [189]	---
'outward, seaward'	*wotu	*-wowu	--- [190]	---	---	pᵛ-iɟu [191]	-ɔt, -wot
'down, westward'	*siwo	*-diwo	-di	téw	-rio, ruo	-du	tu-(fokfok)
'up, upward'	*Sa-ke	*da-ke	-da, dak	-tah-, tak	-rake	-da	-ɛk, -yak
'from'	*mai	*me	---	---	mai	æ-mi-n [192]	-ma, -me [193]
'go, proceed, (as directional) away'	*lako, *laa	*lako, *laa	-la	ḷakʷ	nako	ŋow [194]	læ

[189] Transitive suffix. Note loss of *w word-initially (§4.1.9), which suggests this became grammaticalized as a verb suffix sometime after this sound change. This also appears to have become a suffix in Pohnpeian.

[190] Jackson (1986: 207) gives Pohnpeian *iei*, but Bender et al. (2003) list the equivalent *yey* 'outwards' as the continuation of a different, unknown etymon.

[191] 'travel around the coast of Nauru towards the east', 'trade wind coming from the east'; Compare also Woleaian *-waú, -wéú* 'outward, to the north or to the south (i.e., toward open ocean)' (Bender et al. 2003).

[192] 'be from (a place)'

[193] From Lee (1976) 'to the speaker', directional suffix. Not listed as cognate to PMc *mai 'from' in Bender et al. (2003), but included in Jackson's original table (1986: 207).

[194] 'go, depart'.

4.2.3.9 Demonstratives

Jackson (1986: 208) states that all Micronesian languages have complex demonstrative systems, and Nauruan certainly does as well. Jackson's discussion on this point is short, though he suggests etymologies for the three Nauruan distance suffixes, /-e/, /-a/, /-o/; proximal, medial, and distal, respectively. This is discussed in more detail in §4.2.2.6.

Johnson (2002: 50-53) provides a more detailed examination of the Nauruan demonstratives, which provided a starting point for the analysis presented here. Table 4.2.7 below has been adapted from Johnson (2003: 50-51). Some forms have been changed to match the current analysis, and historic morpheme analyses have been added. The demonstratives in the table that reflect *(-)u- appear to have precisely the same structure as demonstratives containing noun classifiers; *(-)u- in these forms may be reflex of the PMc general classifier *-ua, as it occurs in precisely the same position as other noun classifiers in Nauruan. Compare, for example, Nauruan /ŋaræne/ 'this flat thing here' < *ŋ-a-**raa**-n-e, *DEM-N.PFX-**FLAT.CL**-GEN-PROX* and Nauruan /ŋune/ 'this thing here' < *ŋ-**u**-n-e, *DEM-**GEN.CL**-GEN-PROX*.

In addition to the forms appearing in Table 4.2.7, consider the dual, trial, and quadral animate pronouns, which show a similar structure: /arumʲen/ 'two (animate)' < PMc *a-rua-manu, *N.PFX-two-ANI.CL*; /ejimʲen/ 'three (animate)' < PMc *a-teli-manu, *N.PFX-three-ANI.CL*; /æmʲen/ 'four (animate)' < PMc *a-faa-manu, *N.PFX-four-ANI.CL* (see also Johnson 2002: 38).

Table 4.2.7 – Nauruan Demonstratives [195]

	Nominative/ Pronominal	Nominative/ Accusative	Accusative [196]	Post-nominal	Gloss
Noun Category 1 Singular [197]	*ŋ-u-n-e [198] /ŋune/	*bʲun-n-u-n-e [199] /bʲitune/	*min-n-u-n-e /mʲitune/	*u-n-e /une/	This one here
	*ŋ-a-a /ŋea/	*bʲun-n-a /bʲita/	*min-n-a /mʲita/	*a-a /ea/	That one there
	*ŋ-u-n-o /ŋuno/	*bʲun-n-u-n-o /bʲituno/	*mʲin-n-u-n-o /mʲituno/	*u-n-o /uno/	That one far away

[195] This table has been adapted in part from Johnson (2002: 50, Table 3-7). Some forms have been changed according to the current analysis, and morphological and historical analyses have been added. Reconstructions appear above synchronic forms and show historic morpheme boundaries.

[196] Forms in this column appear to have incorporated the stem of Nauruan /i-min/ 'thing' < PMc *meña 'thing. According to Johnson (2002: 50), in contemporary usage this category can occur as subjects or objects. However, these forms appear to be practically unused.

[197] Category 1 nouns include 'lifeless things without consideration of their form, species or size . . . generic, concrete and collective nouns and even abstract notions.' (Kayser 1936: 8). Category 1 demonstrative pronouns have distinct singular and plural forms (see also Johnson 2002: 50).

[198] *(-)ŋ- may correspond to POc *ŋa- 'linker for units of ten', comparing PMc *ŋa-wulu 'units of ten in counting', but this is uncertain. *(-)a- is also of uncertain origin, though may correspond to PMc *a 'object pronoun'. *-u- is likely a reflex of PMc *-ua 'general classifier. *-n- corresponds to PMc *-na 'of, pertaining to', commonly referred to as the 'construct suffix'. *-e is a proximal suffix, *-a is a medial suffix, and *-o is a distal suffix.

[199] Nauruan /i-bʲun/ 'some, some of' appears to have been incorporated in the forms in this column. The origin of this word is unclear. There is an apparent cognate in Kiribati, *ta-**be**-ua* 'some, a few (general)', which suggests a PMc form beginning with *b (POc *b > PMc *p > Nauruan /b/, Kiribati *b*). Compare also POc *palu 'some, some more' < PMP *balu, which is a perfect semantic match and matches in terms of regular sound corresponds as well, except for the voicing status of the initial stop. A POc doublet *balu 'some, some more' could offer a solution, but it is unclear if this can be reconstructed. Alternately, compare PMc *paa 'count, enumerate' which might suggest a **PMc** form *paa-n-ua, composed of this morpheme plus the construct suffix and the general classifier suffix. No such form has yet been reconstructed in the literature.

Table 4.2.7 (cont.)	*ŋ-a-n-e /ŋane/	*mˠu-ŋ-a-n-e [200] /mˠuŋane/	*min-a-n-e /mʲinane/	*a-n-e /ane/	Those here
Noun Category 1 Plural		*mˠu-ŋ-e /mˠuŋe/			
	*ŋ-a-n-a /ŋana/	*mˠu-ŋa-n-a /mˠuŋana/	*min-a-n-a /mʲinana/	*a-n-a /ana/	Those there
	*ŋ-a-n-o /ŋano/	*mˠu-ŋa-n-o /mˠuŋano/	*min-a-n-o /mʲinano/	*a-n-o /ano/	Those far away
		*mˠu-ŋ-o /mˠuŋo/			
Noun Category 2 Singular [201]	*ŋ-a-u-n-e /ŋeune/	*bʲun-n-u-n-e /bʲitune/	*min-n-u-n-e /mʲitune/	*u-n-e /une/	This one here
	*ŋ-u-n-e /ŋune/			*a-u-n-e /eune/	
	*ŋ-a-a /ŋea/	*bʲun-n-a /bʲita/	*min-n-a /mʲita/	*a-a /ea/	That one there
			*min-n-u-n-a /mʲituna/		
	*ŋ-a-u-n-o /ŋeune/	*bʲun-n-u-n-o /bʲituno/	*min-n-u-n-o /mʲituno/	*u-n-o /uno/	That one far away
	*ŋ-u-n-o /ŋuno/			*a-u-n-o /euno/	

[200] The prefix *mˠu- is of uncertain origin.

[201] Category 2 nouns include 'living beings (men and animals) without considering their size or number' (Kayser 1936: 8). Category 2 demonstrative pronouns come in singular, dual, trial, and plural forms, though only the singular is included in this chart. The dual, trial and plural demonstrative pronouns contain the morphemes /-ar-/, /-ij-/, and /-bʲun-/ respectively, as can be seen in Johnson (2002: 51). These clearly relate to Nauruan /a-ro/ 'two', /e-iɟu/ 'three', and /i-bʲun/ 'some'.

Table 4.2.7 (cont.)	*ŋ-a-ru-mʲen-e /ŋarumʲene/	*mʸu-ru-mʲen-e /mʸurumʲene/	*min-ru-mʲen-e /mʲinrumʲene/	*ru-mʲen-e /rumʲene/	These two here
Noun Category 2 Dual [202]	*ŋ-a-ru-mʲen-a /ŋarumʲena/	*mʸu-ru-mʲen-a /mʸurumʲena/	*min-ru-mʲen-a /mʲinrumʲena/	*ru-mʲen-a /rumʲene/	Those two there
	*ŋ-a-ru-mʲen-o /ŋarumʲeno/	*mʸu-ru-mʲen-o /mʸujimʲeno/	*min-ru-mʲen-o /mʲinrumʲeno/	*ru-mʲen-o /rumʲene/	Those four far away
Noun Category 2 Trial	*ŋ-a-ɟi-mʲen-e /ŋaɟimʲene/	*mʸu-ɟi-mʲen-e /mʸujimʲene/	*min-ɟi-mʲen-e /mʲinɟimʲene/	*ɟi-mʲen-e /ɟimʲene/	These three there
	*ŋ-a-ɟi-mʲen-a /ŋaɟimʲena/	*mʸu-ɟi-mʲen-a /mʸujimʲena/	*min-ɟi-mʲen-a /mʲinɟimʲena/	*ɟi-mʲen-a /ɟimʲene/	Those three there
	*ŋ-a-ɟi-mʲen-o /ŋaɟimʲeno/	*mʸu-ɟi-mʲen-o /mʸujimʲeno/	*min-ɟi-mʲen-o /mʲinɟimʲeno/	*ɟi-mʲen-o /ɟimʲene/	Those three far away
Noun Category 2 Plural	*ŋ-a-bʲun-e /ŋabʲune/	*mʸu-bʲun-e /mʸubʲune/	*mʲini-bʲun-e /mʲinibʲune/	*bʲun-e /bʲune/	These four here
	*ŋ-a-bʲun-a /ŋabʲuna/	*mʸu-bʲun-a /mʸubʲuna/	*mʲini-bʲun-a /mʲinibʲuna/	*bʲun-a /bʲuna/	Those four there
	*ŋ-a-bʲun-o /ŋabʲuno/	*mʸu-bʲun-o /mʸubʲuno/	*mʲini-bʲun-o /mʲinibʲuno/	*bʲun-o /bʲuno/	Those four far away

[202] Dual and trial category 2 forms contain the morphemes /-ru-/ < PMc *rua ‘two’ and /-eɟi-/ < PMc *teli (cf. Kiribati *teni-*) ‘three’, respectively. The morpheme -mʲen- in these categories continues PMc *manu ‘living creature of land or air’.

4.2.3.10 Possessive Classifiers

Jackson (1986: 208) states that all Micronesian languages other the Kiribati have extensive sets of possessive classifiers, though only four are reconstructable for PMc. Possessive classifiers are used in constructions for alienable noun possession across the Micronesian languages (Harrison 1988). In these constructions, the possessive classifier immediately precedes the possessed noun and takes a possessive suffix that otherwise affixes to inalienable nouns. For example, the word for 'hand, arm' in Nauruan is an inalienable noun that takes possessive suffixes: /bʲe-m/ 'your hand/arm'; but the word for 'shoes' /tut/ (a borrowing from English) is inalienable so it must appear in a possessive classifier construction. In this case, the possessive classifier is /wa-/, for general objects; e.g. /wa-m tut/ 'your shoe(s)'.

Jackson's comparative data and reconstructions are provided below in Table 4.2.8. In this table Nauruan cognates have been added and other data has been changed where noted. Nauruan has reflexes for each of these PMc forms, and they are used in possessive classifier constructions that are characteristic of the Micronesian family. This further supports Nauruan's classification within the Micronesian family.

Table 4.2.8 – Micronesian Possessive Classifiers (adapted from Jackson 1986: 208)

	PMc	Pon	Mrs	Kir	Ksr	Nau
General object	*aa- [203]	a(a)-	a(a)-	a-	- [204]	wa-
Drinkable object	*nima-	nima-	(n,l)ime	-	nihmac	nim-
Edible object [205]	*na-	-	-	-	na-	a-ŋa-
Offspring	*natu- [206]	nei-	naji-	-	nahtuh	ŋe-

The general possessive classifier appears to have two forms: /wa-/ ‘general possessive classifier’ and /æ-/ ‘general possessive classifier (in predicate VPs)’. This is discussed in more detail in §4.2.2.4.

The drinkable object possessive classifier is clearly continued in Nauruan; e.g. /nim-ɨ e-bʲɐg/ ‘my water (to drink)’.

Jackson reconstructs PMc *na- ‘edible object’, though this is not reconstructed by Bender et al. (2003). Jackson reconstructs it based only upon the Kosraean reflex *na-*, though several other Kosraean possessive classifiers for food begin with *nwa* or *no*, including the “suffixed forms” *nwac, nohm, nwacl, nwacsr, nwacn* (Lee 1976). This is relevant to Nauruan because the Nauruan reflex contains a velar nasal. Nauruan /ŋ/ either directly continues PMc *ŋ (§4.1.7; cf. PMc *kaŋi ‘eat (something)’) or continues PMc *n where it preceded *o, *w or *u in the same word (§4.1.16). The change PMc *n > ŋ could explain the Nauruan reflex, as well as the

[203] Pre-PMc *aa ‘object, possessed object’ is proposed here, as discussed in §4.2.2.1(4). The initial /w/ in the Nauruan reflex appears to result from glide prothesis §4.1.18, comparing the Woleaian reflexes *wa-*, *ya-*, and Chuukese *-y*, *-ye-*; *-w*, *-we-*. Compare also POc *-a ‘3sg. object’ (ACD), PCMc *aa- ‘alienable object with possessive suffix’ (Bender et al. 2003).

[204] Kosraean uses *la-* in this meaning, which is of unknown origin (Jackson 1986: 208, note 14).

[205] Jackson notes that Chuukic and Pohnpeic languages continue *kana- for edible object possessive classifiers. This could explain the initial /a-/ in the Nauruan reflex, if Nauruan continues *ka-na- > *ga-na- > a-ŋa-. In that case, the correspondence between PMc *n and Nauruan /ŋ/ suggests a following round vowel historically. Compare also Nauruan /an/ ‘eat’.

[206] ‘child; classifier for cherished possessions’ (Bender et al. 2003).

Kosraean reflexes containing velarized *nw*, if this etymon had a following *w or *u historically. Jackson also notes that some Kosraean reflexes of the word for 'eat' contain a velar nasal, along with some in Kiribati, and also that the Western Micronesian languages have reflexes of PMc *kaŋi 'to eat' (1986: 231, note 15).

Nauruan continues the possessive classifier for offspring (children), though it does not necessarily occur in possessive classifier constructions. It also occurs as a simple inalienable noun; e.g. /ŋe-ɨ eita/ child-1SG.POSS woman/girl, 'my daughter' and /ŋe-ɨ/, child-1SG, 'my child'.

4.2.3.11 Numerals and Noun Classifiers

Comparing Nauruan numerals and noun classifiers with those of the nuclear Micronesian languages reveals striking similarities. These words and their usage in Nauruan are almost certainly of common origin with other Micronesian numeral systems. Evidence of this is presented in this section.

Micronesian numeral systems are characterized by the presence of noun classifiers used for counting objects of various kinds. These morphemes are referred to here simply as "noun classifiers", but other terms have been used for them in the literature, including "word stems" within "noun categories" (Kayser 1936: 8), "countable bases" (Harrison and Jackson 1984: 62), and "numeral classifiers". The number of noun classifiers in each Micronesian language varies significantly.[207] Historically, Nauruan had at least 39 of these (Kayser 1936: 8-10; Johnson 2002: 27-28), but the system appears to have been reduced significantly. Presently, only a handful seem to be in use. The general inanimate and animate classifiers, from PMc *-ua and *-manu respectively, have reflexes in Nauruan demonstratives and in numerals used in serial counting

[207] According to Harrison and Jackson (1984: 62), Kosraean has two, Chuukese and Kiribati each have 90 (not all in common use), Pohnpeian has 29, and Woleaian has at least 38.

and general object counting, as described below. Other classifiers still in use include at least those for flat objects, long objects, and possibly trough-shaped objects, but even these appear to be optional.[208] Speakers may instead use the abstract/general numerals, as is more common; e.g. /aro eŋamʲe/ ‘two people’ (ON *a-rua-ua ‘two (general)’), comparing /a-ru-mʲen/ ‘two people’ (ON *a-rua-manu). Harrison and Jackson (1984) give a few examples of typical Micronesian numeral noun classification constructions, using examples from Kiribati. Comparing Nauruan structures of the same type reveals a high degree of similarity.

[208] One consultant suggested that the classifier for trough-shaped objects can be used for vehicles, having been semantically extended from reference to boats.

Table 4.2.9 – Noun classifier constructions in Nauruan and Kiribati [209]

Kiribati	uo-ua te boki *two-GEN.CL ART book*	‘two books’
Nauruan	/a-ro e-řɨ/ (< *a-rua-**ua** te-cuyi) *NUM-two N.PFX-bone* [210]	‘two bones’
Kiribati	uo-man ataei *two-ANI child*	‘two children’
Nauruan	/a-ru-mʲen ŋe-n/ [211] (< *a-rua-**manu** natu-na) *NUM-two-ANI child-GEN*	‘two children (of someone)’
Kiribati	ua-kai te nii *two-PLANT ART coconut*	‘two coconut trees’
Nauruan	/a-ru-ræ dəbᵛug/ [212] *NUM-two-FLAT book*	‘two books’
Kiribati	ua-ai te tikareti *two-LONG ART cigarette*	‘two cigarettes’
Nauruan	/a-ru-mʲæe bᵛe-ɨ/ *NUM-two-LONG pencil/stick-1SG*	‘two pencils/sticks of mine’

[209] Kiribati examples are from Harrison and Jackson (1984: 62).

[210] Nauruan has a numeral prefix /a-/ or /e-/ (both from *a-) on all numeral stems. A cognate morpheme is found in Pohnpeian and Mokilese (Harrison and Jackson 1984: 66).

[211] Compare also Nauruan /arumʲen/ ‘two people’.

[212] This type of structure is used for the numerals 1-4. Other numerals make use of a different type of structure: /a-ræ-n e-ɟimʲo dəbug/, *DEM-FLAT.CL-GEN NUM-five book*, ‘five books’ (Johnson 2002: 39-40; Kayser 1936). Note that the simpler /e-ɟimʲo dəbug/ ‘five books’ is also acceptable. Nauruan /dəbug/ ‘book’ is a loan from English or German.

In Nauruan, inanimate (Category 1) and animate (Category 2) nouns have been analyzed as having a zero morpheme in place of a noun classifier (Johnson 2002: 27; Kayser 1936: 8). According to these authors, the zero morpheme is evidenced by the use of abstract numerals for generic animate and inanimate nouns, forms which are normally used for counting. The actual reason for this is that Nauruan continues numerals containing the PMc general classifier *-ua in its serial counting system, which makes them indistinguishable from the numerals used to count general objects.[213] This is not the case in all Micronesian languages, most of which do not continue forms continuing PMc *-ua in their serial counting systems. In fact, Harrison and Jackson (1984: 64) state that all Micronesian languages other than Marshallese have serial counting systems which do not involve the noun classifiers.[214]

Micronesian serial counting numerals for one through ten are compared in Table 4.2.10 below. This table is partly adapted from Harrison and Jackson (1984: 65). Nauruan cognates have been added and entries have been updated to match comparative data and PMc reconstructions in Bender et al. (2003). Nauruan continues all serial counting numerals with the PMc general classifier *-ua affixed. Nauruan also reflects a numeral prefix /a-/ or /e-/ (< *a-) in all serial counting numerals except for 'one', a morpheme which has cognates in Pohnpeian and Mokilese (Harrison and Jackson 1984: 66). Harrison and Jackson suggest that this morpheme may be continued in Kiribati as *a-* which occurs on demonstratives in that language. If so, the affix (-)a- which occurs in Nauruan demonstratives, may also be cognate to the numeral prefix (§4.2.3.9).

[213] Perhaps with the exception of 'ten'.

[214] Harrison and Jackson refer to noun classifiers as "countable bases".

Table 4.2.10 – Serial counting numerals in Micronesian languages [215]

	PMc	Kir	Ksr	Pon	Mok	Chk	Wol	Nauruan
one	*te	te-	se, so-ko	e-	--- [216]	e-, i-	te-	e-kʷen < *te-ko-ua-na
two	*rua	ua-, uo-	lo-, lu-	(a)-re, (a)-ri, ria-	ria-	(é)-rúú	rúwa-	a-ro < *a-rua-ua
three	*telu	teni-	tol	(e)-sil	(e)-jil	eén	yeeli, seli-	e-ɟu < *e-ɟɟuu < *a-telu-ua
four	*faŋi, *fa(a)-	aŋ [217]	æŋ	(ɛ)-pɛŋ	(ɔ)-pɔŋ	fáán	faŋi	æ-eokʷ < *a-faa-ko-ua [218]
five	*lima	nima-	lʌm, lime-	lima-	(a)-lim	niim, nima,e-	liime, lima-	e-ɟimʲo < *a-lima-ua
six	*wono	one-	on	aun, oun, wɛnɛ-	wono-	woon, wono-	woolo, wolo-	a-ŋo < *a-ono-ua
seven	*fitu	iti-	it	(e)-is	iji-	fúús, fúú-	fiisi, fisi-	e-iju < *a-it-ua
eight	*walu	wani-	ɒ l, al	(ɛ)-wɛl	(a)-wal	waan, wanú-	waali, walu-	o-ɟu < *a-walu-ua.
nine	*Siwa	rua-	yʌ	duwa-	duwa-	ttiiw, ttiwa-	tiwe	a-do < *a-Siwa-ua
ten [219]	*-itaki	(ua)-iaki	singuhul	(e)-isek	(e)-ijek	engoon	seig	a-tæe < *a-ita-? [220]

The Nauruan count numeral for ‘one’ reflects a different development than most of the other Micronesian languages; /e-kʷen/ < PMc *te-ko-ua-na, *one-DX-GEN.CL-GEN*.[221] This form appears to be cognate with Kosraean *soko ‘one’ (Lee 1976) < PMc *te-ko. Kosraean *ko* and Old Nauruan *go (> *wo) were probably deictic morphemes, hence the gloss *DX*; compare Kosraean

[215] See Bender et al. (2003) for additional Micronesian cognates not listed in this table.

[216] No cognate listed in Bender et al. (2003). Harrison and Jackson (1984: 65) give *oahd/ehg*.

[217] ‘eight’ in counting by twos.

[218] The Nauruan serial numeral ‘four’ continues PMc *faa- ‘four (prefixed to classifiers)’ with the *ko stem found also in the serial numeral for ‘one’. Nauruan appears to be the only Micronesian language to incorporate PMc *ko in the numeral ‘four’.

[219] PMc *-itaki is glossed ‘counter for tens’ (Bender et al. 2003).

[220] The etymology of this word is not certain, though the /ta/ that occurs here may relate to PCMc *-itaki ‘counter for tens’. Compare also PPCk *-ik{a,e} ‘counter for tens’, and PMc *ita, *itaita ‘deposit, pile up’.

[221] PMc *te-ko-ua-na > *je-wo-we-na > *je-w-wen > e-kʷen ‘one’ (in serial counting)

ngoh ‘that, those way over there’ (Lee 1976) and Pohnpeian *ko* ‘those, away from you and me’ (Sohl et al). Compare also PMc *ko ‘you (singular subject marker)’, which has vocative reflexes in Kiribati, Woleaian, Puluwatese, and Chuukese.

Nauruan /e-kʷen/ ‘one’ is used in serial counting, as in /ekʷen/, /aro/, /eɲu/ ‘one, two, three’; and in generic object counting, as in /ekʷen tʃir/ ‘one string of fish’. Nauruan has another word for ‘one’ which is only used in generic object counting and never in serial counting, /ɲon/ ‘one (thing)’. This word appears to continue PMc *te-ua-na, one-GEN.CL-GEN, ‘one thing of’, which excludes the PMc deictic morpheme *ko. The Marshallese cognate appears to continue precisely the same form; PMc *te-ua-na > Marshallese *juon* ‘one’, comparing also Kiribati *teuana* ‘one (general object)’, Chuukese *eew* ‘one (general object), and Woleaian *seuw* ‘one (general object). Like Marshallese, Nauruan only continues the PMc form with the general classifier, *te-ua-na, and not the animate classifier, *te-manu-na ‘one living thing of’ (Harrison and Jackson 1984: 66). Continuations of PMc *te-manu-na occur in the serial counting systems of Kiribati, Chuukese, and Woleaian.

Though no reflexes of PMc *-manu ‘living creature of land or air (animate classifier)’ exist in Nauruan serial counting numerals, Nauruan does have reflexes of this word in some other numeral forms. These reflexes occur in some forms for counting people, and in some demonstrative numerals, as illustrated in Table 4.2.11 below.

Table 4.2.11 – Nauruan Continuations of PMc *manu ‘living creature of land or air’

	Synchronic	Historic
‘two people’	/a-ru-mʲen/	*a-rua-manu *NUM-two-ANI*
‘three people	/e-ɟi-mʲen/	*e-tul-mʲen < *a-telu-manu *NUM-three-ANI*
‘four people’	/æ-mʲen/	*e-a-mʲen < *a-fa-manu *NUM-four-ANI*
‘these two here’ [222]	/ŋ-a-ru-mʲen-e/	*ŋ-a-rua-manu-ee DEM-NUM-two-ANI-PROX
‘these three here’	/ŋ-e-ɟi-mʲen-e/	*ŋ-e-ɟi-men-e < *ŋ-a-telu-manu-ee DEM-NUM-three-ANI-PROX
‘these four here’	/ŋ-æ-mʲen-e/	*ŋ-e-a-men-e < *ŋ-a-fa-manu-ee DEM-NUM-four-ANI-PROX

Jackson (1986: 209) also mentions the PMc reconstruction for ‘thousand’, *-ŋa-ratu (Bender et al. 2003), noting the PCk reflex *ŋaratú which “problematically” loses the final syllable. PCk *-ra- in this etymon possibly continues PMc *ra- ‘they (3pl subject marker)’, though the final *-tú is of unknown origin. The apparent Nauruan cognate /a-ra-ŋa/ ‘thousand’ may also continue PMc *ra- ‘they (3pl subject marker)’. Bender et al. (2003) exclude Kiribati *-ŋaa* ‘thousand’ in this comparison, suggesting it is from a different source.

4.2.3.12 Interrogatives

Jackson also presents PMc reconstructions and cognates for the Micronesian interrogatives (1986: 210; 1983: 43). These are reproduced in Table 4.2.12 below, with updated reconstructions and cognates following Bender et al. (2003), and with Nauruan cognates added for comparison. Like the other morphological paradigms identified in Nauruan, the Nauruan system is strikingly similar to other Micronesian systems.

