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The Kamula-Elevala Language Family

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Abstract

Aekyom, Pa and Kamula are spoken in the Western Province of Papua New Guinea. We demonstrate that these languages form a language family by reconstructing the sound system, some vocabulary, pronouns and grammatical suffixes. We also trace loans from neighboring languages. It is shown that Aekyom and Pa form a subfamily called Elevala. We suggest that the nearest relatives of the Kamula-Elevala languages are the Awyu-Dumut languages spoken across the border in Indonesian Papua.

1. Introduction¹

Aekyom and Pa have been assumed to be related since Healey (1964) suggested that they form a family he called Awin-Pare. Yet the relationship has never been formally demonstrated. Kamula became known somewhat later and was not properly integrated into the classificatory scheme of Wurm (1975, 1982), which dominated the literature on Papuan languages until the turn of the last century. For Ross (2005), the position of Kamula within the Trans-New Guinea phylum was a mystery. We present evidence in this paper that Kamula is related to Aekyom and Pa. We use the comparative method to show that these three languages form a language family we call Kamula-Elevala.

In Section 1, we introduce the languages and the sources of information on them. We also give a short overview of their phonology and orthography. Section 2 is the heart of this paper. Here we reconstruct the phonology of Proto-Kamula-Elevala, parts of the lexicon, pronouns and a few other grammatical items. In Section 3, we report on borrowing from neighboring languages. Section 4 is a review of previous classificatory research on the languages of the family and a preview of their wider genealogical affiliation. In Section 5, we summarize the results of this study.

1.1 The languages

The Kamula-Elevala language family is composed of the two Elevala languages Aekyom and Pa and the single language Kamula. These languages are spoken in the northern half of the Western Province of Papua New Guinea (see Map). All three of them are vital, being used in everyday life by speakers of all ages.

Aekyom is situated in an area bounded by the Fly River and the hills north of the Elevala River to the south, by the Ok Tedi River to the west, and by the Black River to the east. In the north, the area extends into the foothills of New Guinea's central cordillera. The Aekyom people call themselves and their language Aekyom. In the older literature they were referred to as Awin, which is the name the neighboring Yongkom people have for them (Stewart 1989: 1). According to Depew (1986: 12f), the Aekyom themselves distinguish three dialects of their language: a dialect called Aekyom-Skai in the northeast along the Black River, a dialect called Aekyom-Pare in the southeast along the Fly River, and a dialect for which there is no other name than Aekyom in

¹ Pamela Waldeck collected the Pa lexical data included in this paper with the help of her daughter Jillian Lowe and their main informant Lazarus Ga:biyo. Jean Stewart shared her Aekyom dictionary and grammar manuscripts with us. Ismo and Judith Routamaa made their Kamula dictionary available to us. Bert Voorhoeve gave us copies of his comparative word lists. We gratefully acknowledge the help and support of all these people. Helpful comments came from two anonymous reviewers. Of course, none of them is responsible for any mistakes we may have made in interpreting the data. We also thank North Cady of the SIL Language Survey Office in Ukarumpa for drawing the map and for providing the speaker numbers from the 2000 census.

the west along the Ok Tedi River. To these Depew added a north central dialect for which there is also no indigenous name. Stewart (1989: 26) gives a somewhat different account of the dialects. In the classification in Table 1 we follow Depew, who presented some comparative lexical data for the dialects he recognized. A proper dialect survey may modify this picture.

Table 1: Classification of the Kamula-Elevala languages

Kamula-Elevala family

Kamula [1,100 speakers in 2000]

Elevala (= Awin-Pare) family

Aekyom (= Awin, Akium) [21,100 speakers in 2000]

Northeastern d (= Aekyom-Skai)

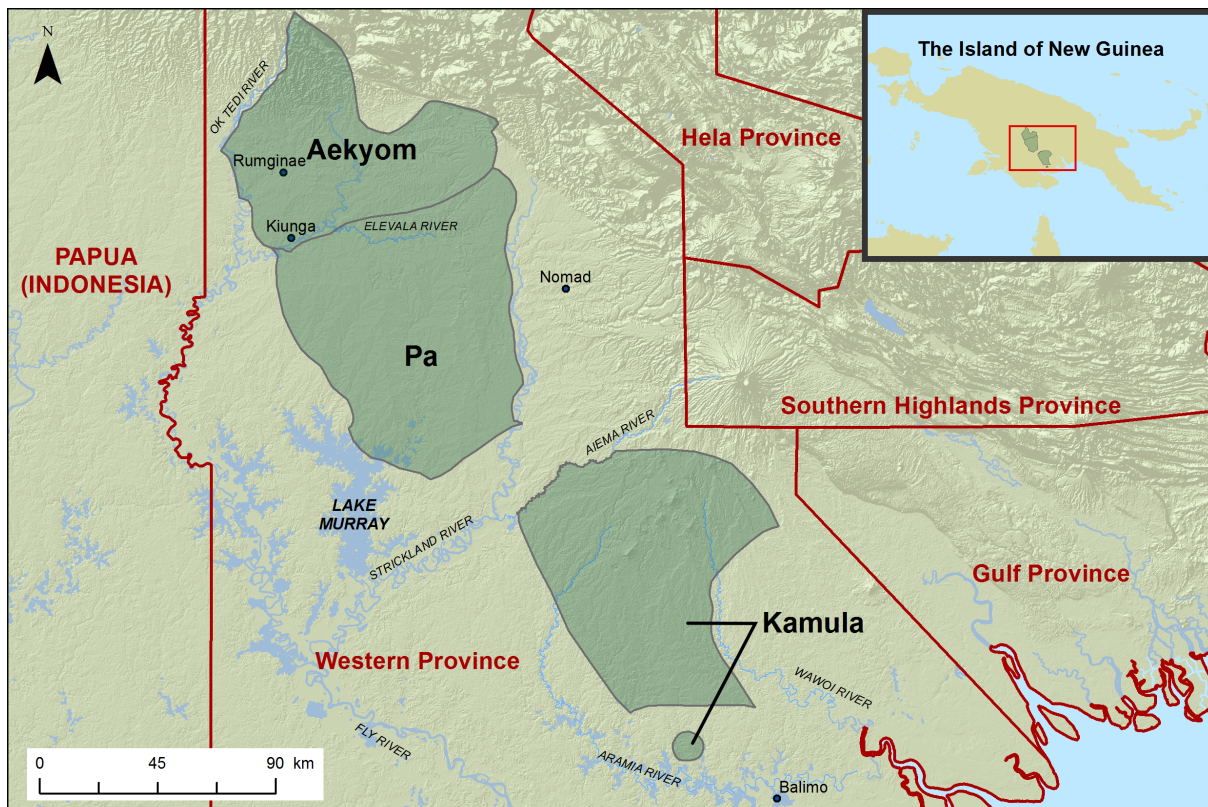
North Central d

Southeastern d (= Aekyom-Pare)

Western d

Pa (= Pare, Ba, Debepare) [6,500 speakers in 2000]

Map: The Kamula-Elevala languages



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Borders shown on this map represent language data. They do not reflect nor should they be used to make land claims.

The territory of the Pa language adjoins that of Aekyom to the north. It extends from the Elevala River in the north to Lake Murray in the south and is bounded by the Strickland River to the east. The Pa people are called Pare by their neighbors, the Aekyom (Depew 1986: 330), and this name alternates with the autonym Pa in the literature. According to Voorhoeve (1975: 390) there are five slightly different dialects, but as we have not seen any data for them we do not include them in the classification in Table 1.

Kamula is spoken in two widely separated places not far from the Wawoi River. In the Wawoi Falls area to the north lie the two villages of Keseki and Samokopa. 90 km to the south, on

a lagoon north of the Aramia River, Wasapea village (also called Kamiyami) is located. In all three of these villages Kamula as well as Doso is spoken. But whereas in the two northern villages Doso is falling out of use, it is gaining ground in the south in Wasapea (Routamaa and Routamaa 1996: 4). Routamaa and Routamaa (1997: 14) give the following historical account of the Kamula settlements: "Up until about 50 years ago, the entire Kamula population lived in close proximity to each other in bush camps near the present village of Samokopa. After that there was a split, with half of the group heading south to the present Wasapea area, and the other half staying in the northern area." It is not surprising, therefore, that there are no dialect differences between the northern villages and the southern village although they are separated from each other by a walk of seven days. In between, there is a vast tract of rain forest that the Kamula use for hunting and gathering. As this land is understood to belong to the Kamula, it is shown as part of the language area on the Map.

1.2 Data sources

We have tried to collect all existing data on the Kamula-Elevala languages, but have not been completely successful. In particular, we have not been able to locate the manuscripts by Joan and Murray Rule. The Rules produced numerous descriptions of languages spoken in the Western and Southern Highlands Provinces, among them a grammar sketch of Aekyom and grammar and phonology papers for Pa and Kamula. Unfortunately, these papers were never published. Kamula is by far the best described Kamula-Elevala language and Pa the least well described. For Pa, only lexical data is available but no description of the grammar.

The first data for Aekyom appeared in the Annual Reports of Papua. Austen (1923) published a word list from Amnat village, located east of the Ok Tedi River. Later he added three short word lists from other Awin (i.e. Aekyom) villages (Austen 1926). A fourth word list included in this publication, called Upper Fly River, seems to be a mixture of Aekyom and Faiwol. In addition, Champion (1928) collected a word list in the eastern part of the language area. In his survey of the central and western Trans-New Guinea languages, Voorhoeve (1975: 389f) included a sketch of the Aekyom phoneme system and some personal pronouns. The lexical data he collected was never published but has been made available to us (Voorhoeve 2007). The ethnography of the Upper Fly River Aekyom by Depew (1986) contains a considerable amount of lexical material and an outline of the dialect situation. Our most important source of information is the manuscripts by Jean Stewart, who was active as a missionary among the Aekyom between 1962 and 1999. Stewart (1989) wrote a paper that describes the phonetics and aspects of the grammar as well as a brief introduction to Aekyom and Tok Pisin (Stewart, n.d.). She also compiled a dictionary (Stewart 2016), most of whose entries were collected in the 1970s.

The first Pa data to appear in print was a word list in the appendix of Franklin's (1973: 590) survey of the Gulf District and adjacent areas. Voorhoeve (1975: 390f) gave a brief account of the phoneme system and the personal pronouns. The lexical data he collected remained unpublished (Voorhoeve 2007). Shaw's (1986: 70) paper on the Bosavi area languages contains another short word list. More extensive word lists have recently been collected by Pamela Waldeck, who did missionary work among the Pa from 1963 to 1980 together with her husband Barry Waldeck. On trips to the Pa area in 2016 and 2017 she elicited a substantial number of words (Waldeck 2016, 2017).

In his survey of the languages of the Aramia River area, Reesink (1976) presented a sketch of the Kamula phoneme system and some aspects of grammar as well as a short word list. Shaw (1986: 68) includes another short word list. This data has been superseded by the work of Judith and Ismo Routamaa, who have been studying Kamula under the auspices of SIL since 1991. They have produced a large body of descriptive materials, most of which is available on the language resources page of the website of SIL PNG. There is a detailed phonology (Routamaa and Routamaa 1995), a grammar (J. Routamaa 1994), and a dictionary (Routamaa and Routamaa 2007). Furthermore, the Routamaas have written papers on events and participants in discourse (J. Rou-

tamaa 1997a), tail-head linkage (J. Routamaa 1997b), sociolinguistics (Routamaa and Routamaa 1996), and the orthography (Routamaa and Routamaa 1997).

