

A phonological reconstruction of Proto-Kawapanan

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ABSTRACT: This paper aims to provide a full diachronic account of the segmental correspondences between two extant Kawapanan languages of Peruvian Amazonia, Shawi and Shiwilu. I put forward a reconstruction of the phonological system of Proto-Kawapanan, which differs from the alternative proposal by Valenzuela (2011) in several respects: I argue that Proto-Kawapanan had two liquid phonemes (**r* and **l*), lacked palatal obstruents, distinguished between two front vowels (**i* and **ɨ*), and its codas did not contrast for place of articulation. The second part of the paper is devoted to the reconstruction of the phonological history of Shawi and Shiwilu, including sound changes such as umlaut and several kinds of palatalization. I conclude with an attempt at reconstructing sound changes that must have taken place before the disintegration of Proto-Kawapanan, such as the debuccalization of pre-Proto-Kawapanan consonantal codas and the positionally conditioned lateralization of **r*.

KEYWORDS: Kawapanan languages; Proto-Kawapanan; Shawi; Shiwilu; phonological reconstruction

RESUMO: Este artigo visa fornecer uma interpretação diacrônica de todas as correspondências sonoras segmentais entre as duas línguas Kawapana faladas na Amazônia peruana, o Shawi e o Shiwilu. Apresento uma reconstrução do sistema fonológico do Proto-Kawapana, que difere da proposta alternativa de Valenzuela (2011) em vários aspectos. Em particular, proponho que o Proto-Kawapana possuía um contraste entre dois fonemas líquidos (**r* e **l*), carecia de obstruintes palatais, distinguia entre duas vogais anteriores (**i* e **ɨ*) e não apresentava contrastes de ponto de articulação em suas codas silábicas. A segunda parte do artigo é dedicada à reconstrução da história fonológica de Shawi e Shiwilu, incluindo mudanças sonoras como a harmonização vocálica (*umlaut*) e diversos tipos de palatalização. Concluo o artigo com uma tentativa de reconstrução de mudanças sonoras que devem ter ocorrido antes da desintegração do Proto-Kawapana, tais como a debucalização das codas consonantais do pré-Proto-Kawapana e a lateralização de **r* em determinados ambientes.

PALAVRAS-CHAVE: línguas Kawapana; Proto-Kawapana; Shawi; Shiwilu; reconstrução fonológica

1. Introduction

Kawapanan is a small language family of Western Amazonia. It includes two closely related extant languages, Shawi (also known as Chayahuita; ISO 639-3 [cbt]) and Shiwilu (also known as Jebero; ISO 639-3 [jeb]), both spoken in Peru between the Marañón and Huallaga Rivers. At least historically, there was also a Shiwilu-speaking community in the Ronda Island in Colombia (Ortiz 1954: 151). In this paper, I contribute to the understanding of Kawapanan historical phonology by identifying previously unnoticed sound changes, based on comparative, philological, and morphophonological evidence. I thus aim to expand on the pioneering proposal in Valenzuela (2011), the only published body of research on the historical phonology of Kawapanan, by providing, for the first time, a full account of segmental correspondences between Shawi and Shiwilu. Note that this study does not take into account the data of a third Kawapanan language, Mikirá, known through a short wordlist collected by Enrique Stanko Vráz and published in Loukotka (1949: 59–64). The reconstruction of Proto-Kawapanan prosody is not attempted either, since the stress system of Shawi is not sufficiently well described.

The following sources have been taken into account in this paper. For Shawi, I mostly rely on Hart's (1988) dictionary as well as on Barraza de García (2005). Shiwilu data come

mainly from the dictionary by Valenzuela et al. (2013); Bendor-Samuel (1961) and Madalengoitia Barúa (2013) were also consulted.

For Shawi, I rely on Rojas-Berscia et al.'s (2019) phonological analysis. The maximal syllable in the language is CVC.¹ The consonants /p m t s n r tʃ ʃ k w/ may fill the onset position, whereas the coda position may be filled by /ʔ/, /N/, or /h/; the latter consonant is represented as ^h in this article and recognized as a phoneme by Barraza de García (2005), but not by Rojas-Berscia et al. (2019). Note that the character /N/ stands for a placeless nasal in this article, as opposed to a uvular nasal. Shawi has four vowel phonemes, represented here as /a ə i o/. In some environments, the obstruents may dialectally surface as voiced, and /p/ may lenite to *w* outside the word-initial disyllabic window in the southern dialects.

For Shiwilu, I depart from Valenzuela and Gussenhoven's (2013) and Madalengoitia Barúa (2013)'s analyses in several ways. In the analysis adopted here, the language has no complex onsets or codas, but has instead one complex nucleus /əɾ/. In native vocabulary, the consonants /p m t s n l ɔ̃ tʃ ʃ n ʎ j k k^w w/ may fill the onset position, whereas the coda position may be filled by /ʔ/, /N/, or /k/. The nuclei include /a ə əɾ i o/. The combination of the complex nucleus /əɾ/ and the coda /ʔ/ surfaces as [əʔɾ]. In loanwords, the onset *p^w* and the rhymes *ir* and *ar* have also been attested. Other authors posit more complex syllable structures, such as CV_{FN}, since they analyze /ɾ/ and /ʔɾ/ as phonemes and /əɾ əʔɾ/ as sequences of a nucleus (/ə/) and a coda (/ɾ/ or /ʔɾ/); Valenzuela and Gussenhoven (2013: 98) also posit the complex onsets /kw/ and /pw/ instead of /k^w/, /p^w/. Stops are allophonically voiced after a nasal coda, and intervocalic consonants (except [r]) are phonetically geminated after [ə]. The sequences /wə/ and /wəɾ/ often surface as [u] and [ur]. Valenzuela and Gussenhoven (2013: 101–2) state that Shiwilu has default peninitial stress except in disyllables, where stress is initial; there are a few lexical exceptions to this rule, and certain affixes attract stress.

The rest of this article is organized as follows. In section 2, I discuss the reconstruction of Proto-Kawapanan onsets and their evolution in Shawi and Shiwilu. Proto-Kawapanan rhymes are tackled in section 3. In sections 4 and 5, I deal with specific processes that are part of the phonological history of Shawi and Shiwilu, respectively. I then proceed to discuss selected morphophonological evidence in section 6 and reconstruct a number of sound changes that must have operated in the internal history of Proto-Kawapanan before its disintegration (pre-Proto-Kawapanan). Irregular correspondences are briefly mentioned in section 7, and section 8 concludes the paper.

2. Proto-Kawapanan onsets

Tables 1 and 2 show the inventories of consonants that may fill the onset position in Shawi (Rojas-Berscia et al. 2019) and Shiwilu (Valenzuela & Gussenhoven 2013; Madalengoitia Barúa 2013). The consonants that only occur in codas are not included. Neither language allows complex onsets.

¹The following abbreviations are used in this paper: C = consonant, PK = Proto-Kawapanan, Qu. = Quechua, Sha = Shawi, Shi = Shiwilu, Sp. = Spanish, A/P = agent/patient of a transitive verb, S = sole argument of an intransitive verb, V = vowel, κ = coda, 1/2/3 = first/second/third person, ABL = ablative, ADDIT = additive, CL = classifier, DIM = diminutive, INCL = inclusive, LOC = locative, NEG = negative, NFUT = non-future, NMLZ = nominalizer, POSS = possessor, PL = plural, PURP = purposive, SG = singular, VM = valency modifier, vt. = transitive verb, × = hypothetical form, ~ = “corresponds to” or “varies with”.

Table 1. Synchronic phonemic inventory of Shawi (onset consonants only)

	labial	alveolar	palatal	velar	labiovelar
obstruents	<i>p</i>	<i>t</i>	<i>tʃ</i>	<i>k</i>	
nasals	<i>m</i>	<i>n</i>			
fricatives		<i>s</i>	<i>ʃ</i>		
tap		<i>r</i>			
approximants			<i>j</i>		<i>w</i>

Table 2. Synchronic phonemic inventory of Shiwilu (onset consonants only)

	labial	alveolar	palatal	velar	labiovelar
obstruents	<i>p</i> (<i>pʷ</i>)	<i>t</i>	<i>tʃ</i>	<i>k</i>	(<i>kʷ</i>)*
nasals	<i>m</i>	<i>n</i>	<i>ɲ</i>		
fricatives		<i>s</i>	<i>ʃ</i>		
lateral approximants		<i>l</i>	<i>ʎ</i>		
central approximants		<i>ʈ</i>	<i>j</i>		<i>w</i>

* = recognized as a phoneme by some authors only

The consonantal inventory reconstructed by Valenzuela (2011: 282) for PK, shown in Table 3, is basically identical to that of Shawi. That way, Valenzuela takes Shawi to be phonologically conservative with regard to its consonants, whereas Shiwilu would have enlarged its inventory by means of phoneme splits.

Table 3. Proto-Kawapanan consonants according to Valenzuela (2011)

	labial	alveolar	palatal	velar	labiovelar	glottal
obstruents	* <i>p</i>	* <i>t</i>	* <i>tʃ</i>	* <i>k</i>		*ʔ
nasals	* <i>m</i>	* <i>n</i>				
fricatives		* <i>s</i>	* <i>ʃ</i>			
tap		* <i>r</i>				
approximants			* <i>j</i>		* <i>w</i>	

I argue that a slightly different consonantal inventory should be reconstructed for PK, as shown in Table 4 (only the consonants that occur in the onset position are included).

Table 4. Proto-Kawapanan consonants (my proposal, onset consonants only)

	labial	alveolar	palatal	velar	labiovelar
stops	* <i>p</i>	* <i>t</i>		* <i>k</i>	* <i>kʷ</i>
nasals	* <i>m</i>	* <i>n</i>			
fricatives		* <i>s</i>			
tap		* <i>r</i>			
approximants		* <i>l</i>	* <i>j</i>		* <i>w</i>

In Table 5, I list the reflexes of the PK onsets in my reconstruction, including those not discussed below due to my acceptance of Valenzuela's proposal (**p*, **m*, **n*, **s*, **j*, **k*, **w*, and **t* in non-palatalizing contexts).

Table 5. Proto-Kawapanan onsets

PK	Shawi	Shiwilu	observations
* <i>p</i>	p; w ^A	p	
* <i>m</i>	m	m	
* <i>t</i>	t; tʃ ^B ; ʃ ^C	t; tʃ ^D	

*n	n	n; n ^D	
*s	s	s; s ^E	
*r	r	l; ʎ ^D	intervocalic only (see 2.1)
*l	n		
*j	j	ʝ; j ^E	
*k	k	k	
*k ^w	k	k ^w	rare
*w	w	w; k ^{wF}	
zero	zero; ʔ ^G	zero; k ^F	

^A = outside the word-initial disyllabic window (dialectally); ^B = preceding *r; ^C = preceding *l; ^D = preceding *l or following *i(κ); ^E = following *l(κ); ^F = after a paragodic k (5.1, 2.4); ^G = between vowels.

In what follows, I discuss the onsets of Proto-Kawapanan, focusing on the differences between my current proposal and the one by Valenzuela (2011). One such difference concerns the reconstruction of PK liquids: while Valenzuela reconstructs only one liquid for PK (the tap *r), I deem it necessary to reconstruct two different liquids (*r and *l). The relevant evidence is presented in subsection 2.1. I then proceed to examine the data that underlie the reconstruction of PK *tʃ, *f in Valenzuela’s (2011) proposal and conclude that the respective tokens either contained *t, *s in PK or are not reconstructible for PK at all (subsection 2.2). In subsection 2.3, I present some evidence against reconstructing PK *ʔ in the onset position. Finally, I briefly discuss the case for PK *k^w (subsection 2.4).

2.1 Proto-Kawapanan liquids

Shiwilu differs from Shawi in having two lateral approximants in its inventory, /l/ and /ʎ/. The latter is positionally restricted—it occurs predominantly either before /i/ or after an underlying /əɾ/, whereas /l/ almost never occurs preceding /i/ or following /əɾ/—and clearly results from a historical palatalization */l/ > /ʎ/ (see subsections 5.2–3; Madalengoitia Barúa 2013: 44-5 for more details). Shiwilu lateral approximants have two possible correspondences in Shawi, /r/ and /n/. Valenzuela (2011: 280-1) notes that Shawi /r/ typically shows up in word-medial onsets, as in Shi *nala* ~ Sha *nara* ‘tree’, Shi *jínəkla* ~ Sha *nínira* ‘tongue’, Shi *anpulu?* ~ Sha *anpuru?* ‘feather’, whereas Shawi /n/ as the correspondence of Shiwilu /l/ or /ʎ/ is primarily found word-initially as well as following a nasal or glottal consonant, as in Shi *a?lasa?* ~ Sha *a?na?* ‘one’, Shi *lansi?* ~ Sha *nansə?* ‘bone’; Shi *la?la?* ~ Sha *nanan* ‘mouth’ (note that the transcription conventions in the cited work differ slightly from mine). Valenzuela reconstructs PK *r and suggests that it underwent lateralization in Shiwilu, whereas Shawi kept it intervocalically and merged it with *n elsewhere. Some cognate sets that exemplify the development of PK *r between vowels are listed in 1.

(1) PK *r > Shawi r, Shiwilu l/ʎ between vowels

	PK	Shawi	Shiwilu	gloss
a.	*anpuru?	anporo?	anpulu?	feather, bodily hair
b.	*irIN-	irin-	iʎIN-	to make noise
c.	*iru	iro	ilu-	cough, cold
d.	*iru?	iro-	ilu?	to suck (Sha); to lick (Shi)
e.	*jamura	jamora	ʝamula	salt
f.	*ka?jura	ka?jora	kaʝula	cicada
g.	*kalaran	kanaran	kalala(N)	sea lion

h.	<i>*kaluʔturuʔ</i>	<i>kanoʔtoroʔ</i>	<i>kaluʔtuluʔ</i>	<i>locrero</i> bird, greater ani
i.	<i>*kara</i>	<i>kara</i>	<i>kala</i>	three
j.	<i>*kuʔluruntʔ</i>	<i>koʔnorontʔ</i>	<i>kuʔluluntʔk</i>	<i>corocoro</i> bird
k.	<i>*kumara</i>	<i>komara</i>	<i>kumala</i>	<i>cumala</i> tree
l.	<i>*marʔ</i>	<i>marʔ</i>	<i>malsk</i>	because of, for
m.	<i>*mirʔ</i>	<i>mʔrʔ</i>	<i>milʔk</i>	<i>yarina</i> palm (Sha); <i>tagua</i> palm, ivory nut palm (Shi)
n.	<i>*nara</i>	<i>nara</i>	<i>nala</i>	tree
o.	<i>*panwara</i>	<i>pawara</i>	<i>panwala</i>	tapir
p.	<i>*pʔra-</i>	<i>pʔra-</i>	<i>pʔkla-</i>	to call (Sha), to sing, to whistle, to bark, to croak (Shi)
q.	<i>*pʔwara</i>	<i>pʔwara</i>	<i>pʔkk^wala</i>	iguana
r.	<i>*-ra</i>	<i>-ra</i>	<i>-la</i>	small and round:CL
	e.g. <i>*tanju-ra,</i>	e.g. <i>tajo-ra,</i>	e.g. <i>taʔu-la,</i>	star
	<i>*ninʔ(?) -ra,</i>	<i>nʔnʔ-ra,</i>	<i>jinʔk-la,</i>	tongue
	<i>*tuʔtʔ(?) -ra</i>	<i>toʔto-ra-tʔʔ ~ toʔtʔ-ra-tʔʔ</i>	<i>tuʔtʔk-la</i>	nail
s.	<i>*sara(?)</i>	<i>sara</i>	<i>salaʔ</i>	guava
t.	<i>*sinirʔ</i>	<i>ʃinʔrʔ</i>	<i>sʔnʔilʔk</i>	dart
u.	<i>*siruʔ</i>	<i>ʃiroʔ</i>	<i>sʔluʔ</i>	<i>paucar</i> bird
v.	<i>*sukiru(?)</i>	<i>sokiro</i>	<i>sukʔluʔ</i>	frog sp.
w.	<i>*suʔpura</i>	<i>soʔpora ~ sʔpora</i>	<i>suʔpula</i>	rapids, waterfall
x.	<i>*suruʔ</i>	<i>soroʔ</i>	<i>suluʔ</i>	<i>choro</i> monkey
y.	<i>*tiru</i>	<i>tʃiro</i>	<i>tʃilu</i>	sloth
z.	<i>*turuma</i>	<i>toroma-tʔʔ ~ toronpa-tʔʔ</i>	<i>tuluma</i>	mushroom sp.
aa.	<i>*urina(N)</i>	<i>orinan</i>	<i>uʔina</i>	jar for chicha or masato
bb.	<i>*waratʔ</i>	<i>wara^htʔ</i>	<i>walatʔk</i>	<i>carachama</i> fish
cc.	<i>*warʔ</i>	<i>warʔ</i>	<i>walsk</i>	until, up to

However, in some cognate sets, such as those listed in 2 below, Shiwilu /l/ corresponds to Shawi *n*—rather than *r*—despite the intervocalic environment. In fact, several of the cognate sets in 2 have already been identified in Valenzuela (2011) as exceptional. Note that reconstructing PK **r* for the tokens in 2 would be a violation of the comparative method, given that such a reconstruction would imply that an unconditioned split has occurred in the independent history of Shawi (PK **r* > Sha *r/n* between vowels). In order to avoid positing an unconditioned split, I propose that the correspondence Shawi *n* ~ Shiwilu /l/ (at least in the intervocalic environment) must be traced back to a distinct PK phoneme, which I reconstruct as **l*.