[222] See Johnson (2002: 61) for additional examples of Nauruan demonstrative numerals.

Table 4.2.12 – Micronesian Interrogatives [223]

	PMc	Ksr	Nau	Kir	Mrs	Pon	Mok	PCk
'how many?'	*fi{s,S}a [224]	(ekahsr)	(ege-n) [225]	ira-	---	depe	doapoa	*fite-
'what?'	*fa{i,u}Sa [226]	e	eken	aera	yet	payd	--- [227]	*faida
'who?'	*(i)-tau [228]	sə	i-ɟe-n	(an)-tai	(won)	(ihs)	(in)-je	*yau, *t{a,e}ú
'when?'	*ŋai-Sa [229]	ŋɛ	ŋæta (pst.)	(ni)-ŋai	ŋaya-t	---	ŋee-d	*(i)-ŋai-da
	*ña(i)-Sa [230]	---	i-ɟet (fut.)	---	---	(y)-aa-d	---	*(i)-nai-da
'where?'	*(i)-fa(a) [231]	o-yɛ, yɛ	i	i-aa	---	---	---	*i-faa
	*iaa (PCMc)	---	---	iaa	yi'yah	yya	yya	*iaa

4.2.3.13 Reflexes of PMc *te- 'one'

PMc *te- appears to have three sets of reflexes in different usages across the Micronesian family. These include a numeral prefix 'one', a nominal prefix, and a prefix on deictic roots (Harrison 1984: 39, Bender 1981). Nauruan has reflexes of PMc *te- in both the numeral and nominal functions. Nauruan does not appear to reflect the deictic prefix usage.

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[223] Forms which do not continue the PMc reconstructions in this table appear in parentheses.

[224] The Pohnpeian and Mokilese cognates are from the table in Jackson (1986: 210) and are not listed as cognates in Bender et al. (2003). These forms show consonant metathesis.

[225] The Kosraean and Nauruan forms are likely cognates.

[226] **PMc** *fau-Sa is hypothesized here, though the reconstruction in Bender et al. (2003) is *faiSa (?), with a question mark for uncertainty. Jackson (1986: 210) relates all forms in this row to PMc *(mee)-Saa 'interrogative suffix' (Bender et al. 2003), though the only one that is a clear continuation of this is Kosraean *meac* (excluded in this table). Nauruan may continue *fauSa-na, suggesting the following development: PMc *fauSa-na > *e-/oDe-n/ > *e/ege-n/ > *egen >> *egegen (RED) > eken 'what'. Alternately, Nauruan may continue some unidentified form.

[227] Jackson (1986: 210) gives Pohnpeian and Mokilese *da*, which relate to PMc *(mee-)Saa here and in Bender et al. (2003). No Mokilese reflex is given for PMc *faiSa in 'do what, what?' in Bender et al. (2003).

[228] This is reconstructed by Bender et al. (2003) as *tau, though all reflexes other than that of Kosraean and Kiribati reflect an optional *i-* or *yi-* prefix. The Marshallese and Pohnpeian forms given here are from Jackson (1986: 210).

[229] PMc *ŋai-Sa >> *ŋai-SaSa (RED) > *ŋæ-d:e/-a > Nauruan ŋætæ 'when' (past)

[230] **PMc** *ña-Sa > *ñe-Sa >> *ñe-SaSa (RED) > *ñe-d: > Nauruan i-/ɟet (future); Cf. PMc *ñai-Sa 'when?'

[231] Most Micronesian languages continue this form with the locative prefix PMc *i-. **PMc** *fa- might also be reconstructed, rather than only *faa. This accounts for the lack of expected vowel change in the Nauruan reflex; *i-fa > *i-a > i 'where'.

Bender et al. (2003) reconstruct only *te- ‘one (prefixed to classifiers)’ and the authors do not list the Kiribati article *te*, the Nauruan nominal prefix /e-/ or /i-/, nor the Marshallese fossilized prefix *jV-* in their comparative data. Whether these forms continue the same PMc etymon or separate ones, it is evident that Nauruan continues each form in the same morphological and semantic function as other Micronesian languages, thereby offering additional support for Nauruan’s classification within the family. Harrison (1984) provides a thorough discussion on the degree to which these forms should or should not be considered reflexes of the same PMc etymon, including some specific discussion of the Nauruan absolute prefix /e-/, /i-/ (citing Nathan 1973a).

Reflexes of PMc *te- include numeral prefixes with a meaning of ‘one’. As discussed in §4.3.2.11, Nauruan continues this form in /e-k^{w}en/ ‘one’ < PMc *te-ko-ua-na, *one-DX-GEN.CL-GEN* and also in /jon/ ‘one (thing)’ < PMc *te-ua-na, *one-GEN.CL-GEN* (cf. Marshallese *juon* ‘one’).

The Kiribati article *te* and the Nauruan nominal prefixes /e-/, /i-/ are apparent cognates.[232] These reflexes function in very similar ways, as discussed by Harrison (1984: 50). Harrison gives a few example phrases showing correspondence between the Nauruan and Kiribati forms, which are reproduced in Table 4.2.13 below. The data have been updated to match the current analysis of Nauruan phonology and morphology. The Kiribati data is reproduced as in Harrison (1984).

[232] Nathan refers to this morpheme as the “absolute prefix” because he believes it to be used with nouns that are “the head of the construction they are in” (1973a: 484). Nauruan /e-/, /i-/ appears to be a nominal prefix that occurs on nouns that are not possessed, so that it does not co-occur with possessive suffixes (§4.2.3.7).

Table 4.2.13 – Kiribati *te* and Nauruan /e-/, /i-/ in comparative morphosyntactic context

Kiribati	te eitei *ART frigate bird*	'frigate bird'
Nauruan	/i-tʃi/ *N.PFX-frigate bird*	'frigate bird'
Kiribati	ana eitei Joe *his frigate bird Joe*	'Joe's frigate bird'
Nauruan	VERB /æ-n i-tʃi dʒo/ [233] *VERB GEN.CL-3sg.poss N.PFX- frigate bird Joe*	'… Joe's frigate bird'
Kiribati	eitei-n Nauru *frigate bird Nauru*	'Nauruan frigate bird'
Nauruan	/tʃi-n næoero/ *frigate bird-GEN Nauru*	'Nauruan frigate bird'

Harrison notes that the Kiribati article *te* does not encode definiteness like the English articles *a* and *the* (1984: 41), and the same is true of Nauruan /e-/, /i-/. These cognates are morphosyntactically similar in that they always immediately precede the noun they modify. Also, neither Kiribati *te* nor Nauruan /e-/ and /i-/ may occur with nouns that have a possessive or genitive suffix. One difference between them is that the prefix in Kiribati maintains some reference to singular number (Harrison 1984: 40, 43), while in Nauruan this does not appear to be the case. Nouns modified by numerals retain the nominal prefix in Nauruan, so it is difficult to claim there is any semantic connection to singularity in the nominal prefix, at least

[233] Harrison gives *an Joe tii* (Nathan 1973a) for Nauruan here, though there are problems with this example. Firstly, it appears to use the general possessive classifier /æ-/, which occurs in predicate VPs. It is suspected that this example was taken from a larger phrase where it followed a verb, else we would expect /wa-n tʃi dʒo/ (§4.2.2.4). Harrison also suggests that the possessed noun in the Nauruan phrase does not have the prefix /i-/, though its presence is possible, if not required. In possessive classifier constructions, if a noun normally has a nominal prefix it will appear on that noun: /nim-n e-bˈag/, *DRINK-3SG.POSS N.PFX-fresh water*, 'his/her water (to drink)'. The syntax of this phrase has also been altered so that the possessed noun immediately follows that possessive classifier, as is typical. Among speakers consulted for the present study, the syntax Harrison suggests does not follow the expected pattern for possessive classifiers; the general classifier /wa-/ and the predicate VP classifier /æ-/ (§4.2.3.10).

synchronically: /aro e-rɨ/, *two* *N.PFX*-*bone*, ‘two bones’.

A subset of Nauruan nouns contain a nominal prefix /də-/ which does not co-occur with the absolute prefix /e-/, /i-/. This prefix appears to be a cognate of the fossilized prefix *jV-* found in Marshallese, which itself is a reflex of PMc *te- (Harrison 1984: 50). Bender (1981: 193-195) cites some 200 Marshallese items that contain this fossilized prefix, including the examples pointed out by Harrison: *ji-bboñ* ‘morning’, *jo-rur* ‘thunder’, *je-mmaan* ‘chief, boss’, *ji-dik* ‘a little’. Several examples of parallel forms in Nauruan are given in Table 4.2.14 below. The PMc reconstructions in this table are proposals that are not reconstructed elsewhere precisely as they are here, with the *te- prefix. As in Marshallese, Nauruan words with this fossilized prefix are not uncommon.

Table 4.2.14 – Some Nauruan nouns with the fossilized prefix /də-/

		Nauruan	Gloss
PMc	*te-kika [234]	də-giga	‘octopus’
PMc	*te-pacapaca-aua [235]	də-bʲařebʲařewa	‘stingray’ (lit. ‘flat fish’)
PMc	*te-lawa	də-ro/-t	‘hibiscus flower (of)’
PMc	*te-pʷuu [236]	də-bˠu	‘conch shell, shell horn’
PMc	*te-qirukuw{e,au} [237]	də-irukʷo	‘heart’
PMc	*te-laŋi [238]	də-naŋ	‘cloud’
PMc	*te-ku-raŋV (?) [239]	də-ku-ræŋ	‘crazy person, fool’
PMc	*te-pʷelu-kaka-kai (?) [240]	də-bˠike	‘wood, stick’
PMc	*te-karakara [241]	də-arar	‘black noddy, black bird’
PMc	*te-kina-ta [242]	də-ginaga	‘wound, sore’
PMc	*te-mani-ni-ara [243]	də-mʲeni-n-er	‘mosquito’
PMc	*para, *parara (?)	də-bʲæ/o	‘thunder’

Nauruan /də-/ (< PMc *te-) is hypothesized to have fossilized at a time when *t was in a transitional period to pre-Nauruan *ȷ, a change which is conditioned by adjacent *i or *e (§4.1.10). The fossilized prefix is the only known instance where Nauruan /d/ corresponds to a

[234] Kiribati /kiika/ ‘octopus’, PMc *kuyita ‘octopus’. It is unclear why Nauruan retains the final vowel in this word. There may have been a suffix historically, or it is possible that this is a loanword.

[235] PMc *pacapaca ‘foot, flat’, PMc *aua ‘kind of fish’.

[236] PMc *pʷuu ‘to sound (when blown as a trumpet)’, Chuukese *pʷu, pʷuu-*, ‘to sound (when blown as a trumpet)’.

[237] Chuukese *eyirúkúúw* ‘cut the heart of out of the palm’, *eyirúk* ‘heart of palm’.

[238] PMc *laŋi ‘sky’, Kiribati /naŋ/ ‘cloud’. Expected /æ/ in the Nauruan form.

[239] Kiribati *rang* ‘crazy, insane, lascivious, blighted or abnormal in growth’, Kosraean *suhlahlkuhng* [sʌlælkʌŋ] ‘stupid, foolish’ (Lee 1976).

[240] PCMc *pʷelu ‘break’, PMc *kaka ‘cracked, split’, PCMc *kai ‘wood’ (cf. PCMc *kai-peti ‘driftwood’, PMc *kayu ‘wood, pole’).

[241] Chuukese *araar* ‘white tern’, Saipan Carolinian *araar* ‘species of small black bird’.

[242] Kiribati *kina* ‘nicked, marred, defaced’, Kiribati *kinaga* ‘disease of the skin, be afflicted with this disease’.

[243] Kiribati *te-mani-nn-ara* ‘mosquito’ (Goodenough 1992).

PMc consonant other than *s or *S. An intermediary stage can be hypothesized during which *t was lenited to a voiced stop *d before becoming fully spirantized to *j̵. In words with the fossilized prefix, the transition to /j̵/ was not completed. The explanation may lie in the reduction of the vowel. Nauruan /də-/ only occurs in historically unstressed syllable positions. Around the time that Old Nauruan *te became *de, it is hypothesized that the vowel *e became reduced, phonologized, and fossilized in unstressed tokens of this prefix: PMc *te > *dĕ- > də-.

An apparent problem with this analysis is that it applies to some Nauruan words but not others which meet the same conditions. Precisely the same problem has been pointed out for Marshallese words containing fossilized *jV-*. Harrison (1984: 51) notes, "… one is disturbed by the fact that what can be assumed to have been a generalized *te [common noun] construction in PMc survives in Marshallese in essentially random instances. Claims regarding fossilization, it seems to me, are stronger if it can be demonstrated that the fossilization is patterned. The Marshallese evidence for PMc *te is thus not as strong as it might otherwise be." There are still no clear criteria by which the occurrence of the fossilized prefix can be predicted, though it is notable that this problem is evident in both Nauruan and Marshallese.

It appears that no Nauruan reflex of PMc *te- is a deictic prefix. In fact, there does not appear to be strong evidence for reconstructing this prefix in this usage for PMc. Harrison states as much in cautioning readers over drawing strong conclusions regarding the relation of the few forms he cites and PMc *te- (1984: 53). Most of the examples cited by Harrison (1984: 52) might be explained by alternate etymologies, except possibly the Kosraean continuation *sacn [sɛn] 'that one (near you)'; that could be from *se-n-a 'ART-GEN-MED'. Harrison cites Marshallese *(i)jin* 'this place (near us both)' and *in-* 'this (near us both)', which may be identical to the Marshallese reflexes of PMc *i 'at (locative)' suggested by Bender et al. (2003), but with

the genitive "construct" suffix added: *yiy-n, yi-n*. Harrison also cites Chuukese *enaan* 'that (away from us both)', which could be comparable to the Nauruan distal demonstratives (§4.2.3.9). Kosraean *acn* [ɛ-n] 'that one near you' might similarly relate to PMc *ee 'here, this near speaker' with the genitive suffix *-n* from PMc *ni or PCMc *-ni, *-na. Harrison also cites, with additional reservation, the Woleaian words *ye* 'the (near me), *yeel* 'that (near us both)', and *yeiy* 'here where I am'. However, compare PMc *ee and its continuation in Woleaian *yee* 'this near me' (Bender et al. 2003). There is no obvious reason to suggest that PMc *te- occurred in these words.

4.3 Excluding Nauruan from Nuclear Micronesian (Jackson 1986)

Jackson argues that Nauruan is a Micronesian language, and the analysis presented here supports that position. However, the crux of Jackson's argument is that Nauruan should be classified apart from the other Micronesian languages, for having failed to undergo a small number of innovations that define the group (1986: 211-212). To this end, Jackson proposes a Greater Micronesian family, composed of Nauruan on one branch and all other Micronesian languages on another. This view of the Micronesian family, illustrated in Figure 4.1, has persisted in the literature (e.g. Lynch et al. 2011: 117), though it does not appear to be well supported.

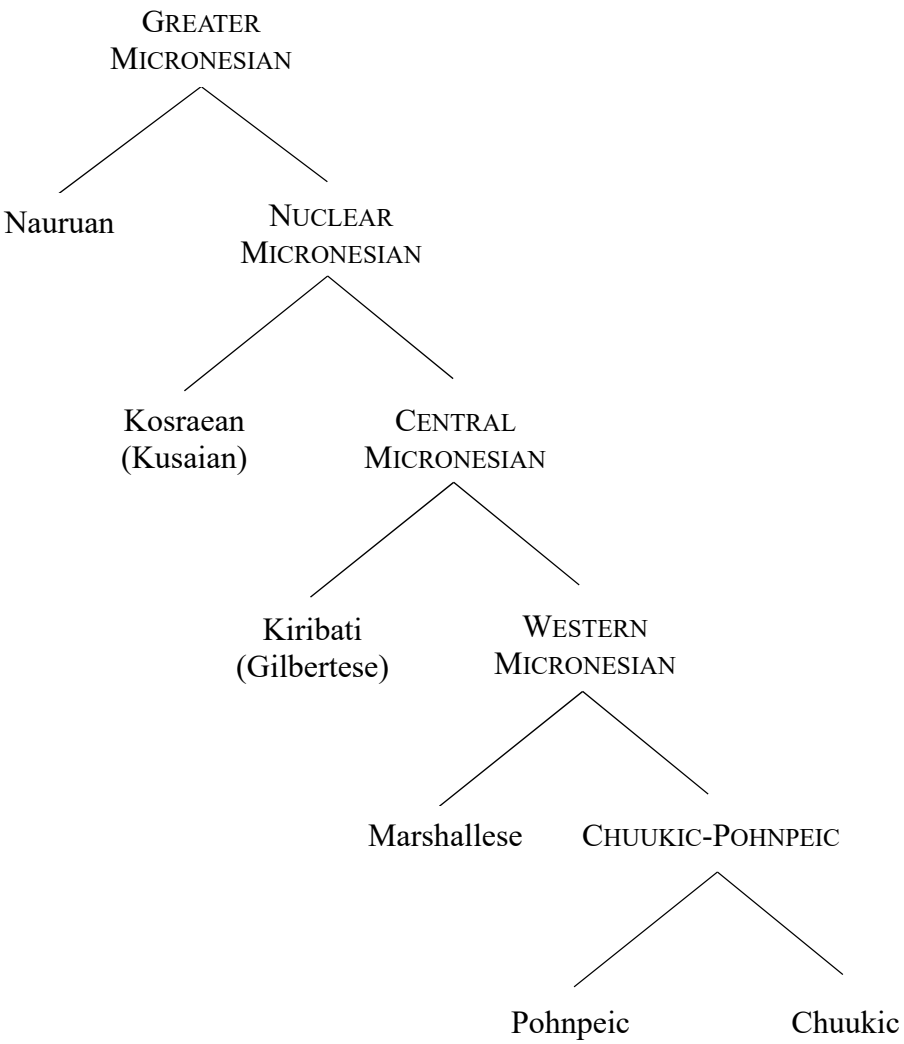

Figure 4.1 – The Greater Micronesian language family (Jackson 1986)

Pohnpeic languages include Pohnpeian, Mokilese, and Pingelapese

Chuukic (Trukic) languages include Mortlockese, Chuukese (Trukese), Puluwatese, Saipan Carolinian, Saipan Carolinian (Tanapag), Satawalese, Woleaian, Pulo-Annan, Sonsorolese, and Ulithian.

4.3.1 Jackson's Primary Argument: Nauruan Fails to Merge POc *d/*dr as PMc *c

Jackson's strongest proposed evidence for excluding Nauruan from the nuclear group is that it fails to reflect the merger of POc *d and *dr as PMc *c. Jackson argues that Nauruan continues each of these proto-phonemes independently; POc *d > t, POc *dr > ř.[244] This proposal hinges primarily on one comparison, for the first person possessive inclusive suffix /-tæ/. He considers that Nauruan /t/ in the words /kætæ/ [245] '1pl. inclusive accusative pronoun', and /-tæ/ '1pl. inclusive possessive suffix' continue POc *d, comparing PMc *kica 'we, us (inc.)' < PEOc *ki-da. He further notes that POc *dr is continued as Nauruan *ř in the words /řamʸa-/ 'forehead' (< PMc *camʷa < POc *dramʷa), /ræ-/ 'blood' (< PMc *caa < PEOc *draRa), and /řen/ 'juice, fresh water' (< PMc *canu- < POc *dranu). This appears to show that POc *d and *dr did not merge in Nauruan.

However, Jackson is unaware of the doublet PMc *-ta '1pl. inc.' which has since been reconstructed by Bender et al. (2003; PMc *kita) to account for reflexes of PMc *t in Marshallese *kéj* 'we, us (inc.)' and Kosraean *kʌt, kite--(l)* 'we, us (inc.)'. Nauruan clearly continues PMc *t in its first person plural inclusive pronominals, as Kosraean and Marshallese do: Nauruan /æ-tæ/, /kæ-tæ/ 'we, us (inc.), /-tæ/ '1pl. inclusive. poss. suffix', /-tær/ '1dl. inc.' (< *-ta-a-rua; PMc *rua 'two'), /-tej/ '1tr. inc.' (< *-ta-a-telu; PMc *telu 'three'). As such, Jackson's comparison does not provide good evidence for classifying Nauruan outside of the nuclear Micronesian group. Nauruan reflects POc *d, *dr > PMc *c > Nauruan /ř/ in all relevant comparisons discovered so far (§4.1.13). In contrast, these pronominals simply continue POc *t

[244] The fortis rhotic /ř/ is written as "barred r" by Jackson, and earlier by Nathan (1973a); ɾ. Jackson also claims that PMc *t is lost in Nauruan, though it is generally continued as *t or *j (§4.1.10).

[245] Jackson writes this pronoun as *kotá*. It is suspected that Jackson intended to spell this *kõtá*, because *õ* generally represents /a/ → [ɐ] in Nauruan orthographies, for which he may have mistaken /æ/. In any case, the suffix /-tæ/ clearly carries the first person plural inclusive meaning in Nauruan and has cognate forms in both Marshallese and Kosraean.

> PMc *t > t (§4.1.10).

4.3.2 Jackson's Additional Evidence

Jackson presents a few pieces of secondary evidence for excluding Nauruan from the nuclear group (1986: 212). These claims are evaluated here.

4.3.2.1 Claim (1)

> Nauruan reflects /r/ in the word *aar* 'current' < POc *qaRus(a), while all Micronesian languages show loss of *R in this word.

Jackson appears to cite the Nauruan word /æřæ-/ 'ocean current, rip tide (of)' as a reflex of POc *qaRus (ACD). However, this Nauruan word is unlikely to be a reflex of POc *qaRus(a). It appears to contain /ř/ which continues PMc *c rather than *r. Kosraean *acsr* 'current' (Lee 1976) is possibly cognate, suggesting a reconstruction containing PMc *c, though no such form is reconstructed by Bender et al. (2003). Additionally, a continuation of POc *qaRus(a) would likely have /e/ as the initial vowel in Nauruan due to the sound change *a > e/__(C)u (§4.1.23). Note also that Bender et al. (2003) reconstruct PMc *ayu, *ayuSa 'current' (< PEOc *qaRu[cs] 'current'), which also cannot continue Nauruan /æřæ-/.

4.3.2.2 Claim (2)

> PMc *f corresponds with both /p/ and Ø in Nauruan, suggesting that reflexes of PMc *patu 'stone' in Nauruan and the nuclear Micronesian languages do not agree in grade.

Jackson claims it is likely that POc *b became Nauruan /p/ and POc *p was lost in Nauruan, but Jackson is only half correct. POc *p was lost in Nauruan via PMc *f > Ø (§4.1.2). However, POc *b is not continued as Nauruan /pʲ/ or /pʸ/. Instead, the regular sound change is POc *b > PMc *p > Nauruan /bʲ/, /bʸ/ (§4.1.1). Nauruan /pʲ/, /pʸ/ continue pre-Nauruan *pːʲ, *pːʸ,

which generally result from reduplication and vowel syncope (§4.1.1; §4.2.3.5).

Still, these observations do not explain the correspondence between PMc *f and Nauruan /pʲ/, if the etymology is in fact PMc *fatu > Nauruan /pʲe/ ‘stone, hard part of body’.[246] If these are cognates it would be the only known example where PM *f became Nauruan /p/, though such an exception has been claimed elsewhere in the Micronesian family. Jackson, for example, claims that in Kosraean, PMc *f became *p* or *f* in a few cases (1983: 329-330). In any case, given the body of evidence to the contrary, one or a few apparent correspondences between PMc *f and Nauruan /pʲ/ would not be sufficient evidence for classifying Nauruan apart from the nuclear Micronesian group.

If Nauruan /pʲe/ is not an exceptional case, then there are two other possibilities for the origin of this word. First, it could be a loanword, though this seems unlikely because ‘stone’ is a Swadesh list item. Second, Nauruan /pʲ/ could continue some other etymon, in which case there must be a corresponding pre-Nauruan word which contains a geminate bilabial stop. There is some evidence for this possibility in the comparative data for PCMc *pei ‘stone structure’, which is continued as Marshallese *ppéy* ‘a platform of rocks’. While the semantics of the Nauruan word /pʲe/ ‘stone’ is not a perfect match for the PCMc reconstruction, the Nauruan form could have predated a semantic shift in this word: **PMc** *pei ‘stone’ > *pei, pepei (?) ‘stone(s), collection of stones, stone structure’ > PCMc *pei, *pepei ‘stone structure’.

4.3.2.3 Claim (3)

> Nauruan fails to reflect the replacement of POc *R by a velar nasal in PMc *maiŋi (Nau *-mow* < POc *mauRi) ‘left side’, and the replacement of final *i in PMc *wakara ‘root’ (Nau *awori-* < POc *wakaR(i))

[246] The expected continuation of PMc *fatu in Nauruan would be /ejˌ/.

Jackson claims that Nauruan fails to reflect PMc *ŋ in the word for ‘left side’. The equivalent reconstruction in Bender et al. (2003) is PCMc *ma{i,u}ŋi ‘left handed’ (reconstructed here for PMc). Indeed, the Nauruan reflex /e-da-mᵛow/ ‘left hand side’ is missing the phoneme /ŋ/, though this may be due to regular sound change rather than a failure to reflect *ŋ; PMc *mauŋi > *mᵛeuŋʷ > *mᵛeug > -mᵛow (see §4.1 for the relevant sound changes). In this case, a series of internal sound changes makes Nauruan’s continuation of PMc *ŋ opaque: *ŋ > *ŋʷ > *g > w.

Jackson also claims that Nauruan continues POc *wakar-i rather than PMc *wakara ‘root’, based on his observation that Nauruan /-i-/ surfaces upon suffixation. However, Nauruan appears to continue a form with epenthetic [-ə-] rather than /-i/ (cf. Nathan 1973a: 492). As such, it seems unnecessary to claim continuation of POc *wakar-i rather than PMc *wakara.

4.4 Classifying Nauruan within Micronesian

It can now be stated with reasonable confidence that Nauruan is a Micronesian language. There appears to be no compelling argument for classifying Nauruan apart from the other languages in the family. The next step is to attempt to establish a more precise classification for Nauruan within Micronesian.

An important factor for Nauruan classification is whether Nauruan merged PMc *S and *s. Bender et al. (2003) show that Kosraean is the only Micronesian language that did not merge these two sounds, though the authors were unable to consider Nauruan data and make no attempt to classify Nauruan. As discussed in §4.1.12, it is possible that Nauruan also failed to merge PMc *S and *s, and in that case both of these languages must be excluded from the Central Micronesian group, which is characterized by the merger of PMc *S and *s. This hypothesis is illustrated in Figure 4.2 below.