1.3 Phonology and orthography

The Kamula-Elevala languages have a moderate number of consonants, but all of them have more than the five vowels of Latin enshrined in our alphabet. The languages are tonal, but the lexical data we have for them does not include a transcription of tone. Therefore we have nothing to say about tone in this paper. The three languages are not equally well documented. Only for Kamula is a thorough phonological analysis available, for Aekyom and Pa we must content ourselves with a discussion of the orthography.

Table 2: Aekyom consonants (Stewart 1989)

[m] <m>	[n] <n>		[ŋ] <ng>	
[p ^h] <p'>	[t ^h] <t'>		[k ^h] <k'>	
[p] <p>	[t] <t>		[k] <k>	
[b] 	[d] <d>		[g] <g>	
	[s] <s>			[h] <h>
[w] <w>	[ɺ] <r>	[j] <y>		

Table 3: Aekyom vowels (Stewart 1989)

[i] <i>		[u] <u>
[e] <e>		[o] <o>
[æ] <ae>	[a] <a>	

In Stewart's (2016) Aekyom dictionary, three series of stops are distinguished: voiceless aspirated, voiceless unaspirated, and voiced unaspirated (Table 2). In her language write-up, Stewart (1989: 7ff) even distinguishes between heavily and lightly aspirated stops, but her description is phonetic and does not include a phonological analysis. Her account suggests that aspiration is found in the onset of stressed syllables and lack of aspiration goes along with a lack of stress. The aspirated and the unaspirated voiceless stop series are therefore probably allophones of one phonological stop series. The voiced unaspirated stops are said to stand beside prenasalized stops (Stewart 1989: 7). But in the orthography an opposition between voiced stop and nasal plus voiced stop only occurs word medially and is best interpreted as simple stop versus nasal plus stop cluster. Aekyom distinguishes between three levels of tongue height in the unrounded front vowels, but only two levels in the rounded back vowels (Table 3).² In addition, there is the low central vowel [a]. Stewart (1989: 20) briefly mentions that there are nasalized vowels in Aekyom, but they are not indicated in the orthography. Neither is tone marked in the orthography, although the language is tonal (Stewart 1989: 22f).

Pa has two series of stops, voiceless and voiced (Table 4). It is not known whether the voiceless stops are phonetically aspirated. In our data, no velar nasal occurs. By contrast, Aekyom has a velar nasal that occurs in postvocalic position. Like Aekyom, Pa has the two voiceless fricatives [s] and [h]. In addition to the continuants [w], [ɺ], and [j], Pa has a voiced velar fricative [ɣ] which occurs only between vowels. It is probably an allophone of word initial [g].

² The vocabularies from different dialects collected by Voorhoeve (2007) make it clear that the Proto-Elevala distinction between three rounded back vowels /u/, /o/, and /ɔ/ was still present in Proto-Aekyom. In the variety recorded by Stewart, /u/ and /o/ have fallen together.

Table 4: Pa consonants (Waldeck 2016, 2017)

[m] <m>	[n] <n>			
[p] <p>	[t] <t>		[k] <k>	
[b] 	[d] <d>		[g] <g>	
	[s] <s>			[h] <h>
[w] <w>	[ɺ] <l>	[j] <y>	[ɣ] <x>	

Table 5: Pa vowels (Waldeck 2016, 2017)

[i] <i>	[ĩ] <i:̃>		[u] <u>
[e] <e:̃>		[ɤ] <u:̃>	[o] <o:̃>
[ɛ] <e>			[ɔ] <o>
[æ] <a:̃>	[a] <a>		

The Pa orthography differentiates between no less than ten vowels (Table 5). Four vowel heights are distinguished among unrounded front vowels and three heights among rounded back vowels. However, in the limited lexical data we have for Pa, we noticed some fluctuation between [i], [e], and [ɛ], on the one hand, and between [u], [o], and [ɔ], on the other. It seems that these different vowel qualities have not always been transcribed correctly. Waldeck's high central vowel [ĩ] and the unrounded back vowel [ɤ] are rare in her data. All vowels can be nasalized. Pa is the only Kamula-Elevala language for which we have a comprehensive transcription of nasalized vowels in the lexical data. Voorhoeve (1975: 390) mentions that Pa has contrastive pitch, but tones are not represented in Waldeck's orthography.

Table 6: Kamula consonants (Routamaa and Routamaa 1995)

/m/ <m>	/n/ <n>			
/p/ <p>	/t/ <t>		/k/ <k>	
/b/ 	/d/ <d>		/g/ <g>	
	/s/ <s>			/h/ <h>
/w/ <w>	/ɺ/ <l>	/j/ <y>		

Table 7: Kamula vowels (Routamaa and Routamaa 1995)

/i/ <i>		/u/ <u>
/e/ <e>		/o/ <o>
/æ/ <a:̃>	/a/ <a>	/ɔ/ <o>

Like Pa, Kamula only has the two nasal consonants /m/ and /n/ and lacks a velar nasal (Table 6). There are two series of stops, voiceless and voiced. The phoneme /p/ has the allophones [p] and [ɸ] in free variation (Routamaa and Routamaa 1995: 4). The voiceless stop /t/ is realized as dental [t̪] whereas /d/ and /n/ are alveolars (Routamaa and Routamaa 1995: 5). Kamula has seven vowel phonemes, symmetric sets of three unrounded front vowels and three rounded back vowels, plus the low central vowel /a/ (Table 7). In the practical orthography, the two back vowels /o/ and /ɔ/ are both rendered with <o> (Routamaa and Routamaa 1997: 5). All vowels can be nasalized, but no minimal pairs between words with an oral and a nasalized vowel have been found (Routamaa and Routamaa 1995: 23). Nasalization of vowels is not shown in the orthography. There are three tones: high, low, and rising (Routamaa and Routamaa 1995: 14), but they are not represented in the orthography. Vowel length is conditioned by stress. Long phonetic

vowels only occur in stressed syllables. Unstressed vowels can be so short that they seem to disappear, giving rise to phonetic consonant clusters. However, native speakers can always identify the submerged vowel (Routamaa and Routamaa 1995: 22). In the orthography, extra short phonological vowels are not written. Thus, /opo.lami/ [op'la:mi] 'man' is spelled <oplami> and /dapɔtala/ [daɸ'ta:ra] 'forehead' is spelled <daptala>. The Kamula dictionary (Routamaa and Routamaa 2007) is written in the practical orthography. All the aspects of the phonology that are not indicated in the orthography (the opposition between /o/ and /ɔ/, nasalized vowels, tone, extra short vowels) are therefore only known to us if a word happens to be included in the phonology paper (Routamaa and Routamaa 1995), where a phonetic and a phonological transcription is given.

2. Reconstruction

In this section, we present our reconstruction of Proto-Kamula-Elevala phonology, lexicon and fragments of the grammar. First, we present the lexical cognate sets on which the comparative phonology is built. In 2.1 we present an annotated list of the top-level cognates of the Kamula-Elevala family and in 2.2 a list of the cognates between the two languages of the Elevala sub-family. Then, in 2.3, we reconstruct the phoneme system of Proto-Kamula-Elevala, giving tables of the correspondences of consonants and vowels. In 2.4 we compare the personal pronouns, the demonstratives and some elements of the verb and noun morphology. Finally, we present the evidence for considering the two Elevala languages, Aekyom and Pa, a subgroup of the Kamula-Elevala family in 2.5.

2.1 Kamula-Elevala cognate sets

In Table 8 we present the lexical cognates we have found between Aekyom, Pa and Kamula and formalize them with a reconstruction. For a Proto-Kamula-Elevala (pKE) reconstruction we need agreement between Kamula and either or both of Aekyom and Pa. Cognates that are only shared by Aekyom and Pa are presented in Section 2.2. The Kamula-Elevala languages are rich in compounds, both in the verbal and in the nominal domain. Accordingly, sometimes only parts of lexical entries are cognate with each other. In the lexical equations in Table 8 we put the unrelated parts in parentheses and report their meaning in a footnote. If the meaning of a reflex in a daughter language is the same as that of the Proto-Kamula-Elevala reconstruction, it is not repeated. Kamula reflexes are cited in phonetic or phonemic transcription where known, otherwise they are given in the practical orthography (cf. 1.3). Unless stated otherwise, the lexical data is taken from Stewart (2016) for Aekyom, Waldeck (2016, 2017) for Pa, and Routamaa and Routamaa (1995, 2007) for Kamula.

Table 8: Proto-Kamula-Elevala lexical reconstructions

pKE *aja 'house' > Pa [a], Kamula /aja/
pKE *ap(ɔ,o) 'mushroom' > Pa [abo(wæ)], Kamula <apo>
pKE *dade- 'hear' > Aekyom (Awin) [dare(-a)] ³ , Pa [dae], Kamula <dale-> 'hear, listen, ask'
pKE *dai 'where?' > Aekyom [di(ke)] 'where, in which direction', [di(wa)] 'where (of what place)', Pa [dæ(-bæ)] ⁴ , Kamula <da:>
pKE *daja 'sago' > Aekyom [da, nda], Pa [da], Kamula <daya> 'sago, food'
pKE *de- 'eat, drink' > Aekyom [d-, nd-], Pa [de], Kamula /de-/
pKE *du- 'burn, cook' > Aekyom [(doei) ⁵ du(-Ja)] ⁶ 'fire burns', Kamula <du-> 'cooked, ready'

³ This attestation is from Voorhoeve (2007). Aekyom [-a] is a medial verb suffix.

⁴ Pa [-bæ] is a locative suffix.

⁵ Aekyom [doei] means 'tree, wood, fire'.

⁶ Aekyom [-Ja] is a present tense suffix.

