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ILLUSTRATION OF THE IPA

Saliba-Logea

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Saliba-Logea (ISO-639-3 sbe) is an Oceanic (Austronesian) language spoken primarily on the islands of Saliba and Logea (also known as Sariba and Rogeia), and the surrounding area in Milne Bay Province, Papua New Guinea (Figure 1). It is classified as a Suauic language within the Papuan Tip cluster within Western Oceanic and has approximately 2,500 speakers (Lewis 2009). The language, often referred to only as Saliba, has two varieties, Saliba and Logea. The differences between Saliba and Logea are mainly lexical and there appears to be little evidence of phonological differentiation (cf. Oetzel & Oetzel 2003). Mutual intelligibility is unproblematic, confirmed by the fact that speakers are not necessarily in agreement about whether lexical items sometimes identified as dialect-specific belong properly only to Saliba or Logea.[1]

Mosel (1994: 4–5) provides a brief overview of the phonology and orthography of Saliba-Logea, including a short summary of stress and syllable structure. Oetzel & Oetzel (2004a and 2004b) provide much more extensive information about the phonology of the language, while detailed information specifically about its grammar is given by Mosel (1994) and Margetts (1999).

The description we provide here is based primarily on the speech of two native speakers (one female and one male, both in their late thirties at the time of recording). The sound files provided for this illustration were captured either in a soundproof studio using a Charter Oak E700 dual diaphragm solid state condenser microphone or in a quiet room using a Zoom H4 portable stereo/4-track recorder. Most recordings were taken from a male speaker aged 35 at the time in 2009.

[1] Data collection and analysis were conducted as part of the documentation project 'Towards the documentation of Saliba-Logea – an endangered language of Papua New Guinea', funded by the Volkswagen Foundation and led by Anna Margetts. Archived materials can be found at https://dobes.mpi.nl/projects/saliba/language/

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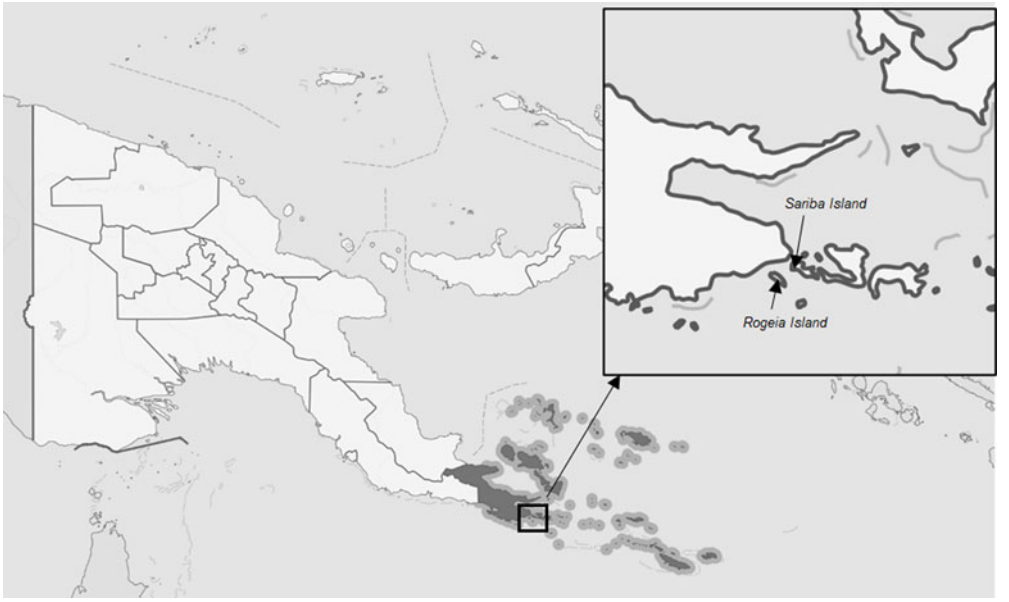

Figure 1. Map of Papua New Guinea showing the location of Saliba and Logea Islands within Milne Bay Province (shaded area). Inset map shows a close-up of the location of Saliba and Logea Islands (referred to as Sariba and Rogeia respectively). Adapted from https://commons.wikimedia.org/wiki/File:Milne_Bay_in_Papua_New_Guinea_(special_marker).svg

Consonants

	Bilabial	Alveolar	Palatal	Velar	Glottal
Plosive	p b	t d		k g	ʔ
Labialized plosive	p^w b^w			k^w g^w	
Nasal	m	n			
Labialized nasal	m^w				
Fricative		s			h
Lateral Approximant		l			
Central Approximant	w		j		

	IPA	**Orth.**	**Gloss**		**IPA**	**Orth.**	**Gloss**
p	pane	*pane*	'to smell'	t	tata	*tata*	'slide'
b	baela [^{m}baera]	*baela*	'banana'	d	dala [^{n}dara]	*dala*	'crawl'
p^w	p^wago	*pwago*	'flying fish'	n	napu	*napu*	'catch'

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b^w	b^wala [$^m b^w$ara]	*bwala*	'lie'	s	sala [sara]	*sala*	'dig'
m	mata	*mata*	'eye'	l	lohe	*lohe*	'to look'
m^w	m^wata	*mwata*	'snake'				
h	hasu [haɕu]	*hasu*	'hair'	k	kaba	*kaba*	'place'
ʔ	aoʔao [ʔaoʔao]	*ao'ao*	'crow'	g	gana [^{ŋ}gana]	*gana*	'fence'
				k^w	k^waba	*kwaba*	'coneshell'
j	jaga	*yaga*	'scrape'	g^w	g^wada [$^ŋ g^w$ada]	*gwada*	'mix with coconut cream'
				w	wabu	*wabu*	'widow'

Table 1. Mean, standard deviation (SD), and number of tokens for voice onset time (VOT) for 139 plosive tokens produced by two speakers in words in isolation in absolute initial position

	VOT (ms)		
Plosive	Mean	SD	N
p	26	15.2	16
t	21	2.9	12
k	46	13.1	40
b	−102	53.2	31
d	−110	48.7	17
g	-117	51.3	23

Saliba-Logea has 19 consonantal phonemes. The system is relatively straightforward, with the added presence of five labialized consonants. All phonemes occur word-medially between vowels, and, with the potential exception of /ʔ/, also occur regularly in word-initial position (see below).