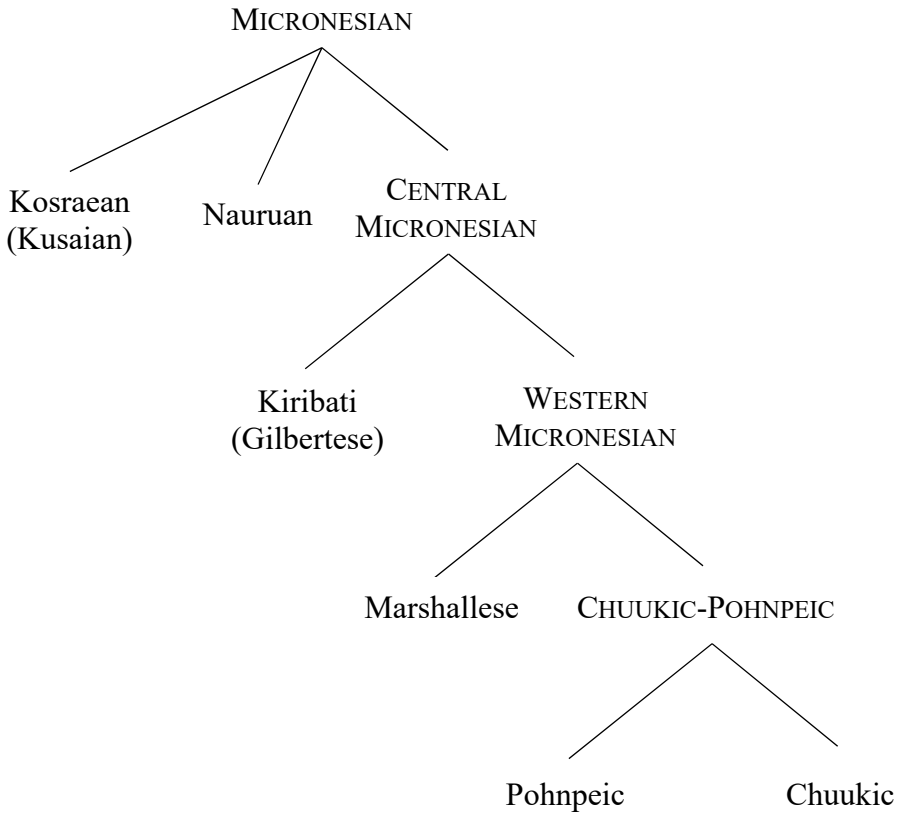

Figure 4.2 – The Micronesian Language Family: Hypothesis 1

There is a possibility that Nauruan and Kosraean share a common ancestor more recent than PMc. There is some evidence for this in that these are the only two Micronesian languages that lost PMc *w in any context. Nauruan loses PMc *w word-initially, and Kosraean loses it in all contexts. The conditions under which *w is lost are different between the two languages, but this could still be a shared innovation if Kosraean at first deleted PMc *w word-initially and later extended the process to all contexts. In that case, a common ancestor for Nauruan and Kosraean should be added to the model of the family, as shown in Figure 4.3.

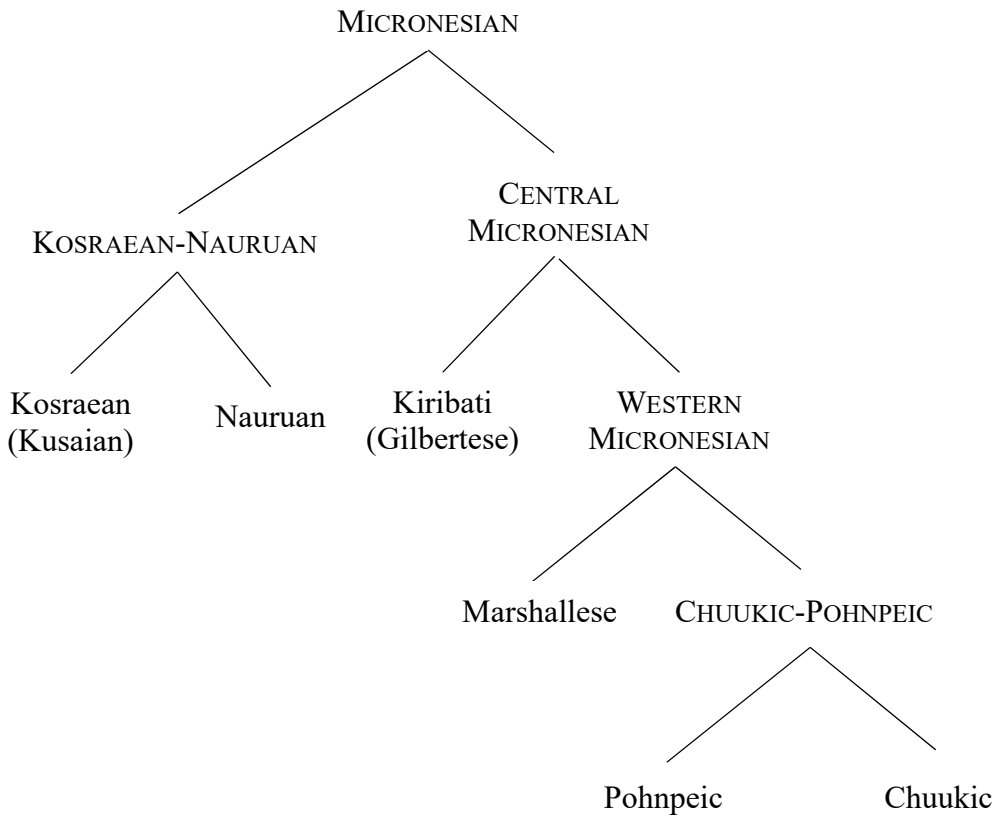

Figure 4.3 – The Micronesian Language Family: Hypothesis 2

The possibility remains that Nauruan should be classified within the Central Micronesian group. As discussed in §4.1.12, evidence for this could come from the discovery of a Micronesian word in which PMc *s is continued adjacent to pre-Nauruan *o, and this is then continued as Nauruan /g/. This is precisely what is observed for PMc *S; PMc *S > *D/o > g. If good evidence for a correspondence between PMc *s and Nauruan /g/ comes to light, this would suggest that PMc *S and *s merged in Nauruan and would place Nauruan within the Central Micronesian group, as illustrated in Figure 4.4 below. The dashed line in this figure represents uncertain classification within the Central Micronesian group.

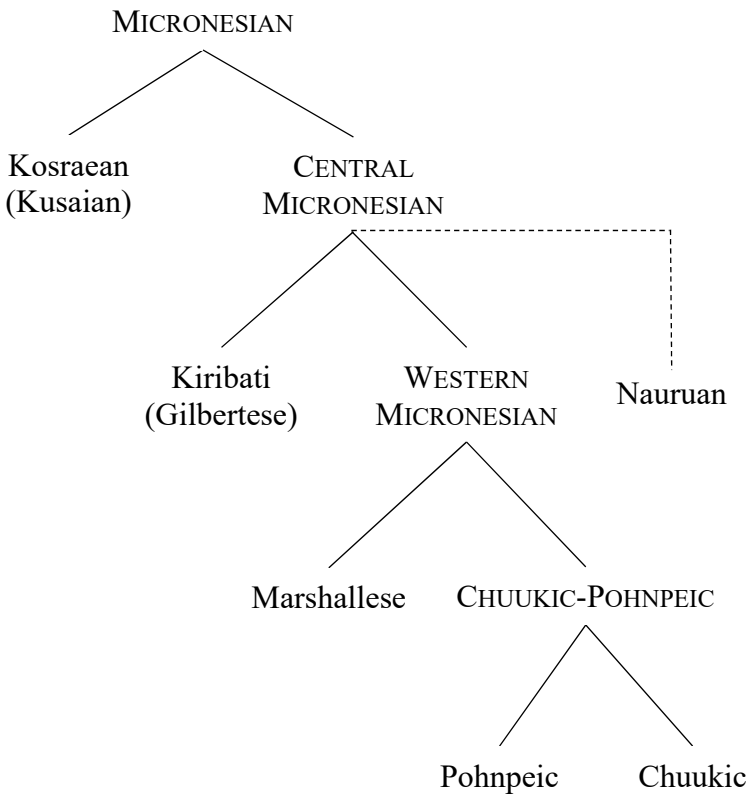

Figure 4.4 – The Micronesian Language Family: Hypothesis 3

Additionally, there are two etymologies that could help determine whether Nauruan can be classified within Central Micronesian. Unfortunately, neither of the relevant words have identified Nauruan cognates at this time. The relevant reconstructions are PMc *kiaZo ‘outrigger boom’ and PMc *laZe ‘kind of coral’ (Bender et al. 2003). These are the only two PMc reconstructions that contain *Z, which is continued as Kiribati *r* and which is lost in all Western Micronesian languages. If Nauruan shows loss of PMc *Z, this could support classifying Nauruan within Western Micronesian, as a sister to Marshallese and the Chuukic-Pohnpeic group. If instead Nauruan continues *Z as /d/, /t/ or /j/, this could lend additional support to excluding Nauruan from the Central Micronesian group. Alternately, reflexes of *Z which are /d/, /t/, /j/ or /r/ could support subgrouping Nauruan and Kiribati, within Central Micronesian but

outside of Western Micronesian. Kiribati continues PMc *s, *S, *Z, and *r as *r*. Identifying cognates for these two words, if any exist, is a priority in future work with Nauruan speakers.

There are also some potential shared innovations between Nauruan and Central Micronesian languages that can be observed. Consider, for example, that among all the Micronesian languages only Nauruan and Kiribati continue PMc *p as a voiced stop *b* (Nauruan /bʲ/). Additionally, both Nauruan and Kiribati continue PMc *l as /n/, but there is independent evidence that Nauruan /n/ results from an internal sound change rather than a shared innovation with Kiribati (§4.1.16).[247] Also of note is that PMc *k appears to have undergone a weakening processes in Nauruan, having been lost word-initially before *a, and continued as /g/ elsewhere.[248] In comparison, Woleaian, Saipan Carolinian, and Saipan Carolinian (Tanapag) also continue PMc *k as /g/, each of which are Chuukic languages; and in other members of the Chuukic group *k is lost, suggesting a general weakening of PMc *k in these languages. At this time, it remains unclear if any of these *k lenition processes can be considered shared innovations with Nauruan.

4.5 Nauruan Words of Unknown Origin

In the course of this research a few Nauruan words have been identified that have no obvious cognates in any other Micronesian language, and which also do not obviously reflect any established POc reconstruction. Most of these words appear to be Austronesian in origin and may continue forms in Proto-Austronesian (PAn), Proto-Malayo-Polynesian (PMP), or Proto-Western Malayo-Polynesian (PWMP). These words are listed in Table 4.5.1, along with some

[247] Additionally, PMc *l : *n* correspondences exist in several Chuukic languages, including Satawalese which has variation between *l* and *n* synchronically.

[248] Though note pre-Nauruan *gg > k, resulting from earlier reduplication and vowel syncope: *kVk > *gVg > *gg (V syncope) > k.

questionable cognates in other Micronesian languages or reconstructions which the Nauruan word might continue.

Table 4.5.1 – Some Nauruan words of unknown origin

Nauruan	Gloss	Potential sources (uncertain) [249]
/egirow/	'angry'	POc *basu 'anger, angry' (ACD) Kwaio *basu-laa* 'warning' (ACD) Kosraean *kasrkuhsrak* 'angry, indignant, furious, snarling
/ibʲibʲagi/	'happy'	Kosraean *engnuh* 'be happy with' Kosraean *engan* 'happy, glad, pleased'
/butʃi/	'very dark, pitch black'	POc *buta 'affliction of the eyes' PWMP *budiŋ 'charcoal, carbon, soot' PAn *buCa 'mote in the eye, blind, blindness
/gamʸ gamʸ/	'scratch'	PMP *kamit 'scratch'
/dabʸar, dabʸ/	'straight, true, honest'	English *level* (loanword)
/tere-/	'neck'	?

Two possible explanations for the existence of these words in Nauruan are considered here. First, these words may continue some unidentified PMc reconstruction. In that case, cognates in other Micronesian languages have simply not been discovered yet, or Nauruan happens to be the only Micronesian language to continue these forms. This possibility can be confirmed only where cognates in other Micronesian languages can be identified.

Several additional Nauruan words appeared in earlier versions of this wordlist but have been subsequently eliminated by careful examination of grammars and dictionaries for individual

[249] Kosraean words are from Lee (1976). All reconstructions are from the ACD (Blust and Trussel).

Micronesian languages. It is certainly possible that these words do in fact have cognates in other Micronesian languages, but they occur in under-documented languages, or otherwise do not appear in the available literature. Alternately, some cognates could simply have been overlooked in this course of this research, though every effort has been made to thoroughly review all available data.

Second, it is possible that these words came into Nauruan via historic language contact. Some of these words, including /butʃi/ ‘black’ and /tere-/ ‘neck’, are Swadesh list items and are unlikely to be borrowings. In such cases it is possible that they have their origin in an as-yet unidentified substratum in Nauruan, stemming from contact during some earlier stage of the language. While possible, the substratum account does not seem very plausible without a much larger set of candidate lexical items to support it, and the candidate list has so far only become shorter with continued research.

Appendix

Comparative Data

Comparative data that informs the analysis in Chapter 4 is provided in this appendix. Comparison sets are listed in alphabetical order by the oldest identified reconstruction in each set. Sets include a Nauruan word, a Proto-Micronesian reconstruction, and if available a Proto-Oceanic reconstruction. Most also include one or more cognates from other Micronesian languages. In many cases there are additional cognates listed in Bender et al. (2003) or in the Austronesian Comparative Dictionary (ACD, Blust and Trussel) which do not appear in this appendix. Nauruan words are written in the IPA,[250] though other words are written as they appear in the relevant source material. In some cases where internal sound change has made the correspondence between a Nauruan word and the PMc reconstruction particularly opaque, the hypothesized sound changes are written out within the comparison set or in a footnote; e.g. PMc *alalau 'long, tall, far' > *wal:eu >> *law:e (MET) > *raw:o > rak^{w}o 'long'. The symbol ">>" indicates a change in form which is not due to regular sound change, such as metathesis or reduplication. Where a Nauruan word has acquired morphology beyond what is reconstructed for PMc, the correspondence is separated from the rest of the word by a slash; e.g. PMc *lima-ua > e-/jim^{j}o 'five'. Instances of reduplication in Nauruan are indicated by the abbreviation RED to the right of the Nauruan form. Metathesis is similarly indicated by MET. Other abbreviations include POc 'Proto-Oceanic'; PEOc 'Proto-Eastern Oceanic; PMc 'Proto-Micronesian'; PCMc 'Proto-Central Micronesian'; PWMc 'Proto-Western Micronesian'; PCk 'Proto-Chuukic'; and S.C.(T) 'Saipan Carolinian (Tanapag)'. Forms marked with (?) should be considered questionable.

Unless another source is cited, PMc reconstructions, POc reconstructions, and cognates from other Micronesian languages are from Bender et al. (2003). Where **PMc** appears in bold this indicates that the reconstruction has not been proposed elsewhere before. In many such cases, the proposed **PMc** reconstruction matches an established reconstruction for PCMc, PWMc, or another chronologically later reconstruction. In those cases, Nauruan appears to continue a form which is reconstructed for one of these later stages, but not for PMc. This results from the hypothesis that Nauruan should be classified outside of the Central Micronesian group (§4.4), though as discussed in Chapter 4, this hypothesis is tentative.

[250] With the exception of /ř/.

A1	POc	*acan	name	(ACD)
	PMc	*aSa	name	
	Nauruan [251]	eg/ə-	name (possessed)	
	Kosraean	e	name	
	Kiribati	ara	name	
	Marshallese	yat	name	
A2	POc	*acok	to sniff, kiss	
	PMc [252]	*ŋa-aSok (?)	to sniff, kiss	
	Nauruan [253]	ægu < *ŋʷa-/aDow (?)	kiss, lean in, sniff	
	Kosraean	ngok	smell, scent, sniff, find out by smelling	
	Kosraean	angok-mweti	kiss, greet each other by rubbing one's nose against another's cheek, nuzzle	(Lee 1976)
A3	**PMc**	*afe	swim	
	Nauruan [254]	eo	swim	RED, MET
	PCMc	*afe	swim	
	Kiribati	ua ua	swim	
	Marshallese	haheh	swim	
	PCk	*yafe	swim	
	Ulithian	eaf	swim	
A4	**PMc**	*aka-ni (?)	how many, how much	
	Nauruan	egen	how many, how much	
	Kosraean	ekahsr	how many	(Lee 1976)

[251] Nauruan continues **PMc** *aSa-ua, with the general classifier suffix *-ua. PMc *aSa-ua > *aDeu > *eDo > *eg/ə- 'name (possessed)'.

[252] Compare also Kiribati *aro-ki* 'to smell or scent an odor', *aro-boi* 'smell, scent, the sense of smell'.

[253] There appears to have been a sound change *ŋ > *ŋʷ > *g and subsequently *g > Ø word initially. However, it remains unclear how the apparent *o > u change was conditioned in this word. The final *w is not expected to condition *o > u, and it is unclear how else this change might have happened. **PMc** *ŋa-aSok > *ŋʷa-aDow > *ga-aDow > *a-aDow > (?) ægu 'kiss, lean in'.

[254] **PMc** *afe > *wae >> *awe (MET) > *aw > *ew > eo 'swim'.

A5	**PMc**	*akekeV (?)	fight	
	Nauruan	æke	fight, attack, dispute	
	Nauruan	e-/æke	war, fight, battle	
	Nauruan	ækæke	quarrelsome, fight	RED
	Kosraean	akuhkuhin	argue, quarrel, dispute	
	Pohnpeian	doahke	to fight, to touch or feel	
A6	PMc	*ala	path, road	
	Nauruan [255]	də-/wan	path, road, way, route of	
	Kiribati	ka-wai	road, way, route, path, street	
	PCk	*yala	path, road	
	Pohnpeian	aal	path, road, trail	
	Pingilapese	al	path, road	
	Mokilese	al	path, road	
A7	PMc	*aŋi, aŋiaŋi	wind	
	Nauruan	eŋ	wind	
	Kosraean	eŋ, eŋyeŋ	wind	
	Kiribati	aŋ, aŋi-	wind	
	Marshallese	haŋ	wind	
	Pingilapese	ɛŋ	wind	
	Pohnpeian	aaŋ, ɛŋiɛŋ	wind	
	Mokilese	eŋ	wind	
A8	**PMc** [256]	taŋoi (?)	dark, black	
	Nauruan	tæŋæŋ	black, be black	RED
	Kiribati	tangoingoi	very black, dark	(Trussel and Groves 1978)

[255] The final -n in the Nauruan reflex has been interpreted as a genitive or 3SG suffix. Consider /də-wa-m/ 'your way, path'. Without reanalysis, the expected form would be /də-wanə-m/. Additionally, it is possible that this is a loanword. The sound change *aCa > *eCa is expected but appears not to have occurred. If it is a loan, it must have been borrowed sometime after the *aCa > *eCa change, but before both *w*-accretion and *l > *n.

[256] Compare PMc *calo, calocalo 'dark, black'.

A9	POc	*{a,Ø}lalau	long, tall, far	
	PMc	*alala{i,u}	long	
	Nauruan [257]	(e)rak^{w}o	long	MET
	Kiribati	ananau	long	
	Marshallese	leyelley	a great distance, far	
	PCk	*yalalayi, layalayi	long	
A10	POc	*api	fire	
	PMc	*afi	fire	
	Nauruan	i-/ei	fire	
	Kosraean	e	fire	
	Kiribati	ai	fire	
	Pohnpeian	aay	fire	
	Mokilese	ɔy	fire	
	Pingilapese	ɛy	fire	
	PCk	*yafi	fire	
A11	PMc	*are, are-ki	haul, pull, tow	
	Nauruan	ær	pull, slide	
	Kosraean	ælʌ-k	to lift, pull, scoop (something)	
	Kiribati	aeae-a	to tow, drag (something)	
A12	**PMc**	*areau	spider	
	Nauruan	æreo	spider; a man appearing in traditional narratives	
	Kiribati	areau	a spider, a cobweb	
	Marshallese	aorak	spider shell	(Abo et al. 1976)
A13	**PMc**	*ar{i,e}ak{i,u} (?)	sick, pale	
	Nauruan	ariag	sick, sickness	
	Kosraean	areyuhk	wan, sickly, pale	(Lee 1976)
	Kiribati	áoraki	sick	(Trussel and Groves 1978)

[257] PMc *alalau > *wal:eu >> *law:e (MET) > *raw:o > rak^{w}o

A14	PMc	*aro-	shore, beach, vicinity	
	Nauruan [258]	arɨrɨ	beach, sand	RED
	Kosraean	yɔrɔ-(l)	his vicinity	
	Kosraean	yuru-(n)	vicinity of	
	Kiribati	ao-(ataata)	beach above the high water line	
	Marshallese	har, hare-(n)	lagoon beach	
	Pohnpeian	ɔrɔɔr	shore, land near the ocean, landing place for boats	
	Mokilese	ɔrɔɔr	shore	
A15	PMc	*a{s,S}o	time	
	Nauruan	ŋ-ag-o	in the distant past	
	Nauruan	ŋ-ag-a	in the recent past	
	Nauruan	ŋ-ag-e	in the present	
A16	POc	*au	yes	
	PMc	*a-ŋu (?)	yes	
	Nauruan [259]	ẽ	yes	
	Kiribati	eng	yes	
A17	PEOc	*bakewa	shark	
	PMc	*pakewa	shark	
	Nauruan	e-/bʲæwo	shark	
	Kosraean	pæko	shark	
	Kiribati	pakoa	shark	
	Marshallese	pakew	shark	
	Pohnpeian	pako, pɔkɛ	shark	
	Mokilese	pako	shark	
	Pingilapese	pakɔ	shark	
	PCk	*pakewa	shark	
	Woleaian	pagowe	shark	
	Pulo-Annan	pakoa	shark	

[258] The precise vowel changes in this word remain unclear.

[259] Often used to indicate listening in conversation, akin to English 'uhuh'.

A18	POc	*bali	answer, oppose, opposite side or part; partner, friend, enemy	
	PMc [260]	*pa-li-y{a,i}	side, enemy, counterpart	
	Nauruan	bʲaru < *bʲari-wa	enemy, adversary	
	PWMc	*pali-a	side	
	Marshallese	paleye-	spouse	
	Pohnpeian	pali	part, side; division, section	
	Mokilese	uh-pal	side with	
	Puluwatese	páliy, peliy	side, as in a game or war; half-section	(ACD)
	Woleaian	paliy	side, flank	(ACD)
A19	**POc** [261]	*balu	some, several	
	Nauruan	i-/bʲun	some, a few	
	Kiribati	ta-bé-ua	some, several, a few (inanimate)	
A20	PEOc	*baRu	hand, arm, wing	(Geraghty 1990)
	PMc	*pau	hand, arm, wing	
	Nauruan	bʲe-	hand, arm, wing	
	Kosraean	po, pæo-(l)	hand, arm, wing	
	Kiribati	bai, bai-(na)	hand, arm, wing	
	Marshallese	pay, peyi-	hand, arm, wing	

[260] Cf. PMc *pa- ‘side’

[261] Cf. POc *palu ‘some, some more’ (ACD)

A21	PEOc	*baya	worm	(Geraghty 1983)
	PMc	*paa	bait, worm	
	Nauruan	e-ka-/bʲæbʲæ	bait, lure	RED
	Kosraean	pa	bait, worm	
	Marshallese	paha-(ney)	feed, give bait (archaic)	
	PCk	*paa, paapaa, paa-[ln]i	bait, worm	
	Pohnpeian	paa-(n)	bait, lure	
	Mokilese	pee-(n)	bait, worm	
A22	PEOc	*biri	growth or lump under the skin, spongy core of mature coconut	
	PMc	*piri	growth or lump under the skin, spongy core of mature coconut	
	Nauruan [262]	bʲir bʲir	sprout (v.)	RED
	Kosraean	pili	mumps, have mumps	
	Marshallese	pér	small, sprouted coconut, tumor, swelling, wen	
	Mokilese	pir, piri-(n)	lymph nodes, lump nodes of	
	Chuukese	piir, piri-(n)	hard growth or lump under the skin, his growth	

[262] Compare also Nauruan /e-bɨr/ 'boil (on skin)'. The *l : r correspondence in the Nauruan reflex /bʲir bʲir/ 'sprout' suggests there was a following *w or *u historically, perhaps *pili-ua (with the general classifier suffix), though this is not evident in the compared reconstructions.

A23	POc	*boi, bou, bona	smell, odor, scent	
	PMc	*pʷoi, pʷoa	odor, smell	
	Nauruan [263]	bᵛo/-n	smell of	
	Kosraean	fo	to smell, have odor	
	Kosraean	fɔlɔ-(l), foli-(n)	its smell, smell of	
	Kiribati	bʷoi	scent, odor, smell	
	Marshallese	bʷiyi-, bʷi-	odor, smell	
	Mokilese	pʷo, pʷɔɔ	smell, its smell	
A24	POc	*buŋi	night	
	PMc [264]	*pʷuŋi	night, 24 hour day	
	Nauruan	bᵛumᵛ	night, 24 hour day	
	Marshallese	bʷéŋʷ	night	
A25	POc	*buak-an	fresh-water spring	(ACD)
	PMc	puak-an (?)	fresh water	
	Nauruan	e-/bʲag	fresh water	
	Kiribati	teboka, te-bóka	to pour water on, to wash, to bathe, to cleanse, to wash one's face, to baptize.	
	Chuukese	appúng	fresh water	
A26	POc	*buto	navel	
	PMc	*pʷuto	navel	
	Nauruan	mʲe-n/ bᵛi-	navel, belly button	
	Kiribati	bʷuto, bʷuto-(na)	navel	
	Marshallese	bʷije-	navel	
	PCk	*pʷut{e,o}	navel	

[263] Compare also reduplicated Nauruan /bᵛobᵛo/ ‘smelly, stinky’.

[264] Compare also POc *pʷoŋi ‘night’, PMc *pʷoŋi ‘night’, Kiribati *boŋ, bʷoŋi-* ‘night’. Bender et al. (2003) reconstruct only PMc *poŋi (from POc *boŋi), but the Nauruan form suggests that POc *buŋi was continued in PMc as well.

A27	POc	*buu	conch shell trumpet	
	PMc	*puu	horn, conch shell	
	Nauruan	də-/bʸu	horn, conch shell	
	Kiribati	bu	a conch, sea shell horn, trumpet, instrument of brass band	
A28	PEOc	*bʷaRucu	nose	(Geraghty 1990)
	PMc [265]	*pʷau-uSi	nose	
	Nauruan [266]	bʸodʒi-	nose (possessed)	
	Kiribati	bʷairi	nose	
	Marshallese	bʷawat(iy)	nose	
	Mokilese	pʷɔɔdi-	nose	
A29	**PMc**	*bʷ{o,a}bʷ{o,a}u	gather, cluster, pandanus fruit	
	Nauruan	epʸo < *bʸobʸou	gather together, group, pandanus fruit	RED
	Kiribati	bo	to gather together, to assemble, to put together	(Trussel and Groves 1978)
	Kiribati	bobo	ripening fruit, pandanus harvest season	
	Marshallese	bōlbōl	gather green pandanus leaves from trees	(Abo et al. 1976)
	Marshallese	ppel	gather fallen pandanus leaves from ground for thatch or handicraft	(Abo et al. 1976)
	Marshallese	bōb	a plant, pandanus, a general name for any pandanus plant	(Abo et al. 1976)
	Marshallese	po	fall off, of ripe pandanus keys	(Abo et al. 1976)
	Chuukese	ápwá	gathering or picking (of breadfruit) to be cooked in an earth oven	(Goodenough and Sugita 1980)

[265] Compare PMc *pʷau-Su ‘nose’ (Bender et al. 2003), and POc *isu ‘nose’.