(2) PK **l* > Shawi *n*, Shiwilu /l/ between vowels

	PK my proposal	PK Valenzuela	Shawi	Shiwilu	gloss
a.	<i>*iki(r/l)ala</i>		<i>ikiana</i>	<i>ikʔala</i>	<i>cunchi</i> fish

b.	<i>*ilansi?</i>		<i>ina(i)nfi-ra ~ inai-ra</i>	<i>ilansəʔr</i>	bird
c.	<i>*ila-rin</i>		<i>ina-rin</i>	<i>ila-ʕin</i>	rope
d.	<i>*jalu-</i>		<i>jano-</i>	<i>ʕalu-</i>	to cut meat
e.	<i>*juli?</i>		<i>joni?</i>	<i>ʕuləʔr-ju?</i>	pus
f.	<i>*kalaran</i>		<i>kanaran</i>	<i>kalala(N)</i>	sea lion
g.	<i>*kaluju?</i> ~ <i>*-N</i>		<i>kanojo?</i>	<i>kaluʕun</i>	<i>maparate, bocón</i> fish
h.	<i>*kaluni?</i>		<i>kanoni?</i>	<i>kaluni?</i>	ocelot
i.	<i>*kaluʔturu?</i>		<i>kanoʔtoroʔ</i>	<i>kaluʔtulu?</i>	<i>lobrero</i> bird, greater ani
j.	<i>*kilən</i>		<i>kənən</i>	<i>kilən</i>	<i>añas-súa</i> fish
k.	<i>*kulu(?)</i>	<i>*kurupi</i>	<i>kono(?)</i> ‘neck, throat’	<i>kulu-pi</i> ‘Adam’s apple’	throat
l.	<i>*lalın</i>		<i>nanin</i>	<i>laʕin</i>	hole
m.	<i>*ləluN</i>		<i>nənən</i>	<i>ləklun</i>	girl menstruating for the first time
n.	<i>*-lın</i>		<i>-nin,</i>	<i>-ʕin</i>	vine:CL
	e.g. <i>*lu-lın</i>		e.g. <i>no-nin</i>	e.g. <i>lu-ʕin</i>	<i>tamshi</i> vine
o.	<i>*-lu?</i>		<i>-no?</i>	<i>-lu?</i>	earth:CL
	e.g. <i>*ja-lu?</i> , <i>*ji-lu?-tə?</i>	<i>*jaru?</i>	e.g. <i>ja-no?</i> , <i>i-no-tə?</i>	e.g. <i>pən-ʕa-</i> <i>lu?</i> , <i>ʕə-ʕu?-tək</i>	ashes sand
p.	<i>*mulu?</i>		<i>mono?</i>	<i>mulu?</i>	leaf (Sha), tree top (Shi)
q.	<i>*pali?</i>		<i>pani-ra</i>	<i>paʕi?-</i>	leaf for the roof
r.	<i>*pilən-</i>		<i>pənən-</i>	<i>pilən-</i>	to advise
s.	<i>*silu</i>		<i>səno</i>	<i>silu</i>	<i>yupana</i> cane
t.	<i>*silupa(?)</i>		<i>sənopa?</i> ~ - <i>wa?</i>	<i>silupa</i>	bee sp.
u.	<i>*sulıman</i>		<i>sonıman</i>	<i>suʕıman</i>	poison
v.	<i>*tula</i>		<i>tona</i>	<i>tula</i>	leg, thigh
w.	<i>*wəla-jə?</i>		<i>wəna-i?</i>	<i>ukla-ʕək</i>	blood
x.	<i>*wəlu-</i>		<i>wəno-</i>	<i>uklu-</i>	to chew, to gnaw
y.	<i>*wılə</i>		<i>wənə</i>	<i>wılək</i>	<i>curhuinsi</i> ant

In non-intervocalic environments (that is, word-initially and after consonants), the contrast /r/ vs. /n/ is neutralized in favor of *n* in Shawi. Valenzuela (2011) correctly identifies the correspondences that involve Shawi *n* in said environments: (i) Shawi *n* ~ Shiwilu *n/p*; (ii) Shawi *n* ~ Shiwilu /ʕ/. The correspondence in (i), as in Sha *nara* ~ Shi *nala* ‘tree’, can be straightforwardly derived from PK **n* (PK **nara* ‘tree’); here my interpretation does not differ from Valenzuela’s (2011). Regarding the correspondence in (ii), Valenzuela is guided by the fact that Shiwilu /ʕ/ has only one possible PK source (namely, **r*) in her interpretation. She thus posits a sound law for Shawi whereby PK **r* > Shawi *n* in non-intervocalic environments (in addition to the unconditional lateralization of PK **r* in Shiwilu). Therefore, Valenzuela (2011) reconstructs forms such as PK **rantik* ‘foot’ > Shawi *nan-tə?*, Shiwilu *lan-tək*. Importantly, this sound law aims at accounting for the numerous alternations between *r* and *n*, which are found synchronically in Shawi (such as those in *-ro?* ‘earth:CL’ and *noʔ-pa?* ‘earth’; Valenzuela reconstructs **ru(?)pa?*).

The problem with Valenzuela’s account of the facts is that the proposed sound change $*r > n$ in the specified environment would appear to be quite unnatural from an articulatory viewpoint. While it is cross-linguistically common (and natural) for [r] to be dispreferred if it is not flanked by vowels, it is not easy to see which mechanism could underlie the purported change of a flap into a nasal, especially postconsonantly. However, an elegant solution to this problem can be found if one considers my hypothesis regarding the reconstruction of intervocalic PK $*l >$ Shawi n , Shiwilu l . Namely, I suggest that not only intervocalic, but ANY instance of Shawi n corresponding to Shiwilu l goes back to PK (or pre-Shawi) $*l$. That way, the alternations between Shawi r and n would have originated as alternations between $*r$ and $*l$, which is a much more common pattern from a typological point of view. The rhotic $*r$, therefore, would have been restricted to intervocalic environments already in Proto-Kawapanan, possibly due to an ancient (pre-Proto-Kawapanan) process that lateralized all non-intervocalic rhotics. The distributional restrictions observed in Shawi, thus, may have not arisen in the course of the independent evolution of this language, but rather continue similar restrictions that existed already in Proto-Kawapanan (or, at the very least, in pre-Shawi). Shiwilu expectedly contains no traces of this PK feature, because PK $*r$ and $*l$ merged in this language. My reconstruction of PK liquids is summarized in Table 6 below.

Table 6. Proto-Kawapanan liquids and their counterparts in the modern languages

PK	$*l$	$*r^A$	compare:	$*n$
Shawi	n	r^A		n
Shiwilu	l, l^B			n, n^B

^A = restricted to intervocalic environments; ^B = preceding i or following or

The sound change $*l > n$ in Shawi is not only reconstructible by means of the comparative method but is also seen in at least one borrowing from Spanish and is attested through the examination of the available philological evidence. The former kind of evidence involves the adaptation of Spanish *sable* as Shawi *sawəni* ‘machete’. The pattern of sound substitution observed in this word is easy to explain if one assumes that Sp. *sable* was initially borrowed as Sha $*sawəli$, which later evolved into *sawəni* by means of the aforementioned sound change. Philological evidence comes from the prayers found in Hervás y Panduro (1787), Teza (1868), and Beuchat and Rivet (1909), written in what appears to be an earlier stage of modern Shawi, or Old Shawi (referred to as *the language of Cerros di Mainas* in Hervás y Panduro 1787, as *Cahuapana* in Teza 1868, and as *Mayna* in Rojas-Berscia 2015). As observed in Rojas-Berscia (2015: 401-2), the Old Shawi corpus presents a number of instances of the grapheme ⟨l⟩ corresponding to n in modern Shawi, as in the examples in 3, taken from Teza (1868: 55-7; the morphological segmentation here follows Rojas-Berscia 2019: 172-3).

(3)	original	restitution	gloss
a.	⟨lovanturanso⟩	<i>lowan-tə-r-an-∅-so?</i>	want-VM-NFUT-2SG _A -3SG _P -NMLZ
b.	⟨launquera⟩	<i>lowan-kə-ra</i>	will-LOC-ABL
c.	⟨loyave pita quera⟩	<i>loja-wə-pita-kə-ra</i>	good-NEG-PL-LOC-ABL
d.	⟨delinso⟩	<i>li?-l-in-∅-so?</i>	do-NFUT-3SG _A -3SG _P -NMLZ
e.	⟨lecaso⟩	<i>li?-ka-so?</i>	do-PURP-NMLZ
f.	⟨laterave⟩	<i>latə-r-awə-∅</i>	believe-NFUT-1SG _A -3SG _P
g.	⟨lonpoa⟩	<i>lo-npoa</i>	flesh-1INCLPOSS
h.	⟨pali⟩	<i>pa?-l-i</i>	go-NFUT-3SG _S

In all these cases, ⟨l⟩ corresponds to modern Shawi *n*: compare Sha *nowan-t-* ‘to want’; *noja* ‘good’; *niʔ-* ‘to do’; *na^htə-* ‘to believe’; *no-fa* ‘meat’; ⟨-l-⟩ ~ Sha *-n-* NFUT (note that this allomorph appears after consonants, whereas intervocalically the allomorph ⟨-r-⟩ ~ Sha *-r-* is found, as in 3a, f). Shiwilu cognates consistently show a lateral approximant, as in *luwan-t-* ‘to want’, *latsək-* ‘to believe’, *luʔ* ‘meat:CL’, *-l-/-l-* NFUT. The correspondence between Old Shawi ⟨l⟩ (> modern Shawi *n*) and Shiwilu /l/ is straightforwardly derived from PK **l* in my reconstruction: PK **luwan-t-* ‘to want’, **latsə(ʔ)-* ‘to believe’, **luʔ* ‘meat, flesh’, **-l-* NFUT. This correspondence contrasts with the one between Old Shawi ⟨r⟩ (modern Shawi *r*) and Shiwilu /l/, which is derived from PK **r* in my reconstruction.²

The examples in 4 show that the sound change **l > n* may have been in course at the time when the Old Shawi prayers were written, at least in the word-initial position. The root ⟨nupa-⟩ ‘earth’ is cognate to Sha *noʔpaʔ*, Shi *lupaʔ* < PK **luʔpaʔ*, whereas the root ⟨ni-⟩ ‘to do’ is spelled with ⟨l⟩ elsewhere in the same text (see 3d–e above).

(4)	original	restitution	gloss
	a. ⟨nupanta⟩	<i>noʔpa-nta</i>	earth-ADDIT
	b. ⟨nili⟩	<i>niʔ-l-i-∅</i>	do-NFUT-3SGA-3SGP

To conclude, I note that both comparative and philological evidence converge pointing at the existence of two distinct PK liquids: **l* (> Sha *n*, Shi /l/) and **r* (> Sha *r*, Shi /l/). The occurrence of the latter was restricted to intervocalic environments; underlying **/r/* thus surfaced as **l* word-initially or after consonants. In Shawi, **l* merged with **n* as /n/, a development that must have occurred after the arrival of the Jesuit missionaries. By contrast, Shiwilu would have merged the two PK liquids as a lateral approximant and subsequently developed a palatal approximant /l/ in the palatalizing environments (see 5.2–3 for more details on palatalization in Shiwilu).

2.2 The case against palatal obstruents in Proto-Kawapanan

Valenzuela (2011) reconstructs two palatal obstruents for PK, the affricate **tʃ* and the fricative **f*. Although the respective segments exist synchronically in both Kawapanan languages, I hypothesize that these arose as a result of recent (post-PK) diachronic palatalization processes, as well as through an influx of lexical borrowings. If instances of regular diachronic palatalization and loanwords are taken out, there remains virtually no evidence that could back up the reconstruction of **tʃ*, **f*.

The palatalization sound laws that are part of the phonological history of the Kawapanan languages will be discussed in detail in subsections 4.2 (Shawi *first palatalization*), 4.6 (Shawi *second palatalization*), 5.2 (Shiwilu *progressive palatalization*), and 5.3 (Shiwilu *regressive palatalization*). For my current purposes, it suffices to note that PK **ti*, **si*, **ti*, **si* regularly evolved into Shawi *ʃi*, *ʃi*, *tʃi*, and *sə*, respectively (both fed and bled by the so-called *Shawi umlaut* rule, see 4.1). In Shiwilu, palatalization affected the PK consonants **t*, **l*, **n*, which evolved into *tʃ*, *l*, *n* in two very different environments: (i) preceding **l* or

² Based on the same data, Rojas-Berscia (2015:402) arrives at a different conclusion, whereby Old Shawi (called Mayna in the cited work) is considered to have undergone the sound change PK **r > l* in some environments. In a later work, by contrast, Rojas-Berscia (2019:174) claims that Old Shawi *l* is a retention from PK **l* and that this phoneme “eventually became a tap in Shawi”. That way, Rojas-Berscia (2015) posits only **r* for PK, and Rojas-Berscia (2019) posits only **l*. My proposal differs in that I reconstruct both **r* and **l* for Proto-Kawapanan.

(ii) following **i*. Note that my account of the facts relies on the reconstruction of two distinct PK vowels, **i* and **I*, which merged in Shawi as *i* in most cases but remained distinct in Shiwilu (PK **i* > Shi *ɔr*; PK **I* > Shi *i*; see 3.5 for a discussion). One example of cognate set where both languages show palatalization effects is Sha *tʃiʔtʃi*, Shi *tʃitʃi* ‘excrement’ < PK **tʃʔtʃi*.

Palatal obstruents are also found in both languages in obvious loanwords, as in Sha *fonka*, Shi *funkaʔ* ‘ten’ < Qu. *chunka*. Yet in other cases, I have been unable to identify loan etymologies for Shawi words that contain *tʃ, ʃ* in non-palatalizing environments, but I still suspect them to be of loan origin because they also lack clear cognates in Shiwilu. Moreover, Rojas-Berscia (2016: 481) points out that variants with a non-palatal segment have been attested for some of these words (*kaʔtʃɔn* ~ *tʃaʔtʃɔn* ‘caterpillar’, *towiʔkoroʔ* ~ *tʃowiʔkoroʔ* ‘type of bird’), suggesting that irregular (sporadic) palatalization processes may have contributed to the emergence of *tʃ, ʃ* in Shawi. The proposed pathways of emergence of the palatal segments in the Kawapanan languages are summarized in Figure 1.

	Shawi	Shiwilu
1	<i>*ti, *si</i> > <i>ʃi</i>	
2	influx of borrowings that contain <i>tʃ</i> , adapted as /ʃ/ at this stage both in Shawi and Shiwilu → /ʃ/ becomes phonemic	
	<i>fonka</i> ‘ten’ (< Qu. <i>chunka</i>)	<i>funkaʔ</i> ‘ten’ (< Qu. <i>chunka</i>)
	<i>kamafi-</i> ~ <i>kamai-</i> ‘to order’ (< Qu. <i>kamachi-</i>)	<i>kamafi-</i> ‘to order’ (< Qu. <i>kamachi-</i>)
	<i>kofɪ</i> ‘pig’ (< Qu. <i>kuchi</i> < Sp. <i>coche</i>)	<i>kufɔr</i> ‘pig’ (< Qu. <i>kutʃi</i> < Sp. <i>coche</i>)
	<i>mofa-</i> ‘to adore’ (< Qu. <i>mucha-</i>)	<i>mufaʔ-</i> ‘to kiss’ (< Qu. <i>mucha-</i>)
	<i>mofaʃo</i> ‘adoptive child, assistant’ (< Sp. <i>muchacho</i>)	<i>mufaʃu</i> ‘adoptive child’ (< Sp. <i>muchacho</i>)
	<i>fonpi</i> ‘pretina band’ (< Qu. <i>chumbi</i>)	<i>funpɔʃtʃʔ-tʃɔk</i> ‘pretina band’ (< Qu. <i>chumbi</i>)
	<i>-ʃa</i> ‘DIM’ (< Qu. <i>-cha</i>)	<i>-ʃa</i> ‘DIM’ (< Qu. <i>-cha</i>)
	<i>ufɔʔ</i> ‘blame’ (< Qu. <i>ucha</i>)	<i>ufɔʔ</i> ‘blame’ (< Qu. <i>ucha</i>)
	<i>kufara</i> ‘spoon’ (< Sp. <i>cuchara</i>)	<i>kufara</i> ‘spoon’ (< Sp. <i>cuchara</i>)
3	<i>*I, *i</i> > <i>i</i>	<i>*I</i> > <i>i</i> ; <i>*i</i> > <i>ɔr</i>
4	<i>*ti</i> > <i>tʃi</i>	<i>*ti/*li/*ni</i> > <i>tʃi/ʃi/ni</i> <i>*ɔr(κ).t/*ɔr(κ).l/*ɔr(κ).n</i> > <i>ɔr(κ).tʃ/ɔr(κ).ʃ/ɔr(κ).n</i> <i>*#i(κ).s</i> > <i>i(κ).ʃ</i>
5	influx of borrowings that contain <i>tʃ, ti</i> → /tʃ/ becomes phonemic:	influx of borrowings that contain <i>tʃ, ʃ, n, ti, ni</i> → /tʃ, ʃ, n/ become phonemic:
	<i>tʃapi</i> ‘key’ (< Sp. <i>llave</i>)	<i>kautʃu</i> ‘rubber’ (< Sp. <i>caucho</i>)
	<i>tʃankaka</i> ‘maize pudding’ (< Sp. <i>chancaca</i>)	<i>ʃamun</i> ‘Ramón’
	<i>tʃapita</i> ‘zipper’ (< Sp. <i>chapita</i>)	<i>sanantuju</i> ‘San Antonio’
	<i>tʃarora</i> ‘lacquer’ (< Sp. <i>charol</i>)	<i>titiri</i> ‘doll’ (< Sp. <i>titere</i>)
	<i>tʃonpa</i> ‘jumper’ (< Sp. <i>chompa</i>)	<i>tikuna</i> ‘Tikuna’
	<i>tʃoro</i> ‘stream’ (< Sp. <i>chorro</i>)	<i>niju-ʃukɔr</i> ‘December’ (< Sp. <i>niño</i> ‘boy’)
	<i>tʃopiti</i> ‘lollipop’ (< Sp. <i>chupete</i>)	
	<i>tɪnpɔ</i> ‘time’ (< Sp. <i>tiempo</i>)	
	<i>tɪnta</i> ‘store’ (< Sp. <i>tienda</i>)	
	<i>tiro</i> ‘shot’ (< Sp. <i>tiro</i>)	

Figure 1. Genesis of Shawi /ʃ tʃ/, Shiwilu /ʃ tʃ ʃ n/

Only in four cases was I able to find pairs of Shawi and Shiwilu words with identical meanings and similar forms featuring *ʃ*, listed in 5 (not a single example for *tʃ* was identified).