The language has six plain oral plosives (/p b t d k g/), which are paired by a voicing distinction, and a glottal plosive /ʔ/. The voicing distinction is cued by a clear voice onset time (VOT) contrast in absolute initial position as shown in Table 1. Voiceless /p t/ are typically unaspirated, with short-lag positive VOT while /k/ appears to be optionally post-aspirated, with an average VOT of 46 ms. Voiced /b d g/, on the other hand, are generally strongly prevoiced as they exhibit long average values of negative VOT. In connected speech, the plosives are subject to some variability, in particular some post-aspiration (or even post-frication) of voiceless stops and optional lenition of voiceless and voiced stops in intervocalic position, as can be heard in the reading of the 'North Wind and the Sun' text (see further below). Examples of variation include, for instance, /haikawajagala/ [haik^{x}awajaɣala] *haikawayagala* 'they are angry with each other' and /taubada/ [tauβ̞aða] *taubada* '(old) man'.

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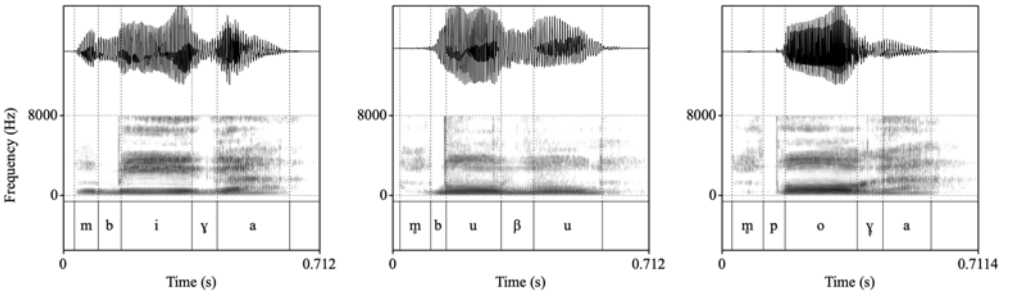

Figure 2. Annotated examples of prenasalized tokens showing full prevoicing (left), prevoicing of closure only (middle), and no prevoicing (right).

In word-initial position, voiced plosives are often prenasalized, consistent with a similar process found in many other Melanesian languages (Foley 1986). In our corpus of words produced in isolation, 39 out of 71 voiced plosive tokens (55%) were prenasalized, with slightly higher rates for /b/ (18/31, 58%) and /d/ (10/17, 59%) as compared to /g/ (11/23, 48%). Seven out of 39 prenasalized instances (18%) lacked prevoicing during nasalization, e.g., /bubu/ [ᵐ̥buβu] 'granny', with one prenasalized /b/ token extending this lack of prevoicing throughout closure (/boga/ [ᵐ̥poɣ̥a], 'type of banana'), making prenasalization an essential cue to voicing in this instance. Visual illustrations of these prenasalized tokens are provided in Figure 2.

The voiceless coronal plosive /t/ is most commonly alveolar, although a dental articulation is also possible, e.g., /tata/ [t̪at̪a] 'slide'. Its voiced congener /d/ is regularly alveolar.

The glottal plosive occurs very infrequently as a phoneme, and may in fact be a loan from Suau, a closely related language (Oetzel & Oetzel 2004a). While its phonemic status in intervocalic position within words is accepted by all, opinions differ as to what happens in word-initial position. Mosel (1994) identifies only a small number of words with /ʔ/, including in initial position, e.g., /ʔaʔa/ *'a'a* 'to clean' and /ʔunai/ *'unai* 'in, at, on'. However, Oetzel & Oetzel (2004a, 2004b) argue that the word-initial glottal stop is not at all phonemic. Instead, in their view, it results from a regular phonetic process of insertion that always occurs before a word-initial vowel, e.g., /aʔa/ [ʔaʔa] *a'a* 'to clean'. Our data provides somewhat conflicting evidence. The word-initial glottal stop is found to be variable in strength of articulation, and can also be deleted (see below). Moreover, unlike the word-medial glottal plosive, it is not usually marked in the spelling. However, productive morphological processes of prefixation allow the predictable initial glottal to surface between vowels, as seen in the following pair, e.g., /aʔa/ 'to be clean'; /heʔaʔa/ *he'a'a* 'to make clean'.

Figure 3 shows two realizations of /anka/ 'anchor' from a male speaker, without (left-hand panel) and with (right-hand panel) clear word-initial glottal plosive insertion. Note the evident glottalization following the glottal plosive in the latter as opposed to modal voicing throughout the initial vowel in the former example.

Saliba-Logea has four labialized plosives (/pʷ bʷ kʷ gʷ/) and one labialized nasal (/mʷ/), almost all of which occur only before the vowel /a/. To date, only three exceptions to this rule have been found:

IPA	**Orthography**	**Gloss**
kʷekʷe	*kwekwe*	'green tree frog'
mʷedamʷeda	*mwedamweda*	'type of surgeon fish'
bʷenabʷenam	*bwenabwenam*	'tree type'

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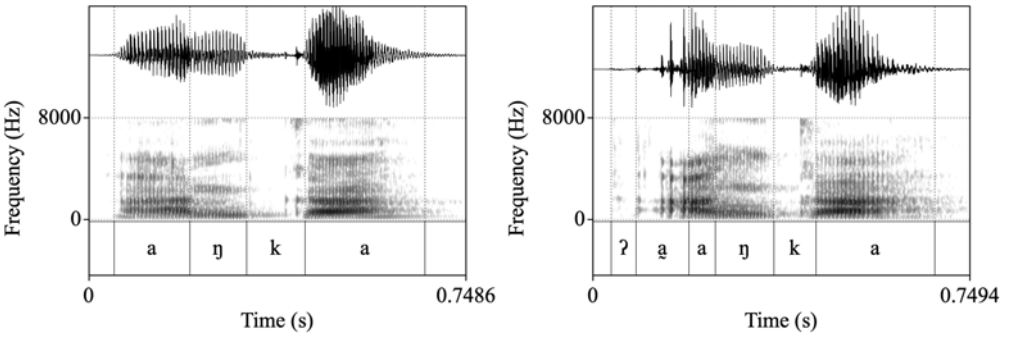

Figure 3. Annotated examples of /anka/ [aŋka] and [ʔaŋka] 'anchor' (in order from left to right) produced by the same male speaker.

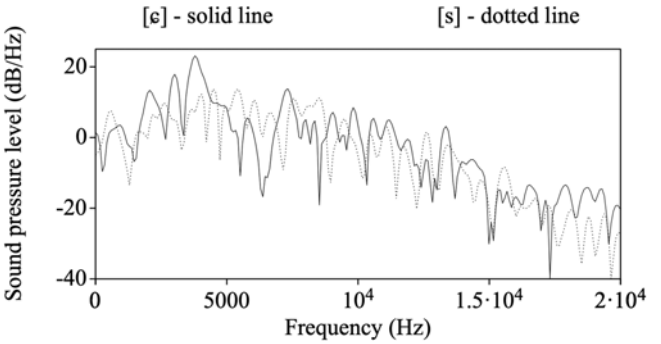

Figure 4. FFT spectra of one alveolar [s] and one alveolopalatal [ɕ] token, as perceived impressionistically, measured at the midpoint of frication.