[266] PMc *pʷau-uSi > *bʸeu-uDi- > *bʸouDi- > bʸodʒi- ‘nose’

A30	PEOc	*bʷula	to flame, flare	
	PMc	*pʷupʷula	to flame, flare	
	Nauruan	pʸiɉ < *pːʸiɉ	light, shine, aflame	
	Nauruan	pʸiɉ pʸiɉ	to shine, sparkle, flare	RED
	Nauruan	pʸiɉ/-ari	fiery, raging	
	Marshallese	bbōl	lights on	(Abo et al. 1976)
	Marshallese	ka-bōlbōl	glow, shine in the distance	(Abo et al. 1976)
	Marshallese	bʷil	burn, hot, fever	
	PCk	*pʷpʷula	to flame, flare	
	Woleaian	bbule	burn, light up	
	Woleaian	bulobulo	shiny, flaming	
	Woleaian	bbubbule	flame, light	
	Chuukese	pʷpʷun, pʷpʷuna-(n)	blaze, flash, flame, its blaze	
	Satawalese	pʷpʷun	be alight	
A31	**PMc**	*bʷun-n{i,a}-mʷoa	chicken egg	
	Nauruan	bʸitamʸo	chicken egg	
	Kiribati	bun-ni-moa	a hen's egg	(Trussel and Groves 1978)
	Marshallese	tabwil	fresh egg	
	Pohnpeic	kakupwel	egg of a nut	
	Pohnpeic	pweisinwair	rotten egg	

A32	**PMc** [267]	*ca(a)-	state of being
	Nauruan [268]	-řæ-	classifier for flat things
	PCk	*ca-, cca- cca[a]-ni	state of being
	Saipan Carolinian	sha-(apaapa)	be very flat (as a board)
	S.C.(T)	Ra-(apaap)	be very flat
	Woleaian	sha-(apaape)	become flat, be flat
	Woleaian	chchaa-li	exist, be available
A33	PMc	*canu-	fresh water
	Nauruan	řen	water, liquid, juice
	Kosraean	srɒ no-	fresh water
	Kiribati	ran	fresh water, sap
	Marshallese	dan	water, liquid, juice
	Mortlockese	shaan	fresh water
	Puluwatese	Raan	fresh water
	Pulo Annan	saanú, sanú-	fresh water
A34	**PMc**	*cacapa	adhere
	Nauruan	e-/řeřebʲ/-eɟ	adhere to, stick to
	PWMc	*cacapa	adhere
	Marshallese	ddap, dedap	cling to, stick to, adhere, sticky
A35	PMc	*cau-lapa	wide, width
	Nauruan	e-/ře-ɟeb	wide
	Kosraean	sra-(læp)	wide
	Pohnpeian	tɛɛ-lap	wide

[267] Bender et al. reconstruct *ca- ‘state of being’.

[268] There are several reflexes for PMc *ca- ‘state of being’ that are glossed with meanings related to flatness (Bender et al. 2003; listed in the present comparison). This form must have had an additional *a at the end to account for the Nauruan reflex /-řæ-/, either in PMc (*caa-) or in Old Nauruan (*řaa-). Several of the listed cognates for PMc *ca- in Bender et al. (2003) suggest the presence of an additional historic *a in this form (preceding suffixes), hence the suggested reconstruction **PMc** *ca(a)-. Compare also PMc *cau ‘leaf’, which may be continued as -řе- in Nauruan e-řе-ɟeb ‘wide’

A36	PMc [269]	*cawu	heavy, heaviness	
	Nauruan	řo/e	heavy, sad	
	Kiribati	rarai	sulky	
	Kiribati	rarau	swoon	
	Pohnpeian	towtow	heavy	
	Pohnpeian	taw-r	weigh down	
A37	**PMc** [270]	*cia{ŋ,k}V	sing, sing a song	
	Nauruan	řiæŋ	sing	
	Pohnpeian	tiak	to start a song	
A38	PMc	*ciki	small, little	
	Nauruan	də-mʲe-/řiki	small living things, insects, small children	
	Kosraean	srik, srisrik	small, little	
	Kiribati	(wa)-riki	narrow	
	PCk	*ciki	small, little	
	Pulo-Annan	-siki	small, little	
A39	**PMc** [271]	*cila-	backbone, spine	
	Nauruan [272]	ři-n	backbone, spine of the spine	(Trussel and Groves 1978)
	Kiribati	rínaba		
	Marshallese	dilep	backbone, spine	(Abo et al. 1976)
	Pohnpeian	tihnsau	backbone, back, the dorsal part of the human body or the upper surface of animals	

[269] Compare also PMc *cacawu, *cawucawu with the same gloss and PCk *ccau 'heavy, heaviness'. The reduplicated Kiribati and Pohnpeian words listed in the comparison may continue these forms directly, or alternately may have undergone reduplication at a later time. Compare also Kosraean *toasr* 'heavy, sad'(Lee 1976) which may be a reflex of the same etymon if it underwent metathesis.

[270] Compare PMc *cia 'give voice'.

[271] Compare PMc *cuyi 'bone', Nauruan /ri-/ 'bone'.

[272] The /n/ in Nauruan, which continues PMc *l, has been reinterpreted as the genitive or 3SG.POSS suffix in this word.

A40	POc	*dram^{w}a	forehead, brow	(Ross 1988)
	PMc	*cam^{w}a	forehead, brow	
	Nauruan	řam^{v}a-	forehead	
	Kosraean	(moton) sro-(n)	forehead of	
	Kiribati	ram^{w}a	forehead, gable end	
	Marshallese	dam^{w}, dem^{w}a-	forehead, brow, gable	
	PCk	*cam^{w}a	forehead, brow	
A41	POc	*draRaq	blood	
	PMc	*caa, cacaa	blood	
	Nauruan	ře-, řeře-	blood	
	Kosraean	sræ	blood	
	Kiribati	raraa	blood	
A42	PMc	*ee	here, this near speaker	
	Nauruan	-e	proximal distance	
	Marshallese	yéy	this	
	Mokilese	-e, -i	this	
	PCk	*yee	here, this near speaker	
A43	**PMc** [273]	*faa-ko-ua	four-DX-GEN	
	Nauruan	æ-e̯ok^{w}	four	
	Kosraean	æ-, yo-	four (prefixed to classifier)	
	Kiribati	a-	four (prefixed to classifier)	
A44	**PMc** [274]	*faa-i-laŋi	lower region of sky	
	Nauruan	ijaŋ	low, below, short	
	PCMc	*faa-i-laŋi	lower region of sky	
	Kiribati	aa-n-naŋ	the atmosphere just below the clouds	
	PCk	*faa-i-laŋi	lower region of sky	

[273] PMc *ko is a vocative or deictic affix and *-ua is a general classifier.

[274] Compare PMc *faa- ‘underside, under’ and *-laŋi ‘sky, heaven, storm’. It is possible that this is a loanword, given the lack of expected vowel changes from *a > e preceding *i.

A45	PMc	*faiSa	do what, what?	
	Nauruan	ed	how?	
	Marshallese	yet	do what?	
	Pulo-Annan	deita	how is it? what happens?	
	Puluwatese	féét	do what, what?	
A46	**PMc** [275]	*fauSa	what?	
	Nauruan [276]	e/ke/n < *fauSa-na	what?	RED
	Kiribati	aera	what … doing?	
A47	**PMc**	*fanukV	climb	
	Nauruan	ani	climb	
	Kosraean	fanukh	climb, climb and fetch	(Lee 1976)
A48	**PMc** [277]	*Sa-le	walk, move around	
	Nauruan	a/dan	walk, travel	
	Nauruan	a/d	walk, go	
	Marshallese	yetal	walk	
A49	PMc	*fa{s,S}ua	child of sibling of opposite sex	
	Nauruan [278]	e-du, i-du < *fasua	sibling	
	PCk	*fadúa	child of sibling of opposite sex	

[275] Compare PMc *fa(i)-Sa 'do what, what?' and PMc *-Saa 'interrogative suffix'.

[276] PMc *fauSa-na > *e-/oDe-n/ > *e/ege-n/ > *egen >> *egegen (RED) > *eken 'what'

[277] Compare also PMc *faSa-le (Bender et al. 2003). It is hypothesized here that the initial /a/ in the Nauruan form was a later addition, probably the causative/verbalizing affix /a-/, rather than a continuation of PMc *fa. The latter may well have been a prefix in PMc, *fa-Sa-le. The Nauruan word /dadaŋe/ 'walk about' (RED) may offer additional support for this analysis. This word could continue **PMc** *Sa-le-oo 'walk a distance', where no prefix is present.

[278] This word is unusual in having variation in the nominal prefix, which is expected to be /e-/ unless the stem has [i] in the first syllable, in which case it is /i-/. Furthermore, if the Nauruan word continues PMc *fasua, as suggested here, the /e-/ prefix may have continued PMc *a, but has since been reanalyzed as a nominal prefix.

A50	**PMc** [279]	*fau-ri-n-ua (?)	Something that is done, made, tied	
	Nauruan	eririŋ, ririŋ	do, make	RED
	Chuukese	féérú-(n)	deed, action, his deed	
	Pulo-Annan	daúlú-(aki)	be made	
A51	PMc	*fau-Si	tie, bind	
	Nauruan	id < *u-Si (?)	weave, braid	
	Marshallese	yawi-t	bind or lash (something)	
	Woleaian	fééféé, féé-ti-(ɪ)	tie, bind	
	Pulo-Annan	daúdaú	to weave	
	Sonsorolese	faúfaú	to weave	
A52	**PMc** [280]	*f{i,a}naŋo	story	
	Nauruan	aŋag/ə-n	story of	RED
	Nauruan	e-ŋag	words	
	Marshallese	yinaŋ^{w}	legend, folkloristic story	(ACD)
A53	PEOc	*fili	choose	
	PMc	*fili, filifili	choose	
	Nauruan	iǰ, iǰiǰ	choose, select	
	Pohnpeian	pilipil, pil	choose, select	
	PCk	*fini, ffini	choose	
A54	**PMc** [281]	*fiti-na	flash (of light)	
	Nauruan	e/itʃin	lightning	
	Chuukese	átittina	provide a light for, provide illumination for, shed light on; examine, investigate, inquire of, interrogate	
	Chuukese	áttina	make shine, light (a lamp)	

[279] Compare PMc *fauru ‘do, make’. Compare also PMc *fau, fai-Si ‘tie, bind’ and PWMc *rii ‘tied, joined’.

[280] Compare PMc *fiaŋo (Bender et al. 2003).

[281] Compare PMc *fiti (Bender et al. 2003). Compare also PMP *sila 'outpouring of light', *kila 'lightning' (ACD).

A55	PEOc	*fuRu	drag, pull	(Geraghty 1990)
	PMc	*uruuru	drag, haul, tow	
	Nauruan	urur/-ej	drag, pull (something)	RED
	Kosraean	ulul	pull, tug, stretch	
A56	POc	*gidik, giri, kidi, kilik, kirik	to tickle	
	PMc [282]	*kirakira	to tickle	
	Nauruan	gir gir	tickle	
	Marshallese	kirkir	tickle	
A57	POc	*-gu	my, of me (suffixed possessive pronoun)	
	PMc [283]	*-x{u,i}	1sg. poss.	
	Nauruan [284]	-ɨ	1sg. poss.	
	Kosraean	-k	1sg. poss.	
	Kiribati	-u	1sg. poss.	
	Marshallese	-hi	1sg. poss.	
	PCk	*yi-	1sg. poss.	
	Pohnpeian	-y	1sg. possessive	
A58	PMc	*i-	at (locative)	
	PMc	*iaa	where?	
	Nauruan	i/-n-a	there (medial)	
	Nauruan	i/-n-e	here (proximal)	
	Nauruan	i/-n-o	far away (distal)	
	Nauruan	i	where?	

[282] Compare also PMc *kurakura 'to tickle', Kosraean korkor 'tickling'

[283] Bender et al. reconstruct only PMc *-xu, and so appear to propose *u > i in many reflexes across the family. Their intention may be to suggested that *u is conditioned by *j (*y*) prothesis; *-xu > *-u > *ju > ji. However, the prothetic glide in Nauruan is proposed to be *w, rather than *j (§4.1.18). Furthermore, Initial PMc *u does not appear to condition glide accretion in Nauruan; e.g. PMc *uruuru ‘drag, haul, tow’ > Nauruan /urur-ej/ ‘pull, drag something’. As such, PMc *-xi is reconstructed here as a doublet. If accurate, we can expect PMc *-xi > *-i > *-wi > Nauruan ɨ, as appears to occur elsewhere in the language. The following change might be proposed as an alternative: PMc *-xu > *-ku (cf. Kosraean) > Old Nauruan *-gu > *-wu > *-wɨ > -ɨ. However, in that case there is no obvious explanation for the loss of initial *w, which is retained in all other cases where PMc *k > *g > w.

[284] PMc *xi > *i > *wi > *wɨ > ɨ

A59	POc	*ia	he, she, it	
	PMc	*ia	he, she, it	
	Nauruan	e	he, she, it	
	Kiribati	ŋa-ia	he, she, it	
	Marshallese	yéy	he, she, it	
A60	**PMc**	*i{a,e}w (?)	year	
	Nauruan	e-/jo/-bᵛeni	year	
	Kosraean	yac [yɛ]	year	
	Marshallese	iiō	year	
A61	**PMc**	*isakua (?)	punch	
	Nauruan	idow	punch, hit	
	Marshallese	dukwaḷ	punch, clenched fist, slug	
A62	**PMc**	*i{s,c}aV (?)	laugh	
	Nauruan [285]	idada	laugh	RED
	Kosraean	isracsr	laugh	
	Kosraean	isrisracsr	laugh continuously	
A63	**PMc**	*ik{a,i}V (?)	yes	
	Nauruan	ɨga < *wiga-V	yes	
	Marshallese	iiũñ ('yiyig)	yes	(Abo et al. 1976)
	Marshallese	iññа (yiggay)	yes	(Abo et al. 1976)
	Pohnpeian	uhki [uuki]	to stand for, to side with, to support, to agree with, to favor'	(Sohl et al.)
A64	PEOc	*ikuR	tail (Ross 1988)	
	PMc	*iku	tail	
	Nauruan	iwɨ	tail	
	Mokilese	ik, iki-(n)	tail	
	Woleaian	úúgú, úgú-	tail	

[285] If the PMc reconstruction contains *s, then the etymology is proposed to be PMc *isaV > *ida >> idada (RED). In that case, there was an internal sound change in Kosraean in this word, **s > sr*. If the PMc reconstruction contains *c, then the etymology is proposed to be PMc *icaV >> *icaca (RED) > *iřřa > *ida >> idada (RED).

A65	**PMc**	*ilu-ka{a,e}	in the center, middle	
	Nauruan [286]	iju-gægæ	middle, waist, center	RED
	PCMc	*luuka	center, middle	
	Kiribati	nuuka, nuuka-(na)	middle, lower waist, its middle	
	Marshallese	lik^{w}e-	middle of, waist	
	Marshallese	i-lew	in, inside	
	Pohnpeian	lukepe	invitation; the waist; in the middle	
	PCk	*luuka	center, middle	
	Woleaian	luuge	center, central point, be centered	
	Chuukese	nuuk, nuuka-(n)	center, middle, abdomen, stomach, belly, its center	
A66	PMc [287]	*(i)nu-m{i,a}	drink	
	Nauruan	nim	drink (n.), drink (v.)	
	Kosraean	ni-m	drink (something)	
	Kiribati	ni-ma	drink (something)	
A67	**PMc** [288]	*i{s,S}a{s,S}aŋa (?)	with, companion, friend	
	Nauruan	itæŋ- < *i-ddaŋ	one's company	
	Nauruan	itæŋ/ə-n	with someone/him/her	
	Nauruan	itæŋ/-ɨ	with me	
	Kiribati	atánga	mutual friendship	(Trussel and Groves 1978)
	Kiribati	atanga	liaison, friendship	(Trussel and Groves 1978)

[286] Compare also Nauruan /gægæ-nado/ ‘important, crucial’ and /oe-gægæ/ ‘in the wilderness’.

[287] Compare also PMc *nima- ‘drinkable object’, and the Nauruan possessive classifier for drinkable objects /nim-/.

[288] Compare PWMP *diŋan 'friend, companion'; PMP *deŋan > POc *droŋan 'with, in conjunction with, companion'

A68	POc	*i-ta	we, us (inclusive)
	PMc [289]	*-ta	1pl. inclusive
	PMc	*ki-ta	we, us (inclusive)
	Nauruan	æ-tæ, kæ-tæ	we, us (inclusive)
	Nauruan	-tæ	1pl. inclusive. poss. suffix
	Nauruan	-tær < *-ta-a-rua	1dl. inclusive (PMc *rua 'two')
	Nauruan	-tej < *-ta-a-telu	1tr. inclusive (PMc *telu 'three')
	Kosraean	kʌt, kitɛ--(l)	we, us (inclusive)
	Marshallese	kéj	we (incl.), us
A69	PMc [290]	*ita, itaita	deposit, pile up
	Nauruan	æ/tæe	ten
	PCMc [291]	*-itaki	counter for tens
A70	PEOc	*ka-	causative prefix
	PMc	*ka-	causative prefix
	Nauruan	a- < *ga-	causative prefix
	PCk	*ka-	causative prefix
A71	PEOc	*ka-	causative prefix
	PMc [292]	*kaka-	causative prefix
	Nauruan [293]	k(a)- < *gga	causative or nominalizing prefix
	PCk	*kka-, *kakka-	causative prefix

[289] Compare PMc *-ca '1pl. inc.' < POc *-da. PMc *-ta is reconstructed by Bender et al. (2003) as part of PMc *kita, a doublet of PMc *kica 'we, us (inc.)' proposed to account for the Marshallese and Kosraean reflexes shown here. Nauruan provides a third member for this cognate set. Morpheme boundaries have been added accordingly.

[290] It is uncertain if this comparison is valid. The etymology of the Nauruan word for 'ten' remains unclear.

[291] Compare also PPCk *-ik{a,e} ‘counter for tens’.

[292] Reduplicated PMc *kaka is reconstructed here, though Bender et al. (2003) only reconstruct *ka for PMc.

[293] The meaning of Nauruan /ka-/ is difficult to describe. It means something like 'that which is’ or ‘that which is the cause or source of’. It sometimes functions as a nominalizer.

A72	**PMc** [294]	*(ka)ka-amii	you (pl.)	
	Nauruan [295]	kæmʲi/ej	you (pl.) (in predicate VPs)	
	Nauruan	æmʲi/ej	you (pl.) (in subject NPs)	
	PCMc	*kamii	you (pl.)	
	Kiribati	(ŋ)-kamii	you (pl.)	
	Kiribati	kamii	you (pl. object)	
	Marshallese	kemiy	you (pl.)	
	PCk	*kaamii, kamii	you (pl.)	
	Chuukese	áámi	you (pl.)	
A73	**PMc**	*kacV (?)	run, go	
	Nauruan	gař	travel, go (by)	
	Kosraean	kahsruhsrsruhsr	run intermittently	(Lee 1976)
	Kosraean	kahsruhsr	run, pass	(Lee 1976)
A74	**PMc**	*kacawu	cloud, rain	
	Nauruan	w/eřo/-n	rain, sky	
	Nauruan	ri-n /weřo/-n	rain drops	
	Nauruan	jæ-n /weřo/-n	heaven (lit. 'in the sky')	
	PCMc	*kacawu	cloud, rain	
	Kiribati	karau	to rain	
	Kiribati	karau	rain-water, rain	
	Marshallese	kedaw	cloud, overcast	
	Mokilese	kɔsɔw	cloud	

[294] Compare PCMc *ka, *kaka ‘plural prefix for demonstrative pronouns’. The same prefixes are suggested here for PMc. Compare also PCMc *kamii ‘you (plural)’ and PMc *kamʷu ‘you (plural)’ (Bender et al. 2003).

[295] *kaka-amii-watu > gga-ami-ej > kæmiej ‘you (pl.)’ (in predicate verb phrases).

A75	**PMc**	*k-ace	throw	
	Nauruan	k-/ařе/-ɟ	throw (something)	
	Nauruan	ařе/-ɟ	throw (something)	
	Nauruan	k-/ařе/-da	cast a net (lit. throw upward)	
	PCMc	*k-ace	throw	
	Marshallese	kadkad	use a throwing net	
	Marshallese	kad, kadey	throw (a net)	
	S.C.(T)	aRe-(y)	to throw (something)	
	Satawalese	yaRe-(i)	throw	
A76	PMc	*kai	to inform	
	Nauruan [296]	ɨ-/ge < *wi-/kai	say, announce	
	Kosraean	kai	to warn, advise, admonish (someone)	
	Marshallese	key-yaŋ	announcement	
	Pohnpeian	kai-r	news	
	Pohnpeian	kai-reeki	to inform	
	Pingilapese	kai-reki-n	to notify	
A77	**PMc**	*kakaa-ua	no, not, nothing, zero	
	Nauruan	kea, keo	no, not, be not	
	Nauruan	e-keo	zero, nothing	
	Kiribati	kákea	no, not	(Trussel and Groves 1978)
A78	**PMc** [297]	*kakaki	hold, clutch	
	Nauruan	agag	hold, accept	
	Marshallese	kōkki	hold something tightly	

[296] From *i-kai (?).

[297] Compare also POc *kukup 'to clutch, hold tight', Marshallese kukuul 'hold tight'.

A79	**PMc** [298]	*kaka-la-ko (?)	run or crawl about	
	Nauruan [299]	gakar/a < *kakkal	run, crawl	MET
	Kosraean	kuhlahk, kuhlahklahk, orahk	crawl, creep (Lee 1976)	
A80	**PMc**	*kakaŋV	sharp	
	Nauruan	ea-/kaŋ	sharp	
	PCMc	*kakaŋi	sharp	
	Kiribati	kakaŋ	sharp	
	Marshallese	kkaŋ	sharp	
A81	**PMc**	*kalamᵛau- (?)	cold, cool with water	
	Nauruan	garamᵛamᵛe	cold, feel cold	
	Pohnpeian	kalamwur	to water, to cool with water	
A82	POc	*kamami, *k-ami	we (exclusive), us (ACD)	
	PMc [300]	*(ka)ka-amami	we (exclusive), us	
	Nauruan	k-æmːʲ/-æ < *gga- < *kaka-	we (ex.), us (in predicate VPs)	
	Nauruan	æmːʲ/-æ < *ga- < *ka-	we (ex.), us (in subject NPs)	
	Nauruan	æmːʲ/-ær	we (dual, ex.), us	
	Nauruan	æmːʲ/-eɟ	we (trial, ex.), us	
	PWMc	*ka{a,Ø}mami, *kami	we (exclusive)	
	Marshallese	kémmém	we (ex.), us	Eastern dialect
	Chuukese	áám	we (ex.), us	
	S.C.(T)	áám	we (ex.), us	
	Woleaian	gaamami, -gemami	we (ex.)	
	Satawalese	yáámem, káámem	we (ex.), us	

[298] Compare also POc *kaRaka 'to crawl', PMc *lako 'go, proceed, (as directional) away'.

[299] Compare also Nauruan /gara/ ‘run about, run off, be lost’ and /imʲi-n gakara/ ‘animals’ (lit. things that crawl or run).

[300] PMc *ka-, *kaka- 'plural prefix for demonstrative pronouns'. Compare PWMc *ka{a,Ø}mami, -kamami ‘we (exclusive)’ (Bender et al. 2003.).

A83	PMc [301]	*kana	food, eat (something)
	Nauruan	an < *gan	eat
	Marshallese	kan	eat (something)
	Marshallese	#kkan	food
	Puluwatese	yana-(n)	food, eat (something)
	Trukese	ana-(n)	his cooked food (to eat)
	Saipan Carolinian	ala-(l)	food, eat (something)
A84	**PMc** [302]	*k{a,o}ut{a,e}	blanket, coverlet
	Nauruan	woije < *goute	cloak, cover
	Kosraean	kæot	cover, blanket, sheet
	Marshallese	kawaj, kawje-	blanket, blanket of
	PCk	*kout{a,e}	blanket, coverlet
	Saipan Carolinian	óuse-(y)	to cover (s.o.)
A85	PMc	*kapi	bottom, but end
	Nauruan [303]	o-/webʲi/-n	bottom, buttocks of
	Kosraean	kapi-(n)	bottom of, end of
	Kiribati	kabi	bottom, but end
	Marshallese	kapi-	bottom, but end
	Pohnpeian	kapi-	bottom, but end
	Mokilese	kap, kapi-	bottom, but end
	PCk	*kapi	bottom, but end
	Chuukese	epi-, -kepi-	bottom, but end
	Mortlockese	aap, api-	bottom
	Puluwatese	yááp, yápi-	bottom, but end
	Saipan Carolinian	ááp, ápi-	buttocks, hip, keel or bottom of a canoe
	Satawalese	yááp, yápi-	bottom, buttocks

[301] Nauruan and the Pohnpeic-Chuukic languages do not continue an initial *k- in this etymon. See the comparison in Bender et al. (2003). Compare also Nauruan /ka/ ‘eat, consume’, which must continue a reduplicated form, PMc *kaka-. It is unclear why the expected sound change *a > e / __Ca is not observed in this word. One possibility is that the final vowel *a was somehow altered before this change took place in Nauruan.

[302] Bender et al. do not reconstruct the initial *k in this word, *{a,o}ut{a,e}.

[303] The origin of the prefix in this word is unclear.