³The examples of Spanish loans in Shawi involving *tʃ* are from Rojas-Berscia (2016:481, fn. 3). The Quechuan forms are representative of Lamas (San Martín) Quechua and are reproduced after Taylor (1979), but it should be kept in mind that the Quechuan loans in Shawi and Shiwilu could in principle come from other closely related varieties.

(5) Shawi and Shiwilu words featuring *f*

	Shawi	Shiwilu	gloss
a.	<i>saʔja</i>	<i>faʔja</i>	<i>shicra</i> bag
b.	<i>faʔpi-</i>	<i>faʔpiʔ</i>	yellow
c.	<i>faʔwə</i>	<i>faʔwi</i>	blue-and-yellow/gold macaw
d.	<i>soni</i>	<i>suləɾ</i>	<i>suri</i> worm

It is immediately evident that even within this small set of potential cognate pairs as many as three different correspondences are observed: Sha *s* ~ Shi *f* (5a); Sha *f* ~ Shi *f* (5b–c); Sha *f* ~ Shi *s* (5d). Moreover, in 5c the correspondence between the word-final vowels (Shawi *ə*, Shiwilu *i*) is entirely irregular. The cognate set in 5d is best accounted for in terms of irregular palatalization in Shawi (PK **suli* > **soni* > *soni*); the unattested non-palatalized form could have been the source of the respective borrowing in Peruvian Amazonian Spanish. Finally, the item in 5a is certainly related to Muniche '*tʃajax-tiʔma* '*shicra* bag' (containing a classifier for woven objects; Michael et al. 2009), even though to date the direction of borrowing is not clear. Only the item 5b could straightforwardly support the reconstruction of PK **f* (would-be PK **faʔpiʔ* 'yellow'), but in light of the scarcity of examples I regard it as a probable borrowing from an unknown source.

Therefore, I propose not to reconstruct **tʃ*, **f* for PK, and suggest instead that the respective segments arose through palatalization as well as via borrowing in both Shawi and Shiwilu.

2.3 The case against PK **ʔ* as an onset

1.1 Valenzuela (2011) includes **ʔ/* in her inventory of reconstructed Proto-Kawapanan consonants. In this subsection, I argue that no such segment can be reconstructed in the onset position. Instead, I propose that all occurrences of PK **ʔ* are better interpreted as codas (for a discussion of the PK coda **-ʔ*, see 3.3). Note that PK supraglottal stops never occur in the coda position, allowing to reinterpret PK **ʔ* as a contextual realization of the underlying stops **p t k/* (which are thus neutralized in coda). Some specific alternations between surface **p/*k* and **ʔ* will be discussed in 6.

1.2 The evidence for the nonexistence of PK **ʔ* in onsets stands as follows. First of all, this segment does not occur word-initially in either Kawapanan language (Barraza de García 2005: 48; Valenzuela & Gussenhoven 2013: 98; Rojas-Berscia et al. 2019). As for the intervocalic occurrences of *ʔ*, Rojas-Berscia et al. (2019: 4) and Valenzuela and Gussenhoven (2013: 98) explicitly state that */ʔ/* is always syllabified as a coda in Shawi and Shiwilu, respectively, as in Sha */naʔ.a/* 'many', */saʔ.a/* 'wife', Shi */paʔ.a.waʔ/* 'that we.incl go'. I assume that this was also the case in Proto-Kawapanan. Some cognate sets that instantiate intervocalic PK **ʔ* are given in 6 (the syllable boundaries are marked with dots).

 (6) PK **-ʔ* preceding an onsetless syllable

	PK	Shawi	Shiwilu	gloss
a.	<i>*səʔ.u</i>	<i>soʔ.o</i>	<i>səʔ.ku-</i>	diced manioc
b.	<i>*təʔ.aʔ-</i>	<i>taʔ.a-</i>	<i>təʔ.kaʔ-</i>	to run, to flow
c.	<i>*waʔ.an</i>	<i>waʔ.an</i>	<i>waʔ.an</i>	chief
d.	<i>*waʔ.an.la</i>	<i>waʔ.a.na</i>	<i>waʔ.an.la</i>	<i>siamba</i> palm

Note that in 6a-b translaryngeal vowel harmony appears to have affected the Shawi reflexes (**səʔ.o* → *soʔ.o*; **təʔ.a-* → *taʔ.a-*). Although it might have been a regular process, the details

of its operation are unclear due to the scarcity of examples. The same words have been affected by a different process in Shiwilu: first, a paragodic *-k* was regularly inserted in the coda of the first syllable (5.1), which was subsequently geminated, yielding an ambisyllabic consonant (cf. Valenzuela & Gussenhoven 2013: 99).

In some cases, which are relatively few, a *V?V* sequence in Shawi corresponds to a single vowel in Shiwilu. I reconstruct heterosyllabic vowel sequences for these cases (*pace* Valenzuela 2011: 285, who reconstructs a *V?V* sequence in **u?u-* ‘to drink’). Both contemporary Kawapangan languages would have done away with the instances of hiatus, but in different ways: Shawi would have inserted an intervocalic glottal stop (syllabified as the coda of the first vowel in a sequences), whereas Shiwilu would have simplified such sequences. This is exemplified in 7a-d. The examples 7e-f further show that PK **aa* appears to have been broken by different epenthetic segments in Shawi (*ʔ*) and Shiwilu (*ǝ*), if only my reconstruction is correct.⁴

(7) Shawi *V?V* ~ Shiwilu *V*

	PK	Shawi	Shiwilu	gloss
a.	<i>*pʁ.iʔ- ~ *puiʔ-</i>	<i>pʁʔ.i-</i>	<i>puʔr- ~ pʷǝʔr-</i>	to fish with <i>barbasco</i>
b.	<i>*tV.ʁ</i>	<i>tʁʔ.ʁ</i>	<i>tʁk-la</i>	flea
c.	<i>*V.u-</i>	<i>oʔ.o-</i>	<i>u-</i>	to drink
d.	<i>*wV.ʁ.ta</i>	<i>wʁʔ.ʁ.ta</i>	<i>wʁk.ta ~ uk.ta</i>	pot
e.	<i>*na.a-</i>	<i>naʔ.a-</i>	<i>na.ǝa-</i>	to increase
f.	<i>*sa.a-</i>	<i>saʔ.a-</i>	<i>sa.ǝa-</i>	wife

The reconstruction of the nuclei of the initial syllables in 7b-c has not been attempted as the Shawi stems could have been affected by translaryngeal vowel harmony (see 6a-b above). Note that Shi *ʁk* (as in 7b and 7d) is a regular reflex of PK **ʁ* in open syllables (5.1), suggesting that PK **ʁ* and **Vʁ* merged at some point in the phonological history of Shiwilu.

Note that new instances of hiatus emerged in Shawi as a result of the glide amalgamation (4.3). Moreover, not all vowel sequences appear to have followed the same pathways of sound change. For one, PK **aʁ/*ai* is reflected as Shawi *aʁ/ai*, Shiwilu *ʁ(k)/ʁr*, on which see 5.4.

2.4 PK **kʷ*

The labialized velar stop [*kʷ*], variably transcribed as [*kw*], is present synchronically in Shiwilu, but not in Shawi. Its phonological status is disputed: Madalengoitia Barúa (2013: 28-9) analyzes it as a realization of a phoneme /*kʷ*/, whereas Valenzuela & Gussenhoven (2013: 98) take it to be a complex onset /*kw*/.⁵ Whichever analysis is accepted, /*kʷ*/ (or /*kw*/) occurs in an extremely limited number of words, and is the only candidate for a complex onset in Shiwilu, apart from /*pʷ*/ (or /*pw*/), found in *pʷijnu* ‘water jar’ (borrowed from Quechua *puyñu* /*pujnu*/).

⁴An anonymous reviewer suggests that 7e-f could instantiate sequences of a front vowel and **a* in Proto-Kawapangan (possibly **nia-*, **sia-*), which would have been resolved by an epenthetic **j* > *ǝ* in Shiwilu. In Shawi, the alleged difference between the two vowels would have been leveled by the harmonization rule (with the glottal stop acting as the hiatus-breaker). Note, however, that there is no independent evidence for an analogous harmonization rule operating in Shiwilu.

⁵Yet another analysis is put forward by Bendor-Samuel (1961: 23), who treats the occurrence of this onset as a phonetic exponents of so-called “*w*-prosody” which acts over the onset /*k*/ (the term “prosody” in Bendor-Samuel’s work follows Firth’s 1948 proposal). The *w*-prosody is considered extra-systemic by Bendor-Samuel (1961), given its low lexical frequency.

In at least two words, Shiwilu /k^w/ corresponds to Shawi /k/. This correspondence is parallel to, but distinct from, Shiwilu /k/ ~ Shawi /k/, which is trivially derived from PK *k both in Valenzuela’s (2011) and in my current proposal. Therefore, Shiwilu /k^w/ ~ Shawi /k/ must continue a PK onset distinct from *k, and I propose to reconstruct it as *k^w. Both known examples are given in 8.

(8)	PK *k ^w > Shawi k, Shiwilu k ^w			
	PK	Shawi	Shiwilu	gloss
a.	*k ^w a	ka(a)	k ^w a	I
b.	*k ^w iɔ ⁶	kɔɔ-	k ^w ɔ ⁷ r-	to be heavy

Not all instances of Shiwilu /k^w/ are derived from PK *k^w. Other possible sources of this onset include the contraction of a PK sequence *kuV, as in PK *kuaɔ ‘kinkajou’ > Shi k^waɔ, Sha ko(w)a-faɔ and the fortition of the onset *w following a paragodic -k in coda (see 5.1), as in PK *pɔwara ‘iguana’ > Shi pɔkk^wala, Sha pɔwara; PK *ɔwan- ‘to sting, to spear’ > Shi ɔkk^wan-, Sha owan-.

3. Rhyme correspondences

In this section, I explore the reconstruction of PK rhymes. Valenzuela (2011: 282-6) reconstructs four vowel phonemes for PK: *i, *i, *a, and *u.⁷ She claims that the correspondences between Shawi and Shiwilu are trivial, with two notable exceptions:

(1) the recurrent correspondence Sha i ~ Shi ɔr is stated to stem from PK *i (alongside the trivial correspondence Sha i ~ Shi i); however, no explanation on the conditions of the assumed split PK *i > Shiwilu ɔr/i is offered;

(2) in some stems it is assumed that PK *i underwent ‘vocalic harmonization’ (*armonización vocálica*) in Shawi, which would have led to the existence of a correspondence Shiwilu i ~ Shawi ɔ; however, there is no explicit statement on the exact conditioning of this process.

As for syllable codas, Valenzuela limits herself to observing that some cognate pairs display non-trivial correspondences (Shiwilu -k, -ɔ, -N ~ Shawi -∅, Shiwilu -∅ ~ Shawi -ɔ, -N) and that the reconstruction of PK codas in the cited work is tentative. Her reconstructed PK wordlist contains instances of syllable-final *-ɔ and *-n (for trivial correspondences), *-k (for Shiwilu -k ~ Shawi -ɔ), as well as many instances of ambiguous reconstructions, such as *-ɔ ~ *-∅, *-k ~ *-∅, *-n ~ *-∅, *-ɔ ~ *-n.

⁶The Shawi rhyme -ɔɔ points to PK *-ɔɔ, whereas Shiwilu -ɔ⁷r points to PK *-iɔ. I tentatively assume that Shiwilu is more conservative here; in the history of Shawi, PK *i would have been backed following PK *k^w (which could have even been a regular sound change, as no examples are known that would contradict it) prior to the merger of PK *k^w and *k in Shawi. An alternative scenario, whereby Shawi would have retained the original PK vowel, is considered less likely, because it would involve positing an antinatural development (fronting of PK *ɔ to *i after a labialized velar segment).

⁷The vowel transcribed by Valenzuela (2011) as *i* is now known to be articulated as close-mid both in Shawi (Rojas-Berscia et al. 2019) and Shiwilu (Madalengoitia Barúa 2013; Valenzuela & Gussenhoven 2013). I use the character ɔ throughout this paper (except for direct quotations). In addition, I follow Rojas-Berscia et al. (2019) in transcribing the rounded vowel of Shawi as *o* (as opposed to *u*).

In subsection 3.1, I outline a refined proposal regarding the reconstruction of PK vowels and codas, aiming to account for the complexity of correspondences between Shawi and Shiwilu.

3.1 Current proposal

A careful inspection of the correspondences between Shawi and Shiwilu rhymes combined with a systematic examination of the synchronic phonology, morphology, and morphophonology of these languages suggests a picture for PK that deviates from Valenzuela's (2011) reconstruction in several ways. I argue that the PK phonemic inventory comprised five (rather than four) vowels, which could be followed by a coda (*ʔ or *N). In addition, open initial syllables of polysyllabic words could be either plain or glottalized. The relevant correspondence sets are given in Table 7 (only the default reflexes are included; see sections 4–5 for the positionally conditioned reflexes in Shawi and Shiwilu).

Table 7. Rhyme correspondences between Shawi and Shiwilu

PK	Sha	Shi	PK	Sha	Shi	PK	Sha	Shi	PK	Sha	Shi
*a(ʔ)	a(ʔ)	a	*aʔ	aʔ	aʔ	*aN	aN	aN			
*u(ʔ)	o(ʔ)	u	*uʔ	oʔ	uʔ	*uN	oN	uN			
*ɪ(ʔ)	i(ʔ)	i	*ɪʔ	iʔ	iʔ	*ɪN	iN	iN	*N	ni	iN
*i(ʔ)	i(ʔ)	ɛɾ	*iʔ	iʔ	ɛʔɾ	*iN	iN	ɛɾN			
*ə(ʔ)	ə(ʔ)	ək	*əʔ	əʔ	ək	*əN	əN	əN			

1. Shiwilu \mathfrak{r} , $\mathfrak{r}ʔ$ and \mathfrak{rN} interact with the following coronal consonants in the following way: $\mathfrak{r} + l \rightarrow \mathfrak{r}l$, $\mathfrak{r}ʔ + l \rightarrow \mathfrak{r}ʔl$, $\mathfrak{rN} + l \rightarrow \mathfrak{rN}l$, $\mathfrak{r} + t \rightarrow \mathfrak{r}t$, $\mathfrak{r}ʔ + t \rightarrow \mathfrak{r}ʔt$, $\mathfrak{rN} + t \rightarrow \mathfrak{rN}t$, $\mathfrak{r} + n \rightarrow \mathfrak{r}n$, $\mathfrak{r}ʔ + n \rightarrow \mathfrak{r}ʔn$, $\mathfrak{rN} + n \rightarrow \mathfrak{rN}n$.
2. Shiwilu \mathfrak{rN} is optionally realized as $\mathfrak{r}ʔN \sim \mathfrak{r}N$, as in $s\mathfrak{r}ʔNpa \sim s\mathfrak{r}Npa \sim s\mathfrak{r}ʔNpa$ ‘pineapple’ (Valenzuela et al. 2013: 364).

Note that I make no claim with regard to the exact height of the only rounded PK vowel. Although I symbolize it as **u*, the choice of the character is arbitrary in this case. It cannot be ruled out that its actual pronunciation was [o], as in Shawi, or midway between Shawi and Shiwilu ([ʊ]). It is possible that PK **ɪ*, **ə*, and **u* were approximately of the same height. Only PK **i* is unequivocally reconstructed as a high vowel (see 3.5 for the reasoning behind this judgment).

In the remainder of this section, I justify the reconstruction of PK glottalized syllables (3.2), glottal codas (3.3), nasal codas (3.4), the distinction between **ɪ* and **i* (3.5) —a major departure from Valenzuela's (2011) reconstruction—, and syllabic **N*- (3.6).

3.2 PK glottalization

The reconstruction of PK glottalized syllables is based on the correspondence Shawi ʔ ~ Shiwilu ∅, which is found only in initial syllables of polysyllabic words (#(C)V_CV...). I use the character *ʔ in my PK reconstructions (thus *#(C)VʔCV...), as opposed to PK *-ʔ > Sha -ʔ/-∅, Shi -ʔ/-k (see 3.3).

It is difficult to ascertain the phonological status of *ʔ in PK. On the one hand, its limited distribution is compatible with a non-segmental interpretation (preglottalization of the following consonant or a non-modal phonation of the vowel). On the other hand, the correspondence in question is not attested in syllables with a nasal coda, suggesting that the glottal element may compete with the nasal coda for the same slot. I lean towards a non-segmental analysis of PK *ʔ, primarily because a distinct, clearly segmental PK *ʔ is

reconstructible in the coda position (see 3.3). The segmental nature of PK *ʔ is most evident when the alternations between *ʔ and *k/*p are considered (see section 6); no such alternations have been found to affect PK *ʔ.

Some examples featuring PK *ʔ are given in 9.