Labialized consonants are a common areal feature of the Milne Bay province (Hajek 2010) and occur regularly in the phoneme systems of many different languages related to Saliba-Logea, including Tawala (Ezard 1997) and Dobu (Lithgow 1977). In Saliba-Logea and related languages, for reasons of analytical parsimony, they are treated as unit phonemes (e.g., /mʷ/) rather than as clusters (e.g., /mw/), as clusters are avoided in syllable-onsets in the native lexicon. Saliba-Logea has only three nasals, two of which are plain and one labialized. There is also an additional allophone: a plain voiced velar nasal, [ŋ], which occurs very rarely and only before velar stops in English loans, e.g., /anka/ [aŋka] *anka* 'anchor'. The plain bilabial nasal is otherwise the only consonant that occurs in coda-position word-medially (see below) and in word-final position in native words, e.g., /kamkam/ *kamkam* 'chicken'.

Saliba-Logea has only two fricatives. One is a voiceless glottal fricative /h/ and the other a voiceless alveolar fricative /s/. /h/ may be voiced between vowels, e.g., /lohe/ [lofie] *lohe* 'to look'. /s/ may be retracted in the corpus and exhibit the quality of an alveolopalatal [ɕ], as observed auditorily and visually through an inspection of fast Fourier transform (FFT) spectra. Possible causes of variation between [s] and the assumed [ɕ] variant are not explored here but deserve future investigation. Figure 4 illustrates a comparison between spectra of /s/ in the examples for /simai/ [ɕimai] 'cat', given in the 'vowels' section below, and for /sala/ [sara] 'dig', presented above. The figure shows a higher concentration of spectral energy below 5 kHz for [ɕ] and above the same threshold for [s], consistent with previous

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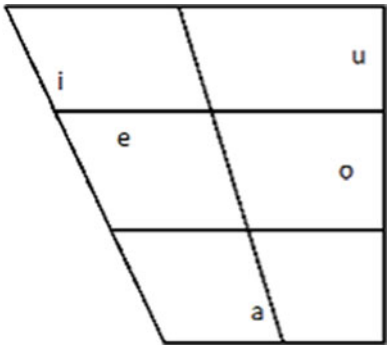
acoustic investigations on these sounds (e.g., Bukmaier & Harrington (2016) on Polish; Lee-Kim (2011) and Ladefoged & Wu (1984) on Mandarin Chinese), whereas energy distributions remain comparable across tokens above roughly 7.5 kHz.

Saliba-Logea has three approximant phonemes. The first is a voiced alveolar lateral approximant /l/. Our observations indicate that in intervocalic position it is more typically realized as a lateral flap [ɺ] or a tap [ɾ]. In less careful speech it can be realized as a central coronal approximant [ɹ] or an approximant tap [ɾ̠], as shown in the North Wind and the Sun transcription below. This variability results in alternations such as /polohe/ [polohe] ~ [porohe] *polohe* 'heavy' for instance.[2] The second approximant phoneme is a voiced palatal central approximant /j/, while the third is a voiced labial-velar central approximant /w/.

Mosel (1994: 4) claims that the phonemic status of /w/ and /j/ is debatable due to evidence of complementary distribution with their vocalic counterparts [u] and [i]. We follow instead Oetzel & Oetzel (2004a, 2004b) who assign phonemic status to /w/ and /j/. We agree with them that it is not the case that the appearance of [w] and [j] is completely predictable nor without unexpected consequences.

Critically, the treatment of [w] and [j] as allophones of high vowels /u/ and /i/ is problematic in relation to the surface interaction between syllable structure and segment assignment. If /wabu/ 'widow' were treated as underlyingly /uabu/, we would expect it to surface as ∗[(ʔ)uwabu], rather than actual [wabu] with word-initial /w/, as a result of a marked tendency for a homorganic glide to be inserted in vowel hiatus contexts in which the first vowel is high or mid-high, i.e. [w] after /u/ or /o/ and [j] after /i/ or /e/, respectively. This process also, however, shows some variability, as reflected by occasional orthographic variation in the written form of the language, e.g., *gonoa* ~ *gonowa* 'ability'. Other examples include *dua* 'give present', *guawana* 'type of shark' which can also be spelt *duwa* and *guwawana* respectively. Oetzel & Oetzel (2004a, 2004b) give additional reasons in favor of the phonemic status of /w/ and /j/, including the observation that treating glides as phonemic is also consistent with the general preference in the language for syllables with onsets (see also below).

Vowels



Saliba-Logea has a simple five vowel system, /a e i o u/, with /a/ representing a low central vowel. Figure 5 shows an F1/F2 vowel plot for the five vowels. It is based on 118 tokens

[2] Variation in the orthographic forms of the names of the islands and their language varieties: *Saliba* ~ *Sariba* and *Logea* ~ *Rogeia* is not likely related to internal variation in Saliba-Logea itself, but the result of the influence of closely related Suau which until recent times was traditionally the only local language used in written form. Suau consistently has something like /ɹ/ which is equivalent to Saliba /l/ and written 'r'.

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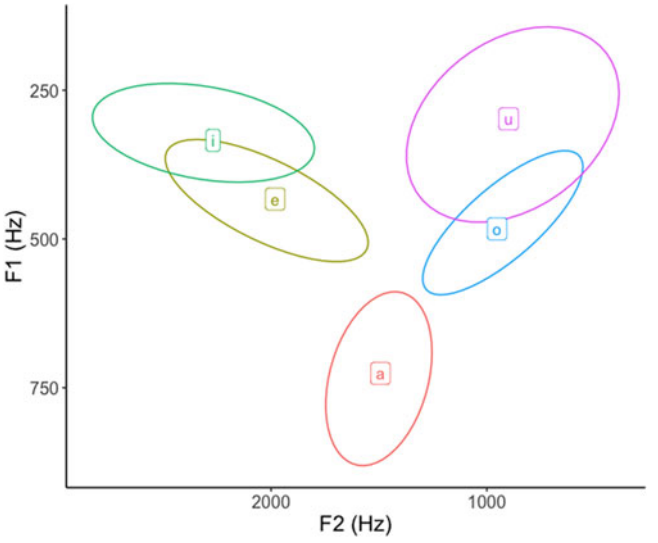

Figure 5. (Colour online) F1–F2 plot of the five Saliba-Logea vowels from two speakers (one male, one female).

from two speakers (one male, one female) with no normalization. Ellipses represent two standard deviations around the mean. We see that the two mid-vowels are relatively high and close, partly overlapping with high vowels /i u/, while low central /a/ has a more vertical distribution.

The five vowels can be contrasted as seen in the following examples.

