

Verbs with conservative first person forms in Cariban 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.¹²³ ⁴A 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 Tiriyo, 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 Tiriyo ‘to be’ is *w-ei-* (triomeira1999).

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-/s-*. However, there is no widely accepted definition of irregularity (stolz2012introduction),

¹The 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.

²In 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.

³We use standard IPA symbols in our transcription of Cariban languages, with the exception of coronal rhotics, which we simply represent with *<r>*, rather than *<ɾ>* for Wayana or *<ɽ>* 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 meira2005southern, although it was likely more back (gildea2010story).

⁴Glossing abbreviations:

Table 1: Some Hixkaryána verbs (howard2001wroughthixkaryanaderby1985)

	‘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 (triomeira1999triocarlin2004)

	‘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 _A	S _P	
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>

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_A and S_P 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 $1/2 > 3$. 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_A verbs took similar markers as the A-oriented ones in transitive verbs, with the exception of first person (1>3 **t(i)-* vs 1S_A **w-*), as well as the absence of **i* after all S_A prefixes. On the other hand, S_P verbs took markers fully identical to the P-oriented ones. The third person marker in S_P 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_A prefix **w-* and are therefore CONSERVATIVE. They contrast with regular S_A 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_A **w-* to 1>3
- (b) 1+2 **k-* to 1S_P (completed in Proto-Waiwaian, ongoing in Werikyana)
- (c) 1+2 **kit-* to 1+2S_P (completed in Proto-Waiwaian, ongoing in Werikyana)

2. Proto-Waiwaian

- (a) 1S_P **k-* to 1S_A
- (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 1_{SP} marker *Ø/j-* (Spike Gildea, p.c.). Hixkaryána has preserved split-S only in the second person pre-

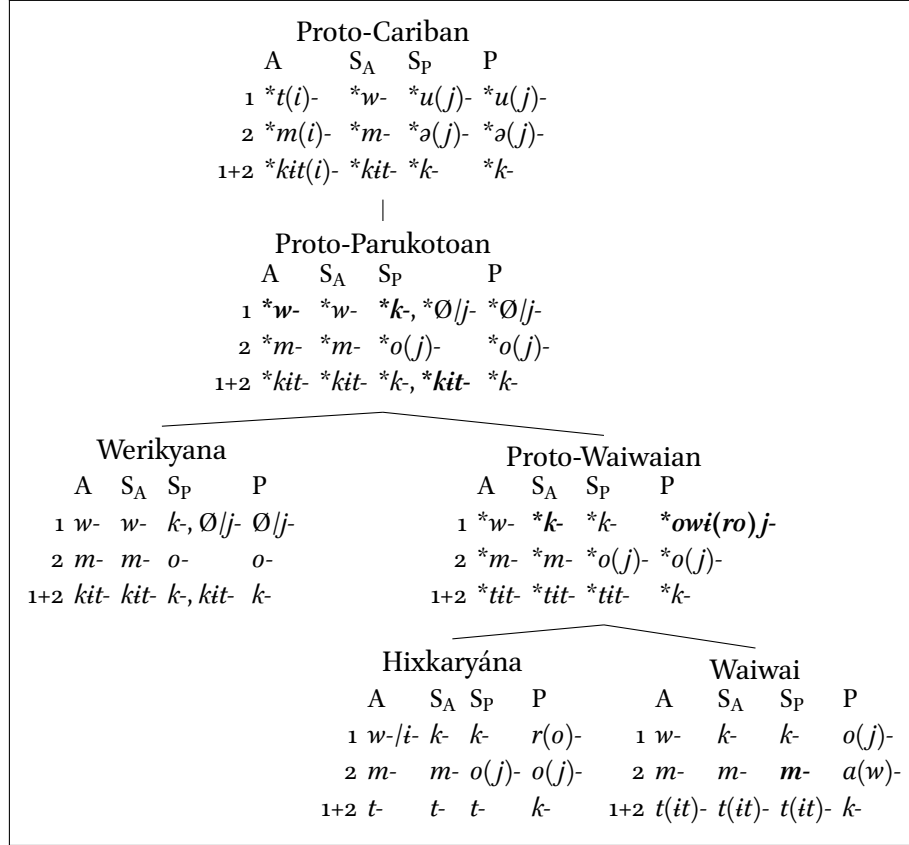


Figure 1: Person marking extensions in Parukotoan, after **gildea1998**

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-*, 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

Table 4: Some examples for completed extensions (gildea1998)

(a) Apalaí			(b) Panare			(c) Waimiri-Atroari		
	S _A	S _P		S _A	S _P		S	
1	<i>t</i> -/Ø	<i>t</i> -/j-	1	<i>w</i> (<i>t</i>)-	Ø/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> -/Ø	

from a change in progress. Second, while there is no detailed diachronic scenario for the switch of $1>3$ **t*- and $1S_A$ in the Tiriyoan languages (Section 2.3), **meira1998proto** 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 Hixkaryana and Tiriyo verbs with conservative first person forms: In both cases, the innovative $1S_A$ prefixes were introduced by a person marker extension spreading via lexical diffusion. We interpret the continued presence of the old $1S_A$ marker in a few verbs as the extension stopping short of these verbs, rather than affecting all targets (S_A 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_A verbs. While extensions occurred with other person values as well, they never affected S_A verbs, only S_P ones, and they always affected all potential targets. Illustrative examples for complete extensions are shown in Table 4: the extension of $1+2S_A$ *s*(*t*)- (< **kit*-) to S_P verbs in Apalaí (Table 4a), of $2S_A$ *m*(*t*)- in to S_P verbs in Panare (Table 4b),⁵ or the extension of the entire S_A set to S_P verbs in Waimiri-Atroari (Table 4c).

The markedly different behavior of S_A and S_P 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_A/S_P distinction to be lost only for a single person, or for S_P verbs to take on S_A markers with apparent semantic impunity.

1.2.3 The morphological basis of the split-S system

As seen in Section 1.2.1, the Proto-Cariban distinction between S_A and S_P verbs was implemented by two inflection classes within the Set I prerson paradigm, but this was not the only

⁵The 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_A and S_P verbs (schuring2018kaxuyanaalves2017araratriomeira1999wayanataavares2005k)

Language	S _A	S _P
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-aturu-e</i> ‘talked’	<i>t-əpəə-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_A and S_P verbs (schuring2018kaxuyanaalves2017araratriomeira1999wayanataavares2005k)

Language	S _A	S _P
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>ereɲmi-tpo</i> ‘killing instrument’
Tiriyó	<i>ji-w-aturu-to</i> ‘(for) my talking’	<i>j-emamina-to</i> ‘(for) my playing’
Wayana	<i>i-w-aturu-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’

morphological criterion: Many languages show an S_A class marker in deverbalized forms, which can be reconstructed to Proto-Cariban as **w-*.⁶ With S_A verbs, **w-* occurred immediately between the possessive prefixes and the verb stem, while S_P 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_A and S_P was also borne out in imperatives. Here, S_P verbs took the P-oriented second person prefix **ə(j)-*, while S_A verbs were unprefixes (both suffixed with **-kə*). This is illustrated with reflexes in various modern languages in Table 7. