

# Verbs with conservative first person forms in Caribbean languages

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# 1 Introduction

## 1.1 The Cariban language family

## 1.2 Verbs with conservative first person forms

Cariban languages feature relatively rich verbal morphology, both pre- and suffixes, inflecting for person, number, tense, aspect, and evidentiality, combined with a range of valency-modifying derivational markers. A split-S system can be reconstructed to Proto-Cariban, discussed in more detail in Section 1.2.3. Table 1 shows person paradigms for four Hixkaryána verbs, members of the  $S_A$  inflectional class.<sup>123</sup> <sup>4</sup>A comparison of these paradigms shows that the verb ‘to be’ diverges from the others in its first person marker. That prefix is *w-*, while other  $S_A$  verbs like ‘to fall’ have *k(i)-*. A similar example can be found in Tiriyó, where the verb ‘to go’ has a first-person prefix *wi-* while other  $S_A$  verbs have a prefix with phonologically conditioned allomorphs *t-* / *\_ə* and *s-* / *\_e* (Table 2). In both languages, the verbs on the left of the table are representative for the  $S_A$  class, since the vast majority is inflected identically. In both languages, there are only a few other verbs inflected identically to the divergent ones on the right; for example, the first-person form of Tiriyó ‘to be’ is *w-ei-* (Meira 1999: 339).

In our synchronic analyses of these two languages, we consider these verbs and their first person prefixes IRREGULAR, contrasting with regular prefixes on regular  $S_A$  verbs, *k(i)-* and *t-*

<sup>1</sup>The presence of a 1+2 person value implies that of a 1+3 value. This is usually expressed with a free pronoun combined with third person morphology in Cariban languages, so it is not represented as a distinct value in the paradigms we show.

<sup>2</sup>In Table 1 and the remainder of this paper, we omit any TAM suffixes found in the original forms found in the literature, since a) our focus lies on the prefixes and stems, and b) full paradigms containing the same TAM suffix are rarely found.

<sup>3</sup>We use standard IPA symbols in our transcription of Cariban languages, with the exception of coronal rhotics, which we simply represent with ⟨r⟩, rather than ⟨ɽ⟩ for Wayana or ⟨ɽ̥⟩ for Ye'kwana etc. In languages with strong morphophonological processes and/or subphonemic orthography we show the original transcription in an additional surface line when presented in an interlinearized glossed example. We follow [gildea2018reconstructing](#) in using ⟨ə⟩ for the proto-vowel reconstructed by Meira & Franchetto (2005), although it was likely more back ([gildea2010story](#)).

<sup>4</sup>Glossing abbreviations:

Table 1: Some Hixkaryána verbs (Howard 2001: 150, 510, 511, 513, 520; Derbyshire 1985: 197, 198)

	‘to fall’	‘to be afraid’	‘to walk’	‘to cut self’	‘to be’
1	<i>k-ehurka-</i>	<i>k-oser'ehi-</i>	<i>k-atar'eknohi-</i>	<i>k-atama-</i>	<i>w-eŋe-</i>
2	<i>m-ehurka-</i>	<i>m-oser'ehi-</i>	<i>m-atar'eknohi-</i>	<i>m-atama-</i>	<i>m-eŋe-</i>
1+2	<i>t-ehurka-</i>	<i>t-oser'ehi-</i>	<i>t-atar'eknohi-</i>	<i>t-atama-</i>	<i>t-eŋe-</i>
3	<i>n-ehurka-</i>	<i>n-oser'ehi-</i>	<i>n-atar'eknohi-</i>	<i>n-atama-</i>	<i>n-eŋe-</i>

Table 2: Some Tiriyo verbs (Meira 1999: 292, 294; Carlin 2004: 274)

	‘to sleep’	‘to see self’	‘to bathe (INTR)’	‘to yawn’	‘to go’
1	<i>t-əəniki-</i>	<i>t-əene-</i>	<i>s-epi-</i>	<i>s-entapo-</i>	<i>wi-tən-</i>
2	<i>m-əəniki-</i>	<i>m-əene-</i>	<i>m-epi-</i>	<i>m-entapo-</i>	<i>mi-tən-</i>
1+2	<i>kit-əəniki-</i>	<i>k-əene-</i>	<i>ke-epi-</i>	<i>k-entapo-</i>	<i>ki-tən-</i>
3	<i>n-əəniki-</i>	<i>n-əene-</i>	<i>n-epi-</i>	<i>n-entapo-</i>	<i>ni-tən-</i>

Table 3: Proto-Cariban Set I (main clause) person markers (meira2010origingildea2016referential)

(a) Transitive					(b) Intransitive		
A/P	1	2	1+2	3	S <sub>A</sub>	S <sub>P</sub>	
1		<i>*k-</i>		<i>*t(i)-</i>	1	<i>*w-</i>	<i>*u(j)-</i>
2	<i>*k-</i>			<i>*m(i)-</i>	2	<i>*m-</i>	<i>*ə(j)-</i>
1+2				<i>*kit(i)-</i>	1+2	<i>*kit-</i>	<i>*k-</i>
3	<i>*u(j)-</i>	<i>*ə(j)-</i>	<i>*k-</i>	<i>*n(i)-</i>	3	<i>*n-</i>	<i>*n(i)-</i>

/s-. However, there is no widely accepted definition of irregularity (stolz2012introduction), and many stricter definitions (haspelmath2010understanding) require the pattern to occur at a single place in the grammar. For such approaches, these verbs simply belong to a small inflectional (sub-)class. Regardless of synchronic analysis, the explanation for these inflectional patterns lies, as so often, in diachrony. Our story starts with the verbal person marking system of Proto-Cariban, discussed in Section 1.2.1. That system was subject to different kinds of innovations; the one responsible for the irregular Hixkaryana and Tiriyo verbs is introduced in Section 1.2.2. A particular component of that system, the distinction between S<sub>A</sub> and S<sub>P</sub> verbs, played a major role in the developments under discussion and is the topic of Section 1.2.3.

### 1.2.1 Proto-Cariban verbal person marking

Proto-Cariban is reconstructed by gildea1998 as using a person paradigm called Set I in its independent verb forms, shown in Table 3. The choice of person marker in transitive verbs can be characterized as being conditioned by a basic person hierarchy  $\boxed{1/2 > 3}$ . The locuphoric markers had two forms, an A-oriented one for direct (SAP>3) scenarios and a P-oriented one for inverse (3>SAP) scenarios. There was a single aliophoric marker *\*n(i)-*, which only surfaced in nonlocal (3>3) scenarios, without morphologically expressed distinctions between different third person referents. Local scenarios were expressed in a non-transparent manner, both using the 1+2 prefix *\*k-*.

Formally identical or etymologically related markers occurred in intransitive verbs, which showed a split-S system (Table 3b). That is, S<sub>A</sub> verbs took similar markers as the A-oriented ones in transitive verbs, with the exception of first person (1>3 \**t(i)*- vs 1S<sub>A</sub> \**w*-), as well as the absence of \**i* after all S<sub>A</sub> prefixes. On the other hand, S<sub>P</sub> verbs took markers fully identical to the P-oriented ones. The third person marker in S<sub>P</sub> verbs was identical to the one in 3>3 scenarios (\**n(i)*-).

Equipped with knowledge about the ancestral system, it becomes clear that the irregularly inflected Hixkaryána and Tiriyo preserve the original Proto-Cariban 1S<sub>A</sub> prefix \**w*- and are therefore CONSERVATIVE. They contrast with regular S<sub>A</sub> verbs, which are innovative in both languages. The reflexes of \**w*- may be considered RELICS, old and restricted to specific lexically conditioned contexts, contrasting with the innovative prefixes found elsewhere. The verbs and their prefixes are comparable with the few English nouns like *ox*, which preserve the old plural suffix *-en*. It, too, was once more widespread, being the normal plural suffix of the weak inflection, compare German *Ochse-n* ‘ox-en’, *Name-n* ‘name-s’, *Hase-n* ‘hare-s’, *Bär-en* ‘bear-s’. Since the irregular Hixkaryána and Tiriyo prefixes are conservative and the regular prefixes are innovative, the next question to be addressed is where these new prefixes came from.

### 1.2.2 Person marker extensions in intransitive verbs

In his discussion of the Proto-Cariban split-S system and reconstruction of the intransitive person prefixes, **gildea1998** shows that the system has undergone many different modifications in various languages. The main mechanism of change leading to these modifications are **person marker extensions**, i.e. the use of verbal person prefixes being extended to contexts previously occupied by other prefixes. There have been many different person marker extensions in Cariban languages, and some are still ongoing. This is illustrated by **gildea1998**, using the three Parukotoan languages as an example. Apart from segmental changes to individual morphemes, the following innovations happened in the Set I paradigm in Parukotoan:

#### 1. Proto-Parukotoan

- (a) 1S<sub>A</sub> \**w*- to 1>3
- (b) 1+2 \**k*- to 1S<sub>P</sub> (completed in Proto-Waiwaian, ongoing in Werikyana)
- (c) 1+2 \**kit*- to 1+2S<sub>P</sub> (completed in Proto-Waiwaian, ongoing in Werikyana)

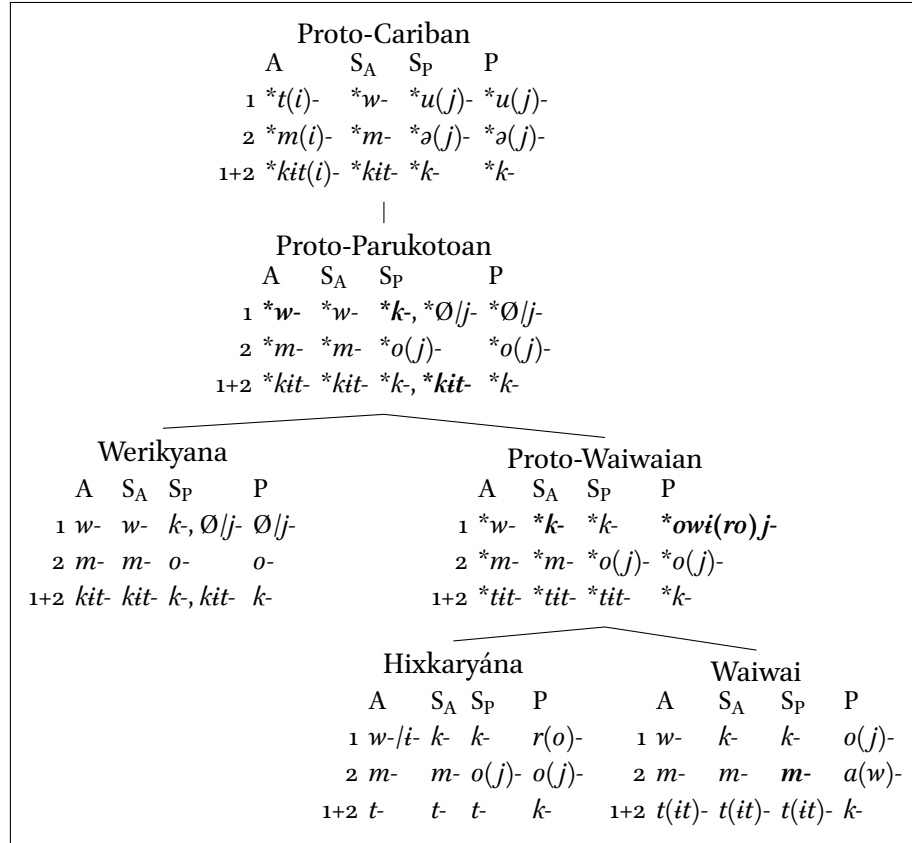
#### 2. Proto-Waiwaian

- (a) 1S<sub>P</sub> \**k*- to 1S<sub>A</sub>
- (b) innovative \**owiroj*- ‘1PRO LK’ for 1P

#### 3. Waiwai

(a)  $2S_A$   $m$ - to  $2S_P$ 

All innovations are person marker extensions except 2b, which combined a pronoun with the linker  $*j$ -. They are printed in bold in Figure 1, which reproduces [gildea1998](#) tables as a tree diagram, with adapted transcription and the additional alternative Werikyana  $1S_P$  marker  $\emptyset/j$ - (Spike Gildea, p.c.). Hixkaryána has preserved split-S only in the second person pre-

Figure 1: Person marking extensions in Parukotoan, after [gildea1998](#)

fixes, while Werikyana still shows the variation in the first person and 1+2 prefixes that is reconstructible to Proto-Parukotoan. Waiwai, on the other hand, has lost the system entirely, which notably happened via distinct innovations at three different diachronic stages.

[gildea1998](#) discusses person marker extensions only in the context of the loss of the split-S system and the accompanying changes to indexing alignment; for our story we will zoom in on a so far neglected aspect of these extensions. To begin, we argue that they took place via lexical diffusion, a type of extension ([harris1995historical](#)); this hypothesis is supported by three facts. First, the variation in first person and 1+2 prefixes described above for Werikyana is not completely free. Rather, some verbs only allow for example first person  $k$ -, but not  $j$ -,



Table 4: Some examples for completed extensions (gildea1998)

(a) Apalaí			(b) Panare			(c) Waimiri-Atroari		
	S <sub>A</sub>	S <sub>P</sub>		S <sub>A</sub>	S <sub>P</sub>		S	
1	<i>t</i> -/∅	<i>t</i> -/j-	1	<i>w</i> ( <i>t</i> )-	∅/j-	1	<i>w</i> ( <i>t</i> )-/i-	
2	<i>m</i> ( <i>t</i> )-	o-	2	<i>m</i> ( <i>t</i> )-		2	<i>m</i> ( <i>t</i> )-	
1+2	<i>s</i> ( <i>t</i> )-		1+2	<i>n</i> ( <i>t</i> )-		1+2	<i>h</i> ( <i>t</i> )-	
3	<i>n</i> ( <i>t</i> )-		3	<i>n</i> ( <i>t</i> )-		3	<i>n</i> -/∅	

while others can occur with both, which is the expected pattern in a lexical diffusion scenario. In addition, this is speaker-dependent (Spike Gildea, p.c.), which is what one would expect from a change in progress. Second, while there is no detailed diachronic scenario for the switch of 1>3 *\*t*- and 1S<sub>A</sub> in the Tiriyoan languages (Section 2.3), Meira (1998: 111–112) convincingly argues that it must have happened gradually rather than instantaneously, and entailed both markers spreading at the same time. Whether this gradual switch was along ordered lines or not, lexical diffusion must have played a role.

Our third argument in favor of the lexical diffusion scenario brings us back to the Hixkaryána and Tiriyo verbs with conservative first person forms: In both cases, the innovative 1S<sub>A</sub> prefixes were introduced by a person marker extension spreading via lexical diffusion. We interpret the continued presence of the old 1S<sub>A</sub> marker in a few verbs as the extension stopping short of these verbs, rather than affecting all targets (S<sub>A</sub> verbs). In our investigations of person marker extensions, we identified 19 individual cases affecting intransitive verbs, and found 6 of them to be incomplete. These incomplete extensions have left between 1 and 7 conservatively inflected verbs in 9 Cariban languages. Interestingly, all six extensions featured innovative first person markers on S<sub>A</sub> verbs. While extensions occurred with other person values as well, they never affected S<sub>A</sub> verbs, only S<sub>P</sub> ones, and they always affected all potential targets. Illustrative examples for complete extensions are shown in Table 4: the extension of 1+2S<sub>A</sub> *s*(*t*)- (< *\*kit*-) to S<sub>P</sub> verbs in Apalaí (Table 4a), of 2S<sub>A</sub> *m*(*t*)- in to S<sub>P</sub> verbs in Panare (Table 4b),<sup>5</sup> or the extension of the entire S<sub>A</sub> set to S<sub>P</sub> verbs in Waimiri-Atroari (Table 4c).

The markedly different behavior of S<sub>A</sub> and S<sub>P</sub> verbs with regards to the extent of extensions affecting them points to the split-S system playing some role, a suspicion which will be confirmed in Section 4. Thus, we will discuss that system in a little more detail before moving on to the incomplete extensions. This will also give readers an idea how it is possible for the S<sub>A</sub>/S<sub>P</sub> distinction to be lost only for a single person, or for S<sub>P</sub> verbs to take on S<sub>A</sub> markers with apparent semantic impunity.

<sup>5</sup>The presence of the third person marker *n*- for 1+2 is due to the wholesale loss of that inflectional value.

Table 5: Participles of S<sub>A</sub> and S<sub>P</sub> verbs (Schuring n.d.: 39; Alves 2017: 118, 207; Meira 1999: 333, 334; Tavares 2005: 400; E. Koehn & S. Koehn 1986: 35, 1994: kuruaz-154; Hoff 1968: 430, 433; T. E. Payne & D. L. Payne 2013: 232, 244)

Language	S <sub>A</sub>	S <sub>P</sub>
Werikyana	<i>t-ehurka-fɛ</i> ‘fallen’	<i>ti-jaʔ-so</i> ‘burnt’
Arara	<i>t-o-ep-te</i> ‘come’	<i>t-oregrum-te</i> ‘sad’
Tiriyó	<i>ti-w-ɔturu-e</i> ‘talked’	<i>t-əpə-se</i> ‘tired’
Wayana	<i>tə-w-epi-he</i> ‘bathed’	<i>t-onopi-he</i> ‘painted’
Apalaí	<i>t-o-ito-se</i> ‘gone’	<i>t-ihto-se</i> ‘gone down’
Kari’ña	<i>tu-w-oʔka-se</i> ‘come out’	<i>t-okari-se</i> ‘told’
Panare	<i>t-o-tatihpə-se</i> ‘wailed’	<i>ti-sirike-fɛ</i> ‘tired’

Table 6: Nominalizations of S<sub>A</sub> and S<sub>P</sub> verbs (Schuring n.d.: 49, 74; Alves 2017: 97; Meira 1999: 246; Tavares 2005: 130, 409; E. Koehn & S. Koehn 1986: 90, 1994: ner2-003; Hoff 1968: 135, 392; T. E. Payne & D. L. Payne 2013: 390; M.-C. Mattéi-Müller 1994: 23)

Language	S <sub>A</sub>	S <sub>P</sub>
Werikyana	<i>o-w-ehurka-tpiri</i> ‘your fall’	<i>o-onenmehi-tpiri</i> ‘your waking up’
Arara	<i>w-orik-tubo</i> ‘dancing place’	<i>erejmi-tpo</i> ‘killing instrument’
Tiriyó	<i>ji-w-ɔturu-to</i> ‘(for) my talking’	<i>j-emamina-to</i> ‘(for) my playing’
Wayana	<i>i-w-ɔturu-topo</i> ‘my story’	<i>j-iniki-topo</i> ‘my object for sleeping’
Apalaí	<i>j-epi-topo</i> ‘my bathing place’	<i>j-enuru-topō-piri</i> ‘the place of my birth’
Kari’ña	<i>a-w-ekupi-ri</i> ‘your taking a bath’	<i>aj-ereʔna-Ø</i> ‘your fainting’
Panare	<i>j-u-fɛreema-n</i> ‘their eating’	<i>tj-arunkampati-n</i> ‘his hair standing on end’

### 1.2.3 The morphological basis of the split-S system

As seen in Section 1.2.1, the Proto-Cariban distinction between S<sub>A</sub> and S<sub>P</sub> verbs was implemented by two inflection classes within the Set I prerson paradigm, but this was not the only morphological criterion: Many languages show an S<sub>A</sub> class marker in deverbalized forms, which can be reconstructed to Proto-Cariban as *\*w-*.<sup>6</sup> With S<sub>A</sub> verbs, *\*w-* occurred immediately between the possessive prefixes and the verb stem, while S<sub>P</sub> verbs took the bare prefixes. Reflexes of *\*w-* in languages from different branches are illustrated in Tables 5 and 6 for participles and nominalizations. The distinction between S<sub>A</sub> and S<sub>P</sub> was also borne out in imperatives. Here, S<sub>P</sub> verbs took the P-oriented second person prefix *\*ə(j)-*, while S<sub>A</sub> verbs were unprefixes (both suffixed with *\*-kə*). This is illustrated with reflexes in various modern lan-

<sup>6</sup>See Meira (2000: 227), who identifies reflexes of this morpheme as having “no purpose other than being ‘class markers’, without any obvious semantic or functional load”.

Table 7: Imperatives of S<sub>A</sub> and S<sub>P</sub> verbs (Derbyshire 1965: 44, 89; Alves 2017: 161; Meira 1999: 323; Tavares 2005: 227; E. Koehn & S. Koehn 1986: 62, 1994: Mopo/20; Hoff 1968: 190; M.-C. Mattéi-Müller 1994: 5, 17)

Language	S <sub>A</sub>	S <sub>P</sub>
Hixkaryana	<i>omoh-ko</i> ‘come!’	<i>oj-okajim-ko</i> ‘go up!’
Arara	<i>odotpot-ko</i> ‘come back!’	<i>o-alum-ko</i> ‘jump!’
Tiriyó	<i>epi-kə</i> ‘bathe!’	<i>ə-eremina-kə</i> ‘sing!’
Wayana	<i>əməm-kə</i> ‘enter!’	<i>əw-eremi-kə</i> ‘sing!’
Apalaí	<i>otuʔ-ko</i> ‘eat!’	<i>o-niʔ-ko</i> ‘sleep!’
Kari’ña	<i>oʔmaʔ-ko</i> ‘stop!’	<i>aj-awon-ko</i> ‘get up!’
Panare	<i>ape-ʔ</i> ‘flee!’	<i>ahpən-kə</i> ‘jump!’

guages in Table 7. Both the S<sub>A</sub> marker \*w- in participles and nominalizations and the prefixes in imperativees have been lost in some languages, but are reconstructible to Proto-Cariban. However, there was one further property uniting most S<sub>A</sub> verbs, not based on inflectional morphology.

Mismatches between the semantics of intransitive verbs and their A- or P-oriented inflectional morphology are common, exemplified with modern Kari’ña data in (1–2).

(1) Kari’ña

- a. *mi-kupi-ja*  
2>3-bathe-PRS  
‘You bathe him/her.’ (Hoff 1968: 160)
- b. *a-kupi-ja*  
3>2-bathe-PRS  
‘S/he bathes you.’ (yamada2011evidentiality)

In (1), the choice between the second person A- and P-oriented markers *mi-* and *a-* depends on the scenario: The transitive verb *kupi* ‘to bathe’ takes *mi-* in 2>3 scenarios (1a), but *a-* in 3>2 scenarios (1b). The intransitive verbs in (2) show the same person markers, but there is no choice what marker a specific verb uses.

(2) Kari’ña

- a. *sipi tinka-ri m-ekema-non hen*  
net pull-NMLZ 2-be.afraid-PRS.UNCERT eh?  
‘You’re afraid to pull up the net, aren’t you?’ (Courtz 2008: 253)

- b. *aya:woiya*  
*aj-awomi-ja*  
 2-get.up-PRS  
 ‘You are getting up.’ (Hoff 1968: 167)

Rather, *ekema* ‘to be afraid’ takes an A-oriented marker, since it is an S<sub>A</sub> verb (2a), while the S<sub>P</sub> verb *awomi* ‘to get up’ takes a P-oriented marker (2b). It seems that in both cases, the prefix does not contribute to the semantics of the predicate, since there are clear mismatches: ‘to be afraid’ with an “agentive” marker can hardly be considered a volitional act, while ‘to get up’ with a “patientive” marker must be considered volitional. Meira (2000) takes a sizable corpus of intransitive verbs from Tiriyo, Kari’ña, Apalaí, and Wayana, and categorizes them by applying different criteria commonly encountered in split-S systems. He shows that neither (non)activities, (non-)agency, (in-)animacy, nor Aktionsart satisfactorily predict the class membership of intransitive verbs.

Rather, the reason for a verb to take the A- or P-oriented prefix is (at least diachronically) a morphological one. Meira (2000: 217–221) demonstrates that those intransitive verbs which (etymologically) have a detransitivizing prefix are treated as S<sub>A</sub> verbs, while essentially all others are S<sub>P</sub> verbs:

Almost all verbs in the S<sub>A</sub> class are detransitized forms of transitive verbs, either synchronically (with still existing transitive sources) or diachronically (with reconstructible but no longer existing transitive sources)  
 (Meira 2000: 201)

Meira (2000: 221–223) also argues that the detransitivizing prefixes are indeed deriving S<sub>A</sub> verbs, rather than being inflectional in nature: a) there are a few underived S<sub>A</sub> verbs, with no detransitivizing prefix; b) S<sub>A</sub> verbs can develop irregular semantics compared to their transitive counterparts; c) it is unpredictable whether the A or P argument of the underlying transitive verb becomes the S of the derived S<sub>A</sub> verb; d) some originally derived S<sub>A</sub> verbs have lost their transitive counterparts; and e) “basic” concepts are expressed as derivations of more complex concepts, like ‘to dance (S<sub>A</sub>)’ from ‘to dance with (TR)’. He also notes that this leads to an inflectional split not based in meaning, but rather morphology:

Apparently, the morphological behavior of the S<sub>A</sub> verb class is an accidental consequence of the fact that detransitivization, as far back as we can reconstruct, entails all the morphology described [...] as typical of S<sub>A</sub> verbs. The alignment of person-marking prefixes appears not to be driven by any semantic forces in the language; it is as though they were being dragged by the evolution of the reflexive marker.  
 (Meira 2000: 226)

As for the form of this marker, **meira2010origin** reconstruct two distinct prefixes for Proto-Cariban: reciprocal *\*ate-* and reflexive *\*e-*, although they have since merged into a

single morpheme, apparently in all languages. Modern reflexes of *\*ate/e*-show a range of meanings, which can all be characterized as “detransitive”; this range is illustrated with Tiriyo examples in (3).

(3) Tiriyo (Meira 2000: 218–219, 1999: 128, 256)

<i>nonta</i> 'abandon'	→	<i>e-nonta</i> , <i>əi-nonta</i>	'abandon each other' (reciprocal)
<i>suka</i> 'wash'	→	<i>e-suka</i> , <i>əi-suka</i>	'wash self' (reflexive)
<i>pahka</i> 'break (TR)'	→	<i>e-pahka</i>	'break (INTR)' (anticausative)
<i>puunəpi</i> 'think about'	→	<i>əh-puunəpi</i> , <i>əi-puunəpi</i>	'think, meditate' (antipassive)

The morphological variation featured in ‘to abandon each other’ and ‘to wash self’ is due to the mentioned collapse between the two Proto-Cariban prefixes: *e-* is a reflex of the reflexive prefix *\*e-*, while the form *əi-* originates in reciprocal *\*ate-*. However, both can occur with either meaning – at least for these two verbs.

#### 1.2.4 Summary and outlook

We identified  $S_A$  verbs that irregularly inflect for first person in 9 Cariban languages. These irregular forms are actually conservative, unaffected by person marker extensions spread via lexical diffusion. Such conservative forms are only found among the first person forms of (etymological)  $S_A$  verbs. Our primary goal is to establish what verbs remained unaffected by the individual extensions and to search for factors explaining the patterns, proceeding as follows: The topic of Section 2 are the six incomplete innovations, the innovative markers they introduced, and the verbs they left untouched. Since these verbs show considerable etymological overlap between languages, they are reconstructed and discussed in more detail in Section 3. Finally, we search for factors motivating the resistance of these verbs, discuss the findings and put them in a general context of language change and morphology in Section 4.

## 2 Incomplete extensions: the innovative $1S_A$ markers

As stated in Section 1.2.2, the person marker extensions which did not affect all potential targets all have in common that they feature innovative first person markers on verbs that are (at least historically) members of the  $S_A$  class. Of the six attested incomplete extensions,

Table 8: Regular Pekodian S<sub>A</sub> verbs (Meira 2003a: 4; Alves 2017: 150; Pachêco 2001: 52)

	Bakairi ‘to go up’	Arara ‘to dance’	Ikpeng ‘to run’
1	<i>k-əku-</i>	<i>k-origu-</i>	<i>k-aranme-</i>
2	<i>m-əku-</i>	<i>m-origu-</i>	<i>m-aranme-</i>
1+2	<i>kíd-əku-</i>	<i>kud-origu-</i>	<i>kw-aranme-</i>
3	<i>n-əku-</i>	<i>Ø-origu</i>	<i>Ø-aranme-</i>

three can be reconstructed to intermediate proto-languages, while three others happened in earlier stages of single modern languages. The sources of innovative markers vary, but not much: the innovative 1S<sub>A</sub> prefix is formally identical to the 1+2P/S<sub>P</sub> marker (Proto-Cariban *\*k-*) in three cases, to the 1P/S<sub>P</sub> marker (Proto-Cariban *\*u(j)-*) in two cases, and to the 1>3 marker (Proto-Cariban *\*t-*) in one case. We discuss each extension separately, contrasting regular and innovative verbs with irregular and conservative verbs, and reconstructing forms where necessary: Section 2.1 investigates the innovation of *\*k-* in Proto-Pekodian, reflected in the three daughter languages Arara, Ikpeng, and Bakairi. Section 2.2 takes a closer look at the extension of *\*k-* in Proto-Waiwaian, which was briefly shown in Section 1.2.2. Section 2.3 concerns the extension of *\*t-* in Proto-Tiriyoan (or Proto-Taranoan), reflected in modern Tiriyo and Akuriyo. Sections 2.4 to 2.6 look at innovative first person markers which are only attested in single modern languages: *k-* in Akuriyo, and *j-* in Carijona and Yukpa.

## 2.1 Proto-Pekodian *\*k-*

The Pekodian branch was suggested by Meira & Franchetto (2005), as the result of fieldwork on Bakairi by Meira and the availability of more material on Ikpeng. It consists of closely related Arara and Ikpeng, with Bakairi as a more distant member. Meira & Franchetto (2005) focused on phonological and lexical properties, so no reconstructive work on Proto-Pekodian morphosyntax can be found in the literature. However, all three Pekodian languages have a regular 1S<sub>A</sub> marker *k-*, as evidenced by the paradigms in Table 8. Thus, it is possible to reconstruct a Proto-Pekodian 1S<sub>A</sub> marker *\*k-*.

In the most detailed description of a Pekodian language, Alves (2017) describes six<sup>7</sup> Arara S<sub>A</sub> verbs forming a subclass defined by a first person marker *w(i)-* rather than *k-*, listed in (4). From a comparative perspective, this list is not quite complete, as there is also a reflex of the copula *\*a[p]*, serving syntactically as a postposition introducing adverbial clauses meaning ‘if’ or ‘when’ (Alves 2017: 199–201). However, its inflectional morphology features verbal Set I prefixes, including first person *w-* (5).

<sup>7</sup>Seven under her analysis, which sees the two meanings of *iffi* ‘to be, to lie down’ as different verbs.

## (4) Arara (Alves 2017: 153)

*wi-geni* 'I said'  
*w-iffini* 'I was, lied down'  
*w-ebini* 'I came'  
*w-ibini* 'I bathed'  
*w-iptoyri* 'I went down'  
*w-idoli* 'I went'

## (5) Arara (Alves 2017: 200)

1 *w-aptam* 'when/if I was'  
 2 *m-od-aptam*  
 1+2 *kud-aptam*  
 3  $\emptyset$ -*aptam*

In his brief discussion of Bakairi verbal person marking, Meira (2003a) reports the existence of two subclasses of  $S_A$  verbs, one taking first person *w-*, and one *k-*. The verb used to illustrate the first group is *i* 'to bathe' (6), contrasting with regular *aku* 'to go up' in Table 8 above.

## (6) Bakairi (Meira 2003a: 4)

*w-i-də*  
 1 $S_A$ -bathe-IMM  
 'I bathed'

Since 'to bathe' is also found in the *w*-list for Arara, other Bakairi cognates of these verbs are of interest. While Meira (2003a: 4) does list *ge* 'to say', *tə* 'to go', and *æ(wi)* 'to come' as examples of  $S_A$  verbs, he does not indicate whether they belong to the class of  $S_{A-1}$  verbs, with first person *k-*, or the  $S_{A-2}$  verbs, with *w-*.<sup>8</sup> Luckily, while von den Steinen (1892) did not accurately record all phonemic distinctions in Bakairi (Meira 2005), he does provide inflected forms of cognates to the Arara verbs in (4). We present them in (7) according to our current understanding of Bakairi phonology and verbal morphology, based on wheatley1969bakairifranchetto2016classesMeira (2003a, 2005).

## (7) Bakairi (von den Steinen 1892: 131, 397, 76, 137, 374, 130)

a. ⟨u-yépa⟩  
*u-ge-pa*  
 1 $S_A$ -say-NEG  
 'I don't say.'

b. ⟨wi-táki⟩ / ⟨wi-tági⟩  
*w-i-taki*  
 1 $S_A$ -be-INT  
 'I was.'

<sup>8</sup>It should be noted at this point that Meira (2003a) indicates that the same verbs which take first person *w-* in Bakairi also take a 1+2 marker *k-*. However, this marker is only illustrated for 'to bathe', both by Meira (2003a) and von den Steinen (1892). Given the lack of data for other verbs, we will not further discuss this potential additional pattern. If the characterization by Meira is accurate, then the pattern is fully parallel to the distribution of the first person prefixes.

- |   |  |
|---|--|
| <p>c. &lt;kχaewí-le&gt;<br/> <i>k-æwi-li</i><br/> 1S<sub>A</sub>-come-IMM<br/> ‘I came.’</p> <p>d. &lt;kχ-itaké-he&gt;<br/> <i>k-itagi-se</i><br/> 1S<sub>A</sub>-go.down-NPST?<br/> ‘I go down.’</p> | <p>e. &lt;úta&gt; / &lt;uúta&gt;<br/> <i>u-tə</i><br/> 1S<sub>A</sub>-go<br/> ‘I go.’</p> <p>f. &lt;töre-w-akine&gt;<br/> <i>tərə w-a-kine</i><br/> there 1S<sub>A</sub>-be-PST.CONT<br/> ‘I was there.’</p> |
|---|--|

All available descriptions of the third Pekodian language, Ikpeng, list *k-* as the only 1S<sub>A</sub> marker (Pachêco 1997: 55; Campetela 1997: 105; Pachêco 2001: 64; Alves Chagas 2013: 205). However, most Ikpeng cognates of the Arara verbs with 1S<sub>A</sub> *w-* actually do not take *k-*, but rather *i-* or  $\emptyset$ , as shown in (8). The exception is ‘to go’, which has *k-* (9). There is a formally identical Ikpeng cognate of Arara *ipton* ‘to go down’, but no first person forms are attested (Angela Chagas, p.c.). Further, while there are reflexes of *\*a[p]* ‘to be’ in Ikpeng, it seems that only reflexes of *\*eti* occur with first person inflectional prefixes (*gildea2018reconstructing*).

(8) Ikpeng

- a. *i-ge-li*  
1-say-REC  
‘I said.’ (Pachêco 2001: 209)
- b.  $\emptyset$ -*effi-li*  
1-be-REC  
‘I was.’ (Pachêco 2001: 139)
- c. *affagotpop*  $\emptyset$ -*ip-tfi*      *ik-gwa-kfti*  
always      1-bathe-NPST      river-LOC.aquatic-ALL  
‘I always bathe in this river.’ (Pachêco 1997: 68)

(9) Ikpeng (Pachêco 2001: 80)

- k-aran-tfi*  
1-go-NPST  
‘I’m going.’

Table 9 gives an overview of the first person forms of the seven verbs under discussion, along with our Proto-Pekodian reconstruction. The presence and distribution of the Ikpeng 1S<sub>A</sub> marker *i-/* $\emptyset$  suggests that it is cognate with Arara 1S<sub>A</sub> *w(i)-*. Indeed, Proto-Xinguan *\*w* is attested as sometimes being lost in Ikpeng, as evidenced by the correspondences in Table 10.



Table 9: Verbs preserving 1S<sub>A</sub> \*w- in Proto-Pekodian (Alves 2017: 153, 200; von den Steinen 1892: 76, 130, 131, 137, 374, 397; Pachêco 2001: 42, 80, 139, 209, 1997: 68; Meira 2003a: 4; p.c., Angela Fabíola Alves Chagas)

	Proto-Pekodian	Arara	Ikpeng	Bakairi
‘be-1’	*w- <i>ap</i> -	w- <i>ap</i> -	–	w- <i>a</i> -
‘be-2’	*w- <i>effi</i> -	w- <i>iffi</i> -	Ø- <i>effi</i> -	w- <i>i</i> -
‘say’	*wi- <i>ge</i> -	wi- <i>ge</i> -	i- <i>ge</i> -	u- <i>ge</i> -
‘go’	*w- <i>itān</i> -	w- <i>ido</i> -	k- <i>aran</i> -	u- <i>tā</i> -
‘come’	*w- <i>epi</i> -	w- <i>ebi</i> -	k- <i>arep</i> -	k- <i>æwi</i> -
‘go down’	*w- <i>iptā</i> -	w- <i>ipton</i> -	?- <i>ipton</i> -	k- <i>itāgi</i> -
‘bathe’	*w- <i>ipi</i> -	w- <i>ibi</i> -	Ø- <i>ip</i> -	w- <i>i</i> -

Table 10: Loss of \*w in Ikpeng (de Souza 1993: 44, 70; Alves Chagas 2013: 118; Alves 2017: 143; Pachêco 2001: 21, 164; de Souza 2010: 9; Campetela 1997: 40)

Meaning	Arara	Ikpeng
‘to defecate’	watke	atke
‘DAT’	wina	ina
‘dog’	wokori	akari
‘capuchin monkey’	tawe	tae
‘to sleep’	winki	inki

While it is by no means a regular sound change, it allows us to securely connect the two prefixes. Similarly, the supposed change of \*wi to Bakairi *u* is found in other correspondences, like *udo* (Meira & Franchetto 2005) from Proto-Cariban \*witoto ‘person’ (gildea2007greenberg). Thus, we reconstruct a 1S<sub>A</sub> prefix \*w(*i*)- to Proto-Pekodian, identical to the Arara one both in form and distribution.

As for the forms of the verb stems, a few comments are necessary: For ‘to be’, Ikpeng *e* is very likely the original vowel, given the Proto-Cariban form \*eti (Section 3.1). For ‘to go down’, we reconstruct \*i as the initial vowel rather than \*i (Section 3.5). Further, the forms are not fully cognate; Meira & Franchetto (2005) make no mention of a regular correspondence between Bakairi *gi* and Ikpeng *ŋ*. However, the addition of a final *ŋ* in Proto-Xinguan is attested elsewhere,<sup>9</sup> and based on the fact Bakairi has generally lost much segmental material, we suggest that both *ŋ* and *gi* are later additions to a root \*iptā.

The forms for ‘to come’ are not fully cognate, either: Ikpeng and Bakairi both show a

<sup>9</sup>a) Proto-Cariban \*ane ‘to see’, Arara and Ikpeng *eney*; b) Proto-Cariban \*ata ‘to hear’, Arara *taŋ*, Ikpeng *iraŋ*; and c) Proto-Cariban \*anə ‘to eat meat’, Arara *onon* ‘to bite’ (gildea2007greenbergAlves 2017: 56, 144, 57; Pachêco 2001: 25, 270).

reflex of the Proto-Pekodian detransitivizer *\*əd-* in combination with a root reconstructible as *\*epi*. In contrast, the Arara first person form is directly based on this root *\*epi*. However, reflexes of *\*əd-epi* can be found elsewhere in the Arara paradigm (10).

- (10) Arara (Alves 2017: 150)  
*m-odebi-ni*  
 2S<sub>A</sub>-come-REC  
 ‘You came.’

On the other hand, both Ikpeng and Bakairi show reflexes of *\*əd-ebi* throughout the whole paradigm. Following the line of reasoning used by Meira (1998: 114) (see also Section 2.3) for a similar pattern in the three Taranoan languages, we suggest that the idiosyncratic pattern in Arara is reconstructible to Proto-Pekodian, and that Bakairi and Ikpeng independently regularized the paradigm to only use *\*əd-epi*; similar issues are found outside of Pekodian (Section 3.4).

Finally, the V-initial nature of Proto-Pekodian ‘to go’ is evidenced in its Xinguan forms; while the Bakairi change *\*wi* → *u* obscured the morpheme boundary, other forms are V-initial (Section 3.3). The Ikpeng form *aran* is compatible with our reconstruction *\*itən* when considering that Ikpeng *a* is an attested outcome of *\*ə*.<sup>10</sup> This attested change of *\*ə* to *a* need only be preceded by a assimilatory lowering of initial *\*i* to *\*ə*, to yield the form *aran* from *\*itən*. Other Ikpeng reflexes of ‘to go’ offer evidence for the suggested intermediate stage *\*ətən*: *əro-li* ‘s/he went’ (Pachêco 2001: 25).

Summing up, an innovative 1S<sub>A</sub> marker *\*k-* is reconstructible to Proto-Pekodian. Seven verbs can be reconstructed as having resisted this innovation and preserving 1S<sub>A</sub> *\*w(i)-* in Proto-Pekodian. In later, individual developments, Bakairi extended *k-* to ‘to go down’, and Ikpeng to ‘to go’. Further, both languages regularized the paradigm of ‘to come’ to *\*əd-epi*, accompanied by the introduction of first person<sub>5</sub> *k-*.

## 2.2 Proto-Waiwaian *\*k-*

This extension led to the Hixkaryána pattern from Table 1 in Section 1.2 and was one of the Parukotoan extensions discussed in Section 1.2.2. In Proto-Waiwaian, the new 1S<sub>P</sub> prefix *\*k-*, already innovated at the Proto-Parukotoan stage, was extended to 1S<sub>A</sub>. For regularly inflected verbs, this created a unified 1S category, reflected in both Hixkaryána and Waiwai (Table 11).

Not all S<sub>A</sub> verbs were affected: Waiwai *ka* ‘to say’ does not take *kí-*, but rather conservative *wí-* (11a). Its Hixkaryána counterpart has a prefix *i-* (11b), a potential reflex of 1S<sub>A</sub> *\*w(i)-*. A formally identical prefix occurs in 1>3 scenarios in Hixkaryána (11c), which regularly corresponds to Waiwai *w(i)-* (11d).

<sup>10</sup>a) *akari* ‘dog’ in Table 10 above; b) *anma* ‘path’ (Pachêco 2001: 24) from Proto-Cariban *\*ətema* (gildea2007greenberg); and c) *jaj* ‘tree’ (Pachêco 2001: 98) from Proto-Cariban *\*jəje*.

Table 11: Regular ‘to fall’ (S<sub>A</sub>) and ‘to sleep’ (S<sub>P</sub>) in Proto-Waiwaian (Howard 2001: 150; Derbyshire 1985: 189, 190, 196; W. N. Hawkins & R. E. Hawkins 1953: 209, 211; R. E. Hawkins 1998: 30)

	Proto-Waiwaian		Hixkaryana		Waiwai	
	‘to fall’	‘to sleep’	‘to fall’	‘to sleep’	‘to fall’	‘to sleep’
1	* <i>k-efurka-</i>	* <i>ki-winiki-</i>	<i>k-ehurka-</i>	<i>ki-niki-</i>	<i>k-efirka-</i>	<i>ki-winiki-</i>
2	* <i>m-efurka-</i>	* <i>o-winiki-</i>	<i>m-ehurka-</i>	<i>o-wniki-</i>	<i>m-efirka-</i>	<i>mi-winiki-</i>
1+2	* <i>t-efurka-</i>	* <i>tit-winiki-</i>	<i>t-ehurka-</i>	<i>ti-niki-</i>	<i>tf-efirka-</i>	<i>tit-winiki-</i>
3	* <i>j-efurka-</i>	* <i>ni-winiki-</i>	<i>j-ehurka-</i>	<i>ni-niki-</i>	<i>j-efirka-</i>	<i>ni-winiki-</i>

- (11) a. Waiwai (R. E. Hawkins 1998: 71)  
*wiikekpe*  
*wi-ka-jakpe*  
 1-say-PST  
 ‘I said.’
- b. Hixkaryana (Derbyshire 1985: 124)  
*roxehra nay hami Kaywerye ikekoni*  
*ro-fe-hira n-a-je hami kajwerje i-ka-jakoni*  
 1-DES-NEG 3-be-NPST.UNCERT EVID K. 1S<sub>A</sub>-say-REM.CONT  
 ‘I said (to myself), “Kaywerye evidently doesn’t like me”’
- c. Hixkaryana (Derbyshire 1985: 191)  
*i-koroka-no*  
 1>3-wash-IMM  
 ‘I washed him.’
- d. Waiwai (R. E. Hawkins 1998: 192)  
*wiyesî*  
*wi-jo-jasi*  
 1>3-boil-NPST  
 ‘I will boil it.’

This correspondence allows us to establish Hixkaryana *i-* a reflex of \**w(i)-*, with a similar phonological reduction as in Ikpeng (Section 2.1). Notably, Derbyshire (1985) does not see this *i-* as an irregular 1S<sub>A</sub> prefix, but as the regular 1>3 prefix, because he considers Hixkaryana *ka* ‘to say’ to be transitive (Section 3.2).

There are three more verbs which did not take innovative \**k-* in Proto-Waiwaian, shown alongside \**ka* ‘to say’ in Table 12. The two roots for ‘to be’ are straightforwardly reconstructible, whereas ‘to go’ is somewhat of a special case. While Hixkaryana has the expected *i-*, Waiwai seems to have combined innovative *k-* with the old \**w-*, an etymological analysis also con-

Table 12: Verbs preserving 1S<sub>A</sub> \*w- in Proto-Waiwaian (Derbyshire 1985: 70, 197, 198, 1979: 4; R. E. Hawkins 1998: 71, 85; p.c., Spike Gildea)

	Proto-Waiwaian	Hixkaryána	Waiwai
‘be-1’	*w-ah-	w-ah-	w-a-
‘be-2’	*w-efi-	w-efe-	w-eeft-
‘say’	*wi-ka-	i-ka-	wi-ka-
‘go’	*wi-tom-	i-to-	kiw-tom-

sidered by **gildea1998**. Alternatively, this form might have been influenced by deverbalized forms of ‘to go’, where a reflex of the S<sub>A</sub> class marker \*w- has become fossilized (12).

(12) Waiwai reflexes of the S<sub>A</sub> class marker \*w-

- a. *o-wto-topo-nho* ‘my trip’ (R. E. Hawkins 1998: 92)
- b. *o-wto-ffhe* ‘after I went’ (R. E. Hawkins 1998: 165)
- c. *ki-wto-me* ‘for us to go’ (R. E. Hawkins 1998: 204)

In any case, Hixkaryána ‘to go’ was clearly not affected by the extension of \*k-, allowing us to reconstruct a Proto-Waiwaian first person form \*wi-tom-.

Summing up, we reconstruct the four verbs \*efi and \*a[h] ‘to be’, \*ka[s] ‘to say’, and \*[i]to[m] ‘to go’ as preserving the old 1S<sub>A</sub> marker \*w- in Proto-Waiwaian, while the rest took on innovative \*k-.

### 2.3 Proto-Tiriyoan \*t-

The moniker Tiriyoan subsumes Tiriyo and Akuriyo, the more closely related of the three Taranoan languages already identified by **girard1971proto**, the more distant member being Carijona. Meira (1998) provides an extensive phonological, morphological, and lexical reconstruction of Proto-Taranoan. He faces an interesting puzzle in the Set I paradigms of Tiriyo and Akuriyo: Proto-Cariban 1>3 \*t- and 1S<sub>A</sub> \*w- seem to have switched places. This resulted in a regular 1S<sub>A</sub> marker of the form \*ff- / \_e, \*t- / \_ə (Table 13).<sup>11</sup> The question of how this switch happened in detail (Meira 1998: 107–112) still has no answer, although it seems necessary to assume a scenario whereby both \*t- and \*w- for a time occurred on both transitive and intransitive verbs (Meira 1998: 112).<sup>12</sup> Regarding S<sub>A</sub> verbs unaffected by the spread of \*t-, Meira

<sup>11</sup>The latter allomorph was subsequently replaced by k- in Akuriyo (Section 2.4).

<sup>12</sup>In fact, even the issue of *when* this happened is open. It could have happened at the Proto-Taranoan stage, but the subsequent introduction of j- in Carijona (Section 2.5) would have erased any traces of such an innovation. Accordingly, Meira (1998) hesitates to assign this extension to a specific proto-language. We take a conservative stance and reconstruct it to Proto-Tiriyoan only, but acknowledge the possibility of it taking place already in Proto-Taranoan.

Table 13: Regular Proto-Tiriyoan S<sub>A</sub> verbs (Meira 1999: 292, 294; Gildea 1994: 87)

	‘to bathe (INTR)’			‘to sleep’		
	Proto-Tiriyoan	Tiriyo	Akuriyo	Proto-Tiriyoan	Tiriyo	Akuriyo
1	* <i>f-epi-</i>	<i>s-epi-</i>	<i>ff-epi-</i>	* <i>t-əəniki-</i>	<i>t-əəniki-</i>	<i>k-əəniki-</i>
2	* <i>m-epi-</i>	<i>m-epi-</i>	<i>m-epi-</i>	* <i>m-əəniki-</i>	<i>m-əəniki-</i>	<i>m-əəniki-</i>
1+2	* <i>ke-epi-</i>	<i>ke-epi-</i>	<i>ke-epi-</i>	* <i>kit-əəniki-</i>	<i>kit-əəniki-</i>	<i>kəʔ-əəniki-</i>
3	* <i>n-epi-</i>	<i>n-epi-</i>	<i>n-epi-</i>	* <i>n-əəniki-</i>	<i>n-əəniki-</i>	<i>n-əəniki-</i>

Table 14: Verbs preserving 1S<sub>A</sub> \**w-* in Proto-Tiriyoan (Meira 1998: 112, 113, 114, 115, 165, 1999: 292, 294, 339)

	Proto-Tiriyoan	Tiriyo	Akuriyo
‘be-1’	* <i>w-a-</i>	<i>w-a-</i>	Ø- <i>a-</i>
‘be-2’	* <i>w-eʔi-</i>	<i>w-ei-</i>	?- <i>eʔi-</i>
‘say’	* <i>wi-ka-</i>	<i>wi-ka-</i>	<i>wi-ka-</i>
‘go’	* <i>wi-təmi-</i>	<i>wi-tən-</i>	ə- <i>təmi-</i>
‘come’	* <i>w-əʔepi-</i>	<i>w-əepi-</i>	Ø- <i>eepi-</i>

(1998) reconstructs the first four items in Table 14 as taking \**w-* in Proto-Taranoan – attentive readers may recognize Tiriyo ‘to go’ – for which we provide our reconstructed Proto-Tiriyoan forms. To this list, the other copular root \**eʔi* (Proto-Taranoan \**effi* [Meira 1998: 165]) can be added, which has first person *w-*, at least in Tiriyo.

We agree with Meira’s (1998: 113) identification of the idiosyncratic Akuriyo first person prefix ə- on ‘to go’ as a reflex of \**wi-*. Both components of the irregular change \**wi-* > ə- – loss of \**w* and lowering of \**i* to ə – are found in other person prefixes (13).

- (13) a. Akuriyo (Gildea 1994: 86)  
       (*w*)*i-toka*  
       1>3-hit  
       ‘I hit him/her.’
- b. Akuriyo (Meira 1998: 114)  
       *kəʔ-eepi*  
       1+2-come  
       ‘We came.’

For ‘to come’, Meira (1998: 114–115) reconstructs Proto-Taranoan \**əepi* for first person, and \**eepi* for the other person values, based on an idiosyncratic paradigmatic pattern in Tiriyo and the vowel length in Akuriyo. Akuriyo (and Carijona) then levelled this original distribu-

tion, similar to what we have suggested for Pekodian (Section 2.1). We agree with this scenario, with the exception that Tiriyo *æpi* looks like a reflex of *\*æt-epi* (Section 3.4), meaning that the Proto-Tiriyoan form would have been *\*æ?epi*.

In addition, Gildea (1994) recorded four more Akuriyó verbs seemingly not affected by innovative *\*t-* (14a), all *e*-initial movement verbs. We have only found a Tiriyo cognate for *erama* ‘to return’, which behaves like a regular *S<sub>A</sub>* verb in taking *s-* (14b). Further, these verbs are not mentioned by Meira (1998), who was also working with Gildea’s (1994) data. Given that this data potentially has strong Tiriyo and/or Wayana influence (Gildea 1998) and the lack of support by the available part of Meira’s (1998) data, we cannot reconstruct these verbs as not being affected by the extension of Proto-Tiriyoan *\*t-*.

- (14) a. Akuriyó *1S<sub>A</sub>* *\*w-* (Gildea 1994: 84–86)  
           ‘return’    Ø-*erama-*  
           ‘get up’    Ø-*eokahtə-*  
           ‘jump’     *w-ejahka-*  
           ‘go out’   *w-ekirika-*  
       b. Tiriyo *s-erama-* (Meira 1999: 301)

## 2.4 Akuriyó *k-*

After the split-up of Proto-Tiriyoan, when *\*t-* had largely replaced *\*w-*, Akuriyó innovated yet another *1S<sub>A</sub>* marker: *k-*. It seems to have replaced *\*t-* only in specific environments, with the two markers showing a clear phonologically conditioned distribution in the Akuriyó data available to us (Gildea 1994), with all relevant verbs shown in Table 15. Meira (1998: 107) largely confirms the distribution shown here, but mentions “several cases of first person *t-* in Akuriyó” (on *ə*-initial verbs), albeit without any examples. He also suggests that *k-* might be more recent, with which we agree: since the distribution *\*t- / \_ə / \*tʃ- / \_e* is reconstructible to Proto-Tiriyoan, the most likely scenario is *k-* replacing *\*t-* but not *\*tʃ-*. The few *t-* mentioned by Meira (1998) were then either reintroduced under Tiriyo influence, or are the last remnants of the replacement of *\*t-*. Since there are no examples of, or further information about, *ə*-initial verbs with *t-*, we cannot discuss these cases.