(9)	PK *ʔ reflected as Shawi -ʔ, Shiwilu -∅			
	PK	Shawi	Shiwilu	gloss
a.	*aʔlaʔ	aʔnaʔ	alaʔ	one
b.	*aʔlan-	aʔnan-	alan-	to lend, to borrow
c.	*aʔpə(ʔ)-	aʔpə-	apək-	to burn
d.	*iʔsa	iʔsa	ifa	curassow
e.	*jaʔka(-ra)	jaʔka-ra	ǰaka(-la)	muena tree
f.	*jaʔpi-	jaʔpi-ra ‘eye’	ǰapi-	pain in the eye
g.	*juʔwin	joʔwin	ǰuwin	toucan
h.	*kaʔjura	kaʔjora	kaǰula	cicada
i.	*kiʔki-təʔ	kəʔkə-təʔ	kiki-tək	cheek
j.	*liʔluna	niʔnona	ləʔluna(N)	tacarpó stick
k.	*luʔsun	noʔson	lusun	moth
l.	*naʔku-	naʔko-	naku-	to pass by
m.	*naʔti	naʔfi	natəʔr	bushmaster
n.	*niʔniʔ	niʔniʔ	niʔniʔ ‘dog’	jaguar
o.	*paʔpiʔ-	paʔpi-	papəʔr-	to bury
p.	*piʔti	piʔfi	pitəʔr-	thread
q.	*puʔpun	poʔpon	pupun	pucahuicsa fish
r.	*siʔwi(N)	fiʔwi-roʔ	səʔwin	macana fish
s.	*suʔja	soʔja	suǰa	husband
t.	*suʔsu-	soʔso-	susu-	to grow
u.	*taʔla	taʔna	tala	hammock
v.	*tiʔtiʔ	fiʔfiʔ	tʃits(ʔ)r	maize
w.	*tuʔja	toʔja	tuǰa	maquisapa monkey, spider monkey
x.	*tuʔsin	toʔfin	tusəʔn	mite, chiggers, tick sp.
y.	*waʔsəʔ	waʔsəʔ	wasək	carachamita fish
z.	*wiʔla	wiʔna-	wila	child

It is necessary to point out that even if glottalization was also present in PK medial syllables, it is not recoverable in this environment. The reason behind this is that there is independent evidence that shows that Shawi (a key language for reconstructing PK glottalization) lost all glottal stops in its medial syllables (see 3.3).

3.3 PK *ʔ

The reconstruction of PK *ʔ is based on the correspondence Shawi -ʔ (in initial and final syllables) / -∅ (in medial syllables) ~ Shiwilu -ʔ (after *a, i, u, ə*) / -*k* (after *ə*). In effect, Shiwilu -ʔ and -*k* still occur in a complementary distribution (Madalengoitia Barúa 2013: 54), which is somewhat obscured by morphophonological processes that occur on morpheme boundaries. Below I provide a non-exhaustive list of PK words featuring *ʔ in monosyllabic stems (10a-i), as well as in word-final (10j-jj) and initial (10kk-hhh, also 10r, u, v) syllables of polysyllabic stems. For examples of PK *ʔ between vowels, which is best analyzed as a coda (i.e., *...*(C)Vʔ.V*...), see 2.3.

(10) PK *-ʔ reflected as Shawi -ʔ, Shiwilu -ʔ/-k

	PK	Shawi	Shiwilu	gloss
a.	*jəʔ	iʔ	ǰəʔk	water
b.	*juʔ	joʔ-nan	ǰuʔ	belly
c.	*kaʔ-	kaʔ-	kaʔ-	to eat, to have sex
d.	*kiʔ	kiʔ(-fa), kəʔ-fa	kəʔr	manioc
e.	*laʔ-	naʔ-	laʔ-	to fast, to avoid food
f.	*liʔ-	niʔ-	liʔ-	to see
g.	*-luʔ / *-ruʔ	-noʔ / -roʔ	-luʔ	earth:CL
h.	*-təʔ	-təʔ	-təʔk	cover:CL
i.	*wəʔ-	wəʔ-	uk- ~ wəʔk-	to come
j.	*aʔlaʔ	aʔnaʔ	alaʔ	one
k.	*anpuruʔ	anporoʔ	anpuluʔ	feather, bodily hair
l.	*apiʔ(-)	apiʔ; api-	apəʔr-	wound; to injure oneself (Sha); to spoil, to rot
m.	*itəʔ	iʔtəʔ	ɪtʔəʔk	agouti
n.	*isəʔ	isəʔ	ifəʔk	bat
o.	*juliʔ	juniʔ	ǰuləʔr-juʔ	pus
p.	*kajuʔ	kajoʔ	kaǰuʔ	egg
q.	*kukuʔ	koʔkoʔ	kukuʔ	oropendola, <i>paucar</i> bird
r.	*kuʔluruntəʔ	koʔnorontəʔ	kuʔluluntəʔk	<i>corocoro</i> bird
s.	*kuwiʔ	kowiʔ	kuwəʔ(?)r	worm
t.	*lansiʔ	nansəʔ	lansiʔ	bone
u.	*luʔluʔ	noʔnoʔ	luʔluʔ	<i>coto</i> monkey
v.	*luʔpaʔ	noʔpaʔ	luʔpaʔ	earth
w.	*marəʔ	marəʔ	maləʔk	because of, for
x.	*muluʔ	monoʔ	muluʔ	leaf (Sha), tree top (Shi)
y.	*mutuʔ	moʔtoʔ	mutuʔ	head
z.	*niʔniʔ	niʔniʔ	niniʔ ‘dog’	jaguar
aa.	*nukaʔ	noʔkaʔ	nukaʔ	hot pepper
bb.	*pijəʔ	pəiʔ	piǰəʔk	house
cc.	*sasaʔ	sasaʔ	sasaʔ	<i>martín-pescador</i> bird
dd.	*sinkantəʔ	səʔnkantəʔ	sinkantəʔk	hoatzin bird
ee.	*supuʔ	soʔpoʔ ~ səʔpoʔ	supuʔ	vulture
ff.	*suruʔ	soroʔ	suluʔ	<i>choro</i> monkey
gg.	*trʔtiʔ	fiʔfiʔ	tʔitəʔ(?)r	maize
hh.	*waratəʔ	waraʔtəʔ	walətəʔk	<i>carachama</i> fish
ii.	*warəʔ	warəʔ	waləʔk	until, up to
jj.	*waʔsəʔ	waʔsəʔ	wasəʔk	<i>carachamita</i> fish
kk.	*aʔlanan	aʔnanan	aʔlana(n)	<i>huasaco</i> fish
ll.	*aʔli-	aʔni-	aʔləʔr-	to roast (manioc, plantain)
mm	*iʔla	iʔna-	əʔrɿla	trace
.				
nn.	*iʔtəʔ(?)	iʔtəʔ-rəʔ	ɪtʔəʔk-la	termite
oo.	*iʔwa	iʔwa	əʔrwa	recently, late, afternoon
pp.	*iʔwa-ju	iʔwa-jo	əʔrwa-ǰu	evening star
qq.	*jaʔ-wan	jaʔ-wan	ǰaʔ-wan	snake
rr.	*puʔsi	poʔʔi ‘squirrel sp.’	puʔsəʔr ‘pygmy-marmoset’	mammal sp.

ss.	*saʔkaʔ-	saʔka- ‘to have rough skin, to have mole’	saʔkaʔ-	to be rough
tt.	*saʔlaʔ(-pi)	saʔnaʔ, saʔna-pi	saʔlaʔ(-pi)	pox
uu.	*saʔpuʔ	saʔpo-roʔ	saʔpuʔ	lung
vv.	*səʔ-muʔ-	səʔ-mo-	sək-muʔ-	to dilute
ww.	*siʔka	səʔka- ‘to sting’	siʔka-	tingotero/isulilla ant
xx.	*siʔpa	səʔpa- ^h kə-N, səʔpa-raʔwa-iN	siʔpa	branch
yy.	*suʔpura	soʔpora ~ səʔpora	suʔpula	rapids, waterfall
zz.	*suʔtuN	soʔtoN	suʔtuN-ǝʔk ‘lagoon’	island
aaa.	*tiʔləʔ(?)	təʔnə-faʔwə	tʃiʔlək	armadillo
bbb	*tiʔ-təʔ	təʔ-təʔ ‘breast (of birds)’	tʃiʔ-tək	chest
ccc.	*tuʔtəʔ(?) -ra	toʔto-ra-təʔ ~ toʔtə-	tuʔtək-la	nail
ddd	*tuʔtuʔ-pi	toʔto-wi-təʔ ~ -pi-	tuʔtuʔ-pi	knee
eee.	*tuʔwan	toʔwan	tuʔwan	cunchi, tullu uma fish
fff.	*uʔjapi	oʔjapi ~ iʔjapi	uʔǝapi	peach palm
ggg	*waʔjan	waʔjan-	waʔǝan	spirit
hhh	*waʔna	waʔna	waʔna	metal

Note that syllable-final -ʔ occurs exclusively in initial and final syllables in Shawi. I hypothesize that PK syllable-final *-ʔ was regularly lost in medial syllables in this language: *#...CVʔ...# > *#...CV...#. Only Shiwilu allows us to reconstruct syllable-final -ʔ in the words affected by this sound change, as shown in 11. Note that verbal stems (given here with a hyphen) always receive suffixal morphology, meaning that the stem-final *ʔ in examples such as 11b-c, e-n actually occurs in medial syllables.

(11) PK *-ʔ reflected as Shawi -ǝ, Shiwilu -ʔ/-k

	PK	Shawi	Shiwilu	gloss
a.	*ilansiʔ	ina(i)nʃi-ra ~ inai-ra	ilansəʔr	bird
b.	*iluʔ-	iru-	iluʔ-	to suck (Sha), to lick (Shi)
c.	*iNjaʔ-	ija-	iNjaʔ-	to urinate
d.	*ji-luʔ-təʔ	i-no-təʔ	ǝʔ-ʎuʔ-tək	sand
e.	*jiʔsiʔ-	iʔʃi- ‘to dip into salt’	ǝiʔsəʔr-	to burn (<i>transitive</i>)
f.	*kapiʔ-	na ^h -kapi-	kapsəʔr-	to meet
g.	*naniʔ-	nani-	nansəʔr- ‘to forget, to end to flee’	
h.	*pasiʔ-	pafi- ‘to perfume’	pasəʔr-	to pour
i.	*paʔpiʔ-	paʔpi-	papsəʔr-	to bury
j.	*pitaʔ-	pi ^h ta-	pitaʔ-ka-	to push
k.	*sakaʔ-t-	saka-t-	sakaʔ-t-	to work
l.	*səʔ-muʔ-	səʔ-mo-	sək-muʔ-	to dilute
m.	*takiʔ-	ta ^h ki-	təkəʔr-	to die out
n.	*təʔaʔ-	taʔa-	təkkaʔ-	to run, to flow

o.	<i>*tuʔtuʔ-pi</i>	<i>toʔto-wi-təʔ</i> <i>toʔtopi-təʔ</i>	~	<i>tuʔtuʔ-pi</i>	knee
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Only one exception has been identified so far: PK **kaluʔturuʔ* ‘greater ani’ unexpectedly preserved its word-internal **-ʔ-* in Shawi (Sha *kanoʔtoroʔ*); in Shiwilu, the reflex is regular (Shi *kaluʔtuluʔ*).

Note that the loss of PK **ʔ* in medial syllables in Shawi left a trace in the morphophonology of this language. More specifically, accretion of any suffixal morphology to a bisyllabic stem deletes the stem-final *ʔ* (if present): *tonpoʔ* ‘bundle’ → *tonpo-* ~ *tənpo-* ‘to tie’ (compare PK **tənpuʔ-* ‘to tie’ > Shi *tənpuʔ-*).

As for PK medial syllables that contained the nucleus **ə*, Shiwilu data are not particularly revealing, because this language did not preserve the contrast between the PK rhymes **ə(ʔ)* and **əʔ* (3.1, 5.1). That way, the presence of a syllable-final **-ʔ* is not recoverable in words such as those in 12.

(12) Items where the presence of PK **-ʔ* is not recoverable

	PK	Shawi	Shiwilu	gloss
a.	<i>*aʔpə(ʔ)-</i>	<i>aʔpə-</i>	<i>apək-</i>	to burn
b.	<i>*əʔki- ~ *əʔki-</i>	<i>iʔki-ri-</i>	<i>əkkər-</i>	to untie
c.	<i>*kɪtə(ʔ)-</i>	<i>kətə-</i>	<i>kɪtək</i>	to bite
d.	<i>*latə(ʔ)-</i>	<i>naʰtə-</i>	<i>latək-</i>	to believe
e.	<i>*nanpə(ʔ)-</i>	<i>nanpə-</i>	<i>nanpək-</i>	to climb
f.	<i>*njə(ʔ)-</i>	<i>nii-</i>	<i>inǝk-</i>	to jump
g.	<i>*patə(ʔ)-</i>	<i>paʰtə-</i>	<i>patək-</i>	to crawl
h.	<i>*pəʔtə(ʔ)- ~ *pəʔtə(ʔ)-</i>	<i>pəʔtə-</i>	<i>pəktək-</i>	to cut
i.	<i>*piʔpə(ʔ)-</i>	<i>pəʔpə-</i>	<i>piʔpək-</i>	to carry
j.	<i>*ɪʔlə(ʔ)</i>	<i>təʔnəʔ-fawə</i>	<i>tʃiʔlək</i>	armadillo
k.	<i>*witə(ʔ)-</i>	<i>wiʰtə-</i>	<i>witək-</i>	to sweep

PK **-ʔ* is likely to be a result of a neutralization between underlying PK stops **p t k/* in the coda position. Concrete examples of alternations involving PK **p/k* (in onsets) and PK **ʔ* (in codas) will be examined in 6.

3.4 PK **-N*

The reconstruction of PK **-N* is based on a trivial correspondence between Shawi and Shiwilu *-N*. In 13, I provide a non-exhaustive list of PK words featuring **-N*. Note that **-N* is regularly lost in Shawi if followed by another nasal (13b, g, j, o, bb, hh), by a glide (13s, x), or by a fricative (in onsetless syllables only, 13d).

(13) PK **-N* reflected as Shawi *-N*, Shiwilu *-N*

	PK	Shawi	Shiwilu	gloss
a.	<i>*aʔlanan</i>	<i>aʔnanan</i>	<i>aʔlanan</i>	<i>huasaco</i> fish
b.	<i>*anpinnian</i>	<i>anpinian</i>	<i>anpənjan</i>	<i>huaman samana</i> tree
c.	<i>*anpuruʔ</i>	<i>anporoʔ</i>	<i>anpuluʔ</i>	feather, bodily hair
d.	<i>*ɪənsun-</i>	<i>ison-</i>	<i>jənsun-</i>	to kneel
e.	<i>*ɪlansiʔ</i>	<i>ina(i)nʃi-ra ~ inai-ra</i>	<i>ilansəʔr</i>	bird

f.	* <i>janku</i>	<i>janko</i>	<i>ǰanku</i>	flower
g.	* <i>jənni</i>	<i>ini</i>	<i>ǰənni</i>	otter
h.	* <i>juʷwin</i>	<i>joʷwin</i>	<i>ǰuwin</i>	toucan
i.	* <i>kanki</i>	<i>kanki</i>	<i>kankəɾ</i>	<i>ñejilla</i> palm
j.	* <i>kənma</i>	<i>kəma</i>	<i>kənma</i>	you
k.	* <i>kupi-wan</i>	<i>koʰpi-wan</i>	<i>kupi-wan</i>	boa
l.	* <i>laman</i>	<i>naman</i>	<i>laman</i>	<i>huangana</i> peccary
m.	* <i>lan-təʔ</i>	<i>nan-təʔ</i>	<i>lan-təʔ</i>	foot
n.	* <i>lawan</i>	<i>nawan</i>	<i>lawan</i>	thorn
o.	* <i>linlin</i>	<i>ninin</i>	<i>linlin</i>	name
p.	* <i>nanpə(ʔ)-</i>	<i>nanpə-</i>	<i>nanpək-</i>	to climb
q.	* <i>nun</i>	<i>non</i>	<i>nun</i>	canoe
r.	* <i>panpə</i>	<i>panpə</i>	<i>panpək-lu</i>	<i>irapai</i> palm
s.	* <i>panwara</i>	<i>pawara</i>	<i>panwala</i>	tapir
t.	* <i>pəN</i>	<i>pəN</i>	<i>pəN</i>	fire
u.	* <i>pəN-</i>	<i>pəN-</i>	<i>pəN-</i>	to fly
v.	* <i>-riN, *-lin</i>	<i>-riN, -nin</i>	<i>-lin</i>	vine:CL
w.	* <i>sinpa</i>	<i>ʃinpa</i>	<i>səɾnpa</i>	pineapple
x.	* <i>tanju-la</i>	<i>tajo-ra</i>	<i>tanǰu-la</i>	star
y.	* <i>tanku</i>	<i>tanko</i>	<i>tanku</i> ‘banana’	platanillo
z.	* <i>timəN</i>	<i>təməN</i>	<i>tʃiməN</i>	louse
aa.	* <i>timin-</i>	<i>tʃimin-</i>	<i>tʃimin-</i>	to die
bb.	* <i>tinpin-nan / *-nam-</i>	<i>tʃinpinam-əN</i>	<i>tʃinpənjan</i>	river mouth
cc.	* <i>tukun</i>	<i>toʰkon</i>	<i>tukun</i>	<i>tocón</i> monkey
dd.	* <i>tunka</i>	<i>tonka</i>	<i>tunka</i>	horsefly
ee.	* <i>tuʔwan</i>	<i>toʔwan</i>	<i>tuʔwan</i>	<i>cunchi, tullu uma</i> fish
ff.	* <i>wan</i>	<i>wan-fa</i>	<i>wan-fəN</i>	shrimp
gg.	* <i>wanki</i>	<i>wanki</i>	<i>wankəʔ{ʔ/t}-tʃək</i>	<i>boquichico</i> fish
hh.	* <i>wənni</i>	<i>wəni</i>	<i>wənni ~ unni</i>	<i>shuyo</i> fish

PK *-N is likely a result of a neutralization between underlying PK stops */n m/ in codas. Examples of alternations involving PK */m/n (in onsets) and PK */N (in codas) are given in 6.