A86	**PMc**	*kapi-sa, kapi-si	oil for skin or hair, anoint	
	Nauruan	abʲid	rub, rubbing, apply oil	
	PCMc	*kapi-sa, kapi-si	oil for skin or hair, anoint	
	Kiribati	kabi-ra	anointing oil, to anoint someone	
	Marshallese	pitpit	rub with oil as medical treatment (Trussel online)	
	Chuukese	epi-ti	anoint him/her with oil or perfume	
	Mortlockese	api-te	to oil, anoint	
	Saipan Carolinian	ápi-ti	anoint (someone)	
A87	PEOc	*kaRa	parrot	(Geraghty 1990)
	PMc	*karakara	tern	
	Nauruan	də/-arar	black noddy (a type of tern)	
	Kiribati	kaakaa	a bird	
	PCk	*karakara	tern	
	Chuukese	araar	white tern	
	Puluwatese	yaraar	a king or sooty tern	
	Saipan Carolinian	araar	species of small, black bird	
	Woleaian	garegare	gray-backed tern	
A88	POc	*karis	to scratch	(Ross 1988)
	PMc	*kari	to scratch	
	Nauruan	wɨri < *iri < *ari	to scratch, scrape, claw	
	Pohnpeian	kɛri-(pʷud)	scratch (as when itching)	
	Pohnpeian	kari- (pʷudɛ)	scratch (an itch)	
	Mokilese	kari-(pʷɔd)	to scratch	
	Mokilese	kari-(pʷɔdɔ)	scratch (something)	
	Mortlockese	aikér	be scratched	
	Mortlockese	aikarɛ	scratch (something)	
	Puluwatese	yáriker, keriker	scratch	
	Puluwatese	keri-(y)	scratch it	

A89	PMc	*kaua (?)	to repeat	
	Nauruan	go/-ej	repeat (something)	
	Kosraean	kohresi	repeat	
	Kiribati	kaua	to relapse, to renew, to repeat, to double, to rival, to augment	(Trussel and Groves 1978)
A90	**PMc** [304]	*pʸapʸa-utiwa	go, depart to the east	
	Nauruan	pʸiju	travel around the coast of Nauru towards the east; travel north while inland; easterly tradewind (moving westward)	
	Kiribati	b'ab'á-ka-rio	depart to the west (Trussel and Groves 1978)	
A91	**PMc**	*kausaa	pelagic fish	
	Nauruan [305]	kudædæ	trevally	RED
	PCMc	*kausaa	a pelagic fish	
	Kiribati	kairaa	a fish	
	PCk	*kawudaa	a pelagic fish	
	Chuukese	owuta	species of tuna (skipjack)	
	Saipan Carolinian	ówuta	species of edible fish found outside reef	
A92	PMc	*kiakia	white or fairy tern	
	Nauruan [306]	də-/gigiæ	white noddy (a kind of tern)	
	PCMc	*kiakia	white or fairy tern	
	Kiribati	kiakia	a bird	

[304] PMc *pʸapʸa 'go, depart', PMc *ka-utiwa 'east'. Compare also Marshallese *kawtéw* 'northeast trade wind'; Chuukese *éétiw* 'east' (Goodenough and Sugita 1980).

[305] The initial *k in this word must have come from pre-Nauruan *g: following reduplication and vowel syncope. The final *-dæ was also reduplicated.

[306] Because the sound change PMc *ki > tʃi is expected here, it is possible that this is a loanword.

A93	POc [307]	*kilala	to know (a person), recognize, be acquainted with; to feel, perceive (ACD)	
	POc	*kilala	sign, symbol	
	PMc	*kilala	sign, symbol	
	Nauruan	tʃit < *tʃinna	to know, to understand	
	PCk	*killa	sign, symbol	
A94	**PMc**	*ki-li-b{u,e}rV (?)	mat	
	Nauruan	i-/tʃi-bʸer	mat	
	Marshallese	kilbur	mat used as a blanket or sheet	
	Mokilese	rohp	mat	MET
	Pohnpeian	lirop	mat used to sleep or sit on	
A95	POc	*kinit	pick, pinch off	
	PMc	*kini	pick, pinch off	
	Nauruan [308]	tʃi-n	picked, collected	
	Kosraean	kin	pick, pinch	
	Kosraean	kinis	pick or pinch (something)	
	Mokilese	kin, kinkin	pinch with the nails, cut grass, pluck feathers, pick flowers	
	Pulo-Annan	kini	to pick up (fruit)	
	Chuukese	kin	be cut, separated, segmented, picked (of fruit)	
A96	**PMc**	*kiki-mama	breast, suckle	
	Nauruan [309]	ki-mama	suckle, breastfeed	
	Nauruan	i-/ki-mama	milk, breast	

[307] Compare also POc *kila 'to know', PMc *kila, kila-a, kila-i 'to know', PCk *kila, kila-i, kula, kula-a, kula-i

[308] The final /-n/ in this word may have been reanalyzed as the passive suffix.

[309] Compare also Kiribati *mæ/mma* 'udder, breasts, suck at the breast', *kamæm/ma* 'to suckle, to give suck to', *mamma, kamamma* 'to suckle, to give suck, to nurse' (Trussell and Groves 1978).

A97	POc	*koe	you, 2sg	
	PMc	*koe, *ko-	you, 2sg; vocative, deictic	
	Nauruan	æ-/we, wo	you, 2sg	
	Kiribati	ŋ-koe, ko-	vocative, independent pronoun	
	PCk	*koe-ña	you, 2sg	(Jackson 1986)
A98	PMc	*kona	to arrive, be able	
	Nauruan	gonæ < *kona-a	be able to do	
	Nauruan	gon gon	smart, able	
	Kiribati	kona	can, be able	
	Kiribati	kona-(a)	be able to do	
	Pohnpeian	kɔnɔ	to catch up with (someone), be on time for (an event)	
	PCk	*ko{l,n}a	to arrive, be able	
	Woleaian	gola-a	to arrive at, reach, land at, come to (shore)	
A99	PEOc	*koRi	grater	(Geraghty 1990)
	PMc	*koyi	bivalve shell, shell knife or grater	
	Nauruan [310]	wiwi	scrape, grate, scrape coconut, scrapper for coconut	RED
	Kosraean	koe, koekoe	scrape, grate, smooth out, plane	
	Kiribati	koikoi	bivalve shell used in scraping food	
	Kiribati	koa	to scrape (a coconut) with a shell	
	Pohnpeian	koykoy	be scraped on a grater (of coconut)	

[310] Compare also the Nauruan doublet /k-iwi/ ‘scrape, grind’ (< *gga-iwi) and /æn k-iwi/ ‘coconut’.

A100	POc	*kukuh	claw, talon, fingernail	
	PMc	*kuku	fingernail, toenail, claw	
	Nauruan	kʷi- < *wwu	nail, claw	
	Nauruan	kʷi/-n bʲe-	fingernail	
	Kiribati	uuki, uki-(na)	fingernail, toenail, claw	
	Marshallese	hakkiy, hakkiyi-(n pay)	fingernail, toenail, claw	
	PCk	*kkú-	fingernail, toenail, claw	
A101	POc	*kulit	skin, bark, peel, shell	
	PMc	*kuli	skin, bark	
	Nauruan [311]	i-/wit, witʃi-	skin, bark	
	Kiribati	kun, kuni-	skin, bark	
	Marshallese	kil	skin, bark	
A102	**PMc**	*kuraauV	vomit, spit	
	Nauruan	uræu	spit, spit out	
	Kiribati	kóukou	to retch, vomit	
A103	**PMc**	*kur{a,e}(-ta,-ti)	pulled back, pull back (of foreskin or eyelid)	
	Nauruan	wer /gæ < *wure	uncover (lit. pull back cover)	MET
	Kiribati	uka	to open, uncover	(Trussel and Groves 1978); metathesis
	PWMc	*kura, kura-ta, kura-ti	pulled back, pull back (of foreskin or eyelid)	
	Marshallese	wérév	pull back foreskin	
	Chuukese	kúre-e-(y)	pull it back (of foreskin), circumcise	
	Puluwatese	kúre-e-(y)	pulled back, pull back (of foreskin or eyelid)	

[311] PMc *kuli-ni 'skin, bark of' > *gulini > *wunini- > *winni- > *witi- > witʃi-

A104	POc	*kutu	louse
	PMc	*kutu	louse
	Nauruan	i-/wi < *wiɟ	louse
	Kosraean	kut	louse
	Kiribati	uti	louse
	Marshallese	kij	louse, bacterium, bug, flea
A105	PMc [312]	*kuyita	octopus
	Nauruan	də-/giga	octopus
	Kiribati	kiika	octopus
A106	POc	*lako	to go
	PMc	*lako, laa	go, proceed, direction away
	Nauruan [313]	ŋow	go, depart
	Kiribati	nako	go, proceed, (as directional) away
	Chuukese	nó, -nó, -nóó-, ná, -náá-, -naa-	go, proceed away from place of reference
A107	PEOc	*lalo	inside
	PMc [314]	*i-lalo	inside
	Nauruan	ɟæn, i-ɟæn	inside
	Kiribati	(i)-nano-(na)	in it, inside of it
	PCk	*lalo	inside
	Pohnpeian	lɔlɛ	inside of him/her/it

[312] Nauruan and Kiribati appear to continue the second *t in this word as a velar stop.

[313] PMc *lako > *lago > *new > ŋow; Compare also Nauruan /nuwæ/, /nuwæw/ 'go'.

[314] Compare PMc *lalo. An initial *i is reconstructed here to account for the sound change *l > ɟ in Nauruan, and because there is evidence for it from Kiribati.

A108	PMc	*lama	thought, be in mind	
	Nauruan [315]	ka/mʲærær	think, ponder	MET, RED
	Nauruan	ni/mʲen	think, consider	MET
	Kosraean	lʌma	think it, picture (something) in ones mind	
	Pohnpeian	lamalam	thought, idea, opinion, common sense, religious belief	
	PCk	*lama, lamalama	thought, be in mind	
A109	PMc [316]	*laŋ{i,e}	sky, heaven, storm	
	Nauruan	də-/naŋ < *laŋe	cloud	
	Kiribati	nang	cloud	
	Marshallese	ļoñanwa	cirrus clouds	
A110	POc	*laŋo	housefly	
	PMc	*laŋo	fly (insect)	
	Nauruan [317]	e-/ŋomʸ	fly (insect)	MET
	Kiribati	naaŋo, te-naŋo	fly (insect)	
	Marshallese	ļaŋʷ, ļwaŋʷ	fly (insect)	
	PCk	*laŋo	fly (insect)	
A111	POc	*LapaR	flash of lightning	
	Nauruan	mʲe/rabʸ	lightning	
	Marshallese	meram	light	

[315] The *l > r change in this word requires that there was a following [+back, +round] segment. The Old Nauruan form from which this derives may have been *gaga-malala-ua ‘thought’, with the general classifier suffix *-ua, or another unidentified suffix.

[316] Compare PMc *laŋi ‘sky, heaven, storm’.

[317] PMc *laŋo > *laŋʷo > *leŋʷ > *loŋʷ >> ŋʷol (MET) > ŋʷon > ŋʷoŋʷ > e-/ŋomʸ

A112	**PMc** [318]	*lau-taSi	body of salt water	
	Nauruan	i-/ji-ted	sea, ocean	
	Nauruan	bʸara-/jited	salty	
	Kiribati	nei, (te)-neinei	a fresh water pool or pond	
	Marshallese	law-jét	salt water	
	Marshallese	lọjet	sea	(Abo et al. 1976)
A113	PMc	*lawa	hibiscus	
	Nauruan	də-/ro/t	hibiscus flower	
	Kosraean	lo	young Hibiscus tiliaceus	
	Marshallese	ļaw	Hibiscus tiliaceus	
	Marshallese	rooj	hibiscus flower	(Abo et al. 1976)
	Marshallese	ļọ	a plant, hibiscus, Hibiscus tiliaceus L. (Malvaceae).	(Abo et al. 1976)
A114	**PMc** [319]	*lepV	land	
	Nauruan	jeb	land, country	
	Kosraean	lihp	a piece or section of land	
A115	PMc	*lewe	tongue	
	Nauruan	jo-	tongue	
	Kosraean	lɔ, lɔɔ-(l)	tongue, his tongue	
	Marshallese	lew, lewe-	tongue	
	Kiribati	newe	tongue	
	Pohnpeian	loo-	tongue	

[318] PMc *lau ‘pool, have liquid’, PMc *taSi ‘salt water’.

[319] Compare PMc *lape 'red clay', Kosraean *lap* 'a kind of clay'

A116	POc	*lima	five	
	PMc	*lima-ua	five (general)	
	Nauruan	e-/jimʲo < *a-/jimʲeu	five	
	Kiribati	nima-ua	five	
	Pohnpeian	lima-w	five (general)	
	PCk	*lima-ua	five (general)	
A117	PMc	*lipʷa	ditch, hole (in ground)	
	Nauruan	i-/jib	hole, pit	
	Kosraean	lʌf	hole	
	Kiribati	nibʷa	post hole, small pit or bed for Cyrtosperma	
	Marshallese	lébʷ, libʷi-, libʷe-	grave, tomb	
	PCk	*lipʷa	ditch, hole (in ground)	
	Pohnpeian	liipʷ	large hole in the ground	
	Mokilese	lipʷ	hole, crater, scar	
	Pingilapese	lipʷ	hole	
A118	POc	*lisa	nit, louse egg	
	PMc	*sili	nit, louse egg	
	Nauruan	i-/dij	nit, louse egg	
	PWMc	*sili	nit, louse egg	
	Marshallese	tél	nit, larvae of lice	
	Mokilese	dil	small lice	
A119	**PMc** [320]	*luTu-ŋi	to jump on something	
	Nauruan [321]	iři	jump, leap (v)	RED, MET (see footnote)
	Pohnpeian	lusi-(da)	to jump up, be surprised	
	PCk	*l{u,ú}T{u,ú}	to jump	
	Pulo-Annan	nútú-(ŋi)	to jump or leap on it	
	Woleaian	lútú-(ŋi-i)	jump or leap on it	
	Saipan Carolinian	llus, lullus	to jump	

[320] Compare PMc *luTu ‘to jump’.

[321] PMc *luTu/-ŋi > *luti >> luluti (RED) > ruruti > ririji >> irrij (MET) > iři

A120	**PMc**	*maaŋu	pandanus leaf	
	Nauruan [322]	mʲæg	dry, dry up	
	Nauruan	mʲæmʲæg	dry, dry up	RED
	Kiribati	maeke	dry, crisp	(Trussel and Groves 1978)
	Marshallese	mahaŋ	pandanus leaf	
	Pulo-Annan	maaŋú	dry pandanus leaf	
	Chuukese	#mééŋ	cured pandanus leaf	
	Pohnpeian	mɛŋ	withered, dry, dead vegetation (Sohl et al.)	
	Mokilese	meŋ, meŋmeŋ	dried up, dried (of leaves)	
A121	POc	*mai	and	
	PMc [323]	*me	and	
	Nauruan	mʲe	and	
	Marshallese	yem, yim	and, with	MET
	PCk	*me	and, with	
A122	PMc	*mai	breadfruit	
	Nauruan	də-/mːʲe < *mʲamʲai	breadfruit	RED
	Kiribati	maai, te-mai	breadfruit	
	Marshallese	may	breadfruit	
	Pohnpeian	maay	breadfruit	
	PCk	*mai	breadfruit	
	Chuukese	mááy, meyi-, -mey	breadfruit	
A123	PMc	*mai	from	
	Nauruan	æ-/mʲi/-n	be from (a place)	
	Kiribati	mai	from	
	PCk	*me	from	

[322] **PMc** *maaŋu > *mʲaeŋʷ > *mʲæŋʷ > mʲæg; Compare PMc *maŋu ‘pandanus leaf’.

[323] Bender et al. (2003) reconstruct only PMc *ma.

A124	**PMc**	*ma{i,u}ŋi	left handed	
	Nauruan [324]	e-da-/mʸow	left, left hand side	
	PCMc	*ma{i,u}ŋi	left handed	
	Kiribati	maiŋ	left handed	
	Marshallese	(han)-miyiŋ	left hand, left half of human body	
	Mokilese	meyŋ	left	
A125	**PMc**	*makuri	work, action	
	Nauruan	mʸugur	work	
	Nauruan	mʸugur/-eɟ	do magic on someone	
	Kiribati	makuri	action, work, occupation, duty, operation, labor, employment, charge	
A126	PMc [325]	*ma-lie	forget	
	Nauruan	mʲeɟi/-an	forget	
	Kosraean	mʌ-lye-(la)	forgetful, unmindful, absent minded	
	Marshallese	mma-léyléy	absent minded, forgetful, oblivious	
	Pohnpeian	mʌ-lye-(la)	forgetful, unmindful, absent minded	
A127	PEOc	*ma-ñawa	breath	(Ross 1988)
	PMc	*ma-{n,ñ}awa	life, alive	
	Nauruan [326]	ka-/nano	breathe	RED
	Kiribati	ma-nawa	pit of the stomach	
	Marshallese	me-newnew	to breathe	

[324] PMc *mauŋi > mʸeuŋʷ > *mʸeug > mʸow

[325] Compare also PMc *maleku, maleleku, malekuleku ‘forget’.

[326] Nauruan appears not to have continued the *ma- prefix in this word. Compare also /ekanano/, with the same gloss.

A128	POc	*manoŋi	fragrant, sweet smelling	
	PMc	*manoŋi	fragrant	
	Nauruan	mᵛoŋoŋ/-e-da	stink, smell up	
A129	PEOc	*maqa	ashamed	
	PMc	*maa	ashamed	
	Nauruan	mːʲæ/ur < *mamaa	shy, embarrassed, ashamed	RED
	Kiribati	maamaa	shyness, shame	
	Marshallese	mmālwewe	embarrassment caused by actions of another	(Abo et al. 1976)
A130	POc	*ma-qudip	living, alive; grow, flourish; fresh; heal, cure, revive, recover; vital principle, soul, spirit; flame	(ACD)
	POc	*maquri(p)	alive	(Ross 1988)
	PMc	*mauri	alive	
	Nauruan [327]	tʃi-mᵛor < *ki-mauri	alive, life, flourish, pleasurable	
	Kosraean	moul	alive, live	
	Marshallese	méwir	live, life, existence, alive, cured	
	Pohnpeian	mowr	alive, raw	
	PCk	*maúrú	alive	

[327] Compare POc *ki- ‘allative marker: to, toward’ (ACD).

A131	PMc	*ma-rama	moon; bright, luminous	
	Nauruan	ma-ramʲ/ə-n	moon	
	Nauruan	e-/ma-ram	month	
	Kosraean	mæ-lʷem	moon, month	
	Kiribati	ma-ama	moonlight, be moonlight	
	Marshallese	me-ram	bright, light, flash, glow, luminous	
	Pohnpeian	ma-ram	moon	
	PCk	*rama, ma-rama, ta-rama	bright, luminous	
	Sonsorolese	ma-lama	moon	
	Old Mapian	ma-ram	moon	
A132	POc	*ma-Ruqanay	male	
	PEOc	*mʷaqane	man, male	
	PMc [328]	*mʷaane	man, male	
	Nauruan	e-/mːʏæn	man, male	RED
	Kiribati	mʷaane	man, male	
	Marshallese	mʷmʷahan	man, male, wife's brother	
	PCk	*mʷaane	man, male	
A133	PMc	*ma-Sawa	deep sea, open ocean	
	Nauruan	mʲa-go < *mʲa-Dow	deep sea, overseas	
	Kosraean	me-ɔa	ocean	
	Kiribati	ma-rawa	deep sea, open sea	
A134	PMc	*ma{s,S}o	cooked	
	Nauruan	mʲag/ə-n < *mʲaDo	cooked, ready to eat	
	Kiribati	maro-(a)	food, refreshment	
	Marshallese	mat	cooked	
	PCk	*mado, maddo	cooked	

[328] Compare also Marshallese *ṃṃaan* (Abo et al. 1976).

A135	POc	*mata	eye, face
	PMc	*mata	eye, face
	Nauruan	mʲe- < *mʲeɟ	eye, face
	Marshallese	maj, meja-	eye, face
	Mokilese	maj, mijɔ, miije-(n)	eye, face
A136	POc	*matakut	fear, fearful, afraid
	PMc	*ma-taku	fear, be afraid
	Nauruan	mio < *mi-ɟew	fear, afraid
	Marshallese	mi-jak	fear, horror, afraid
	Mokilese	mi-jik	afraid, scared
A137	PMc	*mate	die, lose consciousness
	Nauruan	i-/mʲæ	dead one
	Nauruan	mʲæ/-n	dead, died
	Kosraean	mʷet	to die
	Kiribati	mate	die, lose consciousness
	Marshallese	méj	die, lose consciousness
A138	POc	*matiruR	sleep
	PMc [329]	*matiu (?)	sleep
	Nauruan	(i)mi(j) mi(ɟ), (i)mi(j)	sleep, dream
	Kiribati	mæ/tu	sleep
	Kiribati	matu	sleep, nap, immobility
	Kiribati	mi	dream
A139	PMc	*ma-tolu	thick
	Nauruan	e-/meɟ	thick, broad
	Kosraean	mæ-tol	thick, dense
	Kiribati	ma-ten	thick

[329] Compare PMc *maturu ‘sleep’, Kosraean *molmol* ‘sleep soundly, sleep like a log’.

A140	**PMc**	*ma-wono	perspiration
	Nauruan	eæ-/mʲaoŋ	sweaty
	PCMc	*ma-wono	perspiration
	Kiribati	ma-ono	perspiration
	PCk [330]	*(?) ma-wonoono	perspiration
	Trukese	mo-onoon, mo-onoone-(n),mo-onoonu-(n)	perspiration, sweat, perspiration of
	Puluwatese	mó-óniyón	perspiration
	Saipan Carolinian	(bʷoo-l) mó-óliyól, mʷó-óliyól, mʷó-óliyal	perspiration
A141	PMc	*meña	thing
	Nauruan	i-/mʲin	thing
	Nauruan	tʃi-/mʲin/e < *ki-/meña/-ee	(there) is, (there) are
	Kosraean	mee-(n)	one of, thing of or for
	Kiribati	mena	thing
	Marshallese	men	thing, matter, object; a person, unnamed
	Pohnpeian	mɛɛ, mɛɛ-(n)	thing, one of, thing of
	Mokilese	mii-(n)	thing of
A142	PMc	*metu	old times
	Nauruan	a-/mʲej/-wak	old
	PCk	*metu	old times
	Mokilese	meej	before, long ago
	Chuukese	musu-(we)	ancient times
	Saipan Carolinian	mʷoi-(we), mʷei-(we)	the past (at least two or three generations ago), in olden days
	Woleaian	mʷoosu, mʷosu-, mʷosu-(wee)	ancient times
	Ulithian	mésu-(we)	old days, long gone
	Pulo-Annan	moodu, modu-	ancient times

[330] Question mark appears in Bender et al. (2003).

A143	PEOc	*{m,mʷ}a-ntauntau	soft
	PMc	*ma-caucau	soft
	Nauruan	mʲeřořo	soft
	Kiribati	ma-raurau	soft
A144	POc	*motu-[sz]	cut, sever, break off
	PMc	*mʷotu, mʷotu-Si	cut, sever, break off
	Nauruan	mʸid < mʸiji-d	cut, snap, divide
	Kosraean	wot	cut
	Kosraean	uti	cut (something)
	Kiribati	mʷoti	broken off
	Marshallese	mʷijmʷij, mʷiji-t	cut
	Pohnpeian	mʷey	be broken
	Pohnpeian	mʷey-d	to break (something, as a string)
	Mokilese	mʷey	snapped, divorced
	Mokilese	mʷey-d	snap (something)
	PCk	*mʷotú, mʷotú-di	cut, sever, break off
A145	PEOc	*mulo	rub together, twist, rumple
	PMc	*mʷulo	rub together, twist, rumple
	Nauruan	mʸun mʸun	rub together, wipe
	PCk	*mʷulomʷulo	rub together, twist, rumple
A146	PEOc	*muqa	ahead, going before
	PMc	*mʷ{o,u}a	ahead, going before
	Nauruan	æ-/mʸo	first, ahead
	Kiribati	mʷoa	first
	Marshallese	mʷaha-	ahead, before, place in front of
	Pohnpeian	mʷowɛ	ahead of him, to offer as a first fruit
	PCk	*mʷmʷa-, mʷua-	ahead, going before

A147	PMc	*mʷaau	good, healthy	
	Kosraean	wo	good, agreeable	
	Nauruan	mːʸo < *mʸamʸeu	good, beautiful	RED
	Marshallese	ṃṃa-n	good	(Abo et al. 1976)
	Pohnpeian	mʷaaw	good	
	Mokilese	mʷeew	good, pretty, nice	
A148	**PMc**	*mʷan{i,e}	knowledge, wisdom	
	Nauruan	e-/mʸæn	knowledge, wisdom	
	Kosraean	lahl-mwetmwet	wise, learned	(Lee 1976)
	Pohnpeian	mwahngih	to know, to understand	(Sohn et al.)
A149	PMc	*mʷare	shoulder garland	
	Nauruan	e-/mːʸar < *mʸamʸar	necklace, lei	RED
	Kiribati	mʷae	shoulder garland	
	Marshallese	mʷarmʷar	necklace, wear a necklace	
	Marshallese	mʷare-	possessive classifier for flowers, medals, necklaces, or fishing baskets	
	Pulo-Annan	mʷaale, mʷale-mʷale	shoulder garland	
	Saipan Carolinian	mʷáár; mʷare-	possessive classifier for garlands, leis, necklaces … worn around the head or neck	
	Satawalese	mʷáár, mʷaremʷar	shoulder garland	
	Chuukese	mʷáár, mʷárámʷár, mʷaramʷar, mʷári-n, mʷári-ni	lei, wreath, wear a lei, his lei, acquire as a lei	

A150	PEOc	*mʷata	snake	
	PMc	*mʷata	worm	
	Nauruan	e-/mʸe < *mʸej	worm, maggot	
	Nauruan	eæ/mʸat < *mʸatt (?) < *mʸateta (?)	eel, eel tribe	RED
	Nauruan	eæ/mʸatəmʸat	a Nauruan tribe [331]	
	Kosraean	wet	worms	
	Kiribati	mʷata	worm	
	Marshallese	mʷaj	eel, intestinal worm	
A151	**PMc**	*mʷaTie	to sneeze	
	Nauruan	mʸeř < *mʸetʃi (?)	to sneeze	
	PCMc	*mʷaTie	to sneeze	
	Chuukese	mʷesi	to sneeze	
	Mortlockese	mʷasey	to sneeze	
A152	**PMc** [332]	*mʷ{i,u}-caa, mʷ{i,u}-caacaa	red	
	Nauruan	mʸiřæřæ	red	
	Kiribati	uráura	red	(Trussel and Groves 1978)
	Marshallese	mir	red colored	(Abo et al. 1976)
	Marshallese	ṃūrar (ṃ = [mᵘ])	reddish color	(Abo et al. 1976)

[331] Some consultants have stated this tribe name refers to eels, but other sources have suggested it refers to worm-like larva in the water.

[332] The word for ‘red’ appears to derive from a prefixed form of PMc *caa, cacaa 'blood'.

