

Tyler M. Heston

Department of Linguistics, University of Hawai'i at Mānoa

tylerheston@earthlink.net**Stephanie Locke**

Department of Linguistics, University of Chicago

locke.stephanie.a@gmail.com

Fataluku ([fataluku], ISO 639-3: *ddg*) is a language spoken by approximately 37,000 people on the eastern end of Timor-Leste (Lewis, Simons & Fennig 2016). Timor-Leste, also known as East Timor, is an independent nation that occupies the eastern half of the island of Timor in island Southeast Asia, which it shares politically with Indonesia in the west. Timor is located north of Australia, between the Indonesian islands of Sumatra and Bali in the west and New Guinea in the east.

Fataluku is a Papuan (i.e. non-Austronesian) language, and is a member of the Timor-Alor-Pantar (TAP) family, which includes roughly twenty-five languages spoken on Timor and nearby islands (Klamer 2014a, Schapper, Huber & van Engelenhoven 2014). Several researchers have suggested a genetic relationship between the TAP family and Papuan languages on the west end of New Guinea (see Hull 2004, Ross 2005 and the literature review in Schapper, Huber & van Engelenhoven 2012), though the external relations of the TAP languages have not yet been agreed upon (for alternative views, see Holton et al. 2012, Robinson & Holton 2012, Schapper & Huber 2012).

Previous work on Fataluku includes an early description (Campagnolo 1973), a Fataluku–Portuguese dictionary (Nácher 2012), a more recent booklet on the morphosyntax (Hull 2005) and a few articles investigating particular aspects of the language (van Engelenhoven 2009, 2010 on the morphosyntax, Stoel 2008 on the suprasegmental phonology). Little instrumental work on the phonetics has been published to this point. Previous reports have indicated significant dialect variation (van Engelenhoven 2009, Lewis et al. 2016), though to our knowledge, there have not yet been any publications that describe this variation instrumentally.

This IPA Illustration presents an overview of the phonetics and phonology of Fataluku, based on the speech of a male speaker of Fataluku in his early twenties. He is from the town of Lospalos, located in the central part of the Fataluku-speaking region, and his parents are from the nearby town of Souro. Fataluku is his first language, and he is also fluent in English, Tetun Dili and Indonesian.

Consonants

	Bilabial	Labio-dental	Alveolar	Palatal	Velar	Glottal
Plosive	p (b)		t (d)		k (g)	ʔ
Affricate			ts			
Fricative		f v	s z			h
Nasal	m		n			
Trill			r			
Approximant				j		
Lateral approximant			l			

Note: Phonemes set in parentheses occur only in loan words.

The words below exemplify the consonants of Fataluku. Each word is given in phonological and phonetic transcription.

p	/pala/	[pala]	‘farm’	v	/vata/	[vaʔa]	‘coconut’
b	/buku/	[buku]	‘book’	s	/sapun/	[sapũn]	‘lung’
t	/taka/	[ʔaka]	‘cover’	z	/zatu/	[d̥zaʔu]	‘airplane’
d	/doutor/	[doʔtor]	‘doctor’	h	/hafa/	[hafa]	‘bone’
k	/kafa/	[kafa]	‘eight’	m	/maka/	[māka]	‘to kick’
g	/governo/	[governo]	‘government’	n	/nava/	[nāva]	‘to eat’
ʔ	/maʔar/	[maʔar]	‘person’	r	/rata/	[raʔa]	‘to be old’
ts	/tsaʔa/	[tsaʔa]	‘fish poison’	j	/pajah/	[pajah]	‘mango’
f	/fata/	[faʔa]	‘direct’	l	/laʔa/	[laʔa]	‘to go’

The native plosive phonemes of Fataluku are voiceless, and realized with some aspiration. Word-initially before /a/, voice onset times are approximately 19 ms for /p/, 16 ms for /t/ and 42 ms for /k/. Word-position has little effect on aspiration: intervocalically, voice onset times are 23 ms for /p/, 18 ms for /t/ and 41 ms for /k/. Word-finally, stops are typically released. Acoustically, the realization of the phoneme /t/ closely resembles a dental, though further articulatory study will be necessary to determine its precise place of articulation. The corresponding voiced stops, /b/, /d/ and /g/, have been observed only in loan words.