- pKE *dunu 'middle' > Aekyom [dunu] 'between, in middle of', Kamula <dulu> 'inside'
- pKE *ei 'brother' > Pa [ẽĩ] 'elder brother', Kamula [ẽĩ] 'younger brother'
- pKE *gani 'sun, day' > Pa [gɛ.lɛ], Kamula [alĩ(-lã)⁷] 'day, time'
- pKE *gene 'belly, bowels' > Aekyom [gene] 'abdomen, excreta', Kamula <ele(-palo)⁸> 'intestines'
- pKE *gimada 'leech' > Pa [gimæ], Kamula <imala>
- pKE *hamV- 'hold' > Aekyom [ham(-sja)⁹] 'having it, take it down', Kamula <ham->
- pKE *hane 'upright' > Pa [hale (he)¹⁰, hali (hi)] 'stand', Kamula /hale-/ 'stay, stand, live (sg)'
- pKE *hi 'name' > Aekyom [hi], Pa [hi], Kamula <hi>
- pKE *hodoka 'light (in weight)' > Pa [howa(-yæ.læ)¹¹], Kamula <holoka>
- pKE *hV- 'stand, stay' > Aekyom [h-] 'stand, live', Pa [he] 'stay', Kamula /hæhæ-/¹² 'stay, stand, live (pl)'
- pKE *jeme 'sago thatch' > Aekyom [jem(-woe)¹³] 'thatching leaf for shelters', Kamula <eme> 'sago leaf, sago leaf roof'
- pKE *jV- 'hit' > Aekyom [j-] 'hit, kill', Pa [jæ], Kamula <yu->
- pKE *kedə 'bone' > Aekyom [(tama)¹⁴ klo] 'patella (knee bone)', Pa [kɔ], Kamula ['e:lo] 'bone; shell of coconuts, nuts or eggs'
- pKE *kopo 'man' > Pa [kobo], Kamula /opo(-lami)¹⁵/
- pKE *kwa- 'now, today' > Aekyom [k^hwa(-su)¹⁶] 'now', Pa [(gɛ.lɛ)¹⁷ kwa(tɛ)] 'today', Kamula <wa(ta)>
- pKE *madina 'thigh' > Aekyom (Amnat) [birine]¹⁸ 'bone', Pa [me.le(-kɔ)¹⁹], Kamula <malla>
- pKE *makæ 'shoulder' > Aekyom [beke, mbeke, meke], Pa [mæyæ], Kamula [ma'kæ:]
- pKE *maN(æ,a)- 'know' > Aekyom [blæ(-ma)²⁰], Pa (Ba) [mã(ga), mara (ga)]²¹, Kamula <-mala->
- pKE *mat(e,i) 'teeth, mouth' > Pa [ma.lɛ] 'tooth', Kamula ['ma:ti] 'mouth, opening'
- pKE *mi- 'kindle' > Aekyom [b-(l)ja]²² 'light a fire', Kamula <mi-> 'make fire, tend fire'
- pKE *mi 'son, child' > Aekyom [bi] 'small', Pa [mi] 'child', Kamula /(ja-)²³mi/ 'his son'
- pKE *mot(e,i) 'body' > Aekyom [bute] 'body, trunk of a tree, knuckles', Kamula <moto>
- pKE *mu 'joint' > Pa [(atowæ)²⁴ (a-)²⁵ mu] 'elbow', Kamula <mu>

⁷ A suffix <-la> occurs in a number of words for days and times of the day, such as <iyela> 'tomorrow', <tatla> 'yesterday', and <utlala> 'morning'.

⁸ This is a compound, probably with <palo> 'strings put diagonally across chest', i.e. the meaning of the compound was 'belly-string'.

⁹ Aekyom [sja] means 'went down'.

¹⁰ Pa [he] means 'stay'.

¹¹ Pa [-yæ.læ] is an attributive suffix.

¹² This is a reduplicated plural form.

¹³ Aekyom [woe] means 'leaf'.

¹⁴ Aekyom [t^hama] means 'knee'.

¹⁵ Kamula /-lami/ is a singulative suffix. The plural is <opa> 'men'.

¹⁶ Aekyom [-su] is a suffix glossed 'after, when'.

¹⁷ Pa [gɛ.lɛ] means 'day'.

¹⁸ This attestation is from Austen (1923). In Stewart's (2016) dictionary, this word is only attested in phrases and compounds such as [(bete-)blin] 'spinal cord' and [(g.la-)blin] 'bottom section of the spine' (cf. [g.la] 'chest (of a person)').

¹⁹ Historically, this is a compound with [kɔ] 'bone'.

²⁰ The suffix *-ma in Aekyom [blæ-ma] recurs in Kamula <mala-ma> 'think'. It is probably etymologically identical with the Kamula present tense suffix <-ma>.

²¹ This attestation is from Voorhoeve (2007). Voorhoeve's [mãga] corresponds to [maja] recorded by Waldeck (2016). The meaning of the second part [-ga] or [-ya] of this compound is unknown.

²² Aekyom [-l)ja] is a variant of the present tense suffix [-la] occurring after *i.

²³ Kamula /ja-/ is a possessive prefix.

²⁴ Pa [atowæ] means 'hand, arm'.

- pKE *patæ 'tusk' > Aekyom [p^hete] 'tooth, teeth', Pa (Ba) [pérɛ] 'tooth'²⁶, Kamula <pate> 'tusk, horn, claw'
- pKE *peseni 'skin disease' > Aekyom [psen (k^hu)²⁷] 'pimples', Kamula <peseli> 'kind of skin disease, manifesting itself in flaky patches, often eventually covering the whole body'
- pKE *po- 'die' > Aekyom [p^hu-], Pa [po], Kamula <po-> 'die, be cold'
- pKE *podi 'tie, wrap' > Aekyom [p^hurj(-a)²⁸] 'tied, wrapped', Kamula <polo-, polu-> (sg), /populiæ-/ (pl)
- pKE *poko- 'pierce, burst' > Aekyom [pku(-j/i)] 'burst', Pa [põyu] 'pierce', Kamula <poko(-sta-)> (sg), <popoko(-ti-)> (pl)
- pKE *pəðəw(e,a) 'heart, pity' > Aekyom [p^hJoe] 'heart, central chest region'²⁹, Kamula <poloa-> 'feel pity, compassion'
- pKE *pəpətæ- 'be soft' > Aekyom [p^hop^hot(-kra)³⁰] 'wet, almost rotten, soft', Kamula <popta:-> 'be soft, be easy'
- pKE *pudi- 'close eyes' > Aekyom [p^hurj(-a)³¹] 'closed (his) eyes', Kamula <pupulu->
- pKE *pV- 'sit' > Aekyom [p^h-], Pa [pæ], Kamula <popa:->³² (pl)
- pKE *sa 'speech' > Pa [sa], Kamula <sa-> 'say, sing'
- pKE *saka 'rafter' > Aekyom [ska] 'rafters', Pa [sāgã, sāyã], Kamula <saka> 'short housepost'
- pKE *sode 'paddle' > Aekyom [su.le], Kamula /so.le-/ 'paddle, scoop water'
- pKE *tai 'tongue' > Aekyom [t^hi] 'tongue, flames', Pa [tæ] 'tongue, flame', Kamula <te>
- pKE *tamide 'afternoon' > Pa [təme], Kamula [tami'le:(-la)³³]
- pKE *ti- 'make, do' > Aekyom [t^h-(l)ja)³⁴] 'said, make, build, plait, paint, wash', Kamula /ti-/
- pKE *tine 'embers' > Aekyom [t^hin] 'red coals of a fire', Pa [tɛ.lɛ], Kamula [tīlɛ] 'fireplace, hearth'
- pKE *tə 'bow (for arrows)' > Pa [tə], Kamula [tə]
- pKE *t(ə,o)t(ə,o) 'upstream' > Pa [(tɛ.lɛ)³⁵ tə.lə], Kamula <toto>
- pKE *tu 'thorn' > Aekyom [t^hu] 'thorn, spike or fins of a fish', Pa [tu] 'thorn, fin', Kamula <tu(-ale)³⁶>
- pKE *tuma 'banana' > Aekyom [dma], Kamula ['tu:ma]
- pKE *tV- 'go' > Aekyom [t^h-] 'go up', Pa [(o)³⁷ tæ] 'go up', Kamula <ta->
- pKE *tVdo 'one' > Aekyom [t.lu] 'another', Kamula <tlo> 'only'
- pKE *u 'illicit' > Aekyom [u] 'taboo', Kamula <u(-ha-)³⁸> 'steal'
- pKE *ud(e,i) 'scar' > Aekyom [ure], Pa [(sə.lə)³⁹ u], Kamula <ulu>
- pKE *ute 'urine' > Aekyom [ute], Pa [u.lɛ], Kamula <uti>
- pKE *wəja 'grub' > Aekyom [wæ] 'tadpole', Pa [we] 'wood grub', Kamula ['wɛ:jã]

²⁵ Historically, Pa [a-mu] is a compound. Its first part recurs in [ã-dayæ] 'fingernail' (cf. pE *d(ə,a)kæ 'fingernail' in Table 9) and must have meant 'hand, arm' (cf. pE *a 'hand, arm' in Table 9).

²⁶ This attestation is from Voorhoeve (2007). In Waldeck's (2016) word list, this etymon only occurs in compounds: [pæ.læ(-gi.lɛ)] 'gums' (cf. pE *gine 'gums' in Table 9), [pæ.læ(-mosija)] 'lips'.

²⁷ Aekyom [k^hu] means 'string'.

²⁸ Aekyom [-a] is a medial verb suffix.

²⁹ For the range of meanings, cf. the derived adjective [p^hroe-kra] 'sympathetic, sorry'.

³⁰ Aekyom [-kra] is used to form adjectives.

³¹ Aekyom [-a] is a medial verb suffix.

³² This is a reduplicated plural form. The singular form <polo-> is extended with a suffix.

³³ A suffix <-la> occurs in a number of words for days and times of the day, such as <iyela> 'tomorrow', <tatla> 'yesterday', and <utlala> 'morning'.

³⁴ Aekyom [-l)ja] is a variant of the present tense suffix [-la] occurring after *i.

³⁵ Pa [tɛ.lɛ] means 'river'.

³⁶ Historically, this is a compound with <ale> 'seed'.

³⁷ Pa [o] means 'up'.

³⁸ Kamula <ha-> means 'do'.

³⁹ Pa [sə.lə] <solo> may be a typographical error for [səkə] <soko> 'sore'.

pKE *weke 'left (hand)' > Aekyom [wek(-næte)⁴⁰] 'left hand side', Kamula <weke> 'left hand, left side'

2.2 Elevela cognate sets

Aekyom and Pa are more closely related to each other than to Kamula (cf. 2.5). They share cognates that cannot be found in Kamula. We call the common ancestor of Aekyom and Pa Proto-Elevela (pE). Table 9 presents the cognates exclusively shared by the two Elevela languages. Of course, Aekyom and Pa share more cognates than this, but if they have a Kamula equivalent, they are included in Table 8 rather than 9.

Table 9: Proto-Elevela lexical reconstructions

pE *a 'hand, arm' > Aekyom [a(-gwote)⁴¹] 'mid upper arm band', Pa [ã(-dayæ)⁴²] 'fingernail'

pE *æ- 'lie down' > Aekyom [æ-], Pa [æ]

pE *daNi 'sand' > Aekyom [d.li, d.lni], Pa [de.le(-na)⁴³]

pE *dæ- 'give' > Aekyom [dæ-], Pa [dæ]

pE *dideme 'flea' > Aekyom [d.ljem] 'red scrub mite, flea', Pa [dɛmɛ]

pE *dinæ 'meat' > Aekyom [dine] 'meat (any kind)', Pa [di.læ]

pE *dipɔ 'testicles' > Aekyom [two], Pa [dibɔ]

pE *dope 'crocodile' > Aekyom [dupe], Pa [dobɛ]

pE *dɔdæ 'sap, juice' > Aekyom [do.le] 'sap, taste, liquid', Pa [dæ] 'sap'

pE *d(ɔ,a)kæ 'fingernail' > Aekyom [(krite)⁴⁴ doke], Pa (Ba) [dagé]⁴⁵

pE *dV- 'see' > Aekyom [d-], Pa [de] 'see, look'

pE *ga 'sugarcane' > Aekyom [ga, ŋga], Pa [ga]

pE *ga 'beak' > Aekyom [ga, ŋga] 'beak of a bird, curve of a bow, feelers', Pa [ga]

pE *gi- 'sing' > Aekyom [g(-lja)⁴⁶], Pa [(iyæ)⁴⁷ gi]

pE *gine 'gums' > Aekyom [(ti-)⁴⁸ ŋgin], Pa [(pæ.læ-)⁴⁹ gi.lɛ]

pE *gɔmɔde 'younger brother' > Aekyom [gmo.le], Pa [gomo]

pE *gu 'cut' > Aekyom [gu] 'cut (as of meat)', Pa [gw(-a)⁵⁰] 'having cut'

pE *gum(ɔ,a) 'stick' > Aekyom [gumo] 'walking stick', Pa [guma] 'dibble stick'

pE *hiakV- > 'count' > Aekyom [hjæk-] 'read or count', Pa [hjãyæ] 'read'

pE *hine 'breath' > Aekyom [hine] 'thought, breath', Pa [hi.lɛ]

pE *hɔmV- 'do, make' > Aekyom [hom-], Pa [hɔmæ] 'make'

pE *i- 'carry on head' > Aekyom [i-], Pa [i (kæ.læ)⁵¹]

pE *ike 'stone' > Aekyom [ike] 'stones', Pa (Ba) [igi]⁵²

⁴⁰ Aekyom [-næte] is a suffix glossed 'for the reason of'.