	IPA	Orthography	Gloss
a	bada	*bada*	'old'
e	beda	*beda*	'betelnut'
i	biga	*biga*	'soft'
o	boga	*boga*	'type of banana'
u	bubu	*bubu*	'granny'

Vowel clusters with final non-low vowel surface with diphthongal effect in Saliba-Logea. Diphthongization in Saliba-Logea is not as tightly knit as in English and other European languages and vowel sequences are readily pronounced as almost disyllabic in careful speech.

	IPA	Orth.	Gloss		IPA	Orth.	Gloss
ai	simai [ɕimai]	*simai*	'cat'	au	wau	*wau*	'today/now'
ei	dei	*dei*	'dorsal fin'	eu	seu	*seu*	'type of bird'
oi	poipoi	*poipoi*	'type of yam'	iu	niu	*niu*	'coconut'
ui	suisui	*suisui*	'animal'	ou	dou [^{n}dou]	*dou*	'to cry'
ae	baela [^{m}baera]	*baela*	'banana'	ao	aoʔao [ʔaoʔao]	*ao'ao*	'crow'

Orth. = Orthography.

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Identical vowel sequences occur rarely as a result of morphological processes, but surface as long vowels as seen in the second example below.

IPA	Orthography	Gloss
je tapitapi	*ye tapitapi*	'she waved'
je tapitapiː	*ye tapitapii*	'she slapped it'

Phonotactic structure

The phonotactic structure of Saliba-Logea is relatively straightforward, with an overwhelming tendency towards CV syllable structure. Phonemic V syllables occur much less frequently and most consistently in word-initial position (cf. Oetzel & Oetzel 2004a, 2004b). As discussed previously, they also tend to resolve at the surface with glottal stop insertion. CVV syllables on the other hand are not uncommon (see examples cited above as well as in the section related to stress below). Syllable-initial CC clusters are very marginal and occur only in rare English loans, such as /stɔli/ *stoli* 'story'. These unusual non-native clusters are also unstable as speakers can also resolve them through insertion of /i/ evident in orthographic variation, e.g., *stoli* ~ *sitoli*[3]. CVC syllables occur rarely and in native vocabulary the rhyme consonant is always /m/. As a result, a small number of /mC/ clusters occur in word-medial position in native vocabulary. Heterorganic clusters are often the result of reduplication, as shown in some of the following examples.

	IPA	Orthography	Gloss
mb	kilamb^{w}au	*kilambwau*	'hard-shell clam'
md	damdam	*damdam*	'type of pandanus'
mg	bulumgai	*bulumgai*	'Southwest wind'
mk	kamkam	*kamkam*	'chicken'
ml	lomlom	*lomlom*	'type of fish'
mn	kamna	*kamna*	'delicious'
mp	kamposi	*kamposi*	'jump'
ms	dugamsika	*dugamsika*	'penis'
mt	malatomtom	*malatomtom*	'morning'

An additional set of word-medial clusters (with nasal place assimilation of /n/ before velar stops) occurs in loans, almost all directly from English.

	IPA	Orthography	Gloss
nd	balanda [baranda]	*balanda*	'veranda'
ŋk	aŋka	*anka*	'anchor'
ns	pensolo	*pensolo*	'pencil'

[3] No recording is available for *sitoli*.

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nt	anti	*anti*	'auntie'
pl	leplep	*leplep*	'sarong'
st	kastam	*kastam*	'custom'

Stress or prominence

Identifying stress is the most problematic part of Saliba-Logea phonology, with indications that Saliba-Logea may not in fact be a stress language. However, this is an issue that requires much more investigation than is possible here, and it may be wiser in the interim to refer to prominence instead. The current difficulties we encounter in understanding Saliba prosody relate in part to a pattern previously noted across different Austronesian languages, whereby basic stress cues (pitch, length and amplitude) often appear displaced differently across syllables rather than appearing together on the same syllable (see, e.g., Palmer (2008) on Kokota, and Rehg (1993) on several Micronesian languages).

This phenomenon of cue dispersal certainly occurs in Saliba-Logea, as Oetzel & Oetzel (2004a) also note specifically. While they provide useful data on what they understand to be stress placement, their results do not always coincide with our own observations. Detailed experimental exploration is still required to understand better these discrepancies.[4] What is clear at this stage is that investigators have responded differently to the spreading of stress-related auditory cues (see also Eades & Hajek (2006) on similar issues in Gayo, an Austronesian language spoken in Eastern Indonesia).

We also acknowledge the potential existence of some phrase-level prominence patterns in Saliba-Logea, based on impressionistic observation of the North Wind and the Sun passage below. However, due to the present analysis being restricted primarily to words produced in isolation, we cannot for the moment draw any conclusive findings in this regard.

Impressionistically, as corroborated by participants during recording, certain patterns of syllable prominence resembling lexical stress emerge. In our corpus, the initial syllable in disyllables is always prominent when the final syllable is light (CV), e.g., *HEsa* 'name'. If the final syllable is heavy (CVC, CVV), it is prominent in citation form, e.g., *heSAM* 'your name' and *kaDAU* 'travel' (but cf. *HEsau* INDEF in the North Wind and the Sun transcription), except in the case of reduplicated forms where both parts appear fairly evenly prominent, e.g., *KAMKAM* 'chicken'. Figures 6 and 7 illustrate acoustic differences between *HEsa* and *heSAM*. Relative to the duration of the vowel in the second syllable, the duration of /e/ is clearly longer for *HEsa* than for *heSAM*. The duration of the first syllable relative to that of the second syllable is also clearly longer for *HEsa*. Furthermore, there is a steep decrease in intensity in the second syllable for *HEsa* but not for *heSAM*. Figure 8 shows a similar trend of the intensity track in *kaDAU* 'travel' as compared to *heSAM* (Figure 7). Intensity in the second syllable stays relatively level across syllable duration and is slightly higher than in the first syllable in both cases.

Figure 9 shows that the average duration and vowel intensity of the final syllable in disyllables are much higher when this syllable is heavy compared to when it is light, suggesting that these parameters may play a more consistent role in cueing prominence in Saliba-Logea. By contrast, no clear changes in average vowel f0 can be seen across final syllable types (Figure 10).

[4] Rehg (1993) notes that for Pingelapese, different researchers using the same experimental equipment and native speaker, arrived at completely different observations about stress and its correlates in that Micronesian language.