The presence of the glottal stop is only phonemic in intervocalic position, though it is added predictably at the beginning of vowel-initial morphemes. The status of the glottal stop as a phoneme is confirmed by minimal pairs such as [rau] ‘good’ and [raʔu] ‘plate’, although in rapid speech, the glottal stop is often retained only as a stretch of creakiness on surrounding vowels or deleted entirely.

The precise place of articulation of the affricate /ts/ remains unclear. Most English speakers perceive the sound variably, as either [ts] or [tʃ]. Spectral analyses show a peak in friction energy between 5,500 Hz and 6,000 Hz, but this knowledge is not sufficient to establish the place of articulation precisely. The segment is clearly coronal, but without more detailed information about the configuration of articulators, it is not clear whether this segment should be transcribed as [ts], [tʃ], [tʃ̥] or some other type of coronal affricate. We adopt the broad transcription [ts] to emphasize the generally alveolar nature of this segment until a more precise analysis can be completed.

The phoneme /z/ is also sometimes realized as a voiced affricate with approximately the same place of articulation, transcribed here as [d̥z]. For some speakers, the realizations [z] and [d̥z] are in free variation, though for the present speaker, the realization of /z/ is dependent primarily upon phrase position: [d̥z] typically occurs after a large prosodic break, while [z] occurs in all other environments. The affricate realization occurs in the word [d̥zaʔu] ‘airplane’ above, where the segment is phrase-initial, while the fricative realization may be

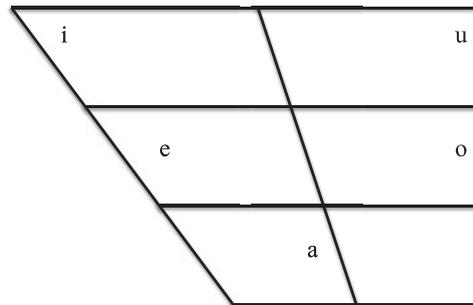
found in words such as [aza] ‘rain’. In theory, one could represent this phoneme either as /d͡z/ or as /z/; we have chosen the latter representation because of the greater frequency of the fricative realization in the present dataset.

Another consonant that shows variation is /v/. While it is realized most frequently as [v], there is free variation on a spectrum including [v], [β] and [w]. For instance, the independent third person personal pronoun /tavar/ ‘3.PL’ is generally realized as [tavar], but has also been recorded as [tawar]. Another type of gradient variation is found in /h/, which sometimes has audible frication in the upper part of the vocal tract corresponding to the place of surrounding vowels.

The sonorants also exhibit variation. The nasal /n/ assimilates to the place of a following consonant. Consonant clusters are rare in Fataluku, but a word-final /n/ can assimilate to the initial consonant in a following word. The labial nasal /m/ has not been observed to assimilate. The phoneme /r/ is typically realized as a trill word-initially and word-finally, as in [raʔa] ‘to be old’ and [maʔar] ‘person’ above, but as a tap word-medially, as in [hara] ‘light’.

Vowels

Fataluku has five vowel phonemes.¹



i	/hikari/	[hikari]	‘knife’
e	/hef-e/	[hefe]	‘to know’
a	/hara/	[hara]	‘light’
o	/horu/	[horu]	‘together’
u	/fuhu/	[fuhu]	‘muscle’

Figure 1 plots the formants of Fataluku’s five vowel phonemes, as spoken by the speaker for this illustration. Analysis was restricted to vowels from non-final syllables that neither preceded nor followed a nasal consonant. Formant measurements were made at the vowel steady-state using Praat (Boersma & Weenink 2015). One may observe that the ellipses, which show one standard deviation from the mean, are quite separate, indicating little overlap in formant values between the vowels. This figure also shows that the front vowels are somewhat higher than the corresponding back vowels, and that the low vowel /a/ is roughly central, though closer to the back vowels than to the front vowels.