The verbs listed for Proto-Tiriyoan in Table 14 above did of course also not introduce *k-* in Akuriyó, although we do not know the first-person form of the copular verb *e?i*. In addition, there is an *S<sub>A</sub>* verb *i(h)tə* ‘to go down’, which has an irregular first person marker *p-* in Akuriyó, also reconstructible to Proto-Tiriyoan (15). It was not affected by the extension of Akuriyó *k-*, but whether it was an *S<sub>A</sub>* verb when Proto-Tiriyoan *\*t-* was extended is unclear (see Section 3.5).

- (15) First person forms of ‘to go down’  
       Tiriyo     *p-ihətə-*   (Meira 1999: 294)  
       Akuriyó   *p-itə-*     (Gildea 1994: 84)

Table 15: Regular Akuriyó 1S<sub>A</sub> markers (Gildea 1994: 77, 79, 82, 84, 85, 86, 87)

first person <i>k-</i>	first person <i>fj-</i>
<i>æempa-</i> ‘to learn’	<i>epi-</i> ‘to bathe (INTR)’
<i>æǝfǝna-</i> ‘to cry’	<i>ekirika-</i> ‘to stay back’
<i>aiwa-</i> ‘to tremble’	<i>entapo-</i> ‘to yawn’
<i>amami-</i> ‘to enter’	<i>etonema-</i> ‘to lie down’
<i>atajiŋka-</i> ‘to run’	<i>ewai-</i> ‘to sit down’
<i>aturu-</i> ‘to talk’	<i>ehpa-</i> ‘to bathe (INTR)’
<i>æniki-</i> ‘to sleep’	

Table 16: Regular Carijona verbs (Robayo Moreno 2000: 173; Meira 1998: 106)

	‘to dance’	‘to arrive’
1	<i>j-eharaga-</i>	<i>ji-tuda-</i>
2	<i>m-eharaga-</i>	<i>mi-tuda-</i>
1+2	<i>kis-eharaga-</i>	<i>kisi-tuda-</i>
3	<i>n-eharaga-</i>	<i>ni-tuda-</i>

## 2.5 Carijona *j-*

Carijona, the cousin of the Tiriyoan languages, has extended the 1S<sub>P</sub> marker *j(i)*-<sup>13</sup> to S<sub>A</sub> verbs (Meira 1998: 105–107). Combined with the extension of 2S<sub>A</sub> *m-* and 1+2S<sub>A</sub> *kit-/kis-* to S<sub>P</sub> verbs, this created a single unified S category for regularly inflected verbs (Table 16). Although the split-S system has been lost entirely, former S<sub>A</sub> verbs can be identified by the presence of a detransitivizer, like *ehinahi* ‘to fight’, derived from *hinahi* ‘to kill’ (Robayo Moreno 2000: 179), shown in (16).

- (16) Carijona (**kochi**90**8hiana**)  
*hɛɲɛ(x)tónoko-máɽɛ y-e-hɛɲɛ(x)ɣaj*  
*hinəhtono-ko=marə j-e-hinahi-jai*  
 enemy-PL=with 1-DETRZ-kill-NPST.CERT  
 ‘I fight with the enemies.’

As noted in Section 2.3, this extension also erased any traces of a potential Proto-Taranoan 1S<sub>A</sub> marker *\*t-*. However, it did not fully eclipse the old 1S<sub>A</sub> marker *\*w-*, which is attested as being preserved in the verbs *tə* ‘to go’ (17a) and *a* ‘to be’ (17b). In addition, the verb *ka* ‘to say’ has a zero-marked first-person form (17c).

<sup>13</sup>Since all affected S<sub>A</sub> verbs are V-initial, only the / \_V allomorph *j-* occurs in that context.

Table 17: Regular Yukpa verbs (Meira 2006: 139; Largo 2011: 72, 76)

	‘to fall’	‘to wash self’	‘to sleep’
1	<i>j-ata-</i>	<i>j-otum-</i>	<i>ji-ni-</i>
2	<i>m-ata-</i>	<i>m-otum-</i>	<i>mi-ni-</i>
3	<i>n-ata-</i>	<i>n-otum-</i>	<i>ni-ni-</i>

## (17) Carijona (guerrero2016karihona)

- a. *wi-tə-e=rehe*  
 1-go-NPST=FRUST  
 ‘I almost go (but I am not going to go).’
- b. *aji-marə-ne w-a-e*  
 2-with-PL 1-be-NPST  
 ‘I am with you all.’
- c. *dēmēmara kae ěwi iya*  
*n-tə-mə=mara Ø-ka-e əwi i-ja*  
 3-go-PST=DUB 1-say-NPST.CERT 1PRO 3-OBL  
 ‘“Did s/he leave?”, I say to him.’

Based on other C-initial verbs like *tə* ‘to go’ or *tuda* ‘to arrive’, one would either expect conservative *wi-* or innovative *ji-*. We analyse this  $\emptyset$  as a reflex of *\*wi-*, primarily based on the (albeit more regular) loss of *\*w* in Ikpeng and Hixkaryána, and the presumed higher propensity of an irregular marker for idiosyncratic phonological erosion. Further, it is possible that the divergent development of *\*w-* on C-initial *ka* ‘to say’ and *tə* ‘to go’ is a result of the latter’s originally V-initial nature (Section 3.3).

## 2.6 Yukpa *j-*

The divergent nature of the family-internal isolate Yukpa is *inter alia* visible in the loss of many Set I forms and the formation of non-cognate innovative constructions (Meira 2006). However, it does preserve the Set I prefixes in the immediate past, where a unified intransitive paradigm is found (Table 17). The wholesale loss of 1+2 as an inflectional value was combined with the extension of 2S<sub>A</sub> *m(i)-* to (former) S<sub>P</sub> verbs like *ni* ‘to sleep’. These verbs share their first person marker *j(i)-* with former S<sub>A</sub> verbs like *otum* ‘to wash self’, identifiable by their reflex of the detransitivizer *\*əte/e-*. The same prefix occurs in 3>1 scenarios (18a), meaning that *j(i)-* is the reflex of the Proto-Cariban 1S<sub>P</sub> marker *\*u(j)-*.

## (18) Yukpa (Meira 2006: 139)



- a. *aw j-esare*  
1PRO 3>1-see  
'S/he saw me.'
- b. *aw Ø-esare*  
1PRO 1>3-see  
'I saw it.'

On the other hand, 1>3 scenarios are zero-marked (18b). Since Proto-Cariban 1S<sub>A</sub> \**w(i)*- was extended to 1>3 scenarios in most languages (gildea1998), and since it is prone to phonological erosion elsewhere in the family (see Sections 2.1 and 2.2), we identify the zero marking in 1>3 scenarios as the Yukpa reflex of \**w*-, contrasting with *j(i)*-, the reflex of \**u(j)*-.

In intransitive verbs, this first-person zero marking is also attested, but only for *to* 'to go' (19). That verb contrasts with regular C-initial verbs, which take *ji*-, like 'to sleep' in Table 17. In summary, the extension of *j*- in Yukpa only spared *to* 'to go', which preserves a phonologically reduced reflex of \**wi*-.

- (19) Yukpa (Meira 2006: 139)  
*aw Ø-to*  
1PRO 1S<sub>A</sub>-go  
'I went.'

### 3 Resistant verbs from a comparative perspective

In Section 2, we introduced six distinct extensions of personal prefixes into 1S<sub>A</sub> territory, and identified verbs resistant to each innovation. The set of unaffected verbs is rather small in most cases, and (proto-)languages show a considerable degree of overlap in what verbs are unaffected. Therefore, this section presents these verbs from a comparative perspective. Section 3.1 treats both roots of the copula \**eti/a[p]* 'to be', Section 3.2 \**ka[ti]* 'to say', Section 3.3 \**itə[mə]* 'to go', and Section 3.4 \*(*ət*)*jəpi* 'to come'. Section 3.5 takes a look at \**ipitə* 'to go down', which is resistant in Proto-Tiriyoan and Proto-Pekodian, and Section 3.6 investigates \**e-pi* 'to bathe', of which the Proto-Pekodian reflex \**i-pi* resisted the extension of \**k*-. The *e*-initial verbs not affected by the extension of *k*- in Akuriyó (Section 2.4) will not be discussed here, as they are a large and phonologically coherent group.

#### 3.1 \**eti* and \**a[p]* 'to be'

For a comprehensive comparative overview for these two roots, we refer the reader to gildea2018reconstructing. \**a[p]* is the original copula and can be reconstructed as already having various irregularities in Proto-Cariban. \**eti*, the other root, is reconstructed by meira2009propertygildea2018reconstructing

as originally meaning ‘to dwell, live’, but serving as a copula in Proto-Cariban.<sup>14</sup> Various modern languages use reflexes of these two roots in a suppletive manner, conditioned by person and/or TAM value. Both roots preserved 1S<sub>A</sub> \*w- in Proto-Pekodian, Proto-Waiwaian, and Proto-Tiriyoan (Sections 2.1 to 2.3). Akuriyó *a* was not affected by the extension of *k-* (Section 2.4), while *eʔi* is not attested in a first-person form. Carijona innovated *j-*, but only in the reflex of \**eti* (20); the *a* root preserves *w-* (Section 2.5). Yukpa introduced *j-* to the reflexes of both \**a[p]* and \**eti*, which are preserved as encliticized auxiliaries in certain constructions (21).

- (20) Carijona (**robayo1989**grame)  
*iretibə eʃfinəme gərə jefʃi*  
*ireti-bə eʃfi-nə=me gərə j-eʃfi-i*  
 then-from be-INF=ATTRZ still 1-be-PFV  
 ‘Then I was already grown up.’

- (21) Yukpa (Meira 2006: 143–144)
- |   | NPST             | PST          |
|---|------------------|--------------|
| 1 | = <i>j-a(-s)</i> | = <i>j-e</i> |
| 2 | = <i>mak(o)</i>  | = <i>m-e</i> |
| 3 | = <i>mak(o)</i>  | = <i>n-e</i> |

### 3.2 \**ka[ti]* ‘to say’

Most reflexes of this verb are simply *ka*, but a fleeting syllable \**ti* is reconstructed by **gildea2007greenberg**, best visible in the imperative forms of some languages (22).

- (22) Apalaí  
*kaʃi-ko* ‘say!’  
 (E. Koehn & S. Koehn 1986: 35)

Table 18 shows a comparison of the longest attested forms for each language.<sup>15</sup> This verb was not affected by any of the extensions found in Proto-Pekodian, Proto-Waiwaian, Proto-Tiriyoan, Akuriyó, or Carijona (Sections 2.1 to 2.5). We do not know the first person form of its Yukpa reflex *ka*.

<sup>14</sup>Such a stative, locative source is also suggested by the existence of *ifʃi* ‘to lie down’ in Arara (Alves 2017: 196).

<sup>15</sup>Cognate segments in Tables 18 to 22 were aligned automatically with LingPy (**lingpy268**), for easier recognition of correspondences.

Table 18: Reflexes of *\*ka[ti]* ‘to say’ (Meira 2003a: 4; Franchetto 2008: 48; Pachêco 2001: 209; Alves 2017: 153; Derbyshire 1985: 182; Meira 1998: 113; E. Koehn & S. Koehn 1986: 107; R. E. Hawkins 1998: 26; Camargo & Tapinkili 2010: 66; Abbott 1991: 59; Swiggers 2010: 123; Courtz 2008: 430; Caesar-Fox 2003: 125; M.-C. Mattéi-Müller 1994: 102; Largo 2011: 63; p.c., Spike Gildea)

Language	Form
Werikyana	<i>ka[s]</i> k a s
Proto-Waiwaian	<i>*ka[s]</i> k a s
Hixkaryána	<i>ka[h]</i> k a h
Waiwai	<i>ka[s]</i> k a s
Proto-Pekodian	<i>*ke</i> k e
Arara	<i>ke</i> k e
Ikpeng	<i>ke</i> k e
Bakairi	<i>ke</i> k e
Proto-Tiriyoan	<i>*ka</i> k a
Tiriyó	<i>ka</i> k a
Akuriyó	<i>ka</i> k a
Carijona	<i>ka</i> k a
Wayana	<i>ka[i]</i> k a i
Apalaí	<i>ka[ɸ]</i> k a ɸ i
Kari’ña	<i>ka</i> k a
Kapón	<i>ka</i> k a
Pemón	<i>ka</i> k a
Macushi	<i>ka</i> k a
Panare	<i>ka[h]</i> k a h
Upper Xingu Carib	<i>ki</i> k i
Yukpa	<i>ka</i> k a

As briefly mentioned in Section 2.2, Derbyshire (1985) analyzes this verb as transitive in Hixkaryána. This analytical choice is not only motivated by the desire to avoid an idiosyncratic intransitive first person prefix *i-* instead of *ki-*. Hixkaryána *ka* also shows the complementary distribution of third person *n-* and preceding objects typical of transitive verbs in Cariban (gildea1998). Due to its semantics, these objects are either direct speech (23) or ideophones.

(23) Hixkaryána

- a. *oni wyaro nkekoni biryekomo, tiyoni wya*  
*oni wjaro n-ka-jakoni birjekomo ti-joni wja*  
 this like 3-say-REM.CONT boy COR-mother OBL  
 ‘This is what the boy said to his mother.’ (Derbyshire 1985: 36)
- b. *moro ha, ketxkoná hatá.*  
*moro ha ka-jatʃkoni hati*  
 MED.DEM.INAN INTS say-REM.CONT.PL HSY  
 ‘‘That one there’’ they said.’ (Derbyshire 1965: 14)

In (23a), the prefix *n-* occurs because there is no preceding object (‘he said it like this’). In (23b), it does not occur, because ‘they said’ is preceded by direct speech. At least the Tiriyo cognate shows the same pattern, albeit inconsistently so (Carlin 2004: 267).