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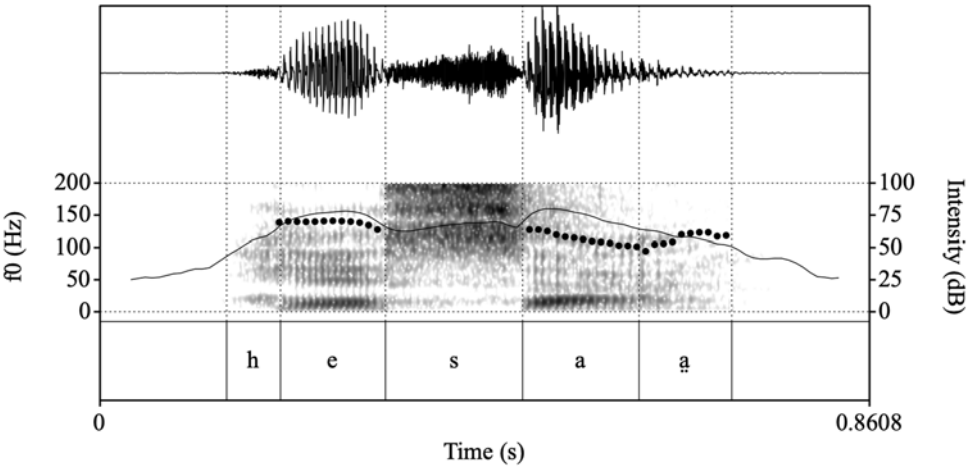

Figure 6. Waveform and spectrogram of *hesa* 'name' produced by a male speaker. The dotted line is the f0 track, and the solid line is the intensity track. Note the comparable duration of the modal voicing portions of the two vowels and the steep decrease in intensity in the second vowel.

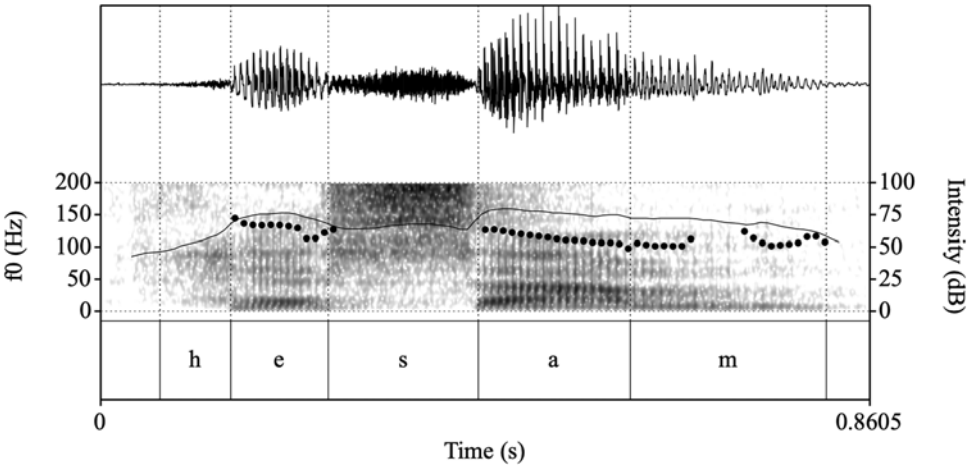

Figure 7. Waveform and spectrogram of *hesam* 'your name' produced by a male speaker. The dotted line is the f0 track, and the solid line is the intensity track. Note the longer duration of the second vowel relative to the first vowel and the smaller, less steep decrease in intensity in the second vowel as compared to Figure 6.

In longer words, identifying consistent prominence patterns is often more problematic, lending further support to the hypothesis that lexical stress may be absent in Saliba-Logea. As illustrated by the *keDEwa* and *KEdewa* 'dog' realizations in Figures 11 and 12 below, stress cue displacement becomes even more apparent in this context. Additionally, while final heavy syllables frequently exhibit stress-like prominence, this is not consistently the case.

Furthermore, vowel duration differences across syllables tend to be minimal, with a frequent tendency for vowels outside the expected locus of stress or prominence to lengthen, even when they might otherwise be classified as unstressed or not prominent.

The perceptual effect is such that monomorphemic words often sound as if they have two equally prominent syllables, e.g., *BAGOdu* 'wave'. In longer multimorphemic words it is

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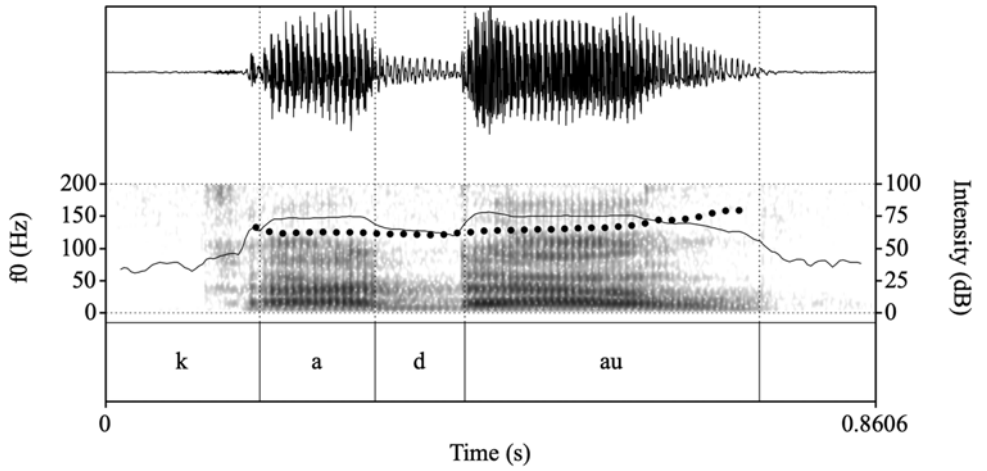

Figure 8. Waveform and spectrogram of *kadau* 'travel' produced by a male speaker. The dotted line is the f0 track, and the solid line is the intensity track. Note the much longer duration of /au/ in the second syllable relative to /a/ in the first syllable and the level intensity track for most of the duration of the diphthong in the second syllable.

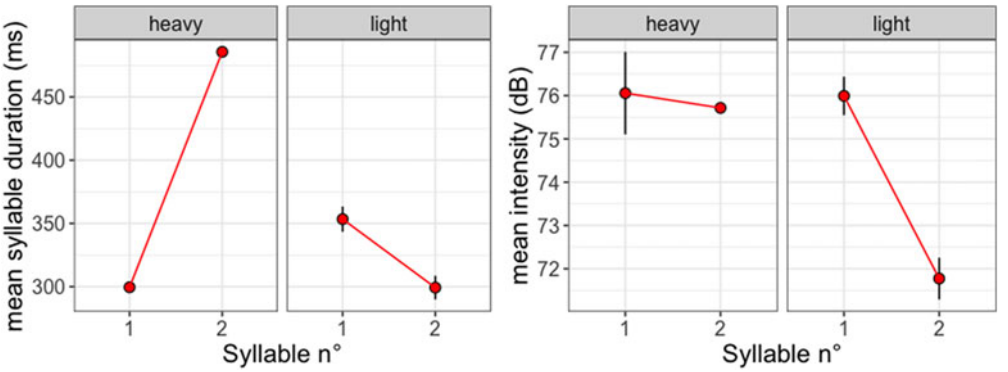

Figure 9. (Colour online) Mean syllable duration (including onset C) and mean vowel RMS amplitude + error bars for disyllabic words ending in a heavy (CVV) vs. light (CV) syllable. The two plots are based on 68 and 116 tokens from one male and one female speaker respectively.

difficult to establish which syllable is most prominent – it can appear to be equal or shift from syllable to syllable on repeated testing. This ambiguity in the placement of potential correlates of stress is shown in Figure 11 through to Figure 16 below. As previously mentioned, these observations highlight the need for further experimental research to better understand the prosodic patterns of Saliba-Logea. Detailed analyses of connected speech and larger datasets would be essential to clarify the role of prosodic cues in this language (cf. Himmelmann 2010).

Given the complexity also of the interaction between number, weight and prosody of syllables in longer words we now provide a simple descriptive quantitative analysis, focusing on words up to four syllables in length composed of CV (light) syllables only, which, as we have seen, is the most frequent syllable type in Saliba-Logea. Figure 14 shows that the average duration of syllables in trisyllables remains stable across our corpus of CVCVCV words.

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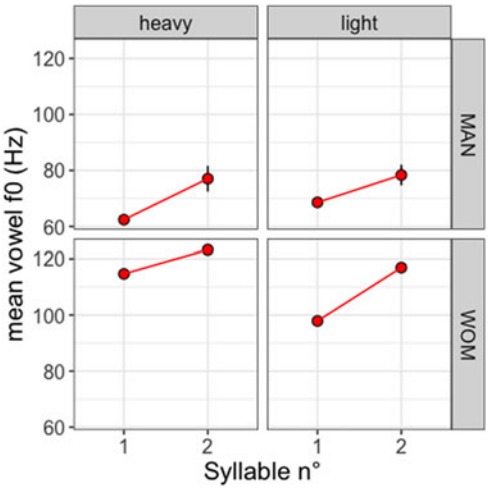

Figure 10. (Colour online) Mean vowel f0 + error bars for disyllabic words ending in a heavy (CVV) vs. light (CV) syllable based on 117 tokens. The top row and the bottom row show the data from one male and one female speakers, respectively.

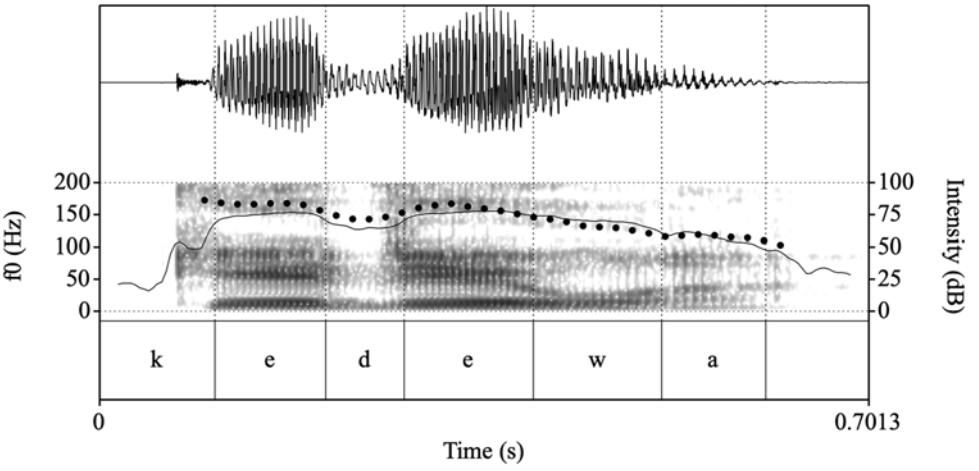

Figure 11. Waveform and spectrogram of *kedewa* 'dog' produced by a male speaker. The dotted line is the f0 track, and the solid line is the intensity track. Note the peak intensity and greater duration in the penultimate vowel, but similar f0 in both the antepenultimate and penultimate vowels.

However, in quadrisyllabic CVCVCVCV words the first and the last syllables appear to have longer duration.

As Figure 15 demonstrates, mean vowel intensity does not seem to signal stress in our target words as intensity decreases across syllables and no specific patterns can be detected. The same can be said for mean vowel f0 (Figure 16). The only obvious difference here is that the female speaker tended to produce a terminal rise in trisyllables and the male speaker a fall, possibly due to a stylistic difference in reading word lists.

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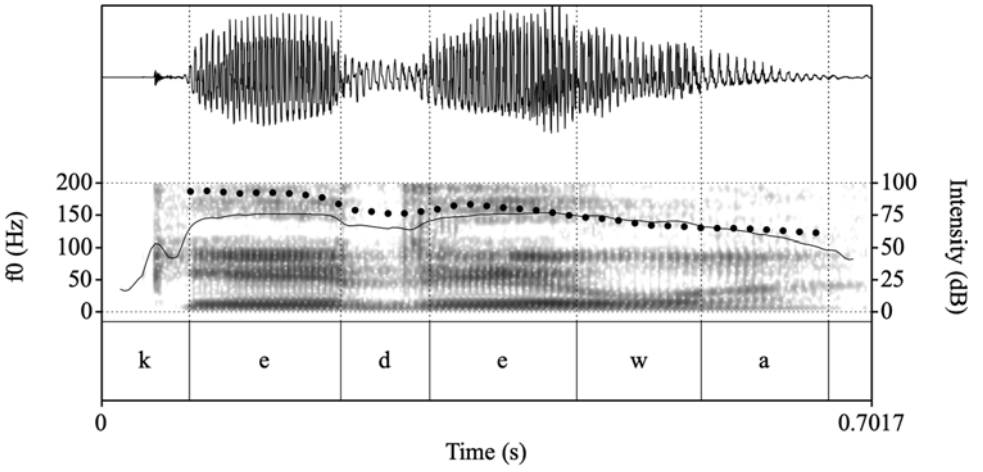

Figure 12. Waveform and spectrogram of *kedewa* 'dog' produced by a male speaker. The dotted line is the f0 track, and the solid line is the intensity track. Note the peak f0 and greater duration in the antepenultimate vowel, but similar intensity in both the antepenultimate and penultimate vowels.

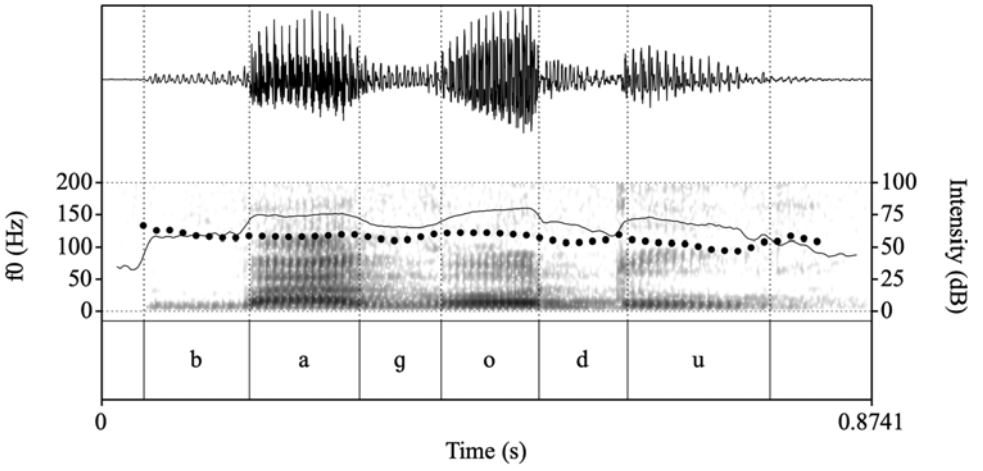

Figure 13. Waveform and spectrogram of *bagodu* 'wave' produced by a male speaker. The dotted line is the f0 track, and the solid line is the intensity track. Note a similar peak intensity, peak f0, and vowel duration between antepenultimate and penultimate vowels.

Transcription

The following presents both broad and narrow phonetic transcriptions of the passage 'The North Wind and the Sun' read by a male speaker of Saliba-Logea. These are followed by the orthographic version of the story and the glossed text. Prominence patterns in the read passage show even greater variability than in isolated utterances as described above. We find, for instance, not only different prominent syllables in the word *mahana* 'sun' as both *MAhana* and *maHAna*, but also cases of prominence on short CV syllables that precede final heavy syllables, e.g., *HEsau* INDEF and *BAyao* 'strong'. Unsurprisingly, there is also much greater phonetic segmental variability in connected speech in comparison to isolated speech, seen in such things as full nasalization of underlying /bʷ/ in /bʷauli/ in one

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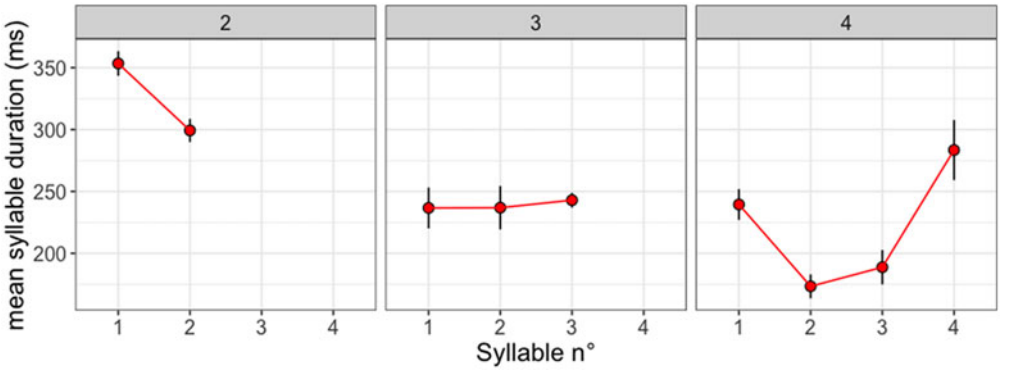

Figure 14. (Colour online) Mean syllable duration (including onset C) + error bars for words of two to four syllables composed of light (CV) syllables only. The plots show data based on 100 tokens from one male and one female speaker.

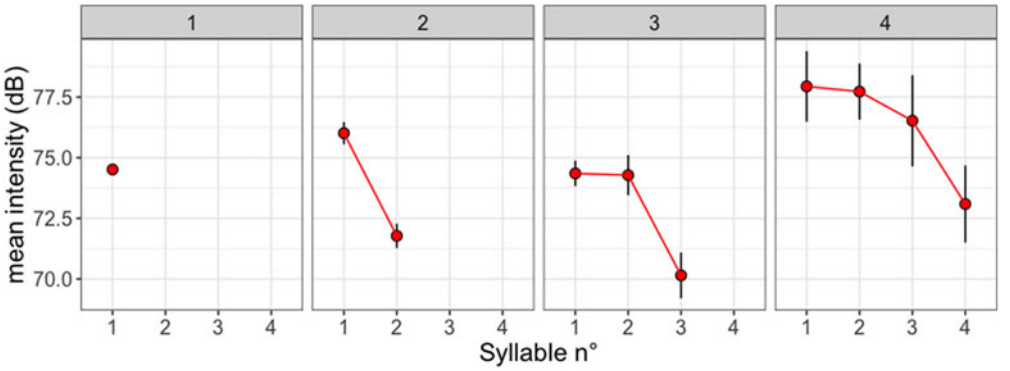

Figure 15. (Colour online) Mean vowel RMS amplitude + error bars for words of one to four syllables composed of light (CV) syllables only. The plots show data based on 178 tokens from one male and one female speaker.

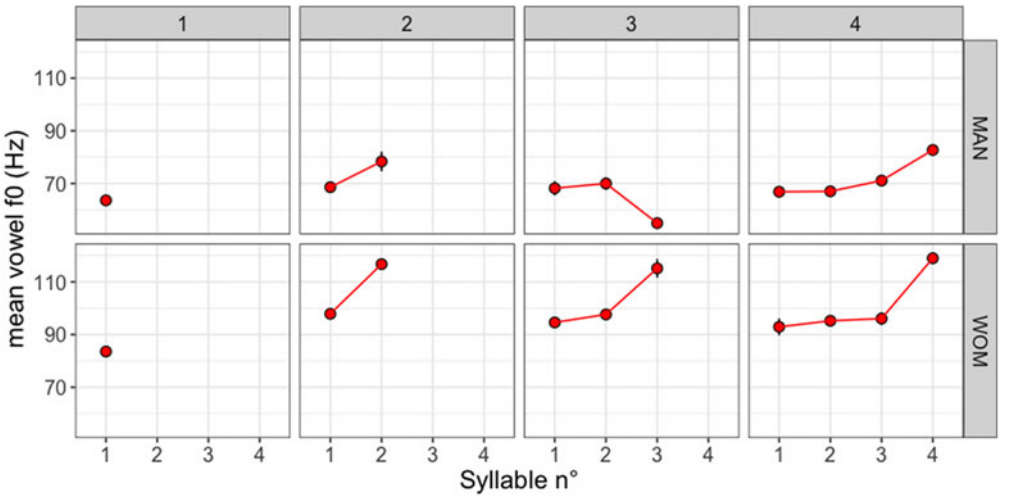

Figure 16. (Colour online) Mean vowel f0 + error bars for words of one to four syllables composed of light (CV) syllables only. The plots show data based on 178 tokens from one male (top) and one female (bottom) speaker.