3.5 PK */I

Valenzuela (2011) suggests that the antecedent of Shiwilu *əɾ* ~ Shawi *i* (as in Sha *paʔpi* ~ Shi *papəʔr-* ‘to bury’, Sha *anaʃi* ~ Shi *anasəɾ* ‘opossum’) is PK */i. It is necessary to emphasize that she derives yet another correspondence from the same reconstructed phoneme: PK */i > Shiwilu *i* ~ Shawi *i* (Sha *kupi-wan* ~ Shi *kupiwan* ‘boa’, Sha *niʔniʔ* ‘jaguar’ ~ Shi *niniʔ* ‘dog’). The conditions that would have determined the alleged split of PK */i into Shiwilu *əɾ* and *i*, however, are not stated. Valenzuela (2011), citing Bendor-Samuel’s (1961) work on Shiwilu grammar, attributes this irregularity to “prosodic features in Shiwilu that trigger vocalic centralization and the addition of a trill at the end of the syllable” (Valenzuela 2011: 286; see Bendor-Samuel 1961: 21). It remains unclear, however, why this process would have affected some instances of PK */i and not others.

In my reconstruction I argue for the existence of a fifth vowel, PK */I, which would have merged with PK */i in Shawi, but which remained distinct from it in Shiwilu: while PK */I yielded Shiwilu *i*, PK */i would have yielded Shiwilu *əɾ*. From a phonotactic point of view,

Shiwilu *ɤr* behaves like any other nucleus in the language and can even be synchronically analyzed as a phoneme: it can occur without a coda (*Cɤr*), followed by the glottal stop *Cɤrʔ* (traditionally analyzed as *Cɤʔr*), or followed by *-N*, *CɤrN* (this rhyme often surfaces as *ɤN* or, less frequently, as *ɤrɤN*). Moreover, it interacts with the following coronal consonants, as briefly described in 3.1 and in Valenzuela & Gussenhoven (2013: 102).

Below I provide a non-exhaustive list of PK words featuring **i*, followed by their synchronic correspondences in Shawi and Shiwilu.

(14) PK **i* reflected as Shawi *i*, Shiwilu *ɤr*

	PK	Shawi	Shiwilu	gloss
a.	<i>*ai-</i>	<i>ai-</i>	<i>ɤr-</i>	sour
b.	<i>*ain</i>	<i>ain</i>	<i>ɤrN</i>	hair
c.	<i>*ana-si</i>	<i>ana-fi</i>	<i>ana-sɤr</i>	opossum
d.	<i>*anpinnian</i>	<i>anpinian</i>	<i>anpɤnɤn</i>	<i>huaman samana</i> tree
e.	<i>*api(?)</i>	<i>apiʔ</i>	<i>apɤr-</i>	thief (> to steal)
f.	<i>*apiʔ</i>	<i>apiʔ</i>	<i>apɤʔr</i>	wound (> to get spoilt, ugly)
g.	<i>*ɤʔki- ~ *ɤʔki-</i>	<i>iʔki-ri-t-</i>	<i>ɤkkɤr-</i>	to untie
h.	<i>*ipa-tɤʔ</i>	<i>iʰpa-tɤʔ</i>	<i>ɤrpa-tɤk</i>	vein, sinew, tendon
i.	<i>*itsʔ</i>	<i>iʰtsʔ</i>	<i>ɤttʃɤk</i>	agouti
j.	<i>*iʔla</i>	<i>iʔna-</i>	<i>ɤʔrʌa</i>	trace
k.	<i>*iʔtɤ(?)</i>	<i>iʔtɤ-rɤʔ</i>	<i>ɤttʃɤk-la</i>	termite
l.	<i>*iʔwa</i>	<i>iʔwa</i>	<i>ɤʔrwa</i>	recently/late, afternoon
m.	<i>*iʔwaju</i>	<i>iʔwajo</i>	<i>ɤʔrwaʃu</i>	evening star
n.	<i>*iki(r/l)ala</i>	<i>ikiana</i>	<i>ikɤʌala</i>	<i>cunchi</i> fish
o.	<i>*ilansiʔ</i>	<i>ina(i)Nfi-ra ~ inaira</i>	<i>ilansɤʔr</i>	bird
p.	<i>*jami</i>	<i>jami-</i>	<i>ʃamɤr</i>	small, thin
q.	<i>*jawi(-ra)</i>	<i>jawi-ra</i>	<i>ʃawɤr, ʃawɤ-ʌa</i>	<i>chonta/açai</i> palm
r.	<i>*juki</i>	<i>joʰki</i>	<i>ʃukɤr</i>	moon
s.	<i>*juliʔ</i>	<i>joniʔ</i>	<i>ʃulɤʔr-juʔ</i>	pus
t.	<i>*kanki</i>	<i>kanki</i>	<i>kankɤr</i>	<i>ñejilla</i> palm
u.	<i>*kapiʔ-</i>	<i>naʰ-kapi-</i>	<i>kapɤʔr-</i>	to find
v.	<i>*kasi-</i>	<i>kaʰfi</i>	<i>kasɤr</i>	sweet
w.	<i>*kiʔ</i>	<i>kiʔ(-fa), kɤʔ-fa</i>	<i>kɤʔr</i>	manioc
x.	<i>*lipi</i>	<i>niʰpi</i>	<i>lipɤr-ʌa ~ ʌ-</i>	<i>pucacuru</i> ant
y.	<i>*luwi-</i>	<i>nowi-</i>	<i>luwɤr-</i>	to know
z.	<i>*maki</i>	<i>maʰki</i>	<i>makɤr</i>	<i>macambo</i> palm
aa.	<i>*naniʔ-</i>	<i>nani-</i> ‘to end’	<i>nansɤʔr-</i> ‘to forget, to flee’	to end
bb.	<i>*ni-tɤʔ</i>	<i>ni-tɤʔ</i>	<i>nɤrtʃɤk ~ nɤttʃɤk</i>	nose
cc.	<i>*nit-</i>	<i>nii-</i>	<i>nɤri-</i>	to breathe
dd.	<i>*nika-ra</i>	<i>niʰka-ra ~ miʰka-ra</i>	<i>nɤrka-la</i>	<i>lisa</i> fish
ee.	<i>*pasiʔ-</i>	<i>paʰfi-</i> ‘to perfume’	<i>pasɤʔr-</i>	to pour
ff.	<i>*paʔpiʔ-</i>	<i>paʔpi-</i>	<i>papɤʔr-</i>	to bury
gg.	<i>*pitu</i>	<i>piʰto</i>	<i>pɤttʃu</i>	breadfruit
hh.	<i>*puʔsi</i>	<i>poʔfi</i> ‘squirrel sp.’	<i>puʔsɤr</i> ‘pygmy-marmoset’	mammal sp.

ii.	* <i>sami</i>	<i>sami</i>	<i>samər</i>	fish
jj.	* <i>sinnirə</i>	<i>finərə</i>	<i>sənpilək</i>	dart
kk.	* <i>sinpa</i>	<i>finpa</i>	<i>sənpa</i>	pineapple
ll.	* <i>siwa</i>	<i>fiwa</i>	<i>səywa</i>	<i>apangora</i> crab
m.	* <i>si[?]wi(N)</i>	<i>fi[?]wi-ro[?]</i>	<i>səwɪn</i>	<i>macana</i> fish
mn.	* <i>siwi(N)(-nan)</i>	<i>fiwi(-nan)</i>	<i>siwəN-na(N)</i>	reed, cane sp.
oo.	* <i>taki[?]-</i>	<i>ta^hki-</i>	<i>takə[?]r-</i>	to die out
pp.	* <i>tia[?]-</i>	<i>fa[?]-</i>	<i>təra-</i>	to sow
qq.	* <i>tipi</i>	<i>fi^hpi</i>	<i>tʃipər</i>	moriche palm
rr.	* <i>tipi-tə[?]</i>	<i>fi^hpi-tə[?]</i>	<i>tʃipər-tʃək ~</i> <i>tʃipət-tʃək</i>	mosquito net
ss.	* <i>ti[?]ti[?]</i>	<i>fi[?]fi[?]</i>	<i>tʃits[?]r</i>	maize
tt.	* <i>tinpinan /</i> * <i>-nam-</i>	<i>tʃinpinam-əN</i>	<i>tʃinpənjan</i>	river mouth
uu.	* <i>uti</i>	<i>o^hfi</i>	<i>utə^(?)r-in</i>	sister of a male ego
vv.	* <i>wani-</i>	<i>wani-</i>	<i>wanər-</i>	to stand (up)
ww.	* <i>wanki</i>	<i>wanki</i>	<i>wankə{t/ʔ}-tʃək</i>	<i>boquichico</i> fish
xx.	* <i>wi-</i>	<i>wi-</i>	<i>wər-</i>	to sting

The rationale behind reconstructing PK **i* for the correspondence Sha *i* ~ Shi *ər* (and not for the correspondence Sha *i* ~ Shi *i*, which is derived from PK **i*) is as follows.

1. First, only PK **i* —but not PK **i*— acted as a trigger of the first palatalization in Shawi (4.2), whereby PK **ti*/**si* > **fi*. The PK sequence **ti* was affected by palatalization only at a later stage and with a different outcome (Sha *tʃi*), whereas the PK sequence **si* was never palatalized and yielded Sha *sə*. This means that at an early stage of the phonological history of Shawi, when **i* and **i* were still distinct, **i* triggered palatalization whereas **i* did not. My reconstruction of the trigger of the first palatalization in Shawi as **i* is in conformity with Bateman's (2007) findings, according to which high front vowels are the most likely candidates for triggering palatalization of coronals.
2. The reconstructed sound changes PK **i* > Shi *ər* affected several borrowings from other languages. This has been already noted by Valenzuela (2015, 2017), who gives the following examples: Shi *kufər* 'pig' (< Qu. *kuchi*, ultimately from Spanish *coche*), Shi *ku^hikər* 'money' (< Qu. *kullki*), Shi *anər* 'don't (*prohibitive*)' (< Aymara *hani*), Shi *kapə^(?)r* '*ampi, curare* poison' (Wanderwort; forms close to #*kapi* are found in Arawakan, East Tucanoan, Kákua, Hup, and Sikuaní; Epps 2020). I add to this list Shi *funpət-tʃək ~ funpə[?]-tʃək /funpər-tək/* '*pretina* band' (< Qu. *chumbi*).
3. The Shiwilu hydronym whose current form is *ərpina* was borrowed into Spanish as *Aipena*. Its earlier shape in Shiwilu can be reconstructed as **aipina*, with subsequent regular sound changes **i* > *ər*, **aV-* > *V-*, **i* > *i* (see 5.4 for further discussion). If this reconstruction is correct, the adaptation of Old Shiwilu **aipina* as Spanish *Aipena* is straightforward.
4. Finally, Shi /*ər*/ (unlike Shi /*i*/) acted as a trigger of a progressive palatalization process (5.2), indicating that, at an earlier stage, the antecedent of Shi /*ər*/ was a likelier trigger

of palatalization than that of Shi /i/. This agrees well with my assumption whereby Shi /əɾ/ goes back to *i, whereas Shi /i/ continues a lower segment, which I reconstruct as *ɿ.

The factors that drove the sound change *i > əɾ in Shiwilu remain unknown.

Two anonymous reviewers question the typological plausibility of a vowel inventory composed of the vowels /i ɪ ə o a/, as proposed in this article. Note, however, that a similar five-vowel inventory (/i ɪ i u a/) has been reported for an unrelated language Omagua, which is spoken not far from the Kawapanan-speaking area in the department of Loreto in Peru (Sandy & O'Hagan 2020: 104-6).

3.6 PK syllabic *N-

I tentatively reconstruct PK *N for the correspondence Sha *ni-* ~ Shi *iN-*, which has been attested in the word-initial position only; some examples are given in 15. The correspondence in question contrasts both with PK *IN- (> Sha *i(N)-*, Shi *iN-*) and *ni- (> Sha *ni-*, Shi *ni-*), as shown in 16 and 17, respectively.

(15) PK syllabic *N- > Sha *ni-*, Shi *iN-*

	PK	Shawi	Shiwilu	gloss
a.	*N-	<i>ni-</i>	<i>iN-</i>	<i>reflexive voice</i>
b.	*Njə(ʔ)-	<i>nii-</i>	<i>iNjəʔ-</i>	to jump

(16) PK *IN- > Sha *i(N)-* (with regular loss of *N before fricatives, glides, and nasals), Shi *iN-*

	PK	Shawi	Shiwilu	gloss
a.	*INjura-tʂk	<i>əʔəra-tʂʔ ~ iʔira-tʂʔ</i>	<i>injula-tʂk</i>	patio
b.	*INSəN	<i>isəN</i> ‘scoop (n.)’	<i>iNʂəN-</i>	to scoop
c.	*INja-	<i>ija-</i>	<i>inja-</i>	to roast
d.	*INjaʔ-	<i>ija-</i>	<i>injaʔ-</i>	to urinate
e.	*INmuru(ə)ʔ-	<i>imoroə-N</i>	<i>inmu(ʌ)ʔ-fa</i> ⁸ ‘brother-in-law (of a woman)’	sibling-in-law (opposite sex of the ego)
f.	*INTina(N)	<i>intʃinan</i>	<i>intʃina(N)</i>	right

(17) PK *ni- > Sha *ni-*, Shi *ni-*

	PK	Shawi	Shiwilu	gloss
a.	*ninanluʔ	<i>ninanoʔ</i>	<i>ninanluʔ</i>	settlement
b.	*nins(ʔ)-ra	<i>nənsə-ra</i>	<i>ninsək-la</i>	tongue
c.	*ni-t-	<i>ni^h-t-</i>	<i>ni-t-</i>	to bear fruit
d.	*niʔniʔ	<i>niʔniʔ</i>	<i>nijiʔ</i> ‘dog’	jaguar

Although PK syllabic *N- is reconstructed for two morphemes only, the reflexive prefix is highly productive in both Kawapanan languages and is thus found in many derived verbs.

⁸The occurrence of Shi /k/ instead of the expected ^ɿ/l/ as a reflex of PK *r is accounted for by a synchronically active palatalization process in *fa*-diminutives (Valenzuela & Gussenhoven 2013: 103).

4. Specific processes in Shawi

In this section, I discuss specific processes that are reconstructed as parts of the independent phonological history of Shawi, in their approximate chronological order: Shawi umlaut (4.1), Shawi first palatalization (4.2), glide amalgamation (4.3), elimination of word-initial ɣ- (4.4), elimination of PK *sɪ (4.5), Shawi second palatalization (4.6), and the emergence of preaspiration (4.7).

4.1 Umlaut

In a number of roots, Shiwilu *i* corresponds to Shawi ɣ. I propose that this correspondence is due to a diachronic process that occurred in the independent history of Shawi, formalized in R1 and henceforth referred to as ‘Shawi ɣ-umlaut’.

$$(R1) \quad *i > \gamma \quad / _ _ (?).C\gamma$$

The known examples are presented in 18 below.

(18) Shawi ɣ-umlaut

	PK	Shawi	Shiwilu	gloss
a.	*kɪʔkɪ-tɔʔ	kɔʔkɔ-tɔʔ	kiki-tɔk	cheek
b.	*kɪlɔN	kɔnɔN	kilɔN	añas-súa fish
c.	*kɪtɔ(?)	kɔtɔ-	kɪtɔk-	to bite
d.	*mɪrɔ	mɔrɔ	mɪlɔk	yarina palm (Sha); tagua/ivory nut palm (Shi)
e.	*nɪnɔ(?)	nɔnɔ-ra	nɪnɔk-la	tongue
f.	*pɪjɔʔ	pɔiʔ	pɪjɔk	house
g.	*pɪlɔN-	pɔnɔN-	pɪlɔN-	to advise
h.	*pɪʔpɔ(?)	pɔʔpɔ-	pɪʔpɔk-	to carry
i.	*sɪnnɪrɔ	ʃɪnɔrɔ	sɪnɪlɔk	dart
j.	*tɪmɔN	tɔmɔN	tɪmɔN	louse
k.	*tɪtɔ(?)	tɔʰtɔ-pi ~ tɔʰti-wi	tɪtɔk-pi-luʔ	floodplain
l.	*tɪʔlɔ(?)	tɔʔnɔ-faʔwɔ	tɪʔlɔk	yanguaturi armadillo
m.	*tɪʔ-tɔʔ	tɔʔ-tɔʔ ‘breast (of birds)’	tɪʔ-tɔk	chest
n.	*wɪlɔ	wɔnɔ	wɪlɔk	curhuinsi ant

Word-initially, the ɣ-umlaut applied on an irregular basis (18o-q) due to a general dispreference for word-initial ɣ in Shawi (see 4.4).

o.	*ɪpɔ	ɔpɔ ~ ɪpɔ	ɪpɔk	giant armadillo
p.	*ɪsɔʔ	ɪsɔʔ	ɪʃɔk	bat
q.	*ɪ-tɔʔ	ɪ-tɔʔ	ɪ-tɔk	root

It is demonstrable that Shiwilu is more conservative than Shawi in this respect: an alternative hypothesis, involving dissimilation *ɣ...ɣ > i...ɣ in Shiwilu and assuming that Shawi is more conservative, would fail to account for the existence of stems such as Shiwilu *pɔktɔk-* ‘to cut off the bark’ (< PK *pɔʔtɔ(?)-, compare Shawi *pɔʔtɔ-* ‘to cut carefully’). I am aware of only one apparent exception to this proposed rule (19).

(19) Exception to the Shawi ɔ-umlaut rule

	PK	Shawi	Shiwilu	gloss
a.	* <i>wits</i> (?)-	<i>wi^htɔ-</i>	<i>witɔk-</i>	to sweep

Shawi ɔ-umlaut clearly operated prior to the development **jɔ* > *i* (see 4.3), as exemplified by Shawi *pɔi*? ‘house’ < **pɔjɔ*? < PK **pijɔ*?. It also bled the sound change **ti* > *tʃi* (Shawi second palatalization, 4.6), as evident from the examples 18j-m.