Contrastive vowel length

Vowel length is contrastive for all five vowel qualities in the Lospalos dialect of Fataluku, though it carries a low functional load and may be in the process of disappearing. Some

¹ Morpheme boundaries are represented with hyphens. The suffix /-e/ occurs on the vast majority of verbs, and is here glossed VB, verbal.

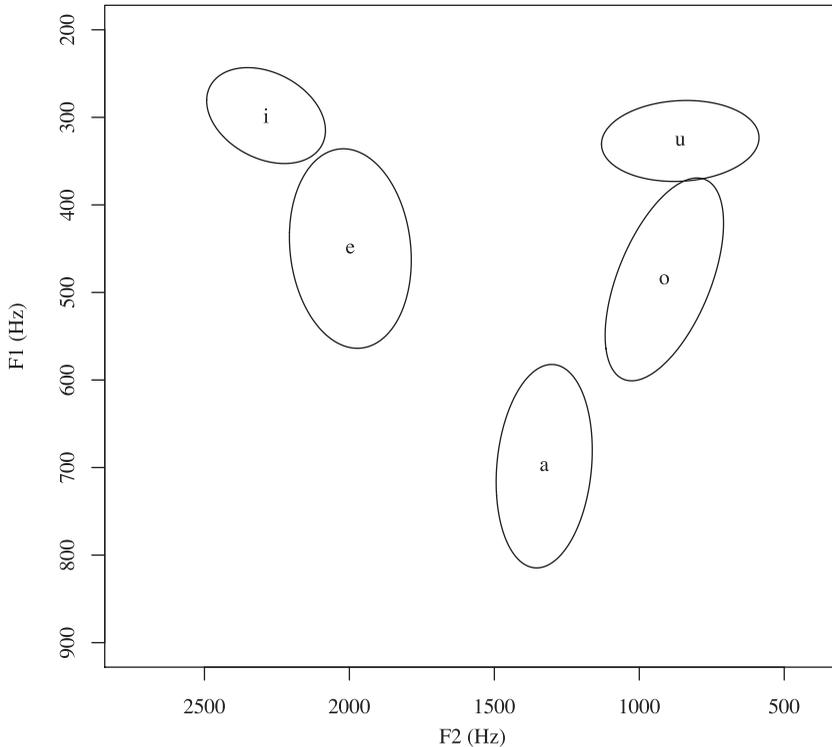


Figure 1 The phonetic realizations of the vowel phonemes of Fataluku, as produced by the speaker in this Illustration. Formant values are based on a phonetically diverse array of words elicited in a carrier phrase; analysis was restricted to short, non-final, non-nasalized vowels. Ellipses show one standard deviation away from the mean. The figure was created using the phonR package in R (McCloy 2015, R Core Team 2015).

examples of each of the five vowel qualities are given below, along with a few minimal and near-minimal pairs for contrastive vowel length.

i	/hiir-e/	[hi:re]	‘wait-VB’
e	/neer-e/	[nē:re]	‘flat-VB’
a	/faat-e/	[fa:te]	‘four-VB’
o	/tsoo-ne/	[tso:ne]	‘far-located’
u	/huula/	[hu:la]	‘spoon’

SHORT

/ner-e/	[nēre]	‘follow-VB’
/aʃsan-e/	[aʃsānē]	‘old-VB’
/a/	[a]	‘1.SG.NSBJ’
/ker-e/	[kere]	‘write-VB’

LONG

/neer-e/	[nē:re]	‘flat-VB’
/aatsan-e/	[a:ʃsānē]	‘enough-VB’
/aa/	[a:]	‘2.SG.SBJ’
/keel-e/	[ke:le]	‘laugh-VB’

Surface diphthongs

Fataluku also has surface diphthongs, as illustrated by the following words:

e _i	/lavei/	[lave _i]	‘crocodile’
a _i	/lafai/	[lafai]	‘to be large’
o _i	/tsoih-e/	[tsoi _h e]	‘mash-VB’
eu	/zeu/	[d _z eu]	‘wife’
a _u	/auru/	[a _u ru]	‘lime (the mineral)’
ou	/arapou/	[arapou]	‘buffalo’

In Fataluku, both surface long vowels and surface diphthongs are represented underlyingly as sequences of vowels, as established by Heston (2014a) on the basis of their phonological behavior and distribution.