Derivational suffixes also point to *\*ka[ti]* ‘to say’ being transitive: Tiriyo *ka* is characterized as the only intransitive verb being able to take the causative suffix *-po* and the agentive nominalizer *-ne* (Meira 1999: 263, 169). The exceptionality of *ka* ‘to say’ taking *-po* ‘CAUS.TR’ has also been noted for Kari’ña (Courtz 2008: 82) and Wayana (Tavares 2005: 258). The agent nominalizer *\*-ne* gave rise to the Panare gnomic verbal suffix *-ne* on transitive verbs (gildea1998). The occurrence of *-ne* on *ka* likely led T. E. Payne & D. L. Payne (2013: 214) to categorize it as transitive, contrasting with the intransitive analysis by M.-C. Mattéi-Müller (1994: 102). Finally, reflexes of the causativizer *\*-metipo*, usually restricted to transitive verbs (gildea2015valency), are found with *ka* in Apalaí (E. Koehn & S. Koehn 1986: 51) and Waiwai (R. E. Hawkins 1998: 52).

Our categorization of ‘to say’ as an intransitive verb is supported primarily by its person prefixes. Kari’ña offers a minimal pair between transitive *ka* ‘to remove’ and intransitive *ka* ‘to say’, *sikai* ‘I took it away’ vs *wikai* ‘I said’ (Courtz 2008: 288, 45).<sup>16</sup> Similarly, ‘to say’ in Pekodian languages has a reflex of 1S *\*w-* (Section 2.1), and not 1>3 *s-* (Bakairi) or *\*ini-* (Proto-Xinguan). Additionally, languages which differentiate direct prefixes from S<sub>A</sub> prefixes by the presence of *i* (meira2010origin) show no *i* for this verb, see (24a) as well as Meira (1999: 294), Tavares (2005: 195), Pachêco (2001: 288), Alves (2017: 150), and Hoff (1968: 168) for the verb’s inflection in individual languages. Finally, the S<sub>A</sub> class marker *w-* occurs on nominalizations

<sup>16</sup>Interestingly, the Kari’ña causativized form *kapo* ‘to make say’ does not have the regular 1>3 prefix *s(i)-*, but irregular *w(i)-* (Courtz 2008: 430).

in Kari'ña (24b), and it is probably reflected as vowel length in the Tiriyo (Meira 1999: 333) and Wayana (Tavares 2005: 196) participles.

- (24) a. Akuriyó (Meira 1998: 113)  
*mi-ka*  
 2-say  
 'You said.'
- b. Kari'ña (Courtz 2008: 202)  
*Òmakon 'wa oti ywykàpo kaiko.*  
*o-ʔma-kon ʔwa oti i-wi-ka-ʔpo kai-ko*  
 2-child-PL OBL greeting 1-SA-say-PST.NMLZ say-IMP  
 'Pass my greetings to your children.'

Summing up, this verb could be reconstructed as being intransitive based on its prefixes, but transitive based on some suffixes. Hixkaryána has lost the main intransitive criteria, making its reflex look more like a transitive verb. It is not attested as being affected by any of the person marker extensions in Section 2.

### 3.3 \**itə*[*mə*] 'to go'

This verb is reconstructed by **gildea2007greenberg** as \**tə*[*mə*], like \**ka*[*tɪ*] 'to say' with a fleeting second syllable. It is true that many reflexes are clearly *t*-initial, for example Hixkaryána *ntoje* 'he went' (Derbyshire 1985: 27), Tiriyo *təkə* 'go!' (Meira 1999: 246), or Wayana *kuptəm* 'we went' (Tavares 2005: 195). However, once one considers all forms of the various reflexes of this verb (Table 19), an initial vowel \**i* must clearly be reconstructed – in contrast to unambiguously C-initial \**ka*[*tɪ*] 'to say'.<sup>17</sup> This verb was not affected by any of the extensions discussed in Section 2.

### 3.4 \*(*ət*-)*jəpi* 'to come'

This verb is reconstructed as \**ətəpi* by **gildea2007greenberg**, but an inspection of all attested reflexes (Table 20) suggests a somewhat more complex story. Crucially, the majority do not reflect the \**ət* part of their reconstruction, and many forms are ostensibly reflexes of \**əpi*, \**jəpi*, or \**jəpi* for the \**əpi* part. We analyze all forms as going back to a Proto-Cariban verb of the form \*(*ət*-)*jəpi*, morphologically segmentable into a detransitivizing prefix and a root \**jəpi*.

<sup>17</sup>As indicated by the brackets in Table 19, there are many languages where the initial vowel is only present in some forms. Also, the prefix-verb boundary in many inflected forms like e.g. Tiriyo *witənnə* or Arara *widoli* 'I went' (Meira 1999: 43; Alves 2017: 153) is ambiguous, since an epenthetic *i* breaks up potential CC clusters. Still, when one considers unambiguous forms, the contrast with \**ka*[*tɪ*] becomes very clear.

Table 19: Reflexes of *\*itə[mə]* ‘to go’ (Cruz 2005: 291; Meira 1999: 292; Tavares 2005: 195; Gildea 1994: 87; Alves 2017: 153; Derbyshire 1985: 27, 248; R. E. Hawkins 1998: 45, 62; Pachêco 2001: 54, 80; von den Steinen 1892: 112, 374; Cáceres 2011: 181, 216; Meira 1998: 112; Hoff 1968: 168; Meira 2006: 139; Cáceres & Gildea 2018: 4; M. C. Mattéi-Müller 1975: 74; M.-C. Mattéi-Müller 1994: 198; Abbott 1991: 48, 50; García Ferrer 2006: 172; Franchetto 2002: 6; Camargo 2002: 99; p.c., Spike Gildea)

Language	Form					
Werikyana	<i>to[mo]</i>		t	o	m	o
Proto-Waiwaian	<i>*[ɪ]to[m]</i>	i	t	o	m	
Hixkaryana	<i>[ɪ]to</i>	i	t	o		
Waiwai	<i>[e]to[m]</i>	e	t	o	m	
Proto-Pekodian	<i>*itən</i>	i	t	ə	n	
Arara	<i>ido</i>	i	d	o		
Ikpeng	<i>aran</i>			a	r	a n
Ikpeng	<i>ero</i>			e	r	o
Bakairi	<i>[ɪ]tə</i>	i	t	ə		
Proto-Tiriyóan	<i>*təmi</i>		t	ə	m	i
Tiriyó	<i>tə[n]</i>		t	ə	n	
Akuriyó	<i>[ə]tə[mɪ]</i>	ə	t	ə	m	i
Carijona	<i>təmə</i>		t	ə	m	ə
Wayana	<i>[ɪ]tə[m]</i>	i	t	ə	m	
Apalaí	<i>ito</i>	i	t	o		
Kari’ña	<i>to</i>		t	o		
Kari’ña	<i>[ɪ]ʔ</i>			i	ʔ	
Ye’kwana	<i>itə[mə]</i>	i	t	ə	m	ə
Ingarikó	<i>ətə</i>	ə	t	ə		
Pemón	<i>[e]tə</i>	e	t	ə		
Macushi	<i>[a]tɪ</i>	a	t	i		
Panare	<i>tə[n]</i>		t	ə	n	
Yawarana	<i>tə</i>		t	ə		
Mapoyo	<i>tə</i>		t	ə		
Upper Xingu Carib	<i>[e]te</i>	e	t	e		
Yukpa	<i>to</i>		t	o		

Table 20: Reflexes of *\*(ət-)jəpi* ‘to come’ (Abbott 1991: 32; Álvarez 2000: 102; Caesar-Fox 2003: 125; Cruz 2005: 299, 415; Cáceres 2011: 438; Robayo Moreno 2000: 178; Meira 1998: 168; M. C. Mattéi-Müller 1975: 74; Meira 1999: 294; Alves 2017: 150; E. Koehn & S. Koehn 1986: 37; Pachêco 2001: 265; Stegeman & Hunter 2014: 160; Meira 2003a: 4; T. E. Payne & D. L. Payne 2013: 65; Méndez-Arocha 1959: 68; Courtz 2008: 429; Meira & Franchetto 2005: 182; p.c., Spike Gildea)

Language	Form							
Werikyana	<i>oohi</i>				oo	h	i	
Werikyana	<i>johi</i>				j	o	h	i
Werikyana	<i>ehi</i>					e	h	i
Proto-Pekodian	<i>*ədepi</i>	ə	d	-		e	p	i
Proto-Pekodian	<i>*epi</i>					e	p	i
Arara	<i>ebi</i>					e	b	i
Arara	<i>odebi</i>	o	d	-		e	b	i
Ikpeng	<i>arep</i>	a	r	-		e	p	
Bakairi	<i>əewi</i>	ə		-		e	w	i
Proto-Tiriyóan	<i>*əʔepi</i>	ə	ʔ	-		e	p	i
Tiriyó	<i>epi</i>					e	p	i
Tiriyó	<i>æpi</i>	ə		-		e	p	i
Akuriyó	<i>eepe</i>					ee	p	i
Carijona	<i>ehi</i>					e	h	i
Apalaí	<i>oepe</i>	o		-		e	p	i
Kari’ña	<i>opi</i>					o	p	i
Ye’kwana	<i>ehə</i>					e	h	ə
Akawaio	<i>əsipi</i>	ə	s	-		i	p	i
Akawaio	<i>jepi</i>				j	e	p	i
Ingarikó	<i>jə</i>				j	ə		
Ingarikó	<i>jepə</i>				j	e	p	ə
Patamona	<i>jepi</i>				j	e	p	i
Patamona	<i>jəpi</i>				j	ə	p	i
Pemón	<i>jepi</i>				j	e	p	i
Panare	<i>əpi</i>					ə	p	i
Yawarana	<i>əpi</i>					ə	p	i
Mapoyo	<i>epi</i>					e	p	i
Upper Xingu Carib	<i>ee</i>					ee		

Evidence for the originally *\*j*-initial nature of the root is found in the Pemongan languages and Werikyana, although the coexistence of *oohi* and *johi* in Werikyana raises the question of whether the *j* in the latter form is actually part of the root. *johi* only occurs with third person in the Progressive (25a), and one might analyze *j(-)* as a reflex of *\*i-w-* ‘3-S<sub>A</sub>’, since the S<sub>A</sub> class marker *\*w-* is present with other person values (25b). However, while C-initial verbs do show a clear reflex of third person *\*i-* (25c), regular V-initial S<sub>A</sub> verbs do not show *j-*, but  $\emptyset$  (25d). Thus, the best explanation for this *j* is that it is indeed part of the root, rather than an outcome of *\*i-w-*, which in turn allows us to safely reconstruct *\*j* back to Proto-Cariban.

(25) Werikyana Spike Gildea (p.c.)

- a. *johi-ri*  
3.come-PROG  
‘S/he is coming.’
- b. *o-w-ohi-ri*  
2-S<sub>A</sub>-come-PROG  
‘You are coming.’
- c. *i-nki-ri*  
3-sleep-PROG  
‘S/he is sleeping.’
- d.  $\emptyset$ -*osone-ri*  
3-dream-PROG  
‘S/he is dreaming.’

Most of the longer forms corresponding to **gildea2007greenberg** *\*ətepi* do not show evidence for the segment *\*j*, but the *i* in the Akawaio form *əsipi* is very likely a reflex of the sequence *\*jə*. This analysis is supported by the reflex *ipi* from bare *\*jəpi* in very closely related Macushi.

Turning to the many forms seemingly reflecting *\*əpi* and *\*epi* rather than *jəpi*, we find that both are distributed widely in the family, sometimes even co-occurring in the same language. A unifying account of these forms requires the root *\*jəpi* to undergo two major sound changes: a) *\*j*-loss; and b) *\*ə*-umlaut after *\*j*. Both phenomena are found in other contexts throughout the family (**meira2010origin**). However, these sound changes appear to have applied irregularly to this verb, and not always in the same order. For example, the Kari’ña form *opi* can only be explained if *\*j* was lost before the umlaut of *\*ə* to *\*e*, which would have been triggered by *\*j*. On the other hand, forms like Ye’kwana *ehə* must be the result of *\*ə* → *\*e* / *\*j*\_, with subsequent loss of *\*j*. The Akuriyó form *eepi* looks like a reflex thereof as well, but the length is unexpected, and is analyzed by Meira (1998) as reflecting an earlier diphthong *\*əe*.

While a root *\*jəpi*, the two sound changes, and the optional addition of *\*ət-* do account for the majority of the forms in Table 20,<sup>18</sup> the distribution within the family is rather chaotic.

<sup>18</sup> Apart from aforementioned Akuriyó *eepi*, another diachronically irregular form is Apalaí *oepe*, where one



In addition to the seemingly unordered distribution of *\*əpi* and *\*epi*, forms with and without *\*ət-* can be found within the same language, usually conditioned by different prefixes. This was briefly discussed in Section 2.1 for Arara (and Proto-Pekodian) and in Section 2.3 for Tiriyo (and Proto-Taranoan). To illustrate, the Tiriyo Set I paradigm shows a reflex of *\*ətepi* (< *\*əjəpi*) for first, but of *\*epi* (< *\*jəpi*) for the other persons (26).<sup>19</sup> It should be noted that forms with and without *\*ət-* in different languages are not triggered by the same person values.