Note that the Shawi ɔ-umlaut did not target Sha *i* < PK **i* (~ Shi ɔr), suggesting that at the stage when the Shawi ɔ-umlaut occurred, the reflex of PK **i* was still distinct from the reflex of PK **ɪ* (otherwise it would have been expected to also undergo the ɔ-umlaut). The examples in 20 illustrate that PK **i* was not targeted by the ɔ-umlaut and invariably yielded Sha *i*.

(20) PK **i* > Shawi *i* even before a syllable that contains ɔ

	PK	Shawi	Shiwilu	gloss
a.	* <i>itɔ</i> ?	<i>i^htɔ?</i>	<i>ɪttʃɔk</i>	agouti
b.	* <i>iʔtɔ</i> (?)-	<i>iʔtɔ-rɔ?</i>	<i>ɪttʃɔk-la</i>	termite
c.	* <i>ni-tɔ</i> ?	<i>ni-tɔ?</i>	<i>nɔrtʃɔk ~ nɔttʃɔk</i>	nose
d.	* <i>sinnirɔ</i>	<i>ʃinɔrɔ</i>	<i>sɔɲɲilɔk</i>	dart
e.	* <i>tʃipi-tɔ</i> ?	<i>ʃi^hpi-tɔ?</i>	<i>tʃipɔr-tʃɔk ~ tʃipɔt-tʃɔk</i>	mosquito net

I propose that yet another process, very similar to the ɔ-umlaut, affected the vowel system of Shawi (R2).

$$(R2) \quad *ɪ > *i \quad _ \text{(?)}Ci$$

R2 (henceforth referred to as ‘*i*-umlaut’) is obviously more difficult to detect than the ɔ-umlaut, because PK **ɪ* and **i* merged in Shawi in non-umlauting contexts, yielding *i*. However, as shown in subsections 4.2 and

4.6, PK **ɪ* and **i* behaved differently with respect to the palatalization of **t*, **s* in Shawi: in non-umlauting contexts PK **ti*/**si* > Sha *ʃi*, whereas PK **ti* > Sha *tʃi*, PK **si* > Sha *sɔ*. The examples in 21 show, however, that PK **ti*/**si* could also evolve into Sha *ʃi*, provided that the following syllable contained an **i*. This conditioned development can be easily accounted for by the *i*-umlaut. Were it not for the umlaut, the unattested forms ^x*sɔwinan*, ^x*tʃi^hpi*, ^x*tʃi^hpi-tɔ*?, and ^x*tʃiʔʃi*? would be expected in Shawi.

(21) Shawi *i*-umlaut

	PK	earlier Shawi	Shawi	Shiwilu	gloss
a.	* <i>srwinnan</i>	* <i>siwi(N)nan</i>	<i>ʃiwinan</i>	<i>siwɔɲɲa(N)</i>	reed, cane sp.
b.	* <i>tʃipi</i>	* <i>tʃipi</i>	<i>ʃi^hpi</i>	<i>tʃipɔ(?)r</i>	<i>moriche</i> palm
c.	* <i>tʃipi-tɔ</i> ?	* <i>tʃipi-tɔ</i> ?	<i>ʃi^hpi-tɔ</i> ?	<i>tʃipɔr-tʃɔk ~ -pɔt-</i>	mosquito net
d.	* <i>tʃiʔti</i> ?	* <i>tʃiʔti</i> ?	<i>ʃiʔʃi</i> ?	<i>tʃitɔ(?)r</i>	maize

The *i*-umlaut likely affected the stems in 21e–g as well. However, it left no traces in these words because of the merger of earlier Shawi **ɪ* and **i*.

e.	* <i>iki(r/l)ala</i>	* <i>iki(r/l)ala</i>	<i>ikiana</i>	<i>ikɔlala</i>	<i>cunchi</i> fish
f.	* <i>ʃiʔsi</i> ?	* <i>ʃiʔsi</i> ?	<i>iʔʃi-</i> ‘to dip into salt’	<i>ʃiʔsɔʔr-</i>	to burn (vt.)
g.	* <i>piʔti</i>	* <i>piʔti</i>	<i>piʔʃi</i>	<i>pitɔr</i>	thread

Apparently, a nasal coda blocked the application of the rule, because no traces of the *i*-umlaut are visible in Shawi *tʃɪnpi-nam-əN* ‘river mouth’ (< PK **tɪnpiN-nan* / **tɪnpiN-nam-*, compare Shiwilu *tʃɪnpəN-nan*).

Finally, there are some cognate sets that suggest that other, less regular apophony or dissimilation patterns may have operated throughout the history of Shawi. These cognate sets are adduced in 22.

(22) Shawi subregular apophony patterns

	PK	Shawi	Shiwilu	gloss
a.	<i>*pənmun</i>	<i>pomon</i>	<i>pənmun</i>	horn
b.	<i>*supuʔ</i>	<i>soʰpoʔ ~ səʰpoʔ</i>	<i>supuʔ</i>	vulture
c.	<i>*suʔpura</i>	<i>soʔpora ~ səʔpora</i>	<i>suʔpula</i>	rapids, waterfall
d.	<i>*tənpuʔ-</i>	<i>tonpoʔ</i> ‘bundle’, <i>tonpo-</i> ~ <i>tənpo-</i>	<i>tənpuʔ-</i>	to tie
e.	<i>*tuʔtə(ʔ)-ra</i>	<i>toʔto-ra-təʔ ~ toʔtə-ra-təʔ</i>	<i>tuʔtək-la</i>	nail

Further research is needed in order to determine to what degree the variation in the Shawi words in 22 can be attributed to dialectal differences. For the time being, I assume that Shiwilu, which does not usually show variation of this kind, is more conservative.

4.2 First palatalization

The *first Shawi palatalization* targeted the PK sequences **ti* and **si*, both yielding Shawi *ʃi*. It is essential that only PK **i*, but not **ɪ*, acted as a trigger in the first Shawi palatalization (the destiny of the PK sequences **tɪ* and **sɪ* in Shawi will be examined in 4.5-6). The development of PK **ti* and **si* in Shawi is illustrated in 23 and 24, respectively.

(23) PK **ti* > Shawi *ʃi*

	PK	Shawi	Shiwilu	gloss
a.	<i>*naʔti</i>	<i>naʔʃi</i>	<i>natsɹ</i>	bushmaster
b.	<i>*pɪnti</i>	<i>pɪnʃi</i>	<i>pɪntɹ</i>	tobacco
c.	<i>*pɪʔti</i>	<i>pɪʔʃi</i>	<i>pɪtɹ-</i>	thread
d.	<i>*tiaʔ-</i>	<i>ʃaʔ-</i>	<i>tɹaʔ-</i>	to sow, to plant
e.	<i>*tɪʔtiʔ</i>	<i>ʃiʔʃiʔ</i>	<i>tʃitɹ(ʔ)r</i>	maize
f.	<i>*uti</i>	<i>oʰʃi</i>	<i>utɹ(ʔ)r-in</i>	sister of a male ego

In 23d, the hiatus was apparently resolved in Shawi by deleting the first vowel (**ʃiaʔ-* > *ʃaʔ-*). In 23e, note that the first syllable was affected by the *i*-umlaut (4.1); otherwise, the reflex **tʃiʔʃiʔ* would be expected.

(24) PK *si* > Shawi *ʃi*

	PK	Shawi	Shiwilu	gloss
a.	<i>*ana-si</i>	<i>ana-ʃi</i>	<i>ana-sɹ</i>	opossum
b.	<i>*ɪlansiʔ</i>	<i>ina(i)nʃi-ra ~ inaira</i>	<i>ilansɹʔr</i>	bird
c.	<i>*kasiʔ</i>	<i>kafi-N</i>	<i>kasɹʔr-</i>	sweet
d.	<i>*ɪnsi</i>	<i>ni(N)ʃi-</i>	<i>ɪnsɹ</i>	pattern, drawing
e.	<i>*pasiʔ-</i>	<i>pafi-</i> ‘to perfume’	<i>pasɹʔr-</i>	to pour
f.	<i>*puʔsi</i>	<i>poʔʃi</i> ‘squirrel sp.’	<i>puʔsɹ</i> ‘pygmy-marmoset’	mammal sp.
g.	<i>*siku</i>	<i>ʃiʰko</i>	<i>sɹ(ʔ)rku</i>	anteater
h.	<i>*sin-nara</i>	<i>ʃi-nara</i>	<i>səN-nala</i>	<i>ungurahui</i> palm

i.	* <i>sinnirə</i>	<i>finəɾə</i>	<i>səŋɲilək</i>	dart
j.	* <i>siruʔ</i>	<i>firoʔ</i>	<i>səʔuʔ</i>	<i>paucar</i> bird
k.	* <i>sinpa</i>	<i>finpa</i>	<i>səŋpa</i>	pineapple
l.	* <i>siʔtaʔ</i>	<i>fiʔtaʔ</i>	<i>sərtfaʔ- ~ səttfaʔ- ~ səʔtfaʔ-</i>	drop
m.	* <i>siwa</i>	<i>fiwa</i>	<i>səɾwa</i>	<i>apangora</i> crab
n.	* <i>siʔwi(N)</i>	<i>fiʔwi-roʔ</i>	<i>səɾwin</i>	<i>macana</i> fish

No exceptions from the first palatalization rule have been identified.

4.3 Glide amalgamation in Shawi

The PK sequences **jə*, **ji*, and **ji* were eliminated in Shawi by a diachronic process that I dub *glide amalgamation*: PK **jə*, **ji*, **ji* > Sha *i*. It is unclear whether it preceded or followed the merger of **i* and **ɪ* in Shawi. Some examples are given in 25a–h for **jə*, 25i for **ji*, 25j–p for **ji*.

(25) Glide amalgamation in Shawi

	PK	Shawi	Shiwilu	gloss
a.	* <i>jəN</i>	<i>iN</i>	<i>ɔ̄əN</i>	who
b.	* <i>jəNni</i>	<i>ini</i>	<i>ɔ̄əNni</i>	otter
c.	* <i>jəʔ</i>	<i>iʔ</i>	<i>ɔ̄əʔ</i>	water
d.	* <i>jəʔ-</i>	<i>iʔ-</i>	<i>ɔ̄əʔ-</i>	with one's fingernails
e.	* <i>kajə</i>	<i>kai</i>	<i>kaɔ̄əʔ</i>	sister of a female ego
f.	* <i>kujə</i>	<i>kowi</i>	<i>kuɔ̄əʔ</i>	<i>musmuque</i> monkey
g.	* <i>pijəʔ</i>	<i>pəiʔ</i>	<i>piɔ̄əʔ</i>	house
h.	* <i>sakaʔ-jəʔ</i>	<i>sa^hka-iʔ</i>	<i>sakaʔɔ̄əʔ</i>	difficult
i.	* <i>ji-luʔ-təʔ</i>	<i>i-no-təʔ</i>	<i>ɔ̄ə-luʔ-təʔ</i>	sand
j.	* <i>aji-pi</i>	<i>ai-pi</i>	<i>aɔ̄i-pi</i>	above
k.	* <i>ajriwan</i>	<i>aiwan</i>	<i>aɔ̄iwan-</i> ‘to scare’	spirit of the forest
l.	* <i>jimu-</i>	<i>imo-</i>	<i>ɔ̄imu-</i>	to pile up
m.	* <i>jiwə</i>	<i>iwə</i>	<i>ɔ̄iwəʔ</i>	firewood
n.	* <i>jiʔ-jəʔ-t-</i>	<i>iʔ-i-t-</i>	<i>ɔ̄iʔ-ɔ̄əʔ-t-</i>	to throw into water
o.	* <i>jiʔsiʔ-</i>	<i>iʔsi-</i> ‘to dip into salt’	<i>ɔ̄iʔsəʔr-</i>	to burn (vt.)
p.	* <i>suʔja</i> , 3 * <i>suʔj-</i>	<i>soʔja</i> , 3 <i>soʔ-iN</i>	<i>suɔ̄a</i> , 3 <i>suɔ̄-iN</i>	husband

IN

The example 25p shows that the glide amalgamation rule operates even synchronically in Shawi.

4.4 Dispreference for word-initial ə in Shawi

Shawi displays a general dispreference for word-initial ə. PK word-initial *ə became *i* word-initially, as seen in 26.

(26) PK or pre-Shawi *ə- > Shawi *i*-

	PK	Shawi	Shiwilu	gloss
a.	* <i>əsa</i>	<i>isa</i>	<i>əksa</i>	genipa
b.	* <i>əʔki-</i> ~ * <i>əʔki-</i>	<i>iʔki-ri-t-</i>	<i>əkkəɾ-</i>	to untie
c.	* <i>ənpu</i>	<i>inpu</i>	<i>ənpu</i>	<i>hualo</i> toad
d.	* <i>əwi-</i>	<i>iwi-</i>	<i>əkk^{wi}-</i>	to scrape
e.	* <i>əwinan</i>	<i>iwinan</i>	<i>əkk^{wi}ina(N)</i>	comb
f.	* <i>ipə</i>	<i>əpə ~ ipə</i>	<i>ipəʔ</i>	giant armadillo

g.	* <i>ISʒ?</i>	<i>isʒ?</i>	<i>i/ʒk</i>	bat
h.	* <i>I-tʒ?</i>	<i>i-tʒ?</i>	<i>i-tʒk</i>	root

The examples 26f-h show that the instances of PK **I* which underwent ʒ-umlaut in Shawi also yielded *i-* in Shawi, probably through **i-* > **ʒ-* > *i-*. In 26f, variation between *ʒpʒ* and *ipʒ* is synchronically attested, suggesting that at the time when ʒ-umlaut took place there was already no strict ban on word-initial ʒ- in Shawi. Yet in one etymology, PK **ʒWAN-* ‘to sting, to spear’ > Sha *owan-* (compare Shi *ʒkkʷAN-*), the word-initial **ʒ-* was rounded rather than fronted, apparently under the influence of the adjacent *-w-*. This is, however, not a regular development (cf. 26d-e).

4.5 PK **SI* > Shawi *sʒ*

The sequence *si* is not attested in the Shawi native vocabulary. In 4.2, I showed that PK **si* palatalized into Shawi *ʃi*, accounting partially for this distributional gap. In contrast, the PK sequence **SI* (expectedly preserved in Shiwilu as *si*) yielded Shawi *sʒ*, as shown in 27.

(27) PK **SI* > Shawi *sʒ*

	PK	Shawi	Shiwilu	gloss
a.	* <i>lANSI?</i>	<i>nANSʒ?</i>	<i>lansi?</i>	bone
b.	* <i>SILU</i>	<i>sʒno</i>	<i>silu</i>	<i>yupana</i> cane
c.	* <i>SILUPA(?)</i>	<i>sʒnopa?</i> ~ <i>sʒnowa?</i>	<i>silupa</i>	bee sp.
d.	* <i>SINKANTʒ?</i>	<i>sʒnkantʒ?</i>	<i>sinkantʒk</i>	hoatzin bird
e.	* <i>SI?KA</i>	<i>sʒ?ka-</i> ‘to sting’	<i>si?ka-</i>	<i>tingotero/isulilla</i> ant
f.	* <i>SI?PA</i>	<i>sʒ?pa-^hkʒ-N</i> , <i>sʒ?pa-ra?wa-iN</i>	<i>si?pa</i>	branch
g.	* <i>JAKU?SI?</i>	<i>ja^hkoso-</i>	<i>ʒaku?si?</i>	to cut hair

The example 27g can be included if one assumes that, at an earlier stage, the Shawi verb had the form **ja^hkosʒ-* and later underwent some sort of an apophonic development. Note that the vowels *o* and *ʒ* frequently oscillate in Shawi, whereas *o* and *i* only rarely oscillate.

In one case, the PK sequence **SI* did not yield *sʒ*, apparently because it had been affected by the *i*-umlaut (4.1) and subsequently by the first palatalization: PK **SIWI(N)(-nan)* ‘reed, cane sp.’ > **siwi(-nan)* > Sha *ʃiwi(-nan)* (compare Shi *siwʒŋa(N)*).

One can be certain about the directionality of this sound change (i.e. that Shiwilu did not innovate in this case by fronting **sʒ* to *si*), because the PK sequence **sʒ* is known to be reflected as *sʒ* in this language (with the insertion of a paragogic *k* in open syllables, 5.1). Examples include PK **sʒ?u* ‘diced manioc’ > Shi *sʒkku*, PK **sʒ?* ‘with one’s fingers’ > Shi *sʒk-*, PK **sʒNma-ru?* ‘porridge, thick soup’ > Shi *sʒNma-lu?*, PK **wa?ʒʒ?* ‘*carachamita* fish’ > Shi *wasʒk*.

4.6 Second palatalization

The sequence *ti* is not attested in the Shawi native vocabulary. In 4.2, I showed that PK **ti* palatalized into Shawi *ʃi*, accounting partially for this distributional gap. In contrast, the PK sequence **ti* survived the first Shawi palatalization, and was palatalized only later, resulting in a different outcome in modern Shawi (namely, Sha *tʃi*). Some examples are given in 28.