A153	POc	*-ña	3sg. possessor of inalienable possessed nouns	
	PMc	*-na	verb suffix indicating acquisition or ownership	
	Nauruan	-n	3SG.POSS	
	PCMc	*-ni, -na	verb suffix indicating acquisition or ownership	
A154	**PMc** [333]	*ña-Sa	when?	
	Nauruan [334]	i-/ɟet	when (future)	RED
	Pohnpeian	y-aa-d	when	
	Saipan Carolinian	(i)-lee-t, (i)-lee-ta	when	
A155	PMc [335]	*ñaña, ñañaña	taste, flavor	
	Nauruan	i-/tæ < *e-ññaV	tasty, delicious	
	Nauruan	ne-n < *ñaña	taste, flavor of	
	Kiribati	nana-ma	to taste or test the taste of food	
	Marshallese	nnan	musty taste, moldy taste	
	PCk	*nna-	taste, flavor	
A156	PEOc	*ñañoRa	yesterday	(Geraghty 1990)
	PMc	*ñañoa	yesterday	
	Nauruan	nene	yesterday	
	Kiribati	(ŋkoa)-nanoa	yesterday	
	Marshallese	(yi)-nney	yesterday	

[333] Cf. PMc *ñai-Sa ‘when?’

[334] PMc *ña-Sa > *ñe-Sa >> *ñe-SaSa (RED) > *ñe-d: > i-/ɟet

[335] Compare also PMc *ñañau ‘delicious, taste good’.

A157	POc	*natu	child, classifier for cherished possessions	
	PMc	*natu	child, classifier for cherished possessions	
	Nauruan	ŋe-	child (of)	
	Kosraean	nætʌ-(l)	his child	
	Kiribati	naati, nati-na, natinati	child; classifier for cherished possessions	
	Marshallese	naji-, néji-	child; of, possessive classifier for children, pets, money, watches, or ones Bible	
	Pohnpeian	naay, nɛy-, naa	child; possessive classifier for children, pets, toys	
	Mokilese	nɔynɔy	have many children	
A158	PMc	*ney{a,e}	leg	
	Nauruan	nænæ- < *nea nea	foot, leg	RED
	Kosraean	niyɛ-(l), niye-(n)	his leg, leg of	
	Marshallese	ney, neye-(n)	leg, leg of	
	Pohnpeian	nɛɛ	his leg	
A159	POc	*-ni	of, pertaining to	
	PMc	*-ni	of, pertaining to	
	Nauruan	-n	of, pertaining to, genitive suffix	
A160	**PMc**	*niŋi	small, little, tiny	
	Nauruan	e-o-/niŋ < *te-ua-niŋi	small one, child	
	PWMc	*niŋi	small, little, tiny	
	Kiribati	(ua)-ŋiiŋii	very small	
	Marshallese	niŋ	small, young, little, tiny, puny	
A161	POc	*niuR	coconut	
	PMc	*niu	coconut	
	Nauruan	i-ni	coconut palm	
	Kiribati	nii, nii-	coconut	
	Marshallese	niy	coconut	

A162	**PMc** [336]	*ŋa (?)	where?	
	Nauruan	i-/ŋa	where?	
	Kiribati	enga	where is it?	
	Kiribati	nga	in what place?	
	Pohnpeian	iahnge	where? (pl.)	(Sohl et al.)
A163	**PMc** [337]	*ŋa	I, 1sg	
	Nauruan	ŋa	I, 1sg	
	Kosraean	ŋa	I, 1sg	
A164	PMc	*ŋai-Sa	when?	
	Nauruan [338]	ŋætæ	when (past)	RED
	Kiribati	(ni-)-ŋai	when	
	Marshallese	ŋaya-t	when	
A165	POc	*ŋipo	tooth	
	PMc	*ŋio	tooth	
	Nauruan	mᵛi- < *ŋʷi < *ŋio	mouth, tooth	
	PCMc	*ŋii	tooth	
	Marshallese	ŋiy	tooth	
	Chuukese	-ŋú	tooth (in some compounds)	
A166	POc	toka	sit, squat; come to rest; stay in a place; settle down, as birds on a tree	
	PMc	me-ka-	stay, rest, sit	
	Nauruan	mʲeg	stay, live in a place	
	Nauruan	mʲegə-da	sit, rest, perch	
	Kosraean	muhta	live, stay	
	Kiribati [339]	máeka	abide, dwell, reside, live	

[336] Compare PMc *iaa ‘where?’.

[337] Bender et al. (2003) reconstruct *ŋaa, *ŋau.

[338] PMc *ŋai-Sa >> *ŋai-SaSa (RED) > *ŋæ-dːe/-a > ŋætæ ‘when’

[339] PMc *t is sometimes lost in Kiribati where *k occurs in the same word (Bender et al. 2003: 5, footnote 7).

A167	**PMc**	*okatatae (?)	fly	
	Nauruan	oweta	fly	
	Marshallese	jokwadikdik, kōtta dede, kōttāte	fly low	(Abo et al.)
A168	POc	*onom	six	
	PMc [340]	*wono-ua	six (general)	
	Nauruan	a-/ŋo < *ono-u	six	
	Kosraean	on	six	
	Kiribati	one-	six	
	Pohnpeian	aun, oun, wɛnɛ-	six	
	Mokilese	wono-	six	
	PCk	*woono, wono-	six	
A169	PMc	*oo	that (out of sight or in the past)	
	Nauruan	-o	far distance	
	Kosraean	ɔ	that (out of sight or in the past)	
	Marshallese	yew	that (out of sight or in the past)	
	Pohnpeian	-o	that (out of sight or in the past)	
	PCk	*wee	that (out of sight or in the past)	

[340] Bender et al. (2003) do not reconstruct the word for 'six' with the general classifier suffix *-ua, though they do for most of the other numerals. Nauruan is hypothesized to continue all PMc numerals with the PMc general classifier suffix *-ua.

A170	POc	*oRo	to go, to come	
	PMc	*(o)ro	to go, to come	
	Nauruan	or	come, appear	
	Nauruan	ro/-ga < *ro-Sa	rise, ascend, come up; move away from the shoreline, from inland or from the ocean	
	Kiribati	roko	to arrive, to come	
A171	**PMc** [341]	*pacapaca-aua	a flat fish	
	Kosraean	asrwacsra	a stingray, a kind of fish	
	Nauruan	də-/bʲařəbʲařawa	stingray	
	Kiribati	aua	a fish	
	PCk	*paca	handle, tail of fish	
A172	**PMc**	*palia	side	
	Nauruan	bʲij biji-	hips, sides (of body)	RED
	PCk	*palia	side	
	Mortlockese	paliye-(n)	side of	
	Puluwatese	peliy, peliye-	side	
A173	POc	*papine, *pai-p<in>ai	woman, female	
	PMc	*faifine	woman	
	Nauruan	i-/en < *i-/æin	woman	
	Kosraean	ɛn	woman	
	Kiribati	aiine	woman	
	PPhn	*peine	woman	

[341] Compare PMc *paca, pacapaca ‘foot, flat’, PMc *aua ‘a kind of fish’. The Nauruan word continues Old Nauruan *də-bař bař-aua.

A174	**PMc**	*pa(t)ak{a,u} (?)	bad, evil
	Nauruan	bʲækæ	bad, evil
	Kiribati	buákaka	bad, poor in quality, evil, sinful
	Kiribati	buakaka	bad, evil, wicked, naughty, vicious, malicious, pernicious, hurtful, disagreeable, dirty, impure, unfit
	Pohnpeian	patukul	very bad
A175	**PMc** [342]	*pei, pepei	stone structure
	Nauruan	e-/pʲe < *ppei	stone
	Nauruan	pʲe/-n nænæ-	ankle
	Nauruan	pʲe/-n bʲe-	heel of palm
	PCMc	*pei	stone structure
	PCk	*peyi	stone structure
	Pohnpeian	peey	altar, any ancient structure of stones, a pile
	Marshallese	ppéy	a platform of rocks, build a pile of rocks
A176	PMc	*peti, pepeti	to float
	Nauruan	pʲi < *pepeti	float
	Nauruan	e-pʲi	float, hang, suspend
	Kiribati	beti, beibeti	to float
	Marshallese	ppéj	to float
	Pohnpeian	pey	float
	PCk	*peti, ppeti	to float
	Chuukese	pi (or) pii, ppii	to float
A177	**PMc** [343]	*pᵛaterV (?)	lip
	Nauruan	bᵛate-	lip
	Pohnpeian	pahres (metathesis)	lower lip

[342] Compare PMc *fatu ‘stone’. Compare also Kosraean *paht* ‘foundation stone, corner stone’ (Lee 1976).

[343] Compare also Pohnpeian *pohris* 'upper lip'.

A178	**PMc**	*pʷawe	old, ancient	
	Nauruan	e-bᵛe	old	
	Kiribati	bawe	old, ancient	
A179	**PMc**	*pᵛeV (?)	divination, spell	
	Nauruan	tʃi-/bᵛe < *ki-pᵛeV	cast a spell, enchant	
	Pohnpeian	pweh	divination, spell, or magical rite	(Sohl et al.)
A180	POc	*pijiko	flesh	
	PMc	*fiSiko	flesh	
	Nauruan [344]	duw- < *i-diw	flesh, meat, muscle	
	Pohnpeian	uduk	flesh	
	PCk	*fidiko	flesh	
	Chuukese	futuk	flesh	
A181	**PMc** [345]	*pile{l,n}ewe (?)	spit, saliva	
	Nauruan	bʲerere	spit, saliva, to spit (vulgar)	
	Pohnpeian	pilen ewe	saliva	
A182	POc [346]	*pilu	a large marine fish, the jackfish or trevally	
	PMc	*filu	fish, a type of fish	
	Nauruan	iju < *ilu-V	fish, sea creature(s)	
	Kosraean	folfol	a kind of fish	(Lee 1976)
	Kosraean	olwol	a kind of fish, tuna	
	Kosraean	ohlohl [ɔlɔl]	a kind of fish	

[344] The initial *i in this word appears to have been reanalyzed as the nominal prefix /i-/. Cf. Nauruan /duw-n/, [duwən] ‘body of; his/her body’.

[345] Compare PMP *ibeR 'saliva in the mouth; drool; desire, crave, lust for'. Compare also Kiribati *baroa* 'to spit on, to cover with …', *baáware* 'to spit', *baware* 'spit, saliva'.

[346] Compare also POc *pilu pilu ‘small trevally varieties’, POc *piRu piRu ‘sailfish’.

A183	POc	*pitu	seven	
	PMc	*fitu-ua	seven (general)	
	Nauruan	e-/iju	seven	
	Kosraean	it	seven	
	Kiribati	itu-ua	seven	
A184	**PMc**	*p^{w}ot{o,e}	swell, become round	
	Nauruan	p^{v}e < *p^{w}op^{w}ote	swollen, round, circular, go round	RED
	Nauruan	a-/p^{v}e	egg	
	PCMc	*p^{w}oto	swell	
	Marshallese	b^{w}b^{w}ej	swollen, swell, lump	
	Pohnpeian	mp^{w}osa-(da)	to swell up, rise (as bread)	
	Woleaian	bba-aliyeli	round	
A185	POc	*puaq	fruit; seed; blossom; egg; nut; testicle; numeral classifier for roundish objects; to fruit, bear fruit; show first signs of pregnancy; to swell, of the sea	
	PMc	*wuaa	fruit	
	Nauruan	k^{w}æ- < *wwaa	fruit, flower	RED
	Kiribati	uaa	fruit	
	Marshallese	kwōle	fruit	(Abo et al.)
	Marshallese	wiwaa	bear much fruit or many flowers	
	PCk	*wuwaa	fruit	
	Saipan Carolinian	wwa, uwa, uwaa-	fruit, flower, it’s fruit	
	Puluwatese	wuwa	fruit, flower, bur	

A186	POc	*pua-ti, pua-ta	carry, convey, transport	
	PMc	*wua, wuawua, wua-ti, wua-ta	carry, convey, transport	
	Nauruan	ota	carry, take	
	Kiribati	uo-ta	to carry (something), something carried	
A187	**PMc** [347]	*pʷa-	to say	
	Nauruan	pʸa/n < *pʸapʸa-	to say, to speak	RED
	Kosraean	fæ-k	say, tell, announce	
	Marshallese	bʷah	to say	
	Marshallese	bōḷa	say	(Abo et al. 1976); Eastern dialect
	Mokilese	pʷa	say	
	Mokilese	pʷee-ŋ	say to, tell (someone)	
A188	**PMc** [348]	*pʷaak{o,u}-lou (?)	break, smash, shatter	
	Nauruan	bʸækʷoro	break, shatter	
	Kosraean	fok	break, smash (of brittle objects)	
	Kosraean	fokfok	broken, smashed	
	Kosraean	fuku-l	break or smash (something)	
	Marshallese	bʷilakʷ (metathesis)	break, crease, fracture (something)	
A189	**PMc**	*pʷaca	type of round basket	
	Nauruan	bʸeř	basket, bag, stomach	
	PCMc	*pʷaca	type of round basket	
	Kiribati	bʷara	a cap-like basket made of coconut leaf	
	PCk	*pʷaca	type of round basket	
	Saipan Carolinian	bʷaash, bʷaaR	type of round basket	
	Woleaian	baashe, bashe-	type of round basket	

[347] Compare PMc *pʷaa ‘to say’.

[348] Compare also PMc *pʷ{a,e}la, pʷ{a,e}la-ŋi, pʷ{a,e}la-ŋaki 'to split something open'; PCMc *pʷelu 'break'

A190	**PMc**	*pʷ{a,e}	because	
	Nauruan	bᵛe	because	
	Kosraean	pihlacni [piɬɛni]	as, since, because	
	PCMc	*pʷ{a,e}	because	
	Kiribati	bʷa	because	
	Marshallese	bʷey	because	
	Pohnpeian	pʷɛ	because	
	PCk	*pʷ{a,e}	because	
A191	PMc	*pʷaku	open (as bud or blossom)	
	Nauruan	bᵛæw	open	
	Nauruan	bᵛe/i-da	open up	
	Marshallese	(hal)-bʷékʷ	flower bud	
	Pohnpeian	mpʷɛk	flower bud	
	Puluwatese	pʷak	open a bit (as a bud)	
A192	POc	*pʷalu	cover, lid	
	PMc	*pʷalu	cover, lid	
	Nauruan	bᵛaŋ < *bᵛaŋu	covered, blocked, plugged	
	Nauruan	a-/bᵛaŋ/-eɉ	cover, conceal, hide (something)	
	Marshallese	bʷal	covered over	
	Marshallese	(kʷe)-bʷal	cover an earth oven with leaves	
	Woleaian	balú-ú-(we)	cover it	
	Chuukese	pʷénú-ú-w	cover it	
A193	PMc	*pʷaŋa	hole	
	Nauruan	e-/pᵛaŋ	hole, pit, ditch	RED
	PCMc	*pʷaŋa	hole	
	Kiribati	bʷaŋa	fish trap	
	Kiribati	bʷaŋa	hide in a hole	
	PCk	*pʷaŋa, pʷpʷaŋa	hole	
	Woleaian	bbaŋe	crevice, have holes	
	Pulo-Annan	pʷaaŋa, pʷaŋa-	vagina	

A194	**PMc**	*pʷapʷa-	go, depart	
	Nauruan [349]	pʸæ/go	travel towards the shoreline from inland	
	Nauruan [350]	pʸo/e	travel inland, away from the shoreline	
	Nauruan [351]	pʸi/ju	travel around the coast of Nauru towards the east; travel north while inland; easterly trade wind (moving east to west)	
	Nauruan [352]	pʸæ/wæ	travel around the coast of Nauru towards the west; travel south while inland; westerly trade wind (moving west to east)	
	Kiribati	b'ab'á-ka-rio	depart to the west	(Trussel and Groves 1978)
	Kiribati	b'ab'á-ka-rake	depart to the east	(Trussel and Groves 1978)

[349] **PMc** *pʸapʸa-Sawa ‘go towards the sea’. Cf. PMc *ma-Sawa > mʲago ‘deep sea, open sea’.

[350] **PMc** *pʸapʸa-watu ‘go walking in a direction’. Cf. PMc *watu ‘towards or in a direction’.

[351] **PMc** *pʸapʸa-kautiwa ‘go east’. Cf. PMc *kautiwa ‘east’.

[352] **PMc** *pʸapʸa-wae ‘go walking in a direction’. Cf. PMc *wae ‘leg, foot, walk in a direction’. The gloss for PMc *wae ‘walk in a direction’ is suggested here is based on reflexes of *wae in Bender et al. (2003) that reference walking. Note that this word refers to circumnavigation towards the westernmost point of the island. This may have originally referenced walking against the easterly trade winds, towards the west.

A195	**PMc** [353]	*pʷata, pʷapʷata	swell, become round
	Nauruan	pʸe < *pʷapʷata	swollen, round, circular, go round
	Nauruan	pʸe /mʲe-n	dizzy, drunk (lit. eyes/face go round)
	Marshallese	bʷbʷej	swollen, swell, lump
	Woleaian	bba-aliyeli	be round
A196	PMc	*pʷecpʷece	white, powdered lime
	Nauruan [354]	bʸuř bʸuř	white
	Kosraean	fasrfasr, fasr	white, powdered lime
	Pohnpeian	pʷɛtɛpʷɛt, pʷɛɛt	white, powdered lime
	Mokilese	pʷɔs	limestone
	PCk	*pʷece, pʷecepʷece	white, powdered lime
A197	PMc	*pʷeki	carry, take
	Nauruan	a-/bʸu < *a-bʸuw	carry, take
	Saipan Carolinian	bʷughi, bʷoghi	to carry, get, take, bring, transport (something)
A198	**PMc**	*pʷoa, upʷoa	fight, combat
	Nauruan	bʸo	fight, battle, have a match
	Nauruan	ubʸo	fight, attack
	Nauruan	bʸoa/-n	crash into, clash with, fight with
	Kiribati	bo	contact, meeting, fight, combat
A199	**PMc**	*pʷuaka	help, assist
	Nauruan	bʸuag	help, assist
	Kiribati	búoka	help, aid, assistance

[353] Compare also PCMc *pʷoto ‘swelling’ (Bender et al. 2003).

[354] The vowel correspondence in the Nauruan cognate remains unexplained.

A200	**PMc** [355]	*pʷuk{a,o}-ti	knot, node, knot it	
	Nauruan	i-pᵛut	knot	
	Kosraean	foko	knot, node	
	PCk	*pʷuk{a,o}-ti-	knot, node	
	Pulo-Annan	pʷuko-di	tie it together, knot it	
	Woleaian	bugo-si-(i)	tie it, connect it	
	Woleaian	bugo-tagi	be tied, fastened	
A201	**PMc**	*pʷukari	sedge	
	Nauruan	i-/bᵛugibᵛugi	grass, weeds	RED
	PWMc	*pʷukari	sedge	
	Marshallese	bʷikér	a plant (Cyperus ferax)	
	PCk	*pʷukari	sedge	
	Woleaian	bugori	several types of grass	
A202	**PMc**	*pʷukele	joint (of body), knot	
	Nauruan	bᵛurə- < *bᵛulewe	joint (of body)	MET
	Nauruan	bᵛurə/-n nænæ-	knee	
	Nauruan	bᵛurə/-n bʲe-	elbow	
	Pohnpeian	pʷukɛl, pʷukɛlɛ	knot, joint, node, its knot	
A203	PMc [356]	*-pʷukiwa, -pʷukua	hundred	
	Nauruan	e-/bᵛuwi	hundred	
	Kiribati	bʷubʷua	hundred	
	Marshallese	(ji)-bʷikʷiy	hundred	
	Pohnpeian	(e)-pʷiki	hundred	
	Mokilese	(e)-pʷki	hundred	
	PCk	*-pʷúkúa	hundred	
	Woleaian	(se)-pʷúgúwe	hundred	
	Ulithian	-buguy	hundred	

[355] Compare PMc *pʷuk{a,o} ‘knot, node’.

[356] This PMc reconstruction might be *pʷuki-ua, with the general classifier suffix *-ua.

A204	PMc	*pʷuro	fall, collide	
	Nauruan	pʸu-du < *bʸubʸur-siw	fall, fall down	RED
	Pohnpeian	pʷuur	to descend into, fall into, step into (as a hole)	
	Saipan Carolinian	bʷur	to fall forward on ones face	
	Chuukese	pʷur	be bumped, stubbed, trip	
A205	PMc [357]	*pʷuro pʷuro	foam, bubbles	(ACD)
	Nauruan	bʸuro bʸuro	foam, bubble up	
	Kiribati	bʷuro	to boil	
	Kiribati	bʷurobʷuro	frothy, foaming, boiling, froth, foam, bubbles	
	PCk	*pʷuro, pʷuro pʷuro	foam	
A206	PMc	*pʷurua	insides	
	Nauruan	bʸurii-	innards, guts, insides, feelings	
	Pohnpeian	pʷuri, pʷuriyɛ	stomach (of certain fish like tuna), core (as of breadfruit), hemorrhoid, its stomach	
	Mokilese	pʷiri, pʷurrɔ, pʷirii-(n), pʷurre-(n), pʷirii-(n)	fish stomach, breadfruit core, its stomach, stomach of	
	Marshallese	bʷérew, bʷiriwe-	seat of the emotions, throat, heart, gills	
	Marshallese	bʷiriy	uvula, esophagus	
	Kiribati	bʷuua	rumen, sack, pocket, bag, throat, mouth	

[357] Compare also Kosraean *pulohllol* 'boiling, bubbling' and *pulohl* 'boil, bubble' (Lee 1976).

A207	**PMc**	*p^{w}uta{e,i}	feces
	Nauruan	i-/b^{ɣ}ijæ	feces
	PCMc	*p^{w}uta{e,i}	feces
	Kiribati	b^{w}utae	feces
	Pohnpeian	p^{w}isɛ	feces
	PCk	*p^{w}utai	feces
A208	POc	*qalo	sun
	PMc	*alo	sun
	Nauruan [358]	k^{w}æn	sun
	Nauruan [359]	k^{w}in/ijo	hot, sunny
	Marshallese	haḷ	sun
	PCk	*yalo	sun
	Mortlockese	yóól, Wóól	sun
A209	POc [360]	*qasawa	spouse, husband, wife
	PMc	*ka-a{s,S}awa	spouse, companion
	Nauruan [361]	æg/-e < *a-aDo < *a-aDew < *ka-aSawa	spouse
	Kiribati	rao	friend, companion, comrade, school-fellow chum, colleague, associate, accomplice, spouse

[358] Pre-Nauruan *e-wæn (?) > *owæn (?) > *w:æn > k^{w}æn; Compare Nauruan /jek^{w}o/ 'afternoon'.

[359] Frequently pronounced [kinjo]. The origin of the /ijo/ portion of the word remains unclear. It may relate to POc *silak ‘to shine’ or POc *silaq ‘outpouring of light’. Compare also POc *qalejaw ‘day’.

[360] The ACD (Blust and Trussel) states “Oceanic reflexes of PMc *qasawa show an assimilation of *-aw- to -/o/- in this form … this assimilatory change took place independently in a number of widely separated languages”.

[361] The /-e/ suffix is of uncertain origin. Perhaps it is the proximal marker, /-e/, suggesting closeness with the speaker.

A210	POc	*qasu	smoke	
	PMc	*a{s,S}u	smoke	
	Nauruan [362]	bʸæ/-dedʒi	smoky, grey	RED
	Kiribati	ari-(a)	to inhale a smoky inhalation; to perfume someone or something	
	Marshallese	(bʷa)-hathat	to smoke	
	Pohnpeian	adi	its vapor, smoke, mist	
	PCk	*adú	smoke	
	Saipan Carolinian	(bʷa)-atiyat	be smoking lightly	
	Pulo-Annan	(bʷ)-atú (sic.)	be smoky	
A211	POc	*qatay	liver, emotions, inner self	
	PMc	*ate	liver	
	Nauruan	æj-, æji/-n	liver, liver of	
	Kosraean	ɛs, esyɛ-(l)	liver, his liver	
	Marshallese	yaj	liver, spleen	
A212	PEOc	*qatu	tuna, bonito	
	PMc	*atu, *atu-la	tuna, bonito	
	Nauruan	i-/æj < *ati-l	skipjack tuna	
	Kiribati	ati	tuna, bonito	
	Marshallese	hajiy-(lewwed)	school of bonito trapped in a lagoon	
	PCk	*atú, atúla	tuna, bonito	
	Woleaian	yaúle	tuna, bonito	

[362] The etymology of this word is unclear. It is possibly from a reduplicated form with a prefix, comparing the listed words from Marshallese and Saipan Carolinian. Compare also Nauruan /tʃiw/ ‘smoke’.

A213	POc	qeno	lie down	(Ross 1988)
	PMc	w{e,o}n{e,o}	lie down, sleep	
	PMc	*w{e,o}l{e,o}	lie down, sleep	
	Nauruan [363]	mʲe/kʷor	lie down	RED
	Kosraean	ona	to lie down	
	Kiribati	wene, wenewene	lie down, sleep	
	Sonsorolese	woro-	lie down, sleep	
	Woleaian	wolo	to lie down, stretch oneself out	
	Saipan Carolinian	wol	lie down, sleep	
A214	PEOc	*quna-fi	hair, feathers, scales, remove (hair or scales)	
	PMc	*una, *unauna	hair, feathers, scales, removal of these	
	Nauruan	e/we-n < *wen < *wanu	hair, feather (of)	MET
	Nauruan	e/wewen	hairy	RED
	Pohnpeian	winɛ	its hair, etc.	
	Satawalese	yúúl, yúla-(n), wúlawúl, únúún, yúnú-fi	hair, feathers, scales, remove (hair or scales)	
A215	PEOc	*quna-fi	hair, feathers, scales, remove (hair or scales)	
	PMc	*una-fi	hair, feathers, scales, removal of these	
	Nauruan	k-/inine	scale (a fish)	RED
	Kosraean	une	pluck or scale (something)	
	Marshallese	kar-win, kar-winiy	to scale (fish)	
	Pohnpeian	kaa-win, kaa-wina, ka-wna	to pluck, scale	

[363] Compare Nauruan /mʲeg/ ‘stay, live, reside’, which may relate to the initial syllable of this word. ON *wowolo > *wːoro > kʷor.

A216	PEOc	*qura	langusta, lobster	
	PMc	*ura	langusta, lobster	
	PMc	*ura, era	langusta, lobster	
	Nauruan	e-/or < *wer < *waru	lobster	MET
	Kosraean	ɔl-(pæp)	a kind of lobster	
	Marshallese	wér	langusta, lobster	
	Pohnpeian	uur, urɛ-(nna)	langusta, lobster	
	Mokilese	uro-(nna)	langusta, lobster	
	PCk	*úra	langusta, lobster	
	Puluwatese	wúúr, wúrá-(n)	langusta, lobster	
	Trukese	wúúr, wúre-(n)	langusta, lobster	
A217	PEOc	*Rak[ou]-t	tie, fasten	(Geraghty 1990)
	PMc	*ako	tie together	
	Nauruan [364]	(e)k^{w}or	tie, fasten	RED
	PCk	*yakoyako	tie together	
	Chuukese	óóyó	strap or rope handle, carrier made of rope or line	
	Puluwatese	yóóyó	coarse sennit used for lashing and calking, to calk	
	Woleaian	yagoyago	to tie together, bind	
A218	PMc	*raŋi, raŋiraŋi	be warmed	
	Nauruan	raŋi < *raŋi-i	heat (v.), warm up (as by fire)	
	Kosraean	laŋlʌŋ	warm up, heat up, dry up	
	Kiribati	aŋ	warm	
	Marshallese	raŋraŋ	warm oneself by the fire	
	Puluwatese	ráŋi-i-(y)	warm (oneself) as by a fire	
	Saipan Carolinian	raŋi-(y)	warm (oneself)	
	Satawalese	raŋi-(y)	warm (oneself)	

[364] Hypothesized to be from Old Nauruan *akoko-rV > *awwor > ek^{w}or.