(26) Tiriyo (Meira 1999: 294)

- 1 *w-əpi*
- 2 *mən-epi*
- 1+2 *ke-epi*
- 3 *n-epi*

Our interpretation of the *\*ət* part as a detransitivizer is based on its form and on the paradigmatically conditioned occurrence in some languages. Although the combination of a detransitivizer and an intransitive verb seems semantically illogical, some historical S<sub>P</sub> verbs are attested as adding the detransitivizer to become S<sub>A</sub> verbs. For example, the Proto-Cariban S<sub>P</sub> verb *\*winiki* ‘to sleep’ becomes Tiriyo *əniki* (Meira 1999: 252) and Kari’ña *əʔniki* (Courtz 2008: 429), both S<sub>A</sub>. Also, Waiwai ‘go to sleep’ can be *winik* (R. E. Hawkins 1998: 30) or *et-winik* (W. N. Hawkins & R. E. Hawkins 1953: 204). The parallels to ‘to sleep’ end here, since bare *\*jəpi* ‘to come’ apparently already was an S<sub>A</sub> verb, as evidenced by its status in Werikyana, Kari’ña, Arara, Tiriyo, and Panare (27).

(27) Panare (T. E. Payne & D. L. Payne 2013: 65)

- ju-w-əəpi-n*      *ka=m*      *kano?*  
 3-S<sub>A</sub>-COME-NSPEC    Q=2.AUX    rain  
 ‘Do you think it is gonna rain?’

Summing up, this verb is highly irregular, both from a synchronic and diachronic perspective. The scenario we suggest involves reflexes of the detransitivizer *\*ət(e)-* being optionally added to an S<sub>A</sub> verb root *\*jəpi*, which further underwent umlaut and loss of *\*j*, but in no systematic manner, resulting in the chaotic picture in Table 20. As discussed in Section 2.1, innovative *\*k-* was introduced on the Ikpeng and Bakairi reflexes of *\*əjəpi*, but not on the Arara reflex of *\*jəpi*. Reflexes of *\*əjəpi* (Tiriyo) and of *\*əjəpi* and/or *\*jəpi* (Akuriyo) resisted the introduction of Proto-Tiriyoan *\*t-*. Carijona *ehi* shows innovative *j-*, rather than

would expect *\*ət-epi* to yield *os-epi* (meiraz0100origin). Similarly, while *oepe* would be a regular outcome of hypothetical *\*əjəpi*, the /\_C allomorph of the detransitivizer is *e-* in Apalaí. One possibility is that the form is due to borrowing from Tiriyo, which has lost intervocalic *\*t* to create *əpe*. Alternatively, Apalaí *oepe* could be a fossilized loan from Wayana, which has replaced its reflex of *\*əjəpi*, but where intervocalic *\*t* was also regularly lost (Tavares 2005: 63).

<sup>19</sup>While the 1+2 form is a regular outcome of *\*kit-epi*, the second person form is mysterious.

conservative *w-* (28). It is unknown whether there is a Yukpa reflex of this verb, and it was fully replaced in Proto-Waiwaian by *\*omoki* ‘to come’ and was thus not a potential target of innovative *\*k-*.

- (28) Carijona (Guerrero Beltrán 2019: 102)  
*aji-wa-e j-eh-i*  
 2-search-SUP 1-come-PFV  
 ‘I came looking for you.’

### 3.5 *\*ipitā* ‘to go down’

Reflexes of this verb were not affected by the extensions of *\*k-* in Proto-Pekodian (Section 2.1) and *k-* in Akuriyó (Section 2.4). The resistance against the former extension was subsequently overcome in Bakairi; its fate in Ikpeng is unknown. When Akuriyó extended *k-*, the verb already had an irregularly inflected first person form with *p-*, inherited from Proto-Tiriyóan. At first sight, it may seem that it also was affected by the two independent extensions of *j-* in Carijona (29a) and Yukpa (29b).

- (29) a. Carijona (David Felipe Guerrero, p.c.)  
*irā wafinakano tae j-ehitā-e*  
 INAN.ANA body.of.water along.bounded 1-go.down-NPST  
 ‘...I go down through that guachinacán.’
- b. Yukpa (Meira 2003b)  
*aw yéwtu*  
*aw j-ewuhtu*  
 1PRO 1-go.down  
 ‘I went down.’

However, a broader comparative perspective reveals a much more complicated story. Table 21 shows all attested cognates of *\*ipitā*, including verb class membership where applicable; parenthesized forms indicate uncertainty about cognacy status. It turns out that while a form *\*ipitā* can be reconstructed to Proto-Cariban, different (proto-)languages do not agree about the class of this verb. Its reflexes in languages that preserve the split-S system are distributed fairly evenly between *S<sub>A</sub>* and *S<sub>P</sub>*.

In one language, Wayana, the verb shows traits of both classes, leading us to consider it a “mixed” verb in our synchronic analysis of Wayana. It takes the first and second person *S<sub>P</sub>* markers *j-* and *əw-* (Tavares 2005: 200), but the 1+2*S<sub>A</sub>* marker *kut-* (Tavares 2005: 206). It also shows the *S<sub>A</sub>* class marker *w-* in nominalizations (30a), but behaves like an *S<sub>P</sub>* verb in taking a second person prefix in imperatives (30b).

Table 21: Reflexes of *\*ipitə* ‘to go down’ (Meira 2003b; Derbyshire 1979: 196; R. E. Hawkins 1998: 55; Guerrero Beltrán 2019: 118; Camargo & Tapinkili 2010: 44; Camargo 2002: 99; Courtz 2008: 263; Cáceres 2011: 450; Stegeman & Hunter 2014: 139; Álvarez 2008: 139; Abbott 1991: 34; M.-C. Mattéi-Müller 1994: 88; Méndez-Arocha 1959: 68; Bruno 1996: 58; Gildea 1994: 84; Alves 2017: 153; von den Steinen 1892: 137; Meira 1998: 116; p.c., Angela Fabíola Alves Chagas, Spike Gildea)

Language	Form	Class							
Proto-Parukotoan	<i>*iφito</i>	S <sub>P</sub>		i	φ	i	t	o	
Werikyana	<i>ihito</i>	S <sub>P</sub>		i	h	i	t	o	
Hixkaryána	<i>hto</i>	?			h		t	o	
Waiwai	<i>hto</i>	–			h		t	o	
Proto-Pekodian	<i>*iptə</i>	S <sub>A</sub>		i	p		t	ə	
Arara	<i>ipton</i>	S <sub>A</sub>		i	p		t	o	- ɲ
Ikpeng	<i>ipton</i>	?		i	p		t	o	- ɲ
Bakairi	<i>itagi</i>	S <sub>A</sub>		i			t	ə	- g i
Proto-Taranoan	<i>*ihtə</i>	S <sub>A</sub>		i	h		t	ə	
Tiriyó	<i>ih̥tə</i>	S <sub>A</sub>		i	h		t	ə	
Akuriyó	<i>ih̥tə</i>	S <sub>A</sub>		i	h		t	ə	
Carijona	<i>ehitə</i>	–		e	h	i	t	ə	
Wayana	<i>iptə</i>	S <sub>A</sub> / S <sub>P</sub>		i	p		t	ə	
Apalaí	<i>ih̥to</i>	S <sub>P</sub>		i	h		t	o	
Kari’ña	<i>oniʔto</i>	(S <sub>A</sub> )	o - n -	i	ʔ		t	o	
Ye’kwana	<i>əʔtə</i>	S <sub>P</sub>		ə	ʔ		t	ə	
Kapón	<i>(uʔtə)</i>	–							
Pemón	<i>(uʔtə)</i>	–							
Macushi	<i>(auti)</i>	–							
Panare	<i>əhtə</i>	S <sub>A</sub>		ə	h		t	ə	
Yawarana	<i>əhtə</i>	–		ə	h		t	ə	
Yukpa	<i>(ewuhtu)</i>	–							
Waimiri-Atroari	<i>iti</i>	–		i			t	i	

(30) Wayana (Tavares 2005: 200)

- a. *ĩwĩptěě*  
*ĩ-w-ipta-ri*  
 1-S<sub>A</sub>-go.down-NMLZ  
 ‘my going down’
- b. *əw-ipta-k*  
 2-go.down-IMP  
 ‘Go down!’

Its causativized form is *ipta-ka* (Tavares 2005: 255); the restriction of *\*-ka* to S<sub>P</sub> verbs in Proto-Cariban ([gildea2019overview](#)) points to S<sub>P</sub> membership. These patterns lead us to posit the hypothesis that the verb was a regular member of the S<sub>P</sub> class in pre-Wayana, but partially switched to the S<sub>A</sub> class, reflected only in its 1+2 prefix and the S<sub>A</sub> class marker. This in turn implies that reflexes of this verb with S<sub>A</sub> membership in other languages fully switched from S<sub>P</sub> at some point.

Wayana-external comparative evidence supports this hypothesis: The Arara causativized form is *enipton* (Alves 2017: 66), and Kari’ña has a cognate form *eni?to* (Courtz 2008: 263); *oni?to* ‘to go down’ in Table 21 is a detransitivized form thereof, lit. ‘to get oneself down’. Both causativized forms contain a reflex of the transitivizer *\*en-*, which was usually found with S<sub>P</sub> verbs ([gildea2019overview](#)). Besides the irregular first person *p-*, Tiriyo *ih̃tə* shows other irregularities, in particular in its causativized forms that also feature a reflex of *\*en-* (Meira 1999: 263). Thus, it seems that this verb was originally S<sub>P</sub>, but then switched its class in four and a half languages of the family, for so far unknown reasons.

These circumstances make it impossible to answer the question of whether ‘to go down’ was affected by the extensions in Proto-Waiwaian, Proto-Tiriyoan, Carijona, and Yukpa. For Proto-Tiriyoan, we cannot establish a relative chronology of the verb class switch, the introduction of the idiosyncratic marker *\*p-*, and the extension of *\*t-*. For Proto-Waiwaian, we lack knowledge not only about the first person form, but even about class membership. Similarly, for Carijona and Yukpa we cannot know whether the verb potentially switched class before the breakdown of the entire split-S system. While there is no language-internal evidence, it is clear that ‘to go down’ does have an inclination to switch classes; in the case of Carijona, that could have already happened at the Proto-Taranoan stage. In all four cases, it is possible that the verb had S<sub>A</sub> status at the time of the extension, resisting it and preserving the old prefix, but it is also possible that it was not even a potential target due to its S<sub>P</sub> status at the time. On the other hand, the class switch happened before the split-up of Tiriyo and Akuriyo, and therefore this verb resisted the extension of Akuriyo *k-* as an S<sub>A</sub> verb. Likewise, it seems very likely that the class switch took place before the extension of Proto-Pekodian *\*k-*. Otherwise, the newly-turned-S<sub>A</sub> verb would have taken on archaic and lexically heavily restricted *\*w-*, either in Proto-Taranoan, Proto-Xinguan, or Arara.

### 3.6 \**e-pi* ‘to bathe’

This verb resisted the extensions of Proto-Pekodian \**k-* (Section 2.1) and, trivially, Akuriyó *k-* (Section 2.4). It took on new 1<sub>SA</sub> prefixes in Proto-Tiriyóan (Tiriyó *s-epi-*, Akuriyó *tʃe+pi-* [Meira 1999: 292; Gildea 1994: 87]) and Proto-Waiwaian (Hixkaryána *k-ewehti-*, Waiwai *k-ejeφu-* [Derbyshire 1985: 195; R. E. Hawkins 1998: 166]). The first person form of its Carijona reflex *ehi* (**koch1908hiana**) is unknown; we are not aware of a Yukpa cognate.

Verbs for intransitive ‘to bathe’ are usually typical *S<sub>A</sub>* verbs in Cariban languages, derived with a detransitivizer from a transitive root. These roots are reflexes of \**pi*, or \**kupi* in some Venezuelan languages (Table 22). As we have shown in Section 2.1, Proto-Pekodian can be reconstructed as having the pair \**ipi* (INTR) / \**ip(i)* (TR). Thus, while Proto-Pekodian ‘to bathe (TR)’ has perfectly regular cognates in other languages of the family, intransitive ‘to bathe’ is divergent in this branch, changing \**e-* to \**i*. This is an irregular development, since reflexes of \**i-* are not attested as a reflex of the detransitivizer in Pekodian (**meira2010origin**); its cause is unknown. However, it should be noted that other languages also show unexpected developments in this verb, considering the apparent glide insertion in Waiwaian or the distribution of \**pi* and \**kupi* in Venezuelan languages.