Vowel allophones and variants

One pervasive form of allophony among the vowels concerns nasalization. Nasalization is not phonemic for vowels, but nasalization can spread to vowels from adjacent nasal stops. Interestingly, nasalization can spread across vowels iteratively both rightward and leftward, even spreading past a glottal stop.

Another form of allophony is the rapid speech process of vowel lowering. In this process, a close vowel (/i/ or /u/) at the end of a word becomes more open when there is an open vowel (/a/) in the preceding syllable, with certain consonants permitted to intervene, such as /ʔ/ or /r/. This precise degree of lowering is dependent on the speech rate. In careful speech, the final vowel is not lowered at all, but in rapid speech, a close vowel may become a close-mid or even an open-mid vowel. One example is the word /maʔu/ ‘to come’. In careful speech, this word is realized with a high vowel, as [maʔu], but in connected speech, the high vowel is lowered and it is pronounced as [maʔo]. This process is well attested when the consonants /ʔ/ or /r/ intervene. It is possible that this process is also permitted to apply when other consonants intervene between the open and close vowels; however, as this process is optional and only occurs in more rapid speech, further investigation is required to determine its precise environment.

Prosody

Existing sources provide contradictory descriptions of the word-level prosodic system of Fataluku. In his early description, Campagnolo (1973) analyzes Fataluku as having phonemic stress, which may land on either the first or the second syllable of a word. In a more recent description, Hull (2005) describes Fataluku stress as predictable. He states that all syllables in a word generally have equal stress, but if a two-syllable word is emphasized, it receives penultimate stress, and if a longer word is emphasized, it receives prepenultimate stress. A different analysis altogether is proposed by Stoel (2008), who analyzes Fataluku as a ‘tone language’, in which every content word has a phonemic high tone on either the first or second syllable.

In the speech of the consultant for this project, we have not found any minimal pairs or near-minimal pairs for stress, accent or tone, as one would expect to find in a system where such features were lexically specified. Rather, words with a similar phonological shape tend to have the same patterns of relative prominence and pitch. In general, each word bears an intonational melody that peaks on its second mora and falls to the end of the word. This rise-fall melody may also spread across multiple words if no major syntactic boundaries intervene (Heston 2015).

As far as utterance-level intonation, declaratives end in a low boundary tone (L%), while polar questions end in a rising-falling boundary tone (L+HL%); the final vowel of a polar question also undergoes prosodic lengthening to accommodate the more complex final sequence of tones (Heston 2014b). The intonational grammar of Fataluku is the active subject of ongoing research.

Transcription of the recorded text: 'The North Wind and the Sun'

Phonetic transcription

ʔɤm² wafsin ūnū nãē / pari ho vats̥u / ɤm / nĩta kurakura // ɤm / iviʔ³ vats̥in ūnū nãē / ɤm / kʰ³ / mã:r ʔũn haj māʔō // mã:r ūn laʔalã:n haj maʔo // ɤm / iviʔ³ / ʔava hoʔsaʔerē ā nĩta at̥si ʔã:n to / ma:r ivin haj māō po / ʔɤm / ʔũmãniʔu / karuēn āfa / karuēn āfã nãli kaluse // ʔũmãniʔ / mã: mivi i laʔ erēm / mũralaku / ʔũmãn mã: / faʔiʔ³ / mã:r i fajit³ / ʔava hĩn laʔ ere mũralaku / ʔãntãũn ʔawaiʔ³ ʔali forsai // iviʔ³ ʔavar hajnũku ha- ʔavar nãũkũ hãm / ivi haj nã: ʔeluhe nʔãũn / pari haj nēmēre / pari ěmērēn / sũnē sũnē sũnē sũnē / mãjs / kuandu ʔava variʔ³ vasiʔali sũnē / mãʔar ia pal pal / ɤ / hĩn lãũm hĩn nũtũ paĩ / kʰ / ʔiviʔ³ ʔava vari f-⁴ / vari sũnē f- / vari sũnē / mãjs mãʔãr ia akã nãvar / hĩn lãũ mũralaku // ʔẽntãũn / ʔɤm / vats̥- vats̥u a / vats̥u ʔali ãnãte // vats̥u a vats̥u ãnãtēn piʔe / piʔe piʔe // mã:r i haj nō ʔal ʔimĩnē mar iãa sēnti ha nō ʔal ʔimĩnē ãntãũn // ma:r hĩn faro he ʔukũ mũralaku // ʔiviʔ³ / ʔɤm / kʰ vats̥ũ nãũ mãnãnē i // vats̥ũ nãũ mãnãnē iviʔ³ / ɤm / pari ãnto / ʔɛn hĩn kõnfeza / katak / vats̥uiʔiʔiʔ / ʔava ʔali forsai //