(28) PK **TI* > Shawi *tʃi*

	PK	Shawi	Shiwilu	gloss
a.	* <i>INTINA(N)</i>	<i>intʃinan</i>	<i>intʃina(N)</i>	right

b.	* <i>muntɪ</i>	<i>montʃi</i>	<i>muntʃi</i>	dove sp.
c.	* <i>piti-</i> / * <i>piti-nan</i>	<i>pitʃi-</i> / <i>pitʃi-nan</i>	<i>pitʃi-</i> / <i>pitʃi-nan</i>	to count / size, measure
d.	* <i>timin-</i>	<i>tʃimin-</i>	<i>tʃimin-</i>	to die
e.	* <i>tɪn-</i>	<i>tʃɪn-</i>	<i>tʃɪn-</i>	to smoke food
f.	* <i>tɪnpinan</i> / * <i>tɪnpinam-</i>	<i>tʃɪnpinam-ɔN</i>	<i>tʃɪnpɔNɲɪan</i>	river mouth
g.	* <i>tɪntɪ</i>	<i>tʃɪntʃi</i>	<i>tʃɪntʃi</i>	river crab
h.	* <i>tɪru</i>	<i>tʃiro</i>	<i>tʃilu</i>	sloth
i.	* <i>tɪʔtɪ</i>	<i>tʃiʔtʃi</i>	<i>tʃitʃi</i>	excrement

In addition, there is limited but reliable philological evidence showing that the second Shawi palatalization occurred only recently. It includes the Mayna-Chawi verb <timin-> ‘to die’ and the adverb <napu-pitinati> ‘likewise’, attested in modern Shawi as *tʃimin-*, *na^hpupia* *na^htʃɪn* (cf. Rojas-Berscia 2015: 399, fn. 9).

Note that the second palatalization survives as a synchronically active morphophonological rule in Shawi: compare *pa-t-* ‘to abandon’ and *pa-tʃ-i* ‘I will abandon’ (Barraza de García 2005: 59).

4.7 Preaspiration in Shawi

The sound [h] (alternatively represented as [ʰ]) is frequent in Shawi in the coda position. Its status is disputed: while Barraza de García (2005) analyzes it as a phoneme, Rojas-Berscia et al. (2019) argue that its occurrences are synchronically predictable and posit an epenthesis rule, whereby a [h] is inserted as a coda to an underlyingly open syllable whenever the onset of the following syllable is an obstruent, as shown in 29. In Rojas-Berscia et al.’s (2019) account, the epenthesis rule applies before any derivational or inflectional processes have taken place (29i).

(29) Preaspiration in Shawi (taken from Rojas-Berscia et al. 2019)

	underlying root	[h]-epenthesis	derivation/inflection	gloss
a.	jo.ki	'jo ^h .ki		moon
b.	ta.ʃi	'ta ^h .ʃi		night
c.	ʃo.ʃo	'ʃo ^h .ʃo		ring-tailed coati
d.	pa.sa	'pa ^h .sa		bruise
e.	i.sa	'i ^h .sa		genipa
f.	na.po.ro.i	'na ^h .po.ro.i		long
g.	pi.ta	'pi ^h .ta	'pi ^h .ta+r+aw+∅	(I) push something
h.	tʃi.to	'tʃi ^h .to	'tʃi ^h .to+ro	cloud
i.	tə.pa	'tə ^h .pa	ni+'tə ^h .pa+w+∅ (*ni ^h +'tə ^h .pa+w+∅)	I will kill myself

Rojas-Berscia et al.’s (2019) rule accounts for most occurrences of [h] in Shawi, and I do not reconstruct a *-h coda for PK: it appears quite possible that [h] was indeed diachronically inserted intramorphemically in the environment $V_C_{[+obstruent]}$ in the history of Shawi, as shown in 30.

(30) Diachronic insertion of [h] in Shawi

	PK	Shawi	Shiwilu	gloss
a.	* <i>itʔ</i>	<i>i^htʔ</i>	<i>ɪtʃʔk</i>	agouti

b.	* <i>juki</i>	<i>jo^hki</i>	<i>ǰukəɾ</i>	moon
c.	* <i>kasi-</i>	<i>ka^hʃi</i>	<i>kasəɾ</i>	sweet
d.	* <i>kukuʔ</i>	<i>ko^hkoʔ</i>	<i>kukuʔ</i>	oropendola, <i>paucar</i> bird
e.	* <i>pitu</i>	<i>pi^hto</i>	<i>pəttʃu</i>	breadfruit
f.	* <i>supuʔ</i>	<i>so^hpoʔ ~ sə^hpoʔ</i>	<i>supuʔ</i>	vulture
g.	* <i>takiʔ-</i>	<i>ta^hki-</i>	<i>takəʔɾ-</i>	to die out
h.	* <i>uti</i>	<i>o^hʃi</i>	<i>utə(ʔ)ɾ-i_N</i>	sister of a male ego
i.	* <i>waratəʔ</i>	<i>wara^htəʔ</i>	<i>walatəɾk</i>	<i>carachama</i> fish

It is not clear to me, however, that the epenthesis rule can be synchronically described as automatic in Shawi. Rojas-Berscia et al. (2019: 10) themselves state that [h] is exceptionally found at morphemic boundaries preceding certain suffixes, such as the genitive *-^hkəN* (*ka+^hkəN* ‘mine’) and the additive *-^hpo* (*kəma+^hpo* ‘and you’). [h] also occurs in the verbal root *ni^h-* ‘to be’ and in the progressive suffix *-sa^h-* (*taʔa+sa^h+pi* ‘they are running’). In light of these facts, I deem it more prudent to grant phonemic status to /h/, following Barraza de García’s (2005) analysis, and leave open the question how this admittedly marginal phoneme emerged in Shawi.

5. Specific processes in Shiwilu

In this section, I discuss specific processes that are reconstructed as parts of the independent phonological history of Shiwilu: the accretion of *-k* (5.1), two types of progressive palatalization (5.2), the regressive palatalization (5.3), and the apheresis of word-initial *a-* (5.4). Minor synchronically active processes, such as the glide amalgamation (*/wə/* → */u/*) or the coalescence of */Nŋ/* → */ɲ/*, are not discussed in this section, since a comprehensive account of these can be found in Valenzuela & Gussenhoven (2013) and Madalengoitia Barúa (2013).

5.1 Paragogic *-k* in Shiwilu

Shiwilu *-k* has no counterpart in Shawi. As noted in Madalengoitia Barúa (2013) and Valenzuela & Gussenhoven (2013), Shiwilu *ə* occurs only in closed syllables, thus requiring the presence of a coda, the options being *k*, *n* or *(ʔ)ɾ* (note, however, that I analyze Shiwilu *əɾ* as a nucleus on its own and transcribe the coda *n* as *N*).⁹ I suggest that there is a diachronic explanation for this distributional gap: namely, in my proposal PK **ə(ʔ)* and **əʔ* merged as Shiwilu *ək*. In 31, I exemplify the development of PK **ə* in open syllables (31a-u) and in syllables with a glottal coda (31z-jj), besides showing that no paragogic *-k* occurs in Shiwilu if the syllable already contains a nasal coda (31h, kk-qq).

(31) PK **ə* reflected as Shawi *ə*, Shiwilu *ək* (*ə* before a nasal coda)

	PK	Shawi	Shiwilu	gloss
a.	* <i>aə</i>	<i>ə(-fa)</i> , <i>aə</i>	<i>ək-pi</i>	anona
b.	* <i>əsa</i>	<i>isa</i>	<i>ək-sa</i>	<i>huito</i> tree
c.	* <i>əwi-</i>	<i>iwi-</i>	<i>ək-k^{wi-}</i>	to scrape
d.	* <i>əwinan</i>	<i>iwinan</i>	<i>ək-k^{wina(N)}</i>	comb
e.	* <i>ipə</i>	<i>əpə ~ ipə</i>	<i>ipək</i>	<i>yanguaturi</i> armadillo
f.	* <i>ɟwə</i>	<i>iwə</i>	<i>ǰiwək</i>	firewood
g.	* <i>juNsə</i>	<i>jonsə</i>	<i>ǰuNsək</i>	pale-vented pigeon

⁹Vásquez-Aguilar (2021) shows, based on instrumental evidence, that the vowel *ə* is significantly shorter than other vowels and that the consonants that follow it are geminated in Shiwilu, suggesting that */ə/* is synchronically non-moraic in the language.

h.	*kajə, 3 *kajə-N	kai, 3 kai-N	kaǰək, 3 kaǰə-N	sister of a female ego
i.	*kə(-t)-	kə-t-	kək-	to fry, to singe
j.	*kujə	kowi	kuǰək	<i>musmuque</i> monkey
k.	*ləlun	nənən	ləklun	girl menstruating for the first time
l.	*mɪrə	mərə	milək	<i>yarina</i> palm (Sha); <i>tagua</i> /ivory nut palm (Shi)
m.	*nansə	nansə	nansək	<i>sábalo</i> fish
n.	*panpə	panpə	panpək	<i>irapai</i> palm
o.	*pəra-	pəra-	pəkla-	to call (Sha), to sing, to whistle, to bark, to croak (Shi)
p.	*pəwara	pəwara	pəkk ^w ala	iguana
q.	*tamə	tamə	tamək	condor
r.	*təpa	təpa	təkpa	tick
s.	*wəla-jə?	wəna-i?	ukla-ǰək ~ wəkla-ǰək	blood
t.	*wə	wə-ra-tə?	wək	ear
u.	*wəlu-	wəno-	uklu-	to gnaw
v.	*i?tə(?)	i?tə-rə?	əttfək-la	termite
w.	*ninə(?) -ra	nənə-ra	jinək-la	tongue
x.	*tu?tə(?) -ra	tu?tə-ra-tə?	tu?tək-la	nail
y.	*ukə(?)	ukə- ^h kən	ukək-	to stink (of blood)
z.	*itə?	i ^h tə?	əttfək	agouti
aa.	*ɪsə?	isə?	ifək	bat
bb.	*jə?	i?	ǰək	water
cc.	*jə?-	i?-	ǰək-	pressing with fingernails
dd.	*ku?luruntə?	ko?norontə?	ku?luluntək	<i>corocoro</i> bird
ee.	*marə?	marə?	malsək	because of, for
ff.	*sə?-	sə?-	sək-	with one's fingers
gg.	*sə?.u	so?.o	səkku	diced manioc
hh.	*-tə?	-tə?	-tək	cover:CL
ii.	*wa?sə?	wa?sə?	wassək	<i>carachamita</i> fish
jj.	*wə?-	wə?-	wək-	to come
kk.	*pən	pən	pən	fire
ll.	*pən-	pən-	pən-	to fly
mm.	*sənma-ru?	səma-ru-t-	sənma-lu?	porridge, thick soup
nn.	*timən	təmən	tʃimən	louse
oo.	*kənma	kəma	kənma	you
pp.	*jənni	ini	ǰənji	otter
qq.	*iənsun-	ison-	jənsun-	to kneel

In some cases, it is impossible to decide whether the PK form contained *ə, *ə?, or *ə?: the reflexes of these rhymes are identical in Shawi in medial syllables (and those of *ə? or *ə? are identical in any position), whereas in Shiwi a paragogic *-k* is expected to have been inserted after any *ə not followed by a nasal coda. For examples of ambiguous reconstructions, see 12 and 31v-y above.

Two anonymous reviewers question the typological plausibility of the *k*-insertion, as proposed in this subsection, since the sound change *ə > ək is cross-linguistically uncommon. One possibility is that it had *əu as an intermediate stage: if so, *ə first developed a

homorganic offglide in open syllables (*ɣ > *[əɰ]), and the velar offglide subsequently underwent fortition to [k].

Synchronically *k* may occur as a coda after vowels other than ɣ in Shiwilu, notably in the allomorph *-k* of the locative suffix *-kək* (< PK **-kə*) and in borrowings (such as *pasak* ‘hundred’, borrowed from an unidentified Quechua variety).

5.2 Progressive palatalization in Shiwilu

Shiwilu displays two types of progressive palatalization, with differing sets of triggers and targets. One such process, conditioned by a preceding **i(κ)* (> ɣ*r(κ)*), affected **t*, **r*/**l* (> *l*), and **n* (recall that *κ* stands for any coda). The outcome of this palatalization process is as follows: *tʃ*, *ʎ*, and *ɲ*. Note that the resulting sequences of a flap and a palatal are subject to further assimilatory processes, such as *rʎ* → *ʎ* (phonetically a geminate, [ʎ:]). Its operation was regular and left a significant trace in the morphophonology of the language (cf. Valenzuela & Gussenhoven 2013: 102). I give only a handful of examples in 32.

(32) PK **i(κ)t*, **i(κ)r*/**i(κ)l*, **i(κ)n* > Shiwilu ɣ*r(κ)tʃ*, ɣ*(κ)ʎ*, ɣ*r(κ)ɲ*

	PK	Shawi	Shiwilu	gloss
a.	<i>*itəʔ</i>	<i>i^htəʔ</i>	<i>ɛttʃək</i>	agouti
b.	<i>*iʔla</i>	<i>iʔna-</i>	<i>əʔrʎa</i>	trace
c.	<i>*iʔtəʔ(-)</i>	<i>iʔtəʔ-rəʔ</i>	<i>ɛttʃək-la</i>	termite
d.	<i>*liʔluna</i>	<i>niʔnona</i>	<i>ləʎluna(N)</i>	<i>tacarp</i> o stick
e.	<i>*ni-təʔ</i>	<i>ni-təʔ</i>	<i>nɛrtʃək ~ nɛttʃək</i>	nose
f.	<i>*pitu</i>	<i>pi^hto</i>	<i>pɛttʃu</i>	breadfruit
g.	<i>*sin-nara</i>	<i>ʃi-nara</i>	<i>sɛN-ɲala</i>	<i>ungurahui</i> palm
h.	<i>*sinnirə</i>	<i>ʃinɛrə</i>	<i>sɛNɲilək</i>	dart
i.	<i>*siruʔ</i>	<i>ʃiroʔ</i>	<i>səʎuʔ</i>	<i>paucar</i> bird
j.	<i>*siʔtaʔ</i>	<i>ʃiʔtaʔ</i>	<i>sɛrtʃaʔ- ~ sɛttʃaʔ- ~ sɛʔtʃaʔ-</i>	drop
k.	<i>*sukiru(?)</i>	<i>sokiro</i>	<i>sukəʎuʔ</i>	frog sp.
l.	<i>*tɪnpin-nan / *-nam-</i>	<i>tʃinpinam-ɛN</i>	<i>tʃinpɛNɲan</i>	river mouth
m.	<i>*tɪpi-təʔ</i>	<i>ʃi^hpi-təʔ</i>	<i>tʃipɛr-tʃək ~ tʃipɛt-tʃək</i>	mosquito net

Another process which can also be plausibly described in terms of progressive palatalization is triggered by a word-initial **r* > *i* (possibly followed by a transparent coda) and affects the onset of the following syllable if it is one of PK **j*, **s*. The normal, non-palatalized reflexes of PK **j*, **s* in Shiwilu is *ʃ*, *s*. When these consonants are preceded by **r(κ)-*, however, they are palatalized to *j* and *ʃ*, respectively, as shown in 33. Note that the word-initial sequence **rj-* regularly undergoes an apocope in Shawi, yielding *j-* (33a-b).

(33) PK **#r(κ)j*, **#r(κ)s* > **#r(κ)ʃ*, **#r(κ)s* > Shiwilu *i(κ)j*, *i(κ)ʃ*

	PK	Shawi	Shiwilu	gloss
a.	<i>*rja(-t)-</i>	<i>ja-(f)i-N, ja-^ht-</i>	<i>ija-, ija-t-</i>	tasty, to like (food)
b.	<i>*rjun</i>	<i>jon</i>	<i>ijun</i>	night mosquito
c.	<i>*rɲja-</i>	<i>ija-</i>	<i>inja-</i>	to roast
d.	<i>*rɲjaʔ-</i>	<i>ija-</i>	<i>injaʔ-</i>	to urinate
e.	<i>*rɲjura-tək</i>	<i>əʔɛra-təʔ ~ iʔira-təʔ</i>	<i>injula-tək</i>	patio

f	*r [?] sa	i [?] sa	ifa	curassow
g	*IS [?]	is [?]	if [?] k	bat
h	*INS [?]	is [?] N ‘scoop (n.)’	in [?] f [?] N-	to scoop

There are two exceptional cases in which progressive palatalization fails to occur even though all necessary conditions for it are met: Shi *INS[?]kuwi[?]* ‘*machin paccha* spider’ (compare Sha *is[?]npi[?] ~ is[?]mi[?] ~ is[?]imi[?]*, probably from PK *INS[?]-) and Shi *i[?]UN-* ‘to swim’ (compare Sha *joN-*, probably from PK *I[?]UN-). I have no explanation for these two cases.

5.3 Regressive palatalization in Shiwilu

It was already noted by Valenzuela (2011: 286) that in some cases Shiwilu *tʃi* demonstrably comes from an earlier **ti*, as in Shi *tʃim[?]N* ‘louse’ (compare Sha *t[?]m[?]N*) and Shi *tʃimiN-* ‘to die’ (attested as <timin-> in 18th-century Shiwilu). Rojas-Berscia (2016) identifies additional examples of non-palatalized <ti> in the 18th-century grammar of Shiwilu published in Alexander-Bakkerus (2016), such as <tipilec> ‘leather’, <utinaléc> ‘I wake up’, <nintitulec> ‘I learn’ (modern Shiwilu *tʃipi-t[?]ək*, *utʃinan-l-[?]ək*, and *nintʃi-tu-l-[?]ək*, respectively).

Based on extensive comparative evidence and on Madalengoitia Barúa’s (2013: 44-5) claim regarding the absence of the sequences /ti/, /li/, /ni/ in underived native Shiwilu words, I propose that such sequences (**ti*, **li*, **ni* < PK **ti*, **li*, **ni*) underwent regressive palatalization in Shiwilu and evolved into modern *tʃi*, *ʃi*, *ni*. The *terminus post quem* for this development is the 18th century.