⁴¹ The second part of this compound recurs in [kli-gwote] 'elbow' (cf. [klite] 'hand') and [k^he-gwote] 'cricoid cartilage' (cf. [ke.le(-b.lin)] 'neck (all around)').

⁴² The compound [ã-dayæ] means literally 'hand-nail'. Its second component is attested in isolation in Voorhoeve (2007): [dagé] 'nail of finger'. The first component recurs in [a-mu] 'elbow' (cf. pKE *mu 'joint' in Table 8).

⁴³ This is a compound with [na] 'feces'. Franklin (1973: 590) gives [deni] 'sand' for Pa.

⁴⁴ Aekyom [krite] means 'hand'.

⁴⁵ This attestation is from Voorhoeve (2007). Waldeck (2016) has the compound [ã-dayæ] 'fingernail' (cf. pE *a 'hand, arm').

⁴⁶ Aekyom [-lja] is a variant of the present tense suffix [-la] occurring after *i.

⁴⁷ Pa [iyæ] means 'song'.

⁴⁸ The first part of this compound is probably [t^hi] 'tongue'.

⁴⁹ The first part of this compound recurs in [pæ.læ-mosija] 'lips' and means 'tooth' (cf. pKE *patæ 'tusk' in Table 8).

⁵⁰ Pa [-a] is probably a medial verb suffix.

⁵¹ Pa [kæ.læ] means 'go'.

- pE *jəkæ 'song' > Aekyom [joke], Pa [eɣæ, iyæ]
- pE *kamV- 'set on fire' > Aekyom [(twan)⁵³ k^ham(na)] 'light the resin', Pa [(nɛ)⁵⁴ kamæ] 'kindle'
- pE *kate 'leg' > Aekyom [k^hali(-ke)⁵⁵, kati(-ke)], Pa [kaɬɛ]
- pE *kiame 'beetle' > Aekyom [k^hjame], Pa [kimɛ] 'large beetles'
- pE *kima(ti) 'thunder' > Aekyom [k^hma] 'thunder, lightning', Pa [kimɛɬɛ]
- pE *kine 'nose' > Aekyom [k^hin(-am)⁵⁶] 'nostrils', Pa (Pare) [kine]⁵⁷
- pE *kiNə-namæ⁵⁸ 'face' > Aekyom [k^hlonam], Pa [keɬenamæ]
- pE *kənV-kaina⁵⁹ 'white' > Aekyom [konkina] 'white, or one colour (animals)', Pa [kɔ̃ɣæɬɛ]
- pE *kəpəkæ 'coconut' > Aekyom [k^hwoke], Pa (Ba) [kəbɔɣɛ]⁶⁰
- pE *mainæ 'pig' > Aekyom [mine]⁶¹ 'pig, four-legged animal', Pa [mæɬɛ]
- pE *mini 'head' > Aekyom [bin(-woe)⁶²] 'hair of head', Pa [mi.li(-dæ)⁶³] 'brain'
- pE *moka 'below' > Aekyom [buk(-ram)⁶⁴] 'in, under', Pa [məɣæ(-bæ)⁶⁵] 'under'
- pE *mone 'fish' > Aekyom [bun]⁶⁶, Pa [moɬɛ, muɬɛ]
- pE *moNæ 'stem' > Aekyom [buɬɛ] 'stem of coconut etc.', Pa [(ē)⁶⁷ moɬɛ]
- pE *na 'what?' > Aekyom [na], Pa [na(-ɣæɬɛ)⁶⁸]
- pE *napo 'cane mail shirt' > Aekyom [napu] 'cuirass (made of light cane)', Pa (Pare) [napɔ]⁶⁹
'belly'
- pE *o 'charcoal' > Aekyom [u], Pa [(nɛtā)⁷⁰ ɔ]
- pE *pi 'drum' > Aekyom [pi] 'drum for ground dancing, lower pitch', Pa (Ba) [pi] 'drum
(hour-glass type)⁷¹
- pE *piena 'heavy' > Aekyom [p^hjena], Pa [pɛɬa]
- pE *po 'buttocks' > Aekyom [p^hu] 'buttocks, bottom part of a bag', Pa [pɔ(-kə)⁷²]
- pE *pəmæ 'smell' > Aekyom [p^hom], Pa [pomæ] 'odor'
- pE *puNe 'bride price' > Aekyom [p^huɬɛ] 'bride price articles', Pa [pũɬɛ] 'father-in-law,

⁵² This attestation is from Voorhoeve (2007). Waldeck (2016) has the compound [igj-abo] 'stone'.

⁵³ Aekyom [twan] means 'resin'.

⁵⁴ Pa [nɛ] means 'fire, firewood'.

⁵⁵ Historically, this is a compound with [k^he] 'egg, fruit, seeds'.

⁵⁶ This is the suffix [-nam] with the basic meaning 'hole'.

⁵⁷ This attestation is from Shaw (1986). The sound change *-n- > -ɬ- to be observed in the Pa variety recorded by Waldeck has not taken place in Shaw's variety, cf. Shaw [gine] 'sun' and Waldeck [gɛɬɛ] 'sun, day', Shaw [kinemɔ] 'eye' and Waldeck [keɬamɔ] 'eye'.

⁵⁸ The suffix *-namæ has the basic meaning 'hole'.

⁵⁹ Proto-Elevala *-kaina is an attributive suffix often appearing on adjectives.

⁶⁰ This attestation is from Voorhoeve (2007). Waldeck (2016) has [kəbɔwæ] 'coconut'.

⁶¹ Aekyom [mine] is consistently given with initial [m] rather than [mb] or [b] in all of our sources. It may be an early loan from Pa.

⁶² Aekyom [woe] is glossed 'leaf' and presumably also means 'hair'.

⁶³ Historically, this is a compound with [dæ] 'sap' (cf. pE *dədæ 'sap, juice'). Aekyom has the cognate compound [bi-dore] 'brain' (literally, 'head-sap').

⁶⁴ Aekyom [-ram] is a suffix with the basic meaning 'hole'.

⁶⁵ Pa [-bæ] is a locative suffix.

⁶⁶ This attestation is from Depew (1986: 165). Stewart (2016) glosses [bun] as 'large fish (Malay)'. Austen (1923) and Champion (1928) agree with Depew that this is the generic word for 'fish'. There is no reason to believe that this word is a loan from Malay.

⁶⁷ Pa [ē] means 'tree'.

⁶⁸ Pa [-ɣæɬɛ] is an attributive suffix.

⁶⁹ This attestation is from Shaw (1986). In the word list by Waldeck (2016), this etymon only occurs in the compounds [nabɔ-tiyi] 'abdomen, belly' and [nabu sija] 'navel'.

⁷⁰ Pa [nɛ] means 'fire, firewood'.

⁷¹ This attestation is from Voorhoeve (2007).

⁷² Historically, this is a compound with [kə] 'bone'.

son-in-law, wife's brother'

pE *sɔNɔmæ 'goanna' > Aekyom [s.lom] 'lizard', Pa [sɔ.lɔmæ]

pE *te 'yesterday' > Aekyom [te] 'yesterday or tomorrow', Pa [te]

pE *temæ 'sago thatch' > Aekyom [t^hem] 'leaf roof', Pa [temæ] 'roofing leaf'

pE *tike 'rattan' > Aekyom [t^hike] 'cane (large variety)', Pa (Ba) [tigi] 'rope'⁷³

pE *tɔ 'ground, earth' > Aekyom [t^ho] 'earth, ground, dirt', Pa [to] 'ground'

pE *tɔna 'wild' > Aekyom [t^hona], Pa [(ga)⁷⁴ tɔ.læ] 'wild sugarcane'

2.3 Comparative phonology

The consonant and vowel systems of the three Kamula-Elevala languages have been introduced in 1.3. Here we put forth the diachronic correspondences between these sounds. We know that all three languages are tonal, but as tone is not rendered in the orthography we have been unable to incorporate it into our reconstructions. The role stress played in the history of the Kamula-Elevala languages is not well understood, either. To arrive at a better understanding of the comparative phonology, a good description of the suprasegmental phonology of all three daughter languages would be required. For the time being, we can only compare phonological segments. We make no attempt to reconstruct nasalized vowels as they are not represented in the Aekyom and Kamula orthographies.

Table 10: Consonant correspondences

pKE	Aekyom	Pa	Kamula
*m- ; *-m-	b- ; -m-	m- ; -m-	m- ; -m-
*n- ; *-n-	n- ; -n-	n- ; -ɺ-	n- ; -ɺ-
*-N-	-ɺ-	-ɺ-	-ɺ-
*p- ; *-p-	p ^h - ; -p-	p- ; -b-	p- ; -p-
*t- ; *-t-	t ^h - ; -t-	t- ; -ɺ-	t- ; -t-
*s- ; *-s-	s- ; -s-	s- ; ?	s- ; -s-
*k- ; *-k-	k ^h - ; -k-	k- ; -ɣ-	∅- ; -k-
*h-	h-	h-	h-
*d- ; *-d-	d- ; -ɺ-	d- ; -∅-	d- ; -ɺ-
*g-	g-	g-	∅-
*w-	w-	w-	w-
*j- ; *-j-	j- ; -∅-	j- ; -∅-	j- ; -j-

Proto-Kamula-Elevala had the two nasal consonants *m and *n (Table 10). Word initially, *m is reflected as [b-] in Aekyom, otherwise the sound has been retained unchanged. The nasal *n has been retained in all languages in word initial position but changed to [-ɺ-] word medially in Pa and Kamula. Kamula /-ɺ-/ has different sources; it can go back either to *-n- or to *-d-. There seems to be a phonetic difference between words with these two different historical derivations, as can be seen in (1) and (2). The Kamula phonology paper contains phonetic transcriptions of four

⁷³ This attestation is from Voorhoeve (2007). Waldeck (2016) has the compound [wa-tiyi] 'rattan'.

⁷⁴ Pa [ga] means 'sugarcane'.

words with pKE *-d- in word medial position, shown in (1a) through (1d). In none of these words is the vowel before or after /-ɺ-/ nasalized. Compare this with [tĩlẽ] 'fireplace' < pKE *tine (2a), where the vowels before and after pKE *-n- are nasalized. In [alĩlã] 'day' < pKE *gani (2b) we also find nasalization, but it seems to have shifted to the right to cover the suffix /-ɺa/ that has been attached to many words for days and times of the day in Kamula (see also 'afternoon' in 1d). There is one exception in the data. In [haləma] 'stand-PRS' < pKE *hane we unexpectedly find no nasalized vowels.

Kamula (Routamaa and Routamaa 1995)

1a	pKE *kedə	>	/eɺo/	[e:lo]	'bone'
1b	pKE *sode	>	/so.ɺe-wa/	[sɔ:rua]	'paddle-F.PST'
1c	pKE *podi	>	/populiæ-ma/	[populi'ɛ:ma]	'wrap.PL-PRS'
1d	pKE *tamide	>	/tamiɺe-ɺa/	[tami'le:la]	'afternoon'
2a	pKE *tine	>	/tɺiɺe/	[tĩlẽ]	'fireplace'
2b	pKE *gani	>	/ali-ɺa/	[alĩlã]	'day'
2c	pKE *hane	>	/ha.ɺe-ma/	[haləma]	'stand-PRS'

Thus, there is a tendency for words with /-ɺ-/ < *-n- to have nasalized vowels while nasalization is absent in words with /-ɺ-/ < *-d-. Routamaa and Routamaa (1995: 24) note that "the phoneme /l/ seems to be linked to nasalisation, in that, in 50% of all occurrences of /l/ it is either followed or both followed and preceded by a nasal vowel." We suggest that one of the origins of nasalized vowels in Kamula is pKE *-n-. Words with the phonetic sequence [-lĩ] in Kamula derive from pKE *-nV. Nasalization can spread from [-lĩ] to other syllables of a word. We do not know why there are exceptions in the other direction, i.e. why [haləma] 'stand-PRS' lacks nasalization although it derives from pKE *-nV. More examples with phonetic transcription are needed to determine the status of this exception.

In addition to the nasals *m and *n, it has proved necessary to postulate another sound *-N- which only occurs word internally. *-N- captures the correspondence set /ɺ : ɺ : ɺ/ whereas *-n- captures the set /n : ɺ : ɺ/ (see Table 10), i.e. the difference lies in the Aekyom reflex [-ɺ-] or [-n-]. Now these two sounds can be seen to be morphophonological alternants of each other in (3) and (4).

Aekyom (Stewart 2016)

3a	[aɺu-nam] 'valley, over the bank'	[aɺu] 'slope of a hill'
3b	[sa-nam] 'garden (established garden)'	[sa-kina] 'old'
3c	[ge(n)-nam] 'toilet, anus'	[gene] 'abdomen, excreta'
4a	[dit-ɺam] 'cave'	[dite] 'calcified sand, limestone'
4b	[hop-ɺam] 'between, in the space'	[hopi] 'air'
4c	[tempok-ɺam] 'sides of basket'	[tempoke] 'opening at top of bag or pants'

Aekyom has a highly productive suffix [-nam ~ -ɺam] with the meaning 'hole, inside'. Some of its occurrences in the lexicon are given in (3) and (4) with the root from which the suffixed lexical item is derived given to its right. It can be seen that the allomorphs [-nam] and [-ɺam] are phonologically conditioned: After a vowel or the nasal consonant [n] we find [-nam] (3a-c), after a non-nasal consonant we find [-ɺam] (4a-c). This opens up the possibility of subsuming the correspondence set /ɺ : ɺ : ɺ/ under the set /n : ɺ : ɺ/, i.e. of eliminating *-N- in favor of *-n-. When Aekyom [-ɺ-] occurs immediately after a non-nasal consonant it might be considered a phonologically conditioned reflex of *-n-. Thus we could derive Aekyom [bɺæ(-ma)] 'know' from pKE

*man(æ,a) and [s.lom] 'lizard' from pE *sɔnɔmæ.⁷⁵ However, there are instances of a /ɭ : ɭ : ɭ/ correspondence set where the conditioning environment leading to an Aekyom reflex [-ɭ-] is not given. Examples are Aekyom [bule] 'stem of coconut etc.' < pE *mɔNæ and [p^hule] 'bride price articles' < pE *puNe. In these instances, Aekyom [-ɭ-] follows a vowel, an environment in which we would expect [-n-] as a reflex of *-n-. Here *-N- stands in opposition to *-n-. To reduce it to *-n-, here too, we would have to postulate a consonant cluster such as *-ʔn- leading to Aekyom [-ɭ-] as opposed to *-n- > Aekyom [-n-]. But as we have no independent evidence of the existence of consonant clusters of the sort of *-ʔn- in Proto-Kamula-Elevala, we abstain from such a solution and derive all instances of a /ɭ : ɭ : ɭ/ correspondence set from *-N- in this paper.

There were three voiceless stops *p, *t and *k in Proto-Kamula-Elevala. In Aekyom, they are usually reflected as aspirated voiceless stops word initially and as unaspirated voiceless stops word medially. It is not clear whether these stop series are allophones of each other or different phonemes. In Kamula, *p and *t were retained in both positions, but *k was only retained word medially and lost word initially. In Pa, the three voiceless stops were retained initially but lenited to [-b-], [-ɭ-] and [-ɣ-] medially. The sibilant *s was generally retained, though we lack an attestation of medial *-s- in Pa. Glottal *h is only attested in word initial position. There is a gap in the Proto-Kamula-Elevala phonological system as reconstructed in Table 10. Whereas the voiceless stops *t and *k have voiced counterparts *d and *g, the bilabial stop *p lacks such a counterpart. External evidence shows that pKE *p comes from earlier *b and pKE *h comes from *p. The gap among bilabial stops has therefore arisen in Proto-Kamula-Elevala, or possibly even later. Areal comparison suggests that the shift *p > *ɸ > *h is a relatively recent phenomenon and may have swept across the Kamula-Elevala languages after their separation.⁷⁶ The voiced stop *d was retained word initially in all three languages. Word medially, it turned to [-ɭ-] in Aekyom and Kamula and was lost in Pa. Velar *g was retained word initially in Aekyom and Pa and lost in Kamula. We have found no correspondence set that could be attributed to *g in word medial position. The semivowels *w and *j pose problems for reconstruction that have not been satisfactorily solved yet. Both sounds are regularly retained in all three languages word initially. Etyma with possible word medial *w are either uncertain or unclear so that we refrain from reconstructing medial *-w-. For word medial *j, there may be other correspondence sets beside /∅ : ∅ : j/, but as possible conditioning factors are not yet clear we do not present them or the cognates in which they may be found in this paper.

We reconstruct seven vowels and a diphthong to Proto-Kamula-Elevala (Table 11). The high front vowel *i is generally retained in all three languages, but there are combinatorial exceptions in Pa and Kamula. The sound sequence *aCi is reflected as [ɛCɛ] in the Pa data recorded by Waldeck, cf. pKE *gani 'sun, day' > Pa [gɛ.lɛ] and pKE *tamide 'afternoon' > Pa [tɛme]. In Kamula, the sequences *oCi and *uCi are reflected as <oCo> or <oCu> and <uCu>, respectively, cf. pKE *podi 'tie, wrap' > Kamula <polo-, polu-> and pKE *pudi- 'close eyes' > Kamula <pupulu->. The mid front vowel *e is reflected as [e] in Aekyom and Kamula and as [e] or [ɛ] in Pa. It is not clear whether the Pa vowels transcribed by <e:> [e] and <e> [ɛ] in Waldeck's data represent different phonemes or are allophones of one phoneme. Separately, they show no consistent correspondences to the vowels of the other languages and are therefore treated together here. Low front *æ is retained in all three languages, with an exception in Aekyom. In polysyllabic words final *æ becomes [e] in Aekyom, cf. pE *dinæ 'meat' > Aekyom [dine] and pE *jɔkæ 'song' > Aekyom [joke]. In words with the sound sequence *aCæ#, vowel raising also affects the penultimate vowel,

⁷⁵ These etyma are reconstructed as pKE *maN(æ,a) and pE *sɔNɔmæ in 2.1 and 2.2.

⁷⁶ For this reason, the correspondence sets reconstructed as *p and *h in this paper are formalized as *b and *p on Newguineaworld (Usher and Suter 2017).

cf. pKE *makæ 'shoulder' > Aekyom [beke, mbeke, meke] and pKE *patæ 'tusk' > Aekyom [p^hete] 'tooth'.

Table 11: Vowel correspondences

pKE	Aekyom	Pa	Kamula
*i	i	i ; [e], [ɛ]/*aC_	i ; u/<o>,uC_
*e	e	[e], [ɛ]	e
*æ	æ ; e/VC_#	æ	æ
*u	u	u	u
*o	u	[o], [ɔ]	<o>
*ɔ	o	[ɔ], [o]	<o>
*a	a ; e/*_Cæ#	a ; [e], [ɛ]/*_Ci ; æ/_Cæ#	a
*ai	i	æ	e, æ

The high rounded back vowel *u is retained in all three languages. Aekyom reflects not only *u but also *o as [u] and Aekyom [o] unambiguously points to *ɔ. This is welcome evidence as *o and *ɔ can often not be reliably identified in the data we have for the other two languages. The Pa vowel transcribed by <o> [o] mostly reflects *o and <o> [ɔ] mostly reflects *ɔ, but the correspondences are not entirely consistent. Possibly the fluctuation is due to inaccuracy in the transcription. The Kamula practical orthography used in the dictionary (Routamaa and Routamaa 2007) does not differentiate between the phonemes /o/ and /ɔ/. We have a phonological transcription of the two phonemes in too few instances to safely conclude that they reflect *o and *ɔ. For the identification of these two vowels we must therefore rely mostly on Aekyom.

The low central vowel *a is reflected as [a] in all three languages, with the exceptions already noted, i.e. the sequence *aCi in Pa and *aCæ# in Aekyom. In addition, *a is reflected as [æ] in the sequence *aCæ# in Pa, cf. pKE *makæ 'shoulder' > Pa [mæyæ] and pKE *patæ 'tusk' > Pa [pæɭæ-] 'tooth'. The diphthong *ai becomes [i] in Aekyom, [æ] in Pa and either /e/ or /æ/ in Kamula. There are only two Kamula reflexes of this rather rare sound in our data, pKE *tai 'tongue' > Kamula <te> and pKE *dai 'where?' > Kamula <da>, and it is not clear which of them is regular and which exceptional. Fluctuation between /e/ and /æ/ can also be observed elsewhere in the Kamula data.

Aekyom has lost vowels under the influence of stress. These changes have not been integrated into Table 11 with the vowel correspondences. In (5a) through (5h) we present words in which Aekyom eliminated the vowel of the first syllable.

- 5a pKE *kedɔ 'bone' > Aekyom [kɭo]
 5b pE *sɔNɔmæ 'goanna' > Aekyom [sɭom] 'lizard'
 5c pKE *peseni 'skin disease' > Aekyom [psen (k^hu)] 'pimples'
 5d pKE *poko- 'pierce, burst' > Aekyom [pku(-j/i)]
 5e pE *kima(ti) 'thunder' > Aekyom [k^hma]
 5f pKE *tuma 'banana' > Aekyom [dma]
 5g pE *kɔpɔkæ 'coconut' > Aekyom [k^hwoke]
 5h pE *dipɔ 'testicles' > Aekyom [two]

As a look at the examples in (5) shows, the loss of the vowel of the first syllable gave rise to a rich variety of consonant clusters. The initial vowel that was lost must have been unstressed in pre-Aekyom and stress fell on the following vowel. Unfortunately, we do not know how far back in history this stress pattern goes. Kamula does not confirm it but shows word initial stress in two of the etyma represented in (5): ['e:lo] 'bone' (5a) and ['tu:ma] 'banana' (5f). Stress cannot yet be reconstructed to Proto-Kamula-Elevala. The consonant clusters that arose in Aekyom include cross-linguistically common ones like [kɹ-] (5a) and [sɹ-] (5b) as well as unusual ones like [ps-] (5c) and [pk-] (5d). That the latter clusters have not been simplified yet suggests that first vowel loss is a rather recent phenomenon. Occasionally, the contact into which the initial and the following consonant came after the disappearance of the intervening vowel triggered further changes. For pKE *tuma 'banana' (5f) we would expect Aekyom †tma but we find [dma]. The initial dental stop must have acquired voicing from the following nasal [m]. But note that the initial velar stop in [k^hma] < pKE *kima(ti) (5e) did not undergo a similar change. Examples (5g) and (5h) suggest that the expected cluster *Tp- regularly turned into a cluster [Tw-]: pE *kəpəkə 'coconut' (5g) > *kpəkə > [k^hwoke]. In the last example, the consonant *p exerted an assimilatory influence on the preceding dental stop before it turned into [w]: pE *dipɔ 'testicles' (5h) > *dɔpɔ > [two].

2.4 Pronouns and other grammatical items

The personal pronouns are only reliably attested in Kamula (J. Routamaa 1994: 46) and Aekyom (Stewart 1989: 49). For Pa, our two sources do not completely agree, which is why we cite both in Table 12. Voorhoeve (1975: 390) only gave first and second person forms, presumably because he realized that the third person forms were demonstratives. There is no reason to assume that Voorhoeve's forms are inaccurate. The forms Waldeck elicited need confirmation.

Table 12: Personal pronouns

	Kamula	pE	Aekyom	Pa (Waldeck)	Pa (Voorhoeve)
1sg	/næ/	*nɔ	[no]	[nɔ]	[nɔ, nɔ̃]
2sg	/wæ/	*go	[gu]	[go]	[go]
3sg	/jæ/		[jo]	[heya]	
1pl.incl.				[niki]	
1pl.excl.	<die, di>		[kwjo]	[niyi]	[neke]
2pl	<uwe>		[gwjo]	[gi]	[geke]
3pl	<jie, ji>		[ko]	[heya]	
1du.incl.				[ni]	
1du.excl.			[ki]		[ni, nigɪ]
2du		*gi	[gi]	[gi]	[gi]
3du			[ti]		

The Aekyom personal pronouns given in Table 12 are absolutive forms. There is a second set of personal pronouns that are used as optional ergatives and as possessive pronouns preposed to the possessed noun (Stewart 1989: 49). Historically, the ergative pronouns were derived from the absolutive pronouns by adding a suffix *-a⁷⁷: [na] 1sg < *nɔ-a, [gwa] 2sg < *go-a, [ja] 3sg <

⁷⁷ The suffix tentatively reconstructed as *-a here has no certain etymology. It may correspond to [-ã] in Pa [nɔ̃-ã] 1sg and [go-ã] 2sg, but Voorhoeve (1975: 390) ascribes an object/indirect object function to these forms rather than ergative function as in Aekyom, which makes their identification doubtful. If Aekyom [-a] and Pa [-ã] are cognate, they would go back to pE *-aɹ.

*jɔ-a. Note that the low rounded back vowel *ɔ in the first and third person singular forms was elided whereas the mid rounded back vowel *o in the second person singular form is reflected as [w] in Aekyom [gwa]. The personal pronouns of Kamula, used in subject, object and possessive function (J. Routamaa 1994: 45), cannot be directly combined with the Aekyom and Pa absolutive pronouns. They contain a different vowel. The second person singular form /wæ/ suggests that this set of pronouns, too, goes back to the absolutive pronouns suffixed with a vowel. For if the vowel /æ/ were the original root vowel, we would expect †æ 2sg < †gæ. The attested form /wæ/ must derive from the absolutive pronoun *go 2sg, the mid high vowel of which is responsible for the /w/ in the Kamula basic pronoun, much as in the Aekyom ergative pronoun: *nɔ-æ 1sg > /næ/, *go-æ 2sg > *gwæ > /wæ/, *jɔ-æ 3sg > /jæ/. Thus, the Kamula basic pronouns are indirect evidence for the existence of absolutive singular pronouns *nɔ 1sg, *go 2sg, and *jɔ 3sg⁷⁸ in Proto-Kamula-Elevala. The absolutive forms themselves were lost in Kamula and only the suffixed pronouns survived. The Kamula basic personal pronouns are probably cognate with a set of emphatic pronouns in Aekyom. Stewart's (2016) dictionary lists [næ] 'my, I, myself' and [jæ] 'itself'. The suffix *-æ that is reflected in these Aekyom pronouns and in the Kamula basic pronouns was therefore most likely a focus marker.

The discrepancy between the plural personal pronouns of the three Kamula-Elevala languages testifies to the considerable genealogical distance between these languages. Kamula and Aekyom have introduced aberrant first person plural forms that have no obvious counterpart in any closely related language. The second person plural forms are difficult to analyze and we attempt no reconstruction here. External evidence suggests that the Kamula third person plural form <ji> is ancient, but neither Aekyom nor Pa have a matching pronoun so that no internal reconstruction is possible. In the dual number, there is a match between the second person forms of Aekyom and Pa and we can reconstruct pE *gi 2du. As Kamula has no dual forms, this comparison is limited to the Elevala languages.

In Aekyom and Kamula, a few kinship terms take pronominal possessive prefixes (Table 13). We do not know whether similarly inflected kinship terms occur in Pa. The two kinship terms compared in Table 13 are not cognate, only the possessive prefixes are. For the Aekyom kinship term 'mother' we only have the singular possessed forms, given in Stewart (n.d. 7). All three of its possessive prefixes are cognate with the corresponding possessive prefixes of the Kamula kinship term 'son' (J. Routamaa 1994: 13). Remember that Kamula regularly loses word initial *g, hence <wami> 'your son' < *gwami.

Table 13: Pronominal possessive prefixes

	pKE	Aekyom 'mother'	Kamula 'son'
1sg	*nV-	[næme]	<nami>
2sg	*gwV-	[gwæme]	<wami>
3sg	*jV-	[jæme]	<jami>
1pl			<diami>
2pl			<uwami>
3pl			<jiami>

The second person singular prefix pKE *gwV- is somewhat surprising. In related languages there is evidence for an ancient proclitic possessive pronoun *ga 2sg. The Aekyom and Kamula possessive prefixes cannot descend from such a form. There are two different ways of accounting for *gwV- between which it is difficult to decide. The first option is that the Kamula-Elevala possessive prefixes go back to the absolutive pronouns suffixed with a vowel, much like

⁷⁸ pKE *jɔ 3sg can be reconstructed from Aekyom [jɔ] and Kamula /jæ/.

the Aekyom ergative pronouns and perhaps identical with them. These proclitic pronouns then turned into the contemporary possessive prefixes. The second option is analogy. Kamula <namɪ> 'my son' and <jami> 'his/her son' look as if they contain the ancient proclitic possessive pronouns *na 1sg and *ja 3sg. The expected second person singular form †ami <*ga-mi may have been replaced with <wami> in analogy with the free pronouns.

A demonstrative root *hV is attested in all three Kamula-Elevala languages. We find it with the vowel *a in Aekyom [ha-kina] 'like that' and [ha-ke] 'at that time' and in Kamula <ha-tlo> 'alone, only' (cf. <tlo> 'only') and <ha-le> 'another, certain'. Furthermore, Aekyom has the demonstratives [hi] 'this' and [ho] 'that' (Stewart 1989: 51) as well as the local deictics [hiwa] 'here' and [howa] 'there' (Stewart 2016). These words cannot be separated from the Kamula local deictics <hema> 'here', <huma> 'over there' (far away but visible), and <hu> 'over there' (far away, generally out of sight)' (J. Routamaa 1994: 44) although the vowels do not match. The Pa anaphors [he] or [heya] glossed 'he, she' probably also belong here. The Aekyom and Kamula local deictics agree in showing a non-low front vowel in the proximal form and a rounded back vowel in the distal form, an iconic distribution of the vowels that signals different distances. It is possible that sound symbolism has interfered with the regular development of the vowels in these words.

The three Kamula-Elevala languages share a verb suffix that is glossed with 'want to' in Aekyom and Pa. It can be used in a kind of purposive construction in the two languages for which we have some syntactic data, as can be seen in (6) and (7).⁷⁹

Aekyom (Stewart 1989: 48)

6 [Ara paku ko wai tɭuɭ-wɛɭa t-eti.]
 woman girl 3PL water scoop-PURP:PL go.F.PST:PL
 'The girls went to get water.'

Kamula (J. Routamaa 1994: 62)

7 <Na: yu ti-la ta-ma.>
 1SG water do-SER go-PRS
 'I'm going to get water.'

In Aekyom, the suffix has a plural form [-wɛɭa] that we see in (6). Its singular form is [-iɭa] ~ [-eɭa] (Stewart 2016: 25). It is the singular form that has cognates in the other languages. Kamula has a suffix <-la> labeled "serial" that is said to occur in a two-verb construction where the second verb is usually a verb of motion (J. Routamaa 1994: 62). Example (7) illustrating this parallels the Aekyom construction in (6). The conclusion suggests itself that Kamula <-la> descends from the same proto-form as Aekyom [-iɭa] ~ [-eɭa]. In Pa, a cognate suffix is attested in [nɔ d-iɭa] 'I want to eat' and [nɔ kɛɭ-iɭa] 'I want to go' (Waldeck 2017). The three reflexes can be united under the reconstruction pKE *-(i,e)Na.

The following comparisons are limited to Aekyom and Pa. These two languages have tense suffixes with separate singular and plural forms. In (8) and (9) we see the present tense suffixes. The plural forms are not cognate, but the singular forms match. The present singular suffixes Aekyom [-ɭa] and Pa [-a] regularly descend from pE *-da.

Aekyom (Stewart 2016: 25f)

8 [p-ɭa] 'sit-PRS:SG', [p-ɭai] 'sit-PRS:PL'

⁷⁹ The following abbreviations are used in the interlinear glosses: F.PST far past tense, PL plural, PRS present tense, PURP purposive, SER serial, SG singular.

Pa (Waldeck 2017)

9 [p-a] 'sit-PRS:SG', [p-æyɔ] 'sit-PRS:PL'

Aekyom and Pa share an adjectivizing suffix pE *-kaina, which is found attached to a good number of adjectives in both languages, as shown in (10) and (11).

Aekyom (Stewart 2016)

10a [drop-kina] 'weak'

10b [baru-kina] 'blunt'

10c [kon-kina] 'white'

Pa (Waldeck 2016)

11a [mɛ-γæɬæ] 'ripe'

11b [howa-γæɬæ] 'light (in weight)'

11c [kɔ̄-γæɬæ] 'white'

As a rule, the root to which *-kaina is attached is not attested on its own in our data. The resultant word forms are adjectives. Note that the words meaning 'white' in (10c) and (11c) are cognate.

The Pa suffix [-γæɬæ] can sometimes be exchanged with [-γα], seemingly without change in meaning. This is the case with the adjectives in (13) (compare (13a) with (11a) above). Pa [-γα] can be etymologically equated with the Aekyom suffix [-kɬa], about which we know a bit more.

Aekyom (Stewart 2016)

12a [k^hjom-kɬa] 'is angry'

12b [t^hlen-kɬa] 'paining, hurting'

12c [weɬmæ-kɬa] 'about to vomit'

Pa (Waldeck 2016)

13a [mɛ-γα] 'ripe'

13b [edja-γα] 'good'

13c [ka-γα] 'hard'

The roots of the Aekyom derivatives with the suffix [-kɬa] in (12) belong to different parts of speech: adjective [k^hjoma] 'sharp' in (12a), noun [t^hren] 'pain' in (12b) and verb [weɬia] 'to vomit' in (12c). In Voorhoeve's (2007) word list, the vowel that is syncopated in Stewart's data appears as [e], e.g. Western Awin [hub-kerə] 'night'. This allows us to reconstruct pE *-keda. The meaning of [-kɬa] in Aekyom is roughly 'being X, having X'. Stewart (1989: 37) mentions a plural form [-kɬai] of this suffix. This agrees well with the hypothesis that *-keda is a former auxiliary verb form whose root is *ke and which carries the present tense suffix *-da.

2.5 Subgrouping

The three Kamula-Elevala languages are not so closely related that an immediate relationship between any two of them is obvious upon an inspection of a comparative word list. After considering all reconstructions we think, however, that there is a closer relationship between Aekyom and Pa than between either of these languages and Kamula. We call the subfamily made up of Aekyom and Pa the Elevala family. In the following, we are going to present evidence speaking in favor of such a subfamily.

Despite some uncertainty about the personal pronouns of Pa, we have reconstructed a second person dual form pE *gi 'you two' (Table 12 in 2.4). External comparison suggests that this pronoun was originally a plural rather than a dual form. In Lowland Ok and Mountain Ok, for instance, the cognate personal pronoun *kip 'you all' is a plural form (Usher 2017a). The shift of *gi from plural to dual is a common innovation of Aekyom and Pa. Kamula has no dual forms of the personal pronoun and its second person plural pronoun <uwe> 'you all' is not cognate with pE *gi. It is therefore not possible to prove that Kamula did not share this innovation before abolishing the dual number. However, we consider such a scenario unlikely.⁸⁰

In examples (3) and (4) in 2.3, Aekyom nouns suffixed with [-nam ~ -lam] 'hole, inside' were presented. Pa has a cognate suffix [-lamæ] with the same meaning, as can be seen in (14).

⁸⁰ Note Kamula <ji> 'they (pl)'.

Pa (Waldeck 2016)

14a	[na-ʎamæ] 'anus'	[na] 'intestines, feces'
14b	[o-ʎamæ] 'fireplace'	[netã ɔ] 'charcoal'
14c	[ka-ʎamæ] 'hole'	[ka] 'light'

The suffix pE *-namæ 'hole, inside' is thus well attested in Aekyom and Pa. It plays an important role in the formation of concepts and occurs in numerous lexical items in both languages. We have not been able to find a cognate suffix in Kamula. Given the wide distribution of *-namæ 'hole, inside' in the lexica of Aekyom and Pa, we would have expected to find at least a relic form if Kamula had ever had a counterpart of this suffix. The suffix pE *-namæ 'hole, inside' is in all likelihood a common innovation of Aekyom and Pa.

In examples (10) and (11) of 2.4, we listed examples of the adjectivizing suffix pE *-kaina > Aekyom [-kina], Pa [-yæɬæ]. This is also a suffix with a wide distribution in the lexica of the Elevela languages. Our endeavor to find a cognate suffix in Kamula remained fruitless. The adjectivizing suffix pE *-kaina looks like another common innovation of the Elevela languages.

3. Borrowing

It is a common misunderstanding that in order to find cognates one must compile a list of similar looking words. That is not so. The first step is looking for recurrent sound correspondences among synonyms. It does not matter whether the words compared look similar or dissimilar. Sometimes similar looking words can be found in the data that do not display regular sound correspondences. They must not be mistaken for cognates. A case in point is Pa [babo] 'mother's brother' and Kamula <bapo> 'maternal uncle, nephew, niece'. A look at Table 10 in 2.3 with the Kamula-Elevela consonant correspondences shows that Pa [b-] : Kamula <b-> is not a valid sound correspondence. In fact, in both languages initial /b/ cannot be derived from a proto-phoneme and words that contain this sound cannot have been inherited from Proto-Kamula-Elevela. The Pa and the Kamula kinship terms just mentioned must have been borrowed, presumably from the same source, hence their similarity. A search in the lexicon of surrounding language families reveals the likely source in Proto-Bosavi *babo 'mother's brother'.

Table 14: Aekyom loanwords from Ok languages

	Aekyom	Mountain Ok	Lowland Ok
1	[mon] 'rubbish'	*mɔ:n 'rubbish, compost'	
2	[lon] 'garden newly felled'	*rang 'garden'	*jong 'garden'
3	[k ^h no] 'canoe'		*kono 'canoe'
4	[ambum(e)] 'turtle'	*ambɔ:m 'turtle species'	*ambom 'turtle'
5	[k ^h wiɬe] 'hornbill'	*kawɛ:r 'Papuan hornbill'	*kawer 'hornbill'
6	[ubine] 'rhinoceros beetle'	*umi:n 'rhinoceros beetle'	
7	[mom] 'nephew, maternal'	*mɔ:m 'mother's brother'	*mom 'mother's brother'
8	[ahwoe] 'grandmother'	*ap(e,o):k 'grandmother'	*apok 'grandmother'
9	[k ^h endoke] 'outer ear'	*kindɔ:ŋg 'inner ear'	*kende 'ear'
10	[mgat-ʎam] 'in the mouth'	*mangat 'mouth, chin'	*mangot 'mouth'

We have not systematically searched for borrowings in the Kamula-Elevela languages. In the following, we only present some conspicuous cases of borrowing we noted in our comparative work. In particular, we want to point out the main sources of borrowing insofar as we can identify them. Aekyom has borrowed a lot of vocabulary from the neighboring Mountain Ok and Lowland

Ok languages. Table 14 presents a sample of such loans.⁸¹ Among the Ok loanwords in Aekyom we find not only cultural vocabulary (1-3) and terms for animals (4-6) but also kinship terms (7-8) and body part terms (9-10). This speaks for a high level of contact and lexical sharing. In fact, the anthropologist Depew (1986: 15) states that many Aekyom regard the linguistically immediately related Pa people as socially more distant from them than the Mountain Ok speaking neighbors to the north. Most of the Aekyom words in Table 14 can be recognized as borrowings owing to their phonological structure. The initial [m] gives the nouns in (1), (7), and (10) away as loanwords. Sequences of a nasal consonant plus voiced stop as in (4) and (9) only occur at morpheme boundaries in native words. The consonant [ɺ] only occurs word medially in native words, not initially as in (2). The opposite is true for [h], which only occurs word initially in native words, not medially as in (8). It is often difficult to determine the precise source of borrowing when a borrowed word is widely reflected in the Ok family. But nothing speaks against the adjacent language Faiwol as the major source of borrowings from Mountain Ok.

Table 15: Loans between Kamula and Doso

	Kamula	Doso	Turumsa
1	<a> 'father'	[a:] 'father'	[a:] 'father'
2	<wai> 'mother'	['wai] 'mother'	['wai] 'mother'
3	<bapa> 'older brother'	['bapa] 'older brother'	
4	<nana> 'older sister'	['nana] 'older sister'	
5	<omali> 'blood'	['omari] 'blood'	
6	<koko> 'stomach'		[kù'ko] 'belly (outside)'
7	<kapiya> 'wallaby'	[ka'pia] 'wallaby'	[kapia] 'wallaby'
8	<watla> 'cassowary'	[wa:tara] 'cassowary'	[wa:tara] 'cassowary'
9	<uwala> 'cloud'	['wara] 'cloud'	
10	<asila> 'sand'	['asira] 'sand'	

Kamula and Doso are spoken side by side in the Kamula settlements (cf. 1.1). It is therefore no surprise that the two languages share many lexical items (Table 15)⁸². Because Doso and the closely related language Turumsa are sparsely documented and we know little about the history of the words, it is often difficult to determine the direction of borrowing. What is more, the diffusion chain also includes Dibiyaso, another little known language. The shared terms for nuclear family members in (1) to (4) suggest that intermarriage was frequent between Kamula and Doso speakers. Again, sometimes the phonological structure betrays that a word has been borrowed. Kamula has no native words with initial <b-> or medial <-n->, hence the two sibling terms in (3) and (4) must be loanwords. Kamula also lacks initial <k-> in native words, therefore the nouns in (6) and (7) must be loans. The borrowings between Kamula and Doso are not confined to concepts that are easily borrowed but affect the whole lexicon.

Kamula has also borrowed words from Aramia River languages spoken to the south of the Kamula village of Wasapea. In Table 16, this family is represented by Waruna and Gogodala. The words Kamula borrowed from these languages pertain to crop cultivation (1-2), river-faring (3-4) and animal husbandry (5), activities that were formerly presumably unknown to the Kamula, whose subsistence economy revolved around sago extraction and hunting and gathering in the rainforest. The loans from Aramia River languages follow the pattern of borrowing cultural practices and artefacts and the associated terminology.

⁸¹ The Mountain Ok and Lowland Ok reconstructions in Table 14 have been taken from Usher (2017a).

⁸² The Doso and Turumsa words in Table 15 are taken from Rueck, Alemán and MacKenzie (2005).

Table 16: Kamula loanwords from Aramia River languages

	Kamula	Waruna	Gogodala
1	<bipi> 'taro'	[bibi] 'taro'	[bibi] 'taro'
2	<wisa> 'yam'		[waisa] 'yam'
3	<koa> 'canoe'	[gwawa] 'canoe'	[gawa] 'canoe'
4	<kiyale> 'paddle, oar'	[keari] 'paddle'	[keari] 'paddle'
5	<gagapo> 'chicken'	[kakaba] 'fowl'	
6	<koke> 'breadfruit'	[kawaki] 'breadfruit'	

The comparative phonology in 2.3 shows that Kamula words with initial <b->, <g-> or <k-> cannot have been inherited. The large number of words with these initial consonants in the dictionary gives an impression of how much of the lexicon has been borrowed. Kamula has been flooded with loanwords. Aekyom has also absorbed a good many loanwords. It is far more difficult to find loanwords in Pa, which is lexically the most conservative language of the family. A sizable Pa dictionary would be a great asset for wider comparison.

4. Previous studies and outlook

The first Kamula-Elevala language to be mentioned in the classificatory literature was Aekyom. In his survey of the Western Division of Papua, Sydney H. Ray (1923: 336) assigned Austen's (1923) Aekyom word list from Amnat village to a Tedi Group, which otherwise comprised Lowland Ok languages. In Arthur Capell's (1962) survey of the South-Western Pacific, all three Kamula-Elevala languages are shown on the map of the Western Division of Papua opposite page 128. However, the accompanying text does not cite any data from any of these languages nor does it attempt to classify them. The language names Awin and Aekyom appear on the map to the west of the Ok Tedi River and, like Ray, Capell (1962: 135) discusses them together with neighboring Lowland Ok languages. The language name Debepari (i.e. Pa) appears north of the Elevala River and the text mentions that the language had about 2000 speakers. Finally, at the head of the Aramia River a language named Kamura is noted, but nothing further is said about this language in the text.