A219	POc	*raqani	day
	PMc	*raani	day
	Nauruan	a-/ræn	day
	Nauruan	jo-/ræn	morning
	Nauruan	i-jæ-/ræn	tomorrow
	Marshallese	rahan, rahani-	day
	Pohnpeian	raani	day
	Mokilese	raan	day
	Pingilapese	reen	day
	PCk	*raan	day
A220	POc	*raun	leaf; head hair; classifier used in counting certain types of objects
	PMc	*cau	leaf
	Nauruan	ře-	leaf (of)
	Nauruan	ře-/n tubʷu-	hair of someone's head
	Nauruan [365]	ře-/t teniŋ	earlobe, earring
	PCk	*caú	leaf
A221	**PMc**	*re	come, arrive
	Nauruan	a-/re	come, arrive
	Kiribati	rere	to come and go rapidly
A222	POc	*rua	two
	PMc [366]	*rua, rua-ua	two
	Nauruan	a-/ro < *a-rua-ua	two
	Kosraean	lo-, lu-	two
	Kiribati	ua-, uo-	two

[365] Compare POc *raun ni taliŋa 'the auricle or shell of the ear'.

[366] Bender et al. (2003) reconstruct only *rua 'two', though the Nauruan form suggests the presence of the general classifier suffix *-ua, as occurs with most of the reconstructed PMc numerals.

A223	PEOc	*Ruja	load, cargo	(Geraghty 1983)
	PMc [367]	*u{s,S}a	cargo, load	
	Nauruan	wad/ə-n < *wadu	load, burden of	MET
	Mokilese	idayd	to take in a vehicle, transport	
	Mokilese	ida-n	transport (something)	
	Mokilese	(a)-wdood	to load, fill	
	Mokilese	(a)-wdo	to load, fill (something)	
	Pohnpeian	(pe)-ydayd	transportation, to transport in a vehicle	
	Pohnpeian	ida-n	carry (something) in a vehicle	
	Pohnpeian	awdawd	be filled, may be loaded, know almost everything	
	Pohnpeian	awdɛ	to fill, load (something)	
	PCk	*úta-na	cargo, load	
A224	POc	*Rum^{w}aq	house	
	PMc	*um^{w}a	house	
	Nauruan [368]	e-/wæg	house	MET
	Kosraean	yuwe-	house	
	Kiribati	uum^{w}a	house	
	Marshallese	yém^{w}	house	
	Old Mapian	yuŋ, uŋ	house	

[367] Also PMc *u{s,S}a-ni, *u{s,S}a-na

[368] PMc *um^{w}a >> *am^{y}u (MET) > *wam^{y}u > *wam^{y} > *waŋ^{w} > e-/wæg

A225	**PMc**	*ruoV	chant, traditional dance	
	Nauruan	ruo	chant, sing	
	Kiribati	ruoia	dance (Gilbertese national), ballet dance in sitting or standing posture with or without foot movement	
	Kiribati	ruóia	heathen chanting accompanied with gestures, slaps, and stamps	
	Marshallese	roro	chant	
A226	POc	*ruRi, suRi	thorn, splinter, fish bone	
	PEOc	*duRi	bone	(Geraghty 1990)
	PMc	*cuyi-	bone	
	Nauruan [369]	ř- < *cui	bone	
	Kiribati	rii-	bone	
	Marshallese	diy-	bone	

[369] PMc *cuyi > *řui > *řuɨ (řwɨ) > *řɨɨ > řɨ ‘bone’.

A227	**PMc** [370]	*-Sa, Sa-ke	up, upwards, eastward
	Nauruan [371]	-da	up, upwards
	Nauruan [372]	ro/-ga	rise, ascend, come up; move away from the shoreline from inland or from the ocean
	Kosraean	-ɛk, -yak	upward
	Marshallese	-tah-	up, eastward
	Chuukese	-tá	up, upwards
	Saipan Carolinian	-dá	up, upwards
	Puluwatese	-dá	up, upwards
	Pohnpeian	-da	up, upward
A228	**PMc** [373]	*saaŋa (?)	friend, companion
	Nauruan	dæŋ-	friend, companion
	Nauruan	dæŋ/ə-n	his/her friend
	Nauruan	dæŋ/-ɨ	my friend
A229	POc	*salan	path, road, way
	Nauruan	e-mʲe-/denæ	road

[370] Compare PMc *Sake 'up, upward' (Bender et al. 2003). Bender et al. show several reflexes under the entry for PMc *Sake which appear to continue a PMc suffix *-Sa meaning ‘up’ (listed here), they do not explicitly reconstruct a PMc suffix of the shape *-Sa. That reconstruction is suggested here.

[371] There are many examples of the suffix /-da/ ‘up’ in Nauruan, e.g. Nauruan /pᵛi-da/ ‘float up’, /ri-da/ ‘awaken, rise up from lying down’. It can also be used to convey completive aspect, similar to how “up” is used with verbs in English, e.g. /nimᵝi-da/ ‘drink up, drink all of something’.

[372] PMc *ro-Sa > *ro-Da > *ro-ga

[373] Compare PWMP *diŋan 'friend, companion'; PMP *deŋan > POc *droŋan 'with, in conjunction with, companion'. Compare also Kiribati atánga ‘mutual friendship’, Kiribati atanga ‘liaison, friendship’ (Trussel and Groves 1978).

A230	PMc [374]	*Sali	in a line or row	
	Nauruan	a-tate	align, line up, put in a row	RED
	Woleaian	ttali	line up, form a line	
	Chuukese	tetten	line, rank, row, list, grade, generation, lineage	
A231	PEOc	*salu	to scrub, wash	
	PMc	*salusalu	to scrub, wash	
	Nauruan	der der	clean, tidy up, be clean	
	Kosraean	tæltæl	to wash	
	PCk	*dalú	to scrub, wash	
	Saipan Carolinian	tattal	to wash kitchen things	(Bender et al. 1984)
	Saipan Carolinian	talú-(w)	to wash (dishes, hands)	
	Satawalese	tettal	to wash things	
	Satawalese	talú	wash (something)	
A232	**PMc**	*{s,c}iku (?)	small, little	
	Nauruan [375]	kæ-/dudu	small	RED
	Kosraean	srihk	small	(Lee 1976)
	Kosraean	srihsrihk	rather small	(Lee 1976)
A233	**PMc** [376]	*siku-ku (?)	slow, delay	
	Nauruan [377]	duwə-ku < *siw-gugu (?)	slow, delay	RED
	Kosraean	sikuhl	to hinder	(Lee 1976)

[374] Old Nauruan *SaSali (RED) > *dadali > *ddaʝi > *taʝi >> *tataʝi (RED) > *tateʝ > a-/tate

[375] If the PMc reconstruction contains *s, then the proposed etymology is PMc *siku > *diw > *duw > *du >> kæ-/dudu (RED). In that case, there was an internal sound change in Kosraean **s* > *sr*. If the PMc reconstruction contains *c, then the proposed etymology is *ciku >> *ciciku (RED) > *řiřiku > *řřuw > *du >> kæ-/dudu (RED).

[376] Cf. PMc *cawa ‘slow, late’.

[377] Often pronounced [dʒuku]. Compare also Nauruan /a-ku/, with the same gloss.

A234	PEOc	*si{q,Ø}u-v	wash	(Geraghty 1983)
	PMc	*SuuSuu	dive, bathe	
	Nauruan	dudu	soak, wash, make wet, splash	
A235	POc	*sira	they, them (ACD)	
	PEOc	*ira	they, them	
	PMc [378]	*ira	they, them	
	Nauruan	ɨræ < *wira-a	they, them	
	Kiribati	(ŋa)-iia	they, them	
	Marshallese	yér	they, them	
	Satawalese	yiir	they, them	
	Puluwatese	yiir	they, them	
	Pulo-Annan	iila	they, them	
A236	**PMc** [379]	*Siwa, *Siwa-ua	nine, nine (general)	
	Nauruan [380]	a-/do	nine	MET
	Kosraean	yʌ	nine	
	PCMc	Siwa-ua	nine (general)	
	Kiribati	rua-	nine	
	Saipan Carolinian	tiiw, tiwa-, tiwo-	nine	
	Satawalese	tiiw, tiwa-	nine	
	Woleaian	tiwe	nine	
	Pulo-Annan	tio-	nine	
	PCk	*diwa	nine	
	Pohnpeian	duwa-	nine	
	Mokilese	duwa-	nine	
	Pingilapese	duwa-	nine	

[378] This occurs as an independent pronoun, a suffixed object pronoun, and a suffixed possessive pronoun in all of these Micronesian languages.

[379] Bender et al. (2003) reconstruct *Siwa-ua for PCMc.

[380] PMc *Siwa-ua > *diweu > *duwo >> *dow (MET) > a/-do ‘nine’.

A237	PMc	*siwo	down, westward
	Nauruan	-du < *diw	down, downward
	Kosraean	tu-(fokfok)	keep on coming down
	Kiribati	-rio	down, westward
	Marshallese	téw	disembark, climb down, westward
	Pohnpeian	-di	downward
A238	PMc	*Soru	near, beside
	Nauruan [381]	dur, durə-n	near, beside, shadow (of someone)
	Kosraean	yɔrɔ-(l)	his vicinity
	Kosraean	yuru-(n)	vicinity of, near
	Kiribati	(i)-rou-(na)	with, by, on account of him
	Marshallese	tir^{w}i-, (yi)-tir^{w}i-	next to, close to, near, beside
A239	POc	*suluq	torch
	PMc	*sulu	torch
	Kosraean	sul	torch
	Nauruan	i-/dij	torch
	Kiribati	rin, rini-	dried coconut leaf
	Marshallese	til	torch
	Pohnpeian	diil	dried coconut fronds, torch
	Pohnpeian	ndil	torch made of dried coconut leaves, to fish with torches
	Mokilese	dil	torch
	PCk	*dúlú	torch

[381] Regressive vowel assimilation occured sometime before *S > *D > g in Nauruan.

A240	PMc	*susu	breast, to suckle	
	Nauruan	dʒid	lick	
	Kosraean	titi-kihn	suck, lick	(Lee 1976)
	Kosraean	titi	suck	(Lee 1976)
	Pohnpeian	dinapw	tongue	
	Mokilese	dihidi	to suck at the nipple	(Harrison & Albert 1977)

A241	**PMc**	*suwa	new	
	Nauruan	e-tʃi-mʲe-/du	new, modern	
	Kosraean	susuah	new, modern, up to date	
	Pulo-Annan	tai-daú	new, fresh	

A242	**PMc**	*t{a,e}(n)ka (?)	to get stuck	
	Nauruan	tægæg	stuck	RED
	Pohnpeian	tengala	to get stuck	

A243	PMc	*tai, ta-	no	
	Nauruan [382]	iɟag < *i-ta-kV	no	
	Nauruan	ɟia, ia	no	
	Kiribati	tiáki	no, not	

A244	PEOc	*takuRu	back (of body)	(Geraghty 1990)
	PMc	*ta-kuru	back (of body)	
	Nauruan	eruwɨ-	back (of body), behind	MET
	Kiribati	akuu	back (of body)	
	Marshallese	jakʷir	shell of turtle or crab	
	PCk	*takúrú	back (of body)	
	Pulo Annan	talúkú	back (of body)	

[382] Compare also Nauruan /ɟia/ ‘no’, /ia/ ‘no’

A245	POc [383]	*talaq	the morning (evening) star: Venus	
	Nauruan	e-də-/taŋ	star	
A246	**PMc**	*talia	side dish of meat, fish, or sauce	
	Nauruan	i-/jeji < *te-/talia	food, meal	
	Nauruan	jeji	eat	
	PCMc	*talia	side dish of meat, fish, or sauce	
	Kiribati	tanna	sauce, relish, appetizer	
	Marshallese	jaléyléy	meat course, sauce, gravy	
	Pohnpeian	sali	eat meat or fish, the meat or fish part of a meal	
A247	POc [384]	*taliŋa	ear, tree fungus, pectoral fin	
	PEOc	*taliŋa	ear, mushroom, fungus	(Geraghty 1983)
	PMc	*taliŋa	ear, mushroom, fungus	
	Nauruan	teniŋa-	ear	
	Kiribati	taniŋa	ear, mushroom, fungus	
	Pohnpeian	salɛŋɛ-	ear	
	PCk	*taliŋa	ear, mushroom, fungus	

[383] Compare also POc *mantalaq; Marshallese *maalal* ‘a star (planet), Evening Star, Venus (evenings only) (Abo et al. 1976).

[384] Pre-Nauruan *l > j is expected in this word, but instead *l > n is observed. It is possible that the *l > n change is in this case conditioned, perhaps by the following nasal *ŋ, but more comparative work is needed to determine if this is a regular sound change, or if the order of the *l > n sound change needs to be revised relative to *l > j. Alternately, this could be a loanword from Kiribati, though ‘ear’ is a Swadesh list item, and is unlikely to be a borrowing. Compare also POc *raun ni taliŋa 'the auricle or shell of the ear'.

A248	POc	*talise	crab species	
	Nauruan	i-/teȷ	coconut crab	
	Kiribati	ai(i)	coconut crab	
	Marshallese	ka-tooj	fishing method, hunt lobster or coconut crab when the moon is right	
	Marshallese	ejej	husking of coconuts by coconut crabs	
A249	**PMc** [385]	*tam^{w}a	father	
	Nauruan [386]	e/taŋ-	father	
	Kosraean	tʌm^{w}ɛ-(l)	his father	
	Kosraean	tuhmwac	father, husband	(Lee 1976)
A250	**PMc**	*ta-ni-si	digit (of body)	
	Nauruan	tʃi-n/ nænæ-	toe	
	Nauruan	tʃi-ni/ b^{j}e-	finger	
	PWMc	*tanisi	finger, toe	
	Marshallese	janit, janti-(n)	finger, crab claw, finger of	
	Pohnpeian	sɛnd	appendage, finger, toe	
	Pohnpeian	sɛndi-(n pee)	finger	
	Mokilese	jaid, jandi-(n)	finger or toe, finger or toe of	
A251	PEOc	*taŋi-z	cry, weep	(Geraghty 1983)
	PMc	*taŋi	cry, weep	
	Nauruan	i/jaŋ	cry, weep	
	Kosraean	tʌŋ	cry	
	Kosraean	tʌŋi	be sorry for	
	Kiribati	taŋ, taŋitaŋ	cry	
	Kiribati	taŋi-ra	desire, cry for (something)	
	Kiribati	(ka)-taŋitaŋ	to cause to cry	
	Marshallese	jaŋ, jaŋi-t	cry, cry for (someone)	

[385] Compare POc *t-ama, PMc *tama

[386] PMc *tam^{w}a > *tam^{ɣ} > *taŋ^{w} > e/taŋ

A252	**PMc**	*tap^{w}akea	kind of turtle	
	Nauruan	eb^{ɣ}ake	turtle	
	PCMc	*tap^{w}akea	kind of turtle	
	Kiribati	tab^{w}akea	kind of turtle with brilliant shell	
	Marshalese	jeb^{w}akey	turtle with multi-colored shell	
	Mokilese	jap^{w}akɔ	species of turtle	
A253	PEOc	*taRa-c	look up	(Geraghty 1990)
	PMc	*tara, tara-{s,S}i	to look, look at	
	Nauruan	i/jed < *taSa	look, look at	MET
	Nauruan	tera-	look (at), see, sight	
	Kiribati	#taratara	be awake, to behold	
	Kiribati	tara-a (? < *taa-ra)	to look at, behold (something)	
	Pohnpeian	sara-(da)	look upwards (-da upwards)	
	Mokilese	jar	bend back ones head	
A254	PMc	*tau	who?	
	Nauruan	je/-n	who?	
	Kosraean	sə	who?	
	Kiribati	(an)-tai	who?	
	Pingilapese[387]	(?) (i)-saa	who?	
	PCk	*yau, -t[ae]ú	who?	

[387] Question mark appears in Bender et al. (2003)

A255	**PMc** [388]	*i-ta{w,Ø}o	press in	
	Nauruan	iɟow	push, shove	
	Kosraean	iso-ŋ	stick in, push in, cram in	
	Kiribati	tao-na		
	Marshallese	jewe-n	press down on, weigh down on (something)	
A256	PMc	*te-	one (prefixed to classifiers)	
	Kosraean	se-	one (prefixed to classifiers)	
	Nauruan	ɟon < *te-ua-na	one (of something)	
	Nauruan	e-	nominal prefix	
	Kiribati	te, te-(uana)	one (prefixed to classifiers)	
	Chuukese	eew	one general-class of thing; another one, a different one	(Goodenough and Sugita 1978)
	Pohnpeian	ewel	one	(Trussel and Groves 1978)
A257	**PMc** [389]	*te-ko	one (vocative, deictic)	
	Kosraean	so-ko	one	(Lee 1976)
	Nauruan [390]	e-k^{w}en < *te-ko-ua-na	one (in serial counting)	
	Pohnpeian	ekin	one	(Trussel and Groves 1978)

[388] Compare PMc *ta{w,Ø}o, ta{w,Ø}o-ni ‘to press’, Kiribati *tao-na* press (something) down, control (something), Marshallese *jewe-n* ‘press down on, weight down on (something)’.

[389] PMc *te ‘one’, PMc *ko ‘vocative, deictic’.

[390] PMc *te-ko-ua-na > *je-wo-we-na > *je-w-wen > e-k^{w}en ‘one’ (in serial counting)

A258	**PMc**	*tei(-w)	stand, jut out	
	Nauruan [391]	(ke-)/ɟo/-da	jut up, stand erect	
	Nauruan	(ke-)/ɟo/-du	jut down	
	Nauruan	(ke-)/ɟo/-weo̯	jut outward	
	Nauruan	(w)e-/ɟo	stand, remain	
	Nauruan	wawe-/ɟo	stand continuously	
	Nauruan	o-/ɟo	stand	
	Kiribati	tei	stand	
	Kiribati	tei-(rake)	stand up	
	Marshallese	jiw-(tak)	stand up	
A259	**PMc**	*ku-raŋV (?)	crazy, insane, foolish, abnormal	
	Nauruan	də-/kuraŋ < *kukuraŋV	crazy, insane, foolish	RED
	Kosraean	suh-lahlkuhng	stupid, foolish	
	Kiribati	rang	crazy, insane, lascivious, blighted or abnormal in growth	
A260	**PMc**	*te-mani-ni-ara	mosquito	
	Nauruan	də-mʲeniner	mosquito	
	Kiribati	te-mani-nn-ara	mosquito	(Goodenough 1992)
	Kiribati	mani-(nn-ara)	mosquito	
A261	**PMc**	*te-qirukuw{e,au}	heart, center	
	Nauruan	də-irukʷo-	heart (body part)	
	Chuukese	eyirúkúúw	cut the heart of out of the palm	
	Chuukese	eyirúk	heart of palm	

[391] Compare also Nauruan /mʲægə-n ki-jeow/ ‘plants, vegetation (lit. plants that jut up)’.

A262	POc	*tian	belly, abdomen	
	PMc	*tia	belly, abdomen, stomach	
	Nauruan	ja- < *jiæ	belly, stomach of	
	Marshallese	(law)-jéy, jéy, (law)-jiye-, jiye-	stomach, belly, abdomen	
	Pulo-Annan	diia, dia-	stomach, belly, abdomen	
	Ulithian	sie-	stomach	
A263	PEOc	*tina	mother	(Geraghty 1983)
	PMc	*tina	mother	
	Nauruan	ine- < *jine	mother	
	PCk	*tina	mother	
A264	PMc [392]	*tiSa-ki	to ask	
	Nauruan [393]	ɨda	ask, question	
	Kosraean	si-yʌk	to ask, requestion, interrogate (someone)	
	Pohnpeian	(pe)-ydɛk	to ask a question	
	Pohnpeian	(ke)-ydɛk	to ask (someone, honorific)	
A265	POc	*tiup	blowing on, fanning	
	Nauruan	jiu	blow	
	Kiribati	tibu (metathesis)	to inflate, to pump up, to blow up	(Trussel and Groves 1978)

[392] Compare PMc *tiSaki (Bender et al. 2003)

[393] The initial *t in this word appears to have been lost. In Kiribati, PMc *t is sometimes lost in words that also contained *k (Bender et al. 2003: 5), and it is possible that the same process applied in this word in Nauruan. It is unclear why Nauruan does not continue a word-final /k/ here, though perhaps it was part of a suffix *-ki. The initial /ɨ/ in this word suggests glide prothesis: *tiSa-ki > *ida > *wida > *wɨda > ɨda.

A266	PEOc	*toka	to chop
	PMc	*toka	to chop
	Nauruan [394]	tow	chop, sever, cut
	Kiribati	oka-a	to cut off (pandanus fruit) with a blade fastened to a stick (showing loss of *t before k)
	Marshallese	jék, jékjék	to cut, hew, chop, prune, salute with the hands
A267	POc	*tolu	three
	PMc	*telu, telu-ua	three
	Nauruan	e-/ju < *telu-ua	three
	Nauruan	-ji-	three (in demonstratives)
	Kosraean	tol, tol-(u)	three
	Kiribati	teni-, tenu-(ua), teni-(ua)	three
	Marshallese	jili-, jili-w	three, three (general)
	Pohnpeian	(e)-sil, sili-	three, three (general)

[394] Also Nauruan /tow tow/ (RED), same gloss.

A268	PEOc	*toRa, taRa (?)	tree, Intsia bijuga	(Geraghty 1990)
	PMc [395]	*ma-tawa, ma-tawa tawa	firm, hard, strong	
	Nauruan [396]	oeo < *jewe jew	strong	
	Kiribati	ma-toa, ma-toatoa	firm, hard	
	Marshallese	ma-jewjew	firm, strong, solid	
	PCk	*ma-toa	firm, hard, strong	
	Woleaian	ma-awe	be strong, ready to eat, ripe, mature	
	Woleaian	(maa)-ma-awe	be strong, powerful	
	Woleaian	ma-sowe, ma-sowasowe	be strong, hard, be ripe or ready to be picked (as breadfruit)	
	Pulo-Annan	ma-doa	be hard, strong	
A269	POc	*tuaka	elder same sex sibling	
	PMc	*t{a,u}kakata (?)	elder same sex sibling	
	Nauruan	tekej	same, identical	
	Chuukese	ékkéés	be siblings-in-law of same sex	
	Chuukese	ékkéés	treat (someone) as a sibling-in-law of the same sex	
	Pohnpeian	duwehte	same, identical	
A270	POc	*tubuŋa	crown of head	
	PMc [397]	*tubu-ŋa	head, hair of head	
	Nauruan	tubʸu-	head, hair of head	
	Kiribati	átubúngubung	having long hair	(Trussel and Groves 1978)
	Pohnpeian	tahpw	head	(Sohl et al.)

[395] Compare the equivalent reconstructions from Bender et al. (2003), *ma-toa, ma-toatoa.

[396] Nauruan apparently does not continue the *ma- prefix.

[397] Nauruan and Pohnpeian apparently do not continue the *-ŋa suffix.

A271	POc	*tubuq	grow	(Ross 1988)
	PEOc	*tubu	grow	(Geraghty 1983)
	PMc	*t{i,u}p^{w}u	be born, bear young	
	Nauruan	ib^{ɣ}(i,u)-	grandparent, grandchild	
	Kiribati	tib^{w}u-(na)	his grandparent, his grandchild	
	Marshallese	jib^{w}i-	grandmother, grandchild	
	Pohnpeian	ip^{w}iip^{w}	be a paternal descendant	
	Mokiliese	ip^{w}-(di)	be born	
	S. Carolinian	ub^{w}u-(tiw)	be born	
A272	POc	*tubuq	grow	(Ross 1988)
	PMc	*t{i,u}p^{w}up^{w}u	give birth	
	Nauruan	ip^{ɣ}u/-du	birth, give birth, fall	
A273	POc	*tura	post, pillar	
	PMc	*tura	house post	
	Nauruan	i-/jor	post, pillar	
	Marshallese	jéwér, jiwre-(n)	pillar, column, post, pole, post of	
	Ponapeian	uur	post	
	PCk	*tura	house post	
A274	PEOc	*tuRi	to thread, string (fish)	(Geraghty 1990)
	PMc	*turi	to string	
	Nauruan	tʃir	fish strung on a line	
	Pohnpeian	iir	string of something (as of flowers or fish)	
	Mokilese	ir	string for stringing things, to work at stringing	
	PCk	*turi	to string	

A275	**PMc**	*tututV	cook	
	Nauruan	tʃitʃi-n	cooked	
	Kiribati	túrú	to trickle, to cook fish unobserved	(Trussel and Groves 1978)
	Kiribati	tutu	to cook fish (etc.) on shore or in forest before returning	
A276	PEOc	*uRat	vein	(Geraghty 1990)
	PMc	*ua	tendon, vein	
	Nauruan	wa-	vein	
	Kiribati	ia	vein	
	Chuukese	(?) wuwa-	tendon	
	Chuukese	wuwó-(ór)	shin, front of leg between knee and ankle	
A277	POc	*wakaR-a	root	
	PMc	*waka, wakara	root	MET
	Nauruan [398]	æwor	root, origin	
	Kosraean	ɒ k ɒ k	mangrove root, okæ root	
	Kiribati	wakaa	root, one who gives support	
	Marshallese	wekar	root	
	PCk	*wakara	root	

[398] PMc *wakara >> *kawara (MET) >> *awara > *awer > *æwer > æwor

A278	PEOc	*walu	vegetation, forest	
	PMc	*walu	vegetation, forest	
	Nauruan	oe < *e-/weȷ	bush, wilderness	
	Nauruan	oe/-gægæ	be in wilderness	
	PPCk	walu	vegetation, forest	
	Pohnpeian	waal	jungle, forest	
	Mokilese	wɔl	forest	
	Pingilapese	wɛl	forest, woods	
A279	POc	*walu	eight	
	PMc	*walu, walu-ua	eight, eight (general)	
	Nauruan	oȷu < *walu-ua	eight	
	Marshallese	(ri)-wali-(yték)	eight, eight (general)	
	PCk	*walú, walu-uwa, walú-ike	eight, eight (general)	
	Pohnpeian	(ɛ)-wɛl, wɛlɛ-, wɛli-, wali-, walu-u	eight, eight (general)	
	Mokilese	(a)-wal, wal-, walu-w	eight, eight (general)	
A280	POc	*wa(n)se	distribute, as food at a feast	
	PEOc	*wase	divide	(Geraghty 1983)
	PMc	*waSe, waSe-ki	to count	
	Nauruan	adu < *aS-u (?)	count, enumerate objects	
	Kiribati	ware-ka	count or read (something)	
	Marshallese	wate-k	count up (something)	
	Pohnpeian	wadɛ-k	read or count (something)	

A281	POc	*wa(n)se-a, *wasea-ŋa	distribute, divide, give	
	PMc	*welsea (?)	distribute, divide, give	
	Nauruan	ojæ	give, bestow	
	Nauruan	ojæŋ/ə-n	gave, offered	
	Marshallese	aje	give away without remuneration	(Abo et al. 1976)
	Marshallese	jake	give (polite)	(Abo et al. 1976)
A282	**PMc** [399]	*wa-{l,s}eki (?)	balloon fish, puffer fish, be large	
	Nauruan	oæg	big, large	
	Kosraean	yohk	big, large	
	Pohnpeian	koahiek	competent, capable, well-versed; able to take care of one's self; large or spacious, of inanimate objects	
	Pohnpeian	walek	large, of any opening	
	Pohnpeian	wahsek	of a hole or an opening, to be large enough so that something may pass through it	
A283	POc	*watu	hence	
	PMc	*watu	toward or in a direction	
	Nauruan	-eɉ	transitive verb suffix	
	Kiribati	wati	toward person who has just spoken	
	Marshallese	waj, wéj	toward or in direction of person addressed	
	Pohnpeian	-wɛy	toward or in direction of person addressed	

[399] Compare PMc *wasi, wasiwasi ‘balloon fish, puffer fish, be large’.