(34)	PK * <i>ti</i> , * <i>li</i> , * <i>ni</i> > * <i>ti</i> , * <i>li</i> , * <i>ni</i> > Shiwilu <i>tʃi</i> , <i>ʃi</i> , <i>ni</i>			
	PK	Shawi	Shiwilu	gloss
a.	* <i>INTina(N)</i>	<i>intʃinan</i>	<i>intʃina(N)</i>	right
b.	* <i>j[?]NNi</i>	<i>ini</i>	<i>ʃ[?]NNi</i>	otter
c.	* <i>lalIN</i>	<i>nanin</i>	<i>laʃin</i>	hole
d.	* <i>-lIN</i>	<i>-nin</i>	<i>-ʃin</i>	vine:CL
	e.g. * <i>lu-lIN</i>	e.g. <i>no-nin</i>	e.g. <i>lu-ʃin</i>	<i>tamshi</i> vine
e.	* <i>lINlIN</i>	<i>ninin</i>	<i>ʃinʃin</i>	name
f.	* <i>lINSi</i>	<i>ni(N)ʃi-</i>	<i>ʃINS[?]</i>	pattern, drawing
g.	* <i>munt[?]i</i>	<i>montʃi</i>	<i>muntʃi</i>	dove sp.
h.	* <i>ninanlu[?]</i>	<i>ninano[?]</i>	<i>ninanlu[?]</i>	settlement
i.	* <i>n[?]n[?]-ra</i>	<i>n[?]n[?]-ra</i>	<i>n[?]n[?]-la</i>	tongue
j.	* <i>ni-t-</i>	<i>ni^h-t-</i>	<i>ni-t-</i>	to bear fruit
k.	* <i>ni[?]ni[?]</i>	<i>ni[?]ni[?]</i>	<i>n[?]n[?][?]</i> ‘dog’	jaguar
l.	* <i>pa[?]li[?]-</i>	<i>pa[?]ni-ra</i>	<i>paʃi[?]-</i>	leaf for the roof
m.	* <i>piti- / *piti-nan</i>	<i>piti- / piti-nan</i>	<i>piti- / piti-nan</i>	to count / size, measure
n.	* <i>s[?]innic[?]</i>	<i>ʃin[?]c[?]</i>	<i>s[?]n[?]ni[?]ʃk</i>	dart
o.	* <i>suliman</i>	<i>soniman</i>	<i>suʃiman</i>	poison
p.	* <i>t[?]m[?]N</i>	<i>t[?]m[?]N</i>	<i>tʃim[?]N</i>	louse
q.	* <i>t[?]miN-</i>	<i>tʃimiN-</i>	<i>tʃimiN-</i>	to die
r.	* <i>t[?]IN-</i>	<i>tʃiN-</i>	<i>tʃiN-</i>	to smoke food
s.	* <i>t[?]INpinan</i> / * <i>t[?]INpinam-</i>	<i>tʃiNpinam-[?]N</i>	<i>tʃiNp[?]n[?]nan</i>	river mouth
t.	* <i>t[?]INTi</i>	<i>tʃiNTi</i>	<i>tʃiNTi</i>	river crab

u.	* <i>turu</i>	<i>tʃiro</i>	<i>tʃilu</i>	sloth
v.	* <i>tʃtʃ(?)</i> - <i>pi</i>	<i>tʃtʃpi</i> ~ <i>tʃti-wi</i>	<i>tʃtʃk-pi-lu?</i>	floodplain
w.	* <i>tʃʃtʃ</i>	<i>tʃiʃtʃi</i>	<i>tʃiʃi</i>	excrement
x.	* <i>tʃʃlʃ(?)</i>	<i>tʃʃnʃ-faʃwʃ</i>	<i>tʃiʃlʃk</i>	armadillo
y.	* <i>tʃʃ-tʃʃ</i>	<i>tʃʃ-tʃʃ</i> ‘breast (of birds)’	<i>tʃiʃ-tʃk</i>	chest
z.	* <i>wʃnʃni</i>	<i>wʃni</i>	<i>wʃnʃni</i> ~ <i>unʃni</i>	<i>shuyʃ</i> fish

No exceptions have been identified as of yet. Note that the application of this process resulted in a series of phonotactic restrictions, which have affected the adaptation of many recent loans from Spanish (including many proper names): *atʃimu* ‘Artemio’, *akustʃin* ‘Agustín’, *akustʃina* ‘Agustina’, *aʃika* ‘Alejandrina’, *aʃiku* ‘Alejandra’, *aʃisia* ‘Alicia’, *tʃikuku* ‘Teodoro’, *tʃirisa* ‘Teresa’, to name just a few. The ban on the sequences /ni/, /li/, /ti/ appears to have been lifted only recently (see Figure 1 for some marginal examples of such sequences in recent loans in Shiwilu).

5.4 **a*-apheresis in Shiwilu

In a number of roots, Shawi word-initial *a*- corresponds to Shiwilu zero before vowels. I assume that Shawi is more conservative in this case and reconstruct PK sequences **aʃ*, **ai*, with a regular apheresis of PK **a* in Shawi (35). I have also considered an alternative scenario, whereby a word-initial *a*- would have been diachronically inserted in Shawi, but this possibility is ruled out by the existence of PK **i*- and **ʃ*-initial stems with no vowel insertion in Shawi (see 4.4 for examples).

(35) Shawi *a*- ~ Shiwilu \emptyset

	PK	Shawi	Shiwilu	gloss
a.	* <i>aʃ</i>	<i>ʃ(-fa)</i> , <i>aʃ</i>	<i>ʃk-pi</i>	anona
b.	* <i>ai</i> -	<i>ai</i> -	<i>ʃr</i> -	sour
c.	* <i>aiN</i>	<i>aiN</i>	<i>ʃrN</i>	hair

Another piece of evidence that corroborates my hypothesis regarding the *a*-apheresis in Shiwilu is the hydronym *ʃrpina* (Spanish *Aipena*), the name of a river located close to the town of Jeberos in a historically Shiwilu-speaking area. One can speculate that the hydronym was borrowed into Spanish at a stage when Shiwilu still retained the initial vowel and had not yet undergone the sound change **i* > *ʃr*. That way, the Shiwilu etymon of Sp. *Aipena* can be reconstructed as **aipma*.

6. Pre-Proto-Kawapanan

Pre-PK is a stage of PK attainable through internal reconstruction. One change that must have occurred throughout the history of PK is the loss of distinctions involving the point of articulation in the coda position: pre-PK **-k*, **-p* seem to have debuccalized into PK **-ʔ*, while pre-PK **-m* appears to have lost its labial point of articulation as well.¹⁰ This is supported

¹⁰Note that PK **-N* in my reconstruction is not specified for point of articulation, representing a placeless nasal consonant in coda. Phonetically, its reflex is a nasal homorganic to the next obstruent in both contemporary languages. If what follows is a pause or a nasal (in Shiwilu only), the default realization of /N/ is [n ~ ŋ] or the nasalization of the preceding vowel in Shawi, and [ŋ̃] in Shiwilu. In both contemporary languages, the obstruents that follow a nasal coda are allophonically voiced, except in the southern varieties of Shawi, such as Paranapura

by the fact that modern Shawi still retains a number of stems where stem-final *-ʔ* and *-N* alternate with other consonants in the purposive construction (in verbs) and in the possessive construction (in nouns). This alternation must have existed already in PK, but it is probable that in an earlier stage of PK (pre-PK) fully articulated **k*, **p*, **m*, **n* (and possibly other consonants) could occur freely in the coda position. Some examples are provided in 36; note that Shiwilu cognates are not listed, because no traces of such alternation have been found in Shiwilu.

(36) Reconstruction of pre-PK **k*, **p*, **m*, **n* in the coda position

	pre-PK	PK	Shawi	gloss
a.	<i>*tiak-</i>	<i>*tiaʔ- / *tiak-V-</i>	<i>ʃaʔ- / ʃak-a-</i>	to sow
b.	<i>*lik-</i>	<i>*liʔ- / *lik-V-</i>	<i>niʔ- / nik-a-</i>	to see
c.	<i>*wəʔk-</i>	<i>*wəʔ- / *wəʔk-V-</i>	<i>wəʔ- / wəʔk-a-</i>	to come
d.	<i>*kap-</i>	<i>*kaʔ- / *kap-V-</i>	<i>kaʔ- / kap-a-</i>	to eat, to have sex
e.	<i>*mak-</i>	<i>*maʔ- / *mak-V-</i>	<i>maʔ- / mak-a-</i>	to grab, to marry
f.	<i>*pak-</i>	<i>*paʔ- / *pak-V-</i>	<i>paʔ- / pak-a-</i>	to go
g.	<i>*tik-</i>	<i>*tiʔ- / *tik-V-</i>	<i>tʃiʔ- / tʃik-a-</i>	to gut
h.	<i>*kajuk</i>	<i>*kajuʔ / *kajuk-V-</i>	<i>kajoʔ / kajok-əN</i>	egg
i.	<i>*lamlam</i>	<i>*lanlan / *lanlam-V-</i>	<i>nanaN / nanam-əN</i>	mouth, language
j.	<i>*-təʔk</i>	<i>*-təʔ / *-təʔk-V</i>	<i>-təʔ / -təʔk-əN</i>	cover:CL
k.	<i>*lɪnlɪn</i>	<i>*lɪnlɪn / *lɪnlɪn-V-</i>	<i>niniN / ninin-əN</i>	name

In fact, it is even possible to synchronically represent the respective codas in PK and Shawi as underlyingly specified for place of articulation (for example, /wəʔk-/ [wəʔ- / wəʔk-] ‘to come’, /kap-/ [kaʔ- / kap-] ‘to eat, to have sex’, /kajok/ [kajoʔ / kajok-] ‘egg’, etc.). The segment [ʔ] would then be viewed as a syllable-final allophone of the stops /p k/ (and possibly /t/, though no concrete example is known) and eliminated from the consonantal inventory of Shawi and PK altogether. Likewise, one could claim that nasals in coda are underlyingly specified for place of articulation (as in Sha /nanam/ ‘mouth, language’), though the contrast is neutralized on surface if no vowel-initial suffix follows. Such representation has not been adopted in this paper, because in the vast majority of cases there is no morphophonological evidence that could help us decide whether a given *-ʔ* or *-N* should be identified with /-p/, /-t/, /-k/, /-m/, or /-n/. It is still important to keep in mind that PK **-ʔ* and **-N* probably go back to supraglottal stops and nasals, respectively; this information is of utmost importance for any hypothesis regarding external genetic ties of the Kawapanan family.

There is yet another sound changes recoverable through internal reconstruction based on Shawi data. As was already mentioned in 2.1, Shawi presents a morphophonological alternation between *r* (between vowels) and *n* (in all other environments), which I derive from an earlier alternation between **r* and **l*. The latter alternation, in turn, must be attributed to an even earlier sound change **r > *l* (in all environments except **V_I*). This is shown in 37.

(Barraza de García 2005: 51; Valenzuela & Gussenhoven 2013: 99, 100; Madalengoitia Barúa 2013: 36-7; Rojas-Berscia et al. 2019).

(37) Pre-PK $*r > PK *r (V_V), *l$ (elsewhere)

	pre-PK	PK	Shawi	gloss
a.	$*-r-$	$*-r-/*-l-$	$-r-/-n-$	NFUT
	$*wəʔk-r-$	$*wəʔl-$	$wəʔ-n-$	to see.NFUT
	$*kap-r-$	$*kaʔ-l-$	$kaʔ-n-$	to eat.NFUT
	$*naʔku-r-$	$*naʔku-r-$	$naʔko-r-$	to pass by.NFUT
	$*piti-r-$	$*piti-r-$	$pitʃi-r-$	to count.NFUT
b.	$*ra-tʂk$	$*la-tʂʔ$	$na-tʂʔ$	tooth
	$*taja ra-tʂk$	$*taja ra-tʂʔ$	$taja ra-tʂʔ$	alligator's tooth

There is no conclusive evidence which would show whether the sound change $*r > *l$ (except $*V_V$) occurred within the individual history of Shawi (= pre-Shawi, or post-PK) or within the shared history of Shawi and Shiwilu (= pre-PK). The data of Shiwilu are not particularly revealing, because this language merged PK $*r$ and $*l$ in all environments. Notwithstanding, I find it more probable that the sound change $*r > *l$ had already applied by the PK stage, because in several instances underlying $*/r/$ appears to have lateralized without any overt trigger either in PK or in Shawi. I tentatively suggest that in some cases the environment that had conditioned the lateralization of pre-PK $*r$ was no longer present in PK, making it necessary to attribute the $*r/*l$ alternation to the morphophonological level already in PK. Some examples are given in 38.

 (38) Pre-PK $*r > PK *r (V_V), *l$ (elsewhere)

	pre-PK	PK	Shawi	gloss
a.	$*-rɪn$	$*-rɪN/-lɪN$	$-rɪn/-nɪN$	vine/cord:CL
	$*ɪla-rɪn$	$*ɪla-rɪN$	$ina-rɪn$	<i>chambira</i> cord
	$*sa\{m/n\}ka-rɪn$	$*sanka-rɪN$	$sanka-rɪn$	zarza vine
	$*\{l/r\}uC-rɪn$	$*lu-lɪN$	$no-nɪN$	<i>tamshi</i> vine
b.	$*-rɪn$	$*-rɪN/-lɪN$	$-rɪN/-nɪN$	woman:CL
	$*kaju-rɪn$	$*kaju-rɪN$	$kajo-rɪN$	pregnant woman
	$*\{l/r\}ɔC-rɪn$	$*lɔ-lɪN$	$nɔ-nɪN$	girl menstruating for the first time

It is readily visible that the initial consonant of the classifier in PK $*lu-lɪN$ ‘*tamshi* vine’ and $*lɔ-lɪN$ ‘girl menstruating for the first time’ (compare Shiwilu $lu-lɪN$, $lɔklɪN$) cannot be synchronically accounted for by the lateralization rule, because $*/r/$ is expected to surface as $*r$ between vowels (unless, of course, one posits an additional sound change $*lVrVN > *lVVN$). Whichever is the diachronic explanation for the occurrence of $*l$ in these words, it must belong to the pre-PK stage, which is not necessarily recoverable.

7. A note on irregular correspondences

Whereas the vast majority of the cognate sets I analyzed display regular correspondences which fit perfectly into my proposal, I was also able to identify a number of Shawi and Shiwilu words which cannot be regularly derived from any common PK form, despite a superficial resemblance. Some of these pairs can be shown to be independent, post-PK borrowings from a non-Kawapanan language. A case in point is Sha *sawəni* (< **sawəli*) ~ Shi *sawəli* (< **sawili*) ‘machete’, possibly borrowed from a Spanish source (Sp. *sable*). Some additional examples are discussed in 2.2 (example 5). Yet in other cases, listed in 39, I am unable to account for the irregular correspondences by presenting a credible loan etymology.

(39) Irregular correspondences between Shawi and Shiwilu

	PK	Shawi	Shiwilu	gloss
a.	* <i>jawəɾ</i> ~ * <i>ɪawəruʔ</i>	<i>jawəɾ</i>	<i>jaukluʔ</i> ~ <i>jawəkluʔ</i>	great egret
b.	* <i>janan</i> ~ * <i>junan</i>	<i>janan</i>	<i>ɸunan</i>	piranha
c.	* <i>kasəʔ</i> ~ * <i>kisəʔ</i>	<i>kasəʔ</i> / <i>kasə-</i>	<i>kisək-</i>	to feel itchy
d.	* <i>kaʔjə(ʔ)-t</i> ~ * <i>kuʔjə(ʔ)-t</i>	<i>kaʔi-t</i>	<i>kuɸək-t</i>	to apply warm water
e.	* <i>(k)əju-</i> , * <i>(k)əju-run</i>	<i>kəjo-ron</i>	<i>əkɸu-</i> , <i>əkɸu-lun</i>	widow
f.	* <i>(k)əpa</i>	<i>kəʰpa</i>	<i>əkpa</i>	<i>caimito</i> fruit
g.	* <i>ɪnlupi</i> ~ * <i>n-</i> ~ * <i>j-</i>	<i>ninopi</i>	<i>ɸinlupi</i>	heart
h.	* <i>lusuʔ-</i> ~ * <i>lutuʔ-</i>	<i>noso-</i>	<i>lutuʔ-</i>	to see in a vision
i.	* <i>tɪ(a)ʔ(j)ə(ʔ)-</i>	<i>tʃaʔə-</i>	<i>tʃiʔjək-</i>	to flee, to escape

It remains to be established whether the irregular correspondences in 39 must be attributed to irregular sound change, horizontal transmission, chance, or some combination thereof.

8. Conclusion

In this contribution, I have presented a revised reconstruction of Proto-Kawapanan phonology and described the sound changes that shaped the phonological history of Shawi and Shiwilu. Needless to say, the historical development of the Kawapanan languages still awaits further research: the lexical, morphological, and syntactic reconstruction of Proto-Kawapanan has not yet been undertaken, and nothing is known about its possible external relations. In addition, my reconstruction has not taken into account the data of the extinct and poorly-known language Mikirá; I plan to deal with it in a future publication.

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CONFLICT OF INTEREST STATEMENT

An early version of this study —with radically different conclusions— was presented at the International Colloquium *Amazónicas VI* in Leticia (Colombia) and Tabatinga (Brazil) in 2016 by Luis Miguel Rojas-Berscia and myself. It was later reworked, mostly by myself, into a coauthored manuscript that was eventually accepted for publication in *International Journal of American Linguistics*. The manuscript, however, was never published, since it was revealed that Rojas-Berscia had —unbeknownst to me— included that contribution in a single-authored volume titled *Pre-Historical Language Contact in Peruvian Amazonia* (John Benjamins, ISBN 978-90-272-0836-1) without attributing its authorship. The ideas exposed in the present paper are my original contribution, whereas Rojas-Berscia's ideas are credited as such and cited in the third person.

AUTHOR CONTRIBUTION

Nikulin: conceptualization, data curation, formal analysis, investigation, methodology, project administration, writing (original draft), and writing (review & editing).

ETHICS OF RESEARCH WITH HUMAN SUBJECTS

The study did not involve research with human subjects.

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