Orthographic transcription

Wacin unu na'e pari ho wacu nita kurakura. Iwi'it wacin unu na'e ma'ar un la'ala'an hai ma'u. Iwi'it tawa hocatere nita acita'an to ma'ar iwin hai ma'u po karu'en afa kaluse. Umanit ma'ar iwi i lau eren muralaku umanit fa'it ma'ar iwin hin laum muralaku nara tawa'it tali forsa⁵ i. Iwi'it tawar na'unuku iwi hai na eluhe. Entaun pari hai nemere, pari emerene sune sune sune. Mais kuandu tawa wasitali sune ma'ar ia walipali hin laum hin nutu pa'i. Iwi'it tawa wari sune mais ma'ar ia aka nawar hin lau muralaku. Entaun wacu ali a'anate. Wacu a pite pite pite. Ma'ar ia senti hai na'u tali timine. Ma'ar ia hin faru hai ukum muralaku. Iwi'it wacu na'u manane'i. Wacu na'u manane'i iwi'it pari anto jen hin konfesa katak wacu'it tawa tali forsa i.

Back translation

One day, the Wind and the Sun were arguing. Then one day, a man came. Then both of them were telling each other, there is a man coming, so let's compete. Whoever can take off his clothes – whoever makes him take off his clothes – he is the strongest. And then both of them agree on that. The Wind goes first to blow, blow, blow, blow. But as he keeps blowing harder, the man keeps wrapping himself. And then, he keeps blowing, but the man never takes off his clothes. And so the Sun took his turn. The Sun shines and shines. That man feels hot. That man takes off all his clothes. And then the Sun wins. The Sun won, and then the Wind confessed that the Sun was stronger than him.

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² The segment [ɤ] has not been observed in any other words in the language. The use of [ɤ] and [ɤm] as pause fillers may be due to the influence of English.

³ A paralinguistic pause filler.

⁴ A false start.

⁵ A few of these words are loans from Tetun (some of which are originally from Portuguese), including *forsa* 'strength', *entaun* 'then', *mais* 'but', *kuandu* 'when', *senti* 'feel', *faru* 'clothes', *konfesa* 'confess' and *katak* 'which, that' (see Williams-van Klinken 2008).