Table 22: Comparison of intransitive and transitive ‘to bathe’ (Derbyshire 1979: 198; R. E. Hawkins 1998: 192, 203; Alves 2017: 150, 162; Pachêco 1997: 103; Campetela 1997: 123; Meira 2003a: 4, 2005: 285, 1999: 697; Gildea 1994: 87; Camargo & Tapinkili 2010: 24, 52; Meira 2000: 218; Courtz 2008: 304; Cáceres 2011: 439, 454; Stegeman & Hunter 2014: 37; de Armellada 1944: 34, 129; M.-C. Mattéi-Müller 1994: 8, 294; p.c., Spike Gildea)

(a) Reflexes of <i>*e-pi</i> ‘to bathe (INTR)’						(d) Reflexes of <i>*(i)pi</i> ‘to bathe (TR)’					
Language	Form					Language	Form				
Werikyana	<i>eehi</i>			ee	- h i	Werikyana	<i>ihi</i>	i		h	i
Hixkaryána	<i>ewehi</i>	e	w	e	- h i	Hixkaryána	<i>ihi</i>	i		h	i
Waiwai	<i>ejeɸu</i>	e	j	e	- ɸ u	Waiwai	<i>pi</i>			p	i
Arara	<i>ibi</i>			i	- b i	Arara	<i>ip</i>	i		p	
Ikpeng	<i>ip</i>			i	- p	Ikpeng	<i>ip</i>	i		p	
Bakairi	<i>i</i>			i		Bakairi	<i>i</i>				i
Tiriyó	<i>epi</i>			e	- p i	Tiriyó	<i>pi</i>			p	i
Akuriyó	<i>epi</i>			e	- p i	Akuriyó	<i>pi</i>			p	i
Wayana	<i>epi</i>			e	- p i	Wayana	<i>upi</i>	u		p	i
Apalaí	<i>epi</i>			e	- p i	Apalaí	<i>pi</i>			p	i
(b) Reflexes of <i>*e-kupi</i> ‘to bathe (INTR)’						(e) Reflexes of <i>*kupi</i> ‘to bathe (TR)’					
Language	Form					Language	Form				
Kari’ña	<i>ekupi</i>	e	-	k	u p i	Kari’ña	<i>kupi</i>	k	u		p i
Ye’kwana	<i>eʔhi</i>	e	-	ʔ	h i	Kapón	<i>kuʔpi</i>	k	u	ʔ	p i
Kapón	<i>ekuʔpi</i>	e	-	k	u ʔ p i	Panare	<i>kupi</i>	k	u		p i
Pemón	<i>ekupi</i>	e	-	k	u p i						
(c) Reflexes of <i>*ə-kupi</i> ‘to bathe (INTR)’											
Language	Form										
Panare	<i>akupi</i>	a	-	k	u p i						

## 4 Discussion

In Section 3, we reconstructed the verbs which were untouched by the incomplete person marker extensions discussed in Section 2. Table 23 gives an overview of what verbs were affected by which extensions, except for *e*-initial Akuriyó verbs unaffected by the extension of *k*-, as they are a large and predictable group. In a few cases we do not know the first person form (?), in others we have reason to believe that the verb does not occur at all or at least not inflected for first person (–), and in the case of ‘to go down’ we often do not know when the switch to  $S_A$  happened, if at all (N/A). Every ✓ stands for a verb affected by an extension, while × represents conservatively inflected verbs. This overview makes clear just how pervasive the tendency for these verbs to resist innovative markers is.

### 4.1 Conclusion

- why are the most irregular verbs all underived  $S_A$  verbs? **something** is there
- ultimately plays into the mystery of how the hell the split-S system actually came into being
- not surprising that more frequent  $S_A$  verbs have no \**ət*-, but definitely surprising that ‘say’, ‘go’, and ‘be’ are  $S_A$  verbs in the first place!

Table 23: Overview of extensions and (un-)affected verbs

	<i>*ka[tí]</i> 'say'	<i>*itə[mə]</i> 'go'	<i>*a[p]</i> 'be-1'	<i>*eti</i> 'be-2'	<i>*(ət-)jəpi</i> 'come'	<i>*ipitə</i> 'go down'	<i>*e-pi</i> 'bathe'
Proto-Waiwaian <i>*k-</i>	×	×	×	×	–	N/A	✓
Hixkaryána	×	×	×	×	–	N/A	✓
Waiwai	×	(✓)	×	×	–	N/A	✓
Proto-Pekodian <i>*k-</i>	×	×	×	×	×	×	×
Arara	×	×	×	×	×	×	×
Ikpeng	×	✓	–	×	✓	?	×
Bakairi	×	×	×	×	✓	✓	×
Proto-Tiriyoan <i>*t-</i>	×	×	×	×	×	N/A	✓
Tiriyó	×	×	×	×	×	N/A	✓
Akuriyó	×	×	×	?	×	N/A	✓
Akuriyó <i>k-</i>	×	×	×	?	×	×	×
Carijona <i>j-</i>	×	×	×	✓	✓	N/A	?
Yukpa <i>j-</i>	?	×	✓	✓	–	N/A	–

✓ affected; × not affected; ? unknown first person prefix; – does not occur; (✓) old and new marker combined; N/A not meaningfully answerable



Table 24: Frequency counts of S<sub>A</sub> verbs in three Apalaí texts from E. Koehn & S. Koehn (1994)  
(163 S<sub>A</sub> verbs, 1070 words)

Verb	Count	% S <sub>A</sub> verb tokens
<i>a</i> ‘be-1’	49	30.06%
<i>efi</i> ‘be-2’	30	18.40%
<i>ka</i> ‘say’	26	15.95%
<i>ito</i> ‘go’	23	14.11%
<i>oepe</i> ‘come’	13	7.98%
<i>e-pore?ka</i> ‘arrive’	3	1.84%
<i>ot-urupo</i> ‘ask’	2	1.23%
<i>ot-u?</i> ‘eat’	2	1.23%
<i>os-enakūnu?</i> ‘choke’	2	1.23%
<i>e-unopi</i> ‘laugh’	1	0.61%
<i>at-akīma</i> ‘pack bags’	1	0.61%
<i>at-ankiema</i> ‘be happy’	1	0.61%
<i>os-ereh</i> ‘be amazed’	1	0.61%
<i>e-metika</i> ‘lose loincloth’	1	0.61%
<i>e-tuarima</i> ‘suffer’	1	0.61%
<i>e-puka</i> ‘fall’	1	0.61%
<i>os-epori</i> ‘meet’	1	0.61%
<i>ot-iri?ka</i> ‘land’	1	0.61%
<i>ot-i?ka</i> ‘finish’	1	0.61%
<i>ot-uru</i> ‘talk’	1	0.61%
<i>at-apiaka</i> ‘divide up’	1	0.61%
<i>e-siri?ma</i> ‘move’	1	0.61%

Table 25: Predictions for Proto-Waiwaian

	* <i>ka</i> [s] ‘say’	* <i>efi</i> ‘be’	* <i>ah</i> ‘be’	*[i] <i>to</i> [m] ‘go’	* <i>eephi</i> ‘bathe (INTR)’
DETRZ	×	×	×	×	✓
DETRZ+freq	×	×	×	×	✓
phono ( / _ * <i>o</i> , <i>e</i> , <i>a</i> )	×	✓	✓	×	✓
phono+freq	×	×	×	×	✓
infl (* <i>w</i> -)	✓	✓	✓	✓	✓
infl+freq	×	×	×	×	✓

Table 26: Evaluating predictions for Proto-Waiwaian

	<i>*ka[s]</i> 'say'	<i>*efi</i> 'be'	<i>*ah</i> 'be'	<i>*[i]to[m]</i> 'go'	<i>*eeφi</i> 'bathe (INTR)'	Score
DETRZ	✓	✓	✓	✓	✓	1.00%
DETRZ+freq	✓	✓	✓	✓	✓	1.00%
phono+freq	✓	✓	✓	✓	✓	1.00%
infl+freq	✓	✓	✓	✓	✓	1.00%
phono	✓	×	×	✓	✓	0.60%
infl	×	×	×	×	✓	0.20%

Table 27: Predictions for Proto-Pekodian

	<i>*ap</i> 'be'	<i>*efi</i> 'be'	<i>*epi</i> 'come'	<i>*itan</i> 'go'	<i>*ipta</i> 'go down'	<i>*ke</i> 'say'	<i>*ipi</i> 'bathe (INTR)'
DETRZ	×	×	×	×	×	×	×
DETRZ+freq	×	×	×	×	×	×	×
phono ( / _ *a, e)	×	✓	✓	×	×	×	×
phono+freq	×	×	×	×	×	×	×
infl (*w-)	✓	✓	✓	✓	✓	✓	✓
infl+freq	×	×	×	×	✓	×	✓

Table 28: Evaluating predictions for Proto-Pekodian

	<i>*ap</i> 'be'	<i>*efi</i> 'be'	<i>*epi</i> 'come'	<i>*itan</i> 'go'	<i>*ipta</i> 'go down'	<i>*ke</i> 'say'	<i>*ipi</i> 'bathe (INTR)'	Score
DETRZ	✓	✓	✓	✓	✓	✓	✓	1.00%
DETRZ+freq	✓	✓	✓	✓	✓	✓	✓	1.00%
phono+freq	✓	✓	✓	✓	✓	✓	✓	1.00%
phono	✓	×	×	✓	✓	✓	✓	0.71%
infl+freq	✓	✓	✓	✓	×	✓	×	0.71%
infl	×	×	×	×	×	×	×	0.00%

Table 29: Predictions for Proto-Tiriyoan

	<i>*a</i> 'be'	<i>*eʔi</i> 'be'	<i>*əʔepi</i> 'come'	<i>*təmi</i> 'go'	<i>*ka</i> 'say'	<i>*epi</i> 'bathe (INTR)'
DETRZ	×	×	✓	×	×	✓
DETRZ+freq	×	×	×	×	×	✓
phono ( / _ *ə, e)	×	✓	✓	×	×	✓
phono+freq	×	×	×	×	×	✓
infl (*w-)	✓	✓	✓	✓	✓	✓
infl+freq	×	×	×	×	×	✓

Table 30: Evaluating predictions for Proto-Tiriyoan

	<i>*a</i> 'be'	<i>*eʔi</i> 'be'	<i>*əʔepi</i> 'come'	<i>*təmi</i> 'go'	<i>*ka</i> 'say'	<i>*epi</i> 'bathe (INTR)'	Score
DETRZ+freq	✓	✓	✓	✓	✓	✓	1.00%
phono+freq	✓	✓	✓	✓	✓	✓	1.00%
infl+freq	✓	✓	✓	✓	✓	✓	1.00%
DETRZ	✓	✓	×	✓	✓	✓	0.83%
phono	✓	×	×	✓	✓	✓	0.67%
infl	×	×	×	×	×	✓	0.17%

Table 31: Predictions for Akuriyó

	<i>ihtə</i> 'go down'	<i>epi</i> 'bathe (INTR)'	<i>[ə]tə[mɪ]</i> 'go'	<i>ka</i> 'say'	<i>eepi</i> 'come'	<i>a</i> 'be'
DETRZ	×	✓	×	×	×	×
DETRZ+freq	×	✓	×	×	×	×
phono ( / _ ə)	×	×	×	×	×	×
phono+freq	×	×	×	×	×	×
infl ( <i>k-</i> )	×	×	×	×	×	×
infl+freq	×	×	×	×	×	×

Table 32: Evaluating predictions for Akuriyó

	<i>ih̥tə</i> ‘go down’	<i>ep̥i</i> ‘bathe (INTR)’	[ə]tə[m̥i] ‘go’	<i>ka</i> ‘say’	<i>ee̯p̥i</i> ‘come’	<i>a</i> ‘be’	Score
phono	✓	✓	✓	✓	✓	✓	1.00%
phono+freq	✓	✓	✓	✓	✓	✓	1.00%
infl	✓	✓	✓	✓	✓	✓	1.00%
infl+freq	✓	✓	✓	✓	✓	✓	1.00%
DETRZ	✓	×	✓	✓	✓	✓	0.83%
DETRZ+freq	✓	×	✓	✓	✓	✓	0.83%

Table 33: Predictions for Carijona

	<i>eh̥i</i> ‘come’	<i>ka</i> ‘say’	<i>ef̥i</i> ‘be’	<i>təmə</i> ‘go’	<i>a</i> ‘be’
DETRZ	×	×	×	×	×
DETRZ+freq	×	×	×	×	×
phono ( / _ə, e )	✓	×	✓	×	×
phono+freq	×	×	×	×	×
infl (*w-)	✓	✓	✓	✓	✓
infl+freq	×	×	×	×	×

Table 34: Evaluating predictions for Carijona

	<i>eh̥i</i> ‘come’	<i>ka</i> ‘say’	<i>ef̥i</i> ‘be’	<i>təmə</i> ‘go’	<i>a</i> ‘be’	Score
phono	✓	✓	✓	✓	✓	1.00%
DETRZ	×	✓	×	✓	✓	0.60%
DETRZ+freq	×	✓	×	✓	✓	0.60%
phono+freq	×	✓	×	✓	✓	0.60%
infl+freq	×	✓	×	✓	✓	0.60%
infl	✓	×	✓	×	×	0.40%

Table 35: Predictions for Yukpa

	<i>to</i> 'go'	<i>a</i> 'be'	<i>e</i> 'be'
DETRZ	×	×	×
DETRZ+freq	×	×	×
phono ( / _V)	×	✓	✓
phono+freq	×	×	×
infl (*w-)	✓	✓	✓
infl+freq	×	×	×

Table 36: Evaluating predictions for Yukpa

	<i>to</i> 'go'	<i>a</i> 'be'	<i>e</i> 'be'	Score
phono	✓	✓	✓	1.00%
infl	×	✓	✓	0.67%
DETRZ	✓	×	×	0.33%
DETRZ+freq	✓	×	×	0.33%
phono+freq	✓	×	×	0.33%
infl+freq	✓	×	×	0.33%

Table 37: Overview of prediction accuracy

	DETRZ	DETRZ+freq	phono	phono+freq	infl	infl+freq
Proto-Waiwaian * <i>k</i> -	1.00%	1.00%	0.60%	1.00%	0.20%	1.00%
Proto-Pekodian * <i>k</i> -	1.00%	1.00%	0.71%	1.00%	0.00%	0.71%
Proto-Tiriyoan * <i>t</i> -	0.83%	1.00%	0.67%	1.00%	0.17%	1.00%
Akuriyó <i>k</i> -	0.83%	0.83%	1.00%	1.00%	1.00%	1.00%
Carijona <i>j</i> -	0.60%	0.60%	1.00%	0.60%	0.40%	0.60%
Yukpa <i>j</i> -	0.33%	0.33%	1.00%	0.33%	0.67%	0.33%

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