In a discussion of surrounding languages in his dissertation on the Ok languages, Alan Healey (1964: 108) suggested that Aekyom and Pa form a language family: "The Awin-Pare Family of 9,000 speakers is a tentative grouping by the present author, and includes Akium-Awin (Aekyom), Akium-Pare, and Pare (Pari)." It is not clear on the basis of what data Healey made this statement, but he must have had access to word lists that made a lexicostatistical count possible, for he states: "The Awin-Pare Family exhibits relationships of 36% and above." (Healey 1964: 115). Healey counted Akium-Pare (i.e. Aekyom-Pare) as a third language whereas Stewart (1989: 1) considers it a divergent dialect of Aekyom that "almost constitutes another language". We follow the traditional classification of Aekyom as a single language in this paper because only small fragments of dialect data are available to us. The question of whether any of the dialects is different enough to be considered a separate language should be addressed in a sociolinguistic survey.

In a programmatic paper outlining his idea of a Central and South New Guinea stock, Clemens L. Voorhoeve (1968) included the Awin-Pare (i.e. Elevala) family, which he had adopted from Healey (1964). He saw the Central and South New Guinea stock as being made up of five language families and four isolated languages (Voorhoeve 1968: 3). One of the families was the Pare-Samo-Beami-Bosavi family, which associated the Elevala languages with languages spoken to their east. This classification was based on lexicostatistical figures, but as Voorhoeve did not present the putative cognates on which his counts were based, it is impossible to judge his reasoning. In the big survey volume on the classification of the Papuan languages edited by Wurm, Voorhoeve (1975: 369) presented a reduced version of his Central and South New Guinea stock,

consisting of eight language families. Three of these families were Awin-Pa (i.e. Elevela), East Strickland and Bosavi, which were no longer combined as a subgroup. Kamula did not appear in the survey volume and must have been unknown to Voorhoeve when he wrote his contribution. In the final synthesis of the survey, Wurm (1982: 136) included Kamula in the Central and South New Guinea stock as a family-level isolate.

The first data to be published on Kamula appeared in Ger P. Reesink's (1976) survey of the languages of the Aramia River area. Reesink found only few potential cognates between Kamula and the Bosavi languages Bainapi and Kaluli and even fewer with the Inland Gulf language Tao Suamato. He considered a connection with Pa most promising and gave a list of 37 possible cognates (Reesink 1976: 16f). He correctly identified the following cognates between Kamula and Pa that also appear in the present paper: pKE *kopo 'man' (3), pKE *tai 'tongue' (7), pKE *makæ 'shoulder' (13), pKE *mu 'joint' (15), pKE *hi 'name' (18), pKE *aja 'house' (23), pKE *dade- 'hear' (33), pKE *po- 'die' (35), and pKE *de- 'eat, drink' (37). Further research may prove a few more of his comparisons valid, but most of the rest are juxtapositions of unrelated words. As a first attempt to point out a relationship between two languages only known from word lists, Reesink's list of possible cognates between Kamula and Pa is an achievement.

R. Daniel Shaw dealt with the languages of the Mt. Bosavi region in two articles. In his contribution to the survey of the Gulf District and adjacent areas edited by Franklin (1973), he distinguished between an East Strickland Plain family and a Papuan Plateau family (adopted by Voorhoeve 1975 under the names East Strickland and Bosavi, respectively). As for the peripheral language Pa, Shaw (1973: 193) mentioned that he counted only 12% potential cognates between Pa and the East Strickland languages whereas Voorhoeve (1968) had given the much higher figure of 36%. Kamula was not among the languages surveyed in the paper. In his second article, Shaw (1986) presented word lists for 14 languages of what he called the Bosavi language family and for six neighboring languages. He carried out a lexicostatistical analysis of the 14 languages, dividing them in three subfamilies: Strickland Plain, Papuan Plateau and Watershed of Mt. Bosavi. The Bosavi languages (in the sense of Voorhoeve 1975) are split up in this classification, three of them being assigned to the Plateau subfamily and five (including Bainapi) being assigned to the Watershed subfamily. The five East Strickland languages are grouped together in the Plain subfamily. The remaining language, Kamula, is included in the Watershed subfamily. Shaw ignored Reesink's (1976) lexical comparisons between Kamula and Pa and his suggestion of a stock-level relationship between Kamula and the Elevela languages. This is all the more remarkable as Pa is one of the neighboring languages for which Shaw collected and published a word list. Kamula is definitely not a member of the Bosavi family and its inclusion in the Watershed grouping was an error.

In his influential paper on pronouns as a preliminary diagnostic for grouping Papuan languages, Malcolm Ross (2005: 22) dismantled Voorhoeve's Central and South New Guinea stock. The Awin-Pa (i.e. Elevela) family consequently ended up as a primary subgroup of Trans-New Guinea and Kamula as an isolate within Trans-New Guinea (Ross 2005: 35). This vague classification of the Kamula-Elevela languages shows the limits of Ross's approach, which left lexical data out of consideration.

In the papers we have discussed above, Voorhoeve and Shaw looked to the east to find a genealogical connection for the Kamula-Elevela languages. We think that these attempts were futile and side with the earlier proposal of Healey (1964) who looked to the west. Healey suggested a connection with the Awyu-Dumut and the Ok languages: "Awin shows about 10% possible cognates with the Ok Family and with the Awyu-Dumut Family, but more detailed investigation is necessary before regular sound correspondences can be established." (Healey 1964: 115). He counted the same percentage of 10% possible cognates between Aekyom and Ok as between Awyu and Ok and expressed his belief that "it may eventually prove possible to demonstrate that the Ok, Awin-Pare, and Awyu-Dumut Families belong to a single linguistic stock or phylum, or perhaps that there was extensive borrowing between the three parent languages of these families."

(Healey 1964: 116). We do not believe that the lexical agreements between these three language families can all be attributed to borrowing. Rather, they form a genealogical unit. Within this stock, we consider it likely that the Kamula-Elevala languages are most closely related to the Awyu-Dumut languages and their nearest relatives. Since Healey wrote his dissertation, further languages have been shown to belong to the Awyu-Dumut family. Voorhoeve (1971) added Sawuy and De Vries, Wester and van den Heuvel (2012) showed that the Ndeiram and Becking-Dawi families go together with the Awyu-Dumut languages. To these languages the lately discovered languages Awbono and Bayono must be added (Usher 2017b). The aforementioned languages and families are the nearest relatives of the Kamula-Elevala languages.

Table 17: Potential cognates between Kamula-Elevala and Awyu-Dumut

Awyu-Dumut (Healey 1970)	Kamula-Elevala
pAD *dat- 'hear'	pKE *dade- 'hear'
pAD *do- ⁸³ 'be cooked'	pKE *du- 'burn, cook'
pAD *ɛdex- 'give'	pE *dæ- 'give'
pAD *fup 'name'	pKE *hi 'name'
pAD *göp 'you (sg.)'	pE *go 'you (sg.)'
pAD *ket 'flower'	Pa [ke] 'blossom'
pAD *mak 'shoulder'	pKE *makæ 'shoulder'
pAD *nop 'I'	pE *nɔ 'I'
pAD *or 'excreta, intestines'	Kamula /o/ 'abdomen, belly'
pAD *xaiban 'head'	Pa [keba] 'head'
pAD *xop 'male, man'	pKE *kopo 'man'
pAD *yin 'tree, wood, fire'	Pa [ẽ] 'tree'
pA *bu 'buttocks'	pE *po 'buttocks'
pA *dübe, *dübi 'island'	Aekyom [dupi] 'island'
pA *düb(-ro) ⁸⁴ 'heart'	Kamula <dupa> 'heart'
pA *makan, *mokan 'low, beneath'	pE *moka 'below'
pA *midi(n) 'thigh'	pKE *madina 'thigh'
pA *wün 'liver'	Pa [wumɛ] 'liver'
pA *xui(-to) ⁸⁵ 'sky'	Aekyom [k ^h woe] 'sky, heaven'
pD *ba- 'sit'	pKE *pV- 'sit'
pD *kumöt 'thunder'	pE *kima(ti) 'thunder'

Healey (1964) reconstructed the phonology, morphology and parts of the lexicon of the Mountain Ok and the Lowland Ok families in his dissertation. This successful application of the comparative method stood virtually alone at a time when the other classifiers of the Papuan languages relied on lexicostatistics. In a subsequent paper, Healey (1970) also presented a reconstruction of the Awyu-Dumut family. But he never followed up on his proposal that the Elevala languages are the third group of languages in the same stock. In his dissertation, he did not cite the potential cognates he had seen between Elevala, Awyu-Dumut and Ok. We made an attempt to reconstruct what cognates Healey may have spotted. For this purpose, we went through his reconstructions of Proto-Awyu-Dumut (pAD), Proto-Awyu (pA) and Proto-Dumut (pD) vocabulary and

⁸³ There is a pair of verbs Healey would have transcribed as *do- 'burn (intr.)' and *dü- 'cook, burn (tr.)' (cf. Usher 2017c). Healey only reconstructs the former, but the latter actually corresponds to pKE *du- 'burn, cook'.

⁸⁴ This is a compound with *ro 'fruit'.

⁸⁵ This is a compound with *to 'hole'.

noted potential cognates in the Kamula-Elevala family. The list of comparisons can be found in Table 17.

5. Conclusion

We have reconstructed the phoneme system and lexical and grammatical morphemes of Proto-Kamula-Elevala, demonstrating beyond reasonable doubt that Aekyom, Pa and Kamula are genealogically related languages. The number of lexical cognates all three languages share is rather modest. There are two possible reasons why this is so, both of which seem to apply. First, there is borrowing. We have seen that Kamula has absorbed a massive amount of loanwords and that Aekyom has also borrowed extensively. The influx of new lexical items has significantly diminished the number of inherited words. Second, there is time depth. In view of the fact that they form a subfamily and are geographically adjacent, Aekyom and Pa have surprisingly divergent lexica. This is a sign that they must have been separate languages for a considerable period of time.

The personal pronouns of Aekyom, Pa and Kamula require knowledge of the historical phonology before they lend themselves to reconstruction. Even so, only the singular forms proved to be reconstructible by internal evidence alone; the plural forms of the three languages are widely different. This is another indication that they separated from each other a long time ago. At present, the reconstruction of morphology is hampered by the lack of a grammatical description for Pa. The available descriptions for Aekyom and Kamula provided only two cases of cognate morphology, the possessive prefixes to kinship terms and a common verb suffix that appears in a purposive construction. Kamula seems to be in the process of simplifying its verb morphology and much old material has already been lost.

What allowed us to recognize that Aekyom, Pa and Kamula are related languages is a stock of common words displaying regular sound correspondences. Once the sound correspondences have been identified, it becomes possible to sort out borrowings. Although Kamula has been subject to massive borrowing, this has not obliterated the core of inherited vocabulary. The lexicon carries a signal that transcends the Kamula-Elevala family. Some of the words we reconstructed to Proto-Kamula-Elevala or Proto-Elevala have cognates in the Awyu-Dumut languages.

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