A284	**PMc**	*wawa	flow
	Nauruan	kæw < *gga-/awa	flow, run
	Nauruan	e-/kæw	river
	Kiribati	wawa	flow, stream, run down
A285	**PMc** [400]	*lii-w{e,o}li	be changed, change
	Nauruan	iwit < *ji-win/-ni	change, turn over
	Saipan Carolinian	(lii)-weli	to change (something)
	Woleaian	(lii)-wen-(ne)	its replacement, its substitute
A286	**PMc**	*woca	coral reef
	Nauruan	e-/oř	reef
	Nauruan	æn-/oř	waters near shore, around reef
	PCMc	*woca	coral reef
	Kiribati	oora, (te)-ora	coral reef
	Marshallese	wed, wede-(n)	coral reef
	PCk	*woca	coral reef
	Pohnpeian	oot	coral reef
	Mokilese	wos	coral reef
A287	PMc [401]	*w{a,o}t-u	outward
	Nauruan	ke-jo-/ej/o	jut outward
	Mortlockese	-wéw	outward
	Mortlockese	-wéw	outward
	Woleaian	-waú, -wéú	outward, to the north or to the south (i.e., toward open ocean)

[400] Compare PMc *w{e,o}li ‘be changed, change’.

[401] Compare PMc *wotu ‘outward’.

A288	**PMc**	*wul{a,e}	penis	
	Nauruan [402]	dor	penis	MET
	PWMc	*wul{a,e}	penis	
	Marshallese	wél, wile-	penis	
	Pohnpeian	wilɛ	his penis	
	Mokilese	wilɔ	his penis	
A289	PMc	*wum^{w}u(-ni)	earth oven, bake in an oven	
	Nauruan [403]	om^{ɣ}	oven, earth oven	
	Nauruan	om^{ɣ}i-n	baked, roasted	
	Kosraean	um, #umi	earth oven, cook food in an earth oven	
	Marshallese	wim^{w}, wim^{w}i-n	earth oven, bake in an oven	
	PCk	*wum^{w}u, wum^{w}u-ni-	earth oven, bake in an oven	
A290	**PMc** [404]	*wusi, wuwusi	splash water on (something)	
	Nauruan	du du < *siwu	splash, soak	MET, RED
	PCk	*wudu, wudi, wuwudi	splash water on (something)	

[402] Pre-Nauruan *də-wul >> *dolu (MET) > dor

[403] PMc *wum^{w}u-ni > *um^{ɣ}i- > *e-um > om^{ɣ}

[404] Reconstructed by Bender et al. (2003) for PCMc. Compare PMc *SuuSuu 'dive, bathe'.

A291	PMc	*wuti	pluck, pull out
	Nauruan [405]	u/-da	pluck, pull out
	Marshallese	wij, wijwij	pull out of ground, uproot
	Pohnpeian	us	to pull out, to pluck, to vote for
	Mokilese	wij	pull (something) up or out
A292	PEOc	*zili-fi	inserted, penetrated
	PMc [406]	*{s,S}ili-fi	inserted, penetrated
	Nauruan [407]	dʒir	sew, lace
	Nauruan	dʒiri/-da	sew up, lace up, stitch
	PCk	*dili, dili-fi-	inserted, penetrated
	Puluwatese [408]	ti (faaR)	sew thatch (pandanus)

[405] The Nauruan reflexes include the suffix /-da/ ‘up’. Compare also Nauruan /ududa/ ‘pluck, pull out’ and Pulo-Annan *udu* ‘to pluck, harvest by pulling’.

[406] Compare also PMc *{s,S}i-, {s,S}i-ki, {s,S}i-ka 'sew, stick through' and PEOc *si-ka 'net needle' (Geraghty 1983).

[407] PMc *{s,S}ili-fi > *dili-i > *dili-wi > diriw > dʒir ‘sew, lace’

[408] Bender et al. (2003) list this as a continuation of PMc *{s,S}i- 'sew, stick through’.

References

Abo, Takaji, Byron W. Bender, Alfred Capelle and Tony DeBrum. 1976. Marshallese-English Dictionary. Honolulu: University Press of Hawaii.

Barker, Xavier. 2012. English language as bully in the Republic of Nauru. In Rapatahana and Bunce, 18-36.

Bender, Byron. n.d. Marshallese reference grammar. University of Hawaii, ms.

Bender, Byron. 1963. Marshallese Phonemics: Labialization or Palatalization? *Word* 19(3). 335-341.

Bender, Byron. 1968. Marshallese phonology. *Oceanic Linguistics* 7. 16-35.

Bender, Byron. 1969. Vowel dissimilation in Marshallese. *University of Hawaii, Working papers in linguistics* 1. 88-96.

Bender, Byron. 1971. Micronesian Languages. In Sebeok et al. 426-465.

Bender, Byron. 1973. Parallelisms in the morphophonemics of several Micronesian languages. *Oceanic Linguistics* 12(1/2). 455-477.

Bender, Byron. 1981. A fossilized article in Marshallese. In Hollyman and Pawley. 209-228.

Bender, Byron (ed.). 1984. *Studies in Micronesian linguistics. Pacific Linguistics series C, no. 80*. Canberra ACT: Australian National University.

Bender, Byron, Jeffrey Marck, Kenneth Rehg, Ho-min Sohn, Ward Goodenough, Frederick Jackson, Stephen Trussel and Judith Wang. 2003. Proto-Micronesian reconstructions -- I. *Oceanic Linguistics* 42(1). 1–110.

Blevins, Juliette. 2004. *Evolutionary phonology: the emergence of sound patterns*. New York: Cambridge University Press.

Blevins, Juliette. 2009. Low vowel dissimilation outside of Oceanic: the case of Alamblak. *Oceanic Linguistics* 48(2). 477–483.

Blevins, Juliette and Sheldon P. Harrison. 1999. Trimoraic Feet in Gilbertese. *Oceanic Linguistics* 38(2). 203-230.

Blumenfeld, Lev, Phillip Burness and Erin Riley. 2015. Stress and length in Nauruan. *Annual meeting of The Linguistic Society of America, Jan. 8 – 11 (presentation).* Portland, OR.

Blumenfeld, Lev. 2017. Quantity and quality in Nauruan phonology. *10th annual Conference on Oceanic Linguistics, July 10 – 15 (presentation)*. Honiara, Solomon Islands.

Blust, Robert. 1978. *The Proto-Oceanic palatals*. JPS monograph 43. Auckland: Polynesian Society.

Blust, Robert. 1984. Malaita-Micronesian: an Eastern-Oceanic subgroup? *The Journal of the Polynesian Society*. 99-140.

Blust, Robert. 1990. Three recurrent changes in Oceanic languages. In Davidson, 7-28.

Blust, Robert. 1996a. Low vowel dissimilation in Ere. *Oceanic linguistics* 35. 96-112.

Blust, Robert. 1996b. Low vowel dissimilation in Oceanic languages: An addendum. *Oceanic Linguistics* 35. 305-309.

Blust, Robert. 2010. Malaita-Micronesian once again. *Oceanic linguistics* 49(2). 559-567.

Blust, Robert, and George William Grace. 1991. *Currents in Pacific linguistics: papers on Austronesian languages and ethnolinguistics in honor of George W. Grace*. Canberra ACT: Australian National University.

Blust, Robert, and Stephen Trussel. 2010 (revised 2019). Austronesian Comparative Dictionary, web edition. Online: www.trussel2.com/ACD.

Blust, Robert. 2013. *The Austronesian languages, revised edition*. Canberra ACT: Australian National University.

Boersma, Paul and David Weenink. 2017. Praat: doing phonetics by computer [computer program]. Version 6.0.36. Online: http://www.praat.org/.

Bye, Patrik. 2011. Dissimilation. In Oostendorp et al., 1408 -1433.

Capell, Arthur. 1962. *A linguistic survey of the south-western Pacific*. New Caledonia: South Pacific Commission.

Choi, John D. 1992. *Phonetic underspecification and target-interpolation: an acoustic study of Marshallese vowel allophony*. UCLA, PhD thesis.

Choi, John D. 1995. An acoustic-phonetic underspecification account of Marshallese vowel allophony. *Journal of phonetics* 23(3). 323–347.

Curriculum Centre Press. 1994. *Nauruan Language Dictionary*. Yaren, Nauru.

Comrie, Bernard. 1995. Review of Nauru Grammar by Alois Kayser; Karl H. Rensch. *Language* 71(2). 411–412.

Connell, John. 2006. Nauru: the first failed Pacific state? *The Round Table* 95(383). 47-63.

Davidson, J. H. C. S. (ed.). 1990. *Pacific Island languages: essays in honor of G.B. Milner.* Honolulu: University of Hawaii Press; London: School of Oriental and African Studies.

Delaporte, Philip Adam. 1907. *Kleines Taschenworterbuch: Deutsch - Nauru*. Nauru: Missions-Druckerei.

Delaporte, Philip Adam and Timothy Detudamo (trns.). 1907. *Neues Testament : ñaran aen wora temoniba ma amen katsimor ñea Jesu Kristo*. Nauru: Missions-Druckerei.

Dyen, Isidore. 1965. A lexicostatistical classification of the Austronesian languages. *Indiana University Publications in Anthropology and Linguistics, 19 (supplement to IJAL vol. 31, no. 1, 1965)*. Baltimore: Waverly Press.

Eberhard, David M., Gary F. Simons, and Charles D. Fennig (eds.). 2019. *Ethnologue: Languages of the World. Twenty-second edition*. Dallas, Texas: SIL International. Online: http://www.ethnologue.com.

Elbert, Samuel H. 1974. *Puluwat grammar*. *Pacific Linguistics B-29*. Canberra: Australian National University.

Fabricius, Wilhelm, Dymphna Clark (ed., trans.) and Stewart Firth (ed., trans.). 1992. *Nauru 1888-1900: An account in German and English based on official records of the Colonial Section of the German Foreign Office held by the Deutsches Zentralarchiv in Postdam*. Canberra: Australian National University.

Firth, Steward. 1978. German labor policy in Nauru and Angaur, 1906-1914. *The journal of Pacific history* 13(1). 36-52.

Fourakis, Marios. 1991. Tempo, stress, and vowel reduction in American English. *The journal of the acoustical society of America* 90(4). 1816-1827.

Geraghty, Paul. 1983. *The history of Fijian languages*. Oceanic linguistics, special publication 10. Honolulu: University of Hawaii Press.

Geraghty, Paul, Lois Carrington and S.A. Wurm (eds). 1986. *FOCAL II: Papers from the fourth international conference on Austronesian linguistics*. Canberra ACT: Australian National University.

Geraghty, Paul. 1990. Proto-Eastern Oceanic *R and its reflexes. In Davidson (ed.).

Gerdts, D. and Karin Michelson (eds.). 1989. *Theoretical perspectives on Native American languages*. Albany: SUNY Press.

Goodenough, Ward and Hiroshi Sugita. 1980. *Trukese-English dictionary*. *Memoirs of the American Philosophical Society.* vol. 141. Philadelphia: American Philosophical Society.

Goodenough, Ward and Hiroshi Sugita. 1990. *Trukese-English dictionary. Memoirs of the American Philosophical Society.* vol. 141S. Philadelphia: American Philosophical Society.

Gowdy, John M. and Carl N. McDaniel. 1999. The physical destruction of Nauru: An example of weak sustainability. *Land economics* 75(2). 333-38.

Grace, George W. 1969. A Proto-Oceanic finder list. *University of Hawaii Working Papers in Linguistics I* (2). 39-84.

Hambruch, Paul. 1914. *Die Sprache von Nauru (Verwaltungsbezirk der Marshallinseln)*. Hamburg: Friederichsen.

Hambruch, Paul. 1915. *Nauru: Ergebnisse der Südsee-Expedition, 1908-1910*. Hamburg: Friederichsen.

Harrison, Sheldon P. 1984. Some arguments for prenominal PMC *te. *University of Hawaii, Working papers in linguistics*. 16(2). 39-61.

Harrison, Sheldon P. 1988. A plausible history for Micronesian possessive classifiers. *Oceanic Linguistics*. 27(1/2). 63-68.

Harrison, Sheldon P. and Salich Albert. 1977. *Mokilese-English dictionary*. The University Press of Hawaii.

Haspelmath, Martin and Uri Tadmor (eds.). 2009. *Loanwords in the world's languages: a comparative handbook*. Berlin: De Gruyter.

Hendrick, Roberta. A., Carrie S. Masek and Mary Prances Miller (eds). 1981. *Papers from the parasession on language and behavior, 17th annual regional meeting, Chicago Linguistic Society*. Chicago: Chicago Linguistic Society.

Hart, Michele E. 1991. The moraic status of initial geminates in Trukese. *Proceedings of the Seventeenth Annual Meeting of the Berkeley Linguistics Society: General Sessions and Parasession on the Grammar of Event Structure*. 107-120.

Hall, Kathleen Currie. 2009. *A probabilistic model of phonological relationships from contrast to allophony*. The Ohio State University, PhD thesis.

Hall, Kathleen Currie. 2013. A typology of intermediate phonological relationships. *The linguistic review* 30(2). 215-275.

Hall, Daniel Currie and Kathleen Currie Hall. 2016. Marginal contrasts and the Contrastive Hypothesis. *Glossa* 1(1), article 50: 1-23.

Hollyman, Jim and Andrew Pawley (eds.). 1981. *Studies in Pacific languages and cultures in honor of Bruce Biggs*. Auckland: Linguistic Society of New Zealand.

Hughes, Kevin. 2012. An overview of low vowel dissimilation. The Graduate Center, City University of New York, ms.

Hughes, Kevin. 2017. Genesis of the Nauruan central vowels. *Annual Meeting of the Linguistic Society of America, Jan. 5 – 8 (presentation)*. Austin, Texas.

Hough, David A. 1974. Summary of Nauruan phonology. University of Hawaii, ms.

Jacob, Maggie. 1996. *Nauruan Language Dictionary*. Nauru.

Jackson, Frederick H. 1983. *The internal and external relationships of the Trukic languages of Micronesia*. University of Hawaii, PhD thesis.

Jackson, Frederick H. 1986. On determining the external relationships of the Micronesian languages. In Geraghty et al., 201–238.

Jaeger, Jeri J. 1978. Speech aerodynamics and phonological universals. *Proceedings of the Annual Meeting of the Berkeley Linguistics Society* 4. 311-29.

Johnson, Lisa. 1999. New perspectives in Nauruan phonology. *Deseret Language and Linguistics Society Symposium*, vol. 25, 55–65.

Johnson, Lisa. 2000. Firstness of secondness in Nauruan morphology. *Deseret Language and Linguistic Society Symposium*, vol. 26, 129–136.

Johnson, Lisa. 2002. *Nauruan classifiers*. Brigham Young University, MA thesis.

Jones, Charles (ed). 1993. *Historical linguistics: problems and perspectives*. London: Longman.

Joseph, Brian and Richard Janda (eds). 2003. *The handbook of historical linguistics*. Cambridge and Oxford: Blackwell.

Kakadelis, Stephaine. 2018. *Phonetic properties of oral stops in three languages with no voicing distinction*. City University of New York, PhD thesis.

Kayser, Alois. 1936. *Nauru Grammar*. In Rensch 1993, 1-223.

Kayser, Alois and Anna Blum (trans.). 2002. *Nauru One Hundred Years Ago, 1 Pandanus*. Nauru: University of the South Pacific Centre; Suva: Institute of Pacific Studies, University of the South Pacific.

Kayser, Alois and Anna Blum (trans.). 2003. *Nauru One Hundred Years Ago, 2 Fishing*. Nauru: University of the South Pacific Centre; Suva: Institute of Pacific Studies, University of the South Pacific.

Kayser, Alois and Pamela Adams (trans.). 2005. *Nauru One Hundred Years Ago, 3 Games & Sports*. Nauru: University of the South Pacific Centre; Suva: Institute of Pacific Studies, University of the South Pacific.

Ladefoged, Peter. 2006. *A Course in Phonetics, 5th edition*. Boston: Thomson Wadsworth.

Ladefoged, Peter and Ian Maddieson. 1996. *The Sounds of the World's Languages*. Cambridge: Blackwell Publishers Inc.

Lass, Norman J. (ed.). 1976. *Contemporary issues in experimental phonetics*. New York: Academic Press.

Lee, Kee Dong. 1975. *Kusaiean reference grammar*. Honolulu: The University Press of Hawaii.

Lee, Kee Dong. 1976. *Kusaiean-English dictionary*. Honolulu: The University Press of Hawaii.

Lee, Kee Dong and Judith Wang. 1984. Kosraean reflexes of Proto-Oceanic phonemes. In Bender (ed.), 403-442.

Lehiste, Ilse. 1976. Suprasegmental features of speech. In Lass, 225-239.

Lindblom, Björn. 1963. Spectrographic study of vowel reduction. *The journal of the acoustical society of America* 35(11). 1773-1781.

Lisker, Leigh. 1957. Closure duration and the intervocalic voiced-voiceless distinction in English. *Language* 33. 42-49.

Lisker, Leigh and Arthur S. Abramson. A cross-language study of voicing in initial stops: acoustical measurements. *Word* 20(3). 384-422.

Lister, Tim. Dec. 5, 2012. Rising sea level puts island nations like Nauru at risk. *CNN*. Online: http://www.cnn.com/2012/12/04/world/asia/nauru-ocean-danger/

Lynch, John. 2002. The Proto-Oceanic labiovelars: some new observations. *Oceanic Linguistics* 41(2). 310-362.

Lynch, John. 2000. Reconstructing Proto-Oceanic Stress. *Oceanic Linguistics* 39(1). 53-82.

Lynch, John, Malcolm Ross and Terry Crowley. 2011. *The Oceanic Languages (Second Edition)*. New York: Routledge.

Lynch, John and Fa'afo Pat (eds.). 1996. *Oceanic studies: proceedings of the first international conference on Oceanic linguistics*. Canberra ACT: Australian National University.

Manner, H.I., R.R. Thaman and D.C. Hassall. 1985. Plant succession after phosphate mining on Nauru. *Australian geographer* 16. 185-195.

Marck, Jeffrey. 1975. *The origin and dispersal of the Proto-Nuclear Micronesians*. University of Iowa, MA thesis.

Michelson, Karin. 1989. Invisibility: vowels without a timing slot in Mohawk. In Gerdts and Michelson, 38-69.

Moseley, Christopher. 2007. *Encyclopedia of the world's endangered languages*. London: Routledge.

Moseley, Christopher (ed.). 2010. *Atlas of the world's languages in danger, 3rd ed*. Paris: UNESCO Publishing. Online: http://www.unesco.org/culture/en/endangeredlanguages/atlas

Muller, Jennifer S. 2001. *The phonology and phonetics of word-initial geminates*. The Ohio State University, PhD thesis.

Nathan, Geoffrey S. 1973a. Nauruan in the Austronesian language family. *Oceanic Linguistics* 12(1/2). 479–501.

Nathan, Geoffrey S. 1973b. A grammatical sketch of Nauruan. University of Hawaii, ms.

Nathan, Geoffrey S. 1973c. The history of Nauruan - a first approximation. University of Hawaii, ms.

Nathan, Geoffrey S. (n.d.). Nauruan word list. University of Hawaii, ms.

Oda, Sachiko. 1977. *The syntax of Pulo Annian: a nuclear Micronesian language*. University of Hawaii, PhD thesis.

Ohala, John J. 1981. The listener as a source of sound change. In Hendrick, Masek and Miller, 178-203.

Ohala, John J. 1993. The phonetics of sound change. In Jones, 237-278.

Ohala, John J. 2003. Phonetics and historical phonology. In Joseph and Janda, 667-686.

Oostendorp, Marc van, Colin J. Ewen, Elizabeth Hume and Keren Rice (eds). 2011. *The Blackwell companion to phonology.* Malden: Wiley-Blackwell.

Padgett, Jaye and Marija Tabain. 2005. Adaptive dispersion theory and phonological vowel reduction in Russian. *Phonetica* 62(1). 14-54.

Petit-Skinner, Solange. 1995. *The Nauruans: nature and supernature in an island of the Central Pacific, second edition*. San Francisco: MacDuff Press.

Piggot, G. L. 1995. Epenthesis and syllable weight. *Natural language and linguistic theory* 13(2). 283-326.

Presses Missionnaires. 1954. *Book It Detaro*. Issey-les-Moulineaux, France.

Pullum, Geoffrey K. and William A. Ladusaw. 1996. *The phonetic symbol guide, second edition*. Chicago: The University of Chicago Press.

Rapatahana, Vaughan and Pauline Bunce, eds. 2012. *Linguistic diversity and language rights, vol. 9: English language as hydra: its impacts on non-English language cultures*. Clevedon, GBR: Channel View Publications.

Rehg, Kenneth. 1973. On the history of Ponapean phonology. *University of Hawaii Working Papers in Linguistics* 5(8). 17-55.

Rehg, Kenneth. 1981. *Ponapean reference grammar*. Honolulu: The University Press of Hawaii.

Rehg, Kenneth. 1984a. The origins of 'compensatory lengthening' rules in Micronesian languages. In Bender (ed.), 53-59.

Rehg, Kenneth. 1984b. On the history of Ponapean phonology. In Bender (ed.), 281-317.

Rehg, Kenneth. 1991. Final vowel lenition in Micronesian languages: an exploration of the dynamics of drift. In Blust and Grace, 383–401.

Rehg, Kenneth. 1993. Proto-Micronesian prosody. *Oceanic linguistics special publications* 24. *Tonality in the Austronesian languages*. 25-46.

Rensch, Karl H. (ed.). 1993. *Nauru Grammar*. Canberra ACT: Embassy of the Federal Republic of Germany.

Ross, Malcolm. 1988. *Proto Oceanic and the Austronesian languages of Western Melanesia*. Canberra, ACT: Australian National University.

Ross, Malcolm. 1996. Reconstructing food plant terms and associated terminologies in proto Oceanic. In Lynch and Fa'afo, 168-221.

Ross, Malcolm. 2011. Proto-Oceanic *k^{w}. *Oceanic Linguistics* 50(1). 25-49.

Sebeok, Thomas A. (ed.); J. Donald Bowen, Isidore Dyen, George W. Grace, Stephen A. Wurm (assoc. eds.); Geoffrey N. O'Grady (asst. ed.); Alexandra Ramsay, Lucia Hadd Zoercher (assts. to the ed.). 1971. *Current trends in linguistics, 8: Linguistics in Oceania*. The Hague: Mouton.

Siegel, Jeff. 1990. Pidgin English in Nauru. *Journal of Pidgin and Creole Languages* 5(2). 157-186.

Sohl, Damian, Kenneth Rehg and Robert Andreas (eds.). Accessed April 2019. Pohnpeian-English online dictionary. Online: http://www.trussel2.com/pnp/

Sohn, Ho-min. 1975. *Woleaian reference grammar*. Honolulu: The University of Hawaii Press.

Sohn, Ho-min and Byron Bender. 1973. *A Ulithian grammar. Pacific Linguistics* C-27. Canberra: Australian National University.

Spennemann, Dirk H. R. 2003. Traditional milkfish aquaculture in Nauru. *Aquaculture international* 10. 551-562.

Star, Tamaiti Willie. 1954. Nauruan Swadesh List. Tri-Institutional Pacific Program, Yale University. Online: www.trussel.com/kir/tip.htm.

Stephen, Marcus. July 18, 2011. On Nauru, a sinking feeling. *The New York Times*.

Tadmor, Uri. 2010. Borrowability and the notion of basic vocabulary. *Diachronica* 27(2). 226-246.

Tadmor, Uri. 2009. Loanwords in the world's languages: findings and results. In Haspelmath and Tadmor, 55-75.

Thomas, Erik R. and Tyler Kendall. 2007 (2015). NORM: The vowel normalization and plotting suite. Online: http://lingtools.uoregon.edu/norm/norm1.php

Trussel, Steven (a). Accessed January 2020. Micronesian comparative dictionary. Adaptation of Bender et al. Online: http://www.trussel2.com/mcd/pmc-intro.htm

Trussel, Steven (trans) (b). Accessed January 2020. Online adaptation of Philip Delaporte's Nauruan dictionary (1907). Online: http://www.trussel.com/kir/naudel.htm

Trussel, Steven (c). Accessed January 2020. Marshallese-English online dictionary. Adaptation of Abo et al. Online: http://www.trussel2.com/mod/index.htm

Trussel, Steven (d). Accessed January 2020. Chuukese-English finderlist. Adaptation of Goodenough and Sugita (1980). Online: http://www.trussel2.com/trk/findera.htm

Trussel, Steven (cmp.) (e). 2003. An English-Kiribati finderlist. Online: https://www.trussel.com/kir/dic/find_a.htm

Trussel, Steven (cmp., ed.) and Gordon W. Groves (cmp.). 1978 [revised 2003]. *A combined Kiribati-English dictionary based on the works of Hiram Bingham, D.D. and Father Ernest Sabatier, M.S.C. (translated by Sr. M. Oliva) with additional scientific material from Luomala, Goo & Banner.* Online: https://www.trussel.com/kir/dic/dic_a.htm.

Wurm, S. A. 2007. Australasia and the Pacific. In Moseley 2007, 425–578.

Whalen, D. H. and Andrea. G. Levitt. 1995. The universality of intrinsic F_0 of vowels. *Journal of Phonetics* 23. 349-366.

Wilson, Heather. 2003. A brief introduction to Marshallese phonology. Brigham Young University, ms.