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case below, i.e. [ˈmʷauɹi]. The speaker also produced a false start in the second line of the passage, indicated by a dash.

1. pilipilidai hesau | mahana jo bʷauli ||

   piɾipiɾidai ɦesau | maɦana jo bʷauɹi ||

   a story: the sun and the north wind

2. bʷauli jo mahana majadai hesau se | hai-haikawajaɡala kaiteja je bajao | kalili | bʷauli | o mahana ||

   bʷauɹi jo maɦana majadai hesau ɕe | hai-haikʰawajaɡaɻa kʰaitʰeja je bajao | kʰaːɹiɹi | bʷauɹi | o maɦaːna ||

   the north wind and the sun one day argued who was very strong, the north wind or the sun

3. haikawajaɡala na taubada hesau | je laoma | je taitaihile | na kouti | je likʷa ||

   haikˣawajaɣaɾa na tʰauβ̞aða ɦesau | je laoma | je tʰaitʰaiɦiile | na kʰouti | je ɹiːkʷa ||

   they argued, and a man came along, going for a walk, and he wore a coat

4. se koitalaliju |ede se wane || kabo kaiteja taubada ne | jona kouti | je hai ɡabae | meta ija | je bajao ede ||

   se kʰoitʰaɻariju |ede se wane || kʰaβ̞o xaitʰeja tʰauβ̞aða ne | jona kʰoutʰi | jeː ɦai ɰaβ̞ae | metʰa ʔiːja | je bajao ede ||

   they made a decision and said, whoever will take the coat off the man is strong, then

5. ede bʷauli | je hetubu je towa | je towa meta | je bajao paɾapa ||

   ede bʷauɹi | je ɦetʰubuː je tʰoːwa | je tʰowa metʰa | jeː bajao pʰaːɻapʰa ||

   and so the north wind started blowing, it blew very strongly

6. je towa | je bajao | ijamo taubada wa | jona kouti je kabi | hekahini palapai ||

   je tʰoːwa | je β̞ajao | iːjamo tʰauβ̞aða wa | jona kʰoutˢi je kʰaːbi | hekʰahiːni pʰaɻapʰai ||

   it blew strongly but the man held on to his coat very tightly

7. bʷauli | je towa | je bajao | palapa | je kaipate | kasaja | ede je kaijawasi ||

   mʷauɹi | je tʰoːwa | je bajao | pʰaːɹapa | je kʰaipatʰe | kʰaːsaja | ede je ᵏxaijawasi̯ ||

   the north wind blew very strongly, it tried in vain and so (finally) he stopped

8. kabo mahana wa hinage | kana huja | je hetubu | je sina | na je | sina bajao ||

   xabo maɦana wa hiːnaɡe | kʰana huja | je ɦeːtʰuβ̞u | jeː siːna | naː je | sina bajao ||

   then the sun also (took) its turn, it started shining, and shone strongly

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9. je sina bajao | ede taubada wa | jona kouti | je hai gabae ||
   je sina bajao | ede tʰaubaða wa | jona kʰoutʰi | je ɦai ɯabae ||
   it shone strongly and so the man took off his coat
10. ede bʷauli je hedede lau | i wane | o kowa ku bajao kalili ||
    ede bʷauɹi je ɦedede lau | ʰi wane | ʔoː kʰowa ko β̞ajao kʰaɪiːɹi ||
    and so the north wind said (to the sun) 'Oh you (are) very strong'

Orthographic version

Pilipilidai hesau mahana yo bwauli.
Bwauli yo mahana mayadai hesau se haikawayagala kaiteya ye bayao kalili bwauli o mahana.
Haikawayagala na taubada hesau ye laoma ye taitaihile na kouti ye likwa.
Se koitalaliyu ede se wane 'kabo kaiteya taubada ne yona kouti ye hai gabae meta iya ye bayao' ede.
Ede bwauli ye hetubu ye towa, ye towa meta ye bayao palapa.
Ye towa ye bayao iyamo taubada wa yona kouti ye kabi hekahini palapai.
Bwauli ye towa ye bayao palapa ye kaipate kasaya ede ye kaiyawasi.
Kabo mahana wa hinage kana huya ye hetubu ye sina na ye sina bayao.
Ye sina bayao ede taubada wa yona kouti ye hai gabae.
Ede bwauli ye hedede lau i wane 'Oh kowa ku bayao kalili'.

Glossed text

Pilipilidai	hesau	mahana	yo	bwauli.
story	INDEFINITE	sun	and	north.wind

Bwauli	yo	mahana	mayadai	hesau	se-haikawayagala
north.wind	and	sun	day	INDEFINITE	3PL-argue

kaiteya	ye-bayao	kalili,	bwauli	o	mahana.
who	3SG-strong	very	north.wind	or	sun

(Se-[5])haikawayagala	na	taubada	hesau	ye-laoma	ye-taitaihile
(3PL-)argue	and	man	INDEF	3SG-come	3SG-go.for.walk

na	kouti	ye-likwa
and	coat	3SG-wear

Se-koitalaliyu	ede	se-wane
3PL-decide	and.so/PRESUP	3PL-say

[5] The person marker is ellipsed in the recording, but is included here for completeness.

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kabo kaiteya taubada ne yona kouti ye-hai gabae
will who man DET his coat 3SG-take off

meta iya ye-bayao ede.
TOPIC 3SG 3SG-strong and.so/PRESUP

Ede bwauli ye-hetubu ye-towa,
and.so/PRESUP north.wind 3SG-start 3SG-blow

ye-towa meta ye-bayao palapa.
3SG-blow TOPIC 3SG-strong very

Ye-towa ye-bayao iyamo taubada=wa yona kouti.
3SG-blow 3SG-strong but man=ANAPH his coat
ye-kabi hekahini palapai.
3SG-hold fast very

Bwauli ye-towa ye-bayao palapa, ye-kaipatekasaya
north.wind 3SG-blow 3SG-strong very 3SG-try in.vain

ede ye-kaiyawasi.
and.so/PRESUP 3SG-stop

Kabo mahana=wa hinage kana huya
and.then sun=ANAPH also its turn

ye-hetubu ye-sina, na ye-sina bayao.
3SG-start 3SG-shine, and 3SG-shine strong

Ye-sina bayao ede
3SG-shine strong and.so/PRESUP

taubada=wa yona kouti ye-hai gabae.
man=ANAPH his coat 3SG-take off

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Ede	bwauli	ye-hedede	lau i-wane
and.so/PRESUP	north.wind	3SG-say go	3SG-say

'Oh	kowa	ku-bayao	kalili'
Oh	2SG	2SG-strong	very

And so the north wind said (to the sun) 'Oh you are the strongest'

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