References

- Boersma, Paul & David Weenink. 2015. Praat: Doing phonetics by computer (version 5.4.17). <http://www.praat.org/>.
- Campagnolo, Henri. 1973. *La langue des Fataluku de Lórehe (Timor Portugais)*. Ph.D. dissertation, Université René Descartes.
- Hammarström, Harald & Wilco van den Heuvel (eds.). 2012. *History, contact and classification of Papuan languages*. Special issue of *Language and Linguistics in Melanesia*.
- Heston, Tyler M. 2014a. The nature and underlying representations of long vowels and diphthongs in Fataluku. *Oceanic Linguistics* 53(2), 467–479.
- Heston, Tyler M. 2014b. Prosodic differences between declaratives and polar questions in Fataluku. *Proceedings of the 28th Pacific Asia Conference on Language, Information and Computation*, Phuket, Thailand, 395–403.
- Heston, Tyler M. 2015. Fataluku word-level prosody. In The Scottish Consortium for ICPHS 2015 (ed.), *Proceedings of the 18th International Congress of Phonetic Sciences (ICPhS XVIII)*, paper number 92. Glasgow: University of Glasgow.
- Holton, Gary, Marian Klamer, František Kratochvíl, Laura C. Robinson & Antoinette Schapper. 2012. The historical relations of the Papuan languages of Alor and Pantar. *Oceanic Linguistics* 51(1), 86–122.
- Hull, Geoffrey. 2004. The Papuan languages of Timor. *Studies in Languages and Cultures of East Timor* 6, 23–99.
- Hull, Geoffrey. 2005. *Fataluku* (East Timor Language Profile No. 7). Dili: Instituto Nacional de Linguística.
- Klamer, Marian. 2014a. The Alor-Pantar languages: Linguistic context, history and typology. In Klamer (ed.), 5–53.
- Klamer, Marian (ed.). 2014b. *The Alor-Pantar languages: History and typology* (Studies in Diversity Linguistics 3). Berlin: Language Science Press.
- Lewis, M. Paul, Gary F. Simons & Charles D. Fennig (eds.). 2016. Fataluku. *Ethnologue: Languages of the world*, 19th edn. Dallas, TX: SIL International. <http://www.ethnologue.com/language/ddg>.
- McCloy, Daniel. 2015. phonR: Tools for phoneticians and phonologists. R package version 1.0-3.
- Nácher, P. Alfonso. 2012. *Léxico Fataluco–Português*. Dili: Gráfica Patria.
- R Core Team. 2015. R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. <http://www.R-project.org/>.
- Robinson, Laura C. & Gary Holton. 2012. Reassessing the wider genetic affiliations of the Timor-Alor-Pantar languages. In Hammarström & van den Heuvel (eds.), 59–87.
- Ross, Malcolm. 2005. Pronouns as a preliminary diagnostic for grouping Papuan languages. In Andrew Pawley, Robert Attenborough, Jack Golson & Robin Hide (eds.), *Papuan pasts: Cultural, linguistic and biological histories of Papuan-speaking peoples*, 15–66. Canberra: Pacific Linguistics.
- Schapper, Antoinette & Juliette Huber. 2012. State-of-the-art in the documentation of the Papuan languages of Timor, Alor, Pantar and Kisar. *Wacana, Journal of the Humanities of Indonesia* 14(2), 1–37.
- Schapper, Antoinette, Juliette Huber & Aone van Engelenhoven. 2012. The historical relation of the Papuan languages of Timor and Kisar. In Hammarström & van den Heuvel (eds.), 194–240.
- Schapper, Antoinette, Juliette Huber & Aone van Engelenhoven. 2014. The relatedness of Timor-Kisar and Alor-Pantar languages: A preliminary demonstration. In Klamer (ed.), 99–154.
- Stoel, Ruben. 2008. Fataluku as a tone language. In Paul Sidwell & Uri Tadmor (eds.), *SEALS XVI: Papers from the 16th Annual Meeting of the Southeast Asian Linguistics Society*, 75–84. Canberra: Pacific Linguistics.
- van Engelenhoven, Aone. 2009. On derivational processes in Fataluku, a non-Austronesian language in East-Timor. In W. Leo Wetzels (ed.), *The linguistics of endangered languages: Contributions to morphology and morphosyntax*, 333–362. Utrecht: LOT.
- van Engelenhoven, Aone. 2010. Verb serialization in Fataluku: The case of ‘take’. In Sascha Völlmin, Aseb Amha, Christian Rapold & Zaugg-Coretti (eds.), *Converbs, medial verbs, clause chaining and related issues* (Frankfurter Afrikanistische Blätter 19), 185–211. Köln: Rudiger Koppe Verlag.
- Williams-van Klinken, Catharina. 2008. *Word Finder: English–Tetun Tetun–Ingles*. Dili: Sentu Lingua Dili Institute of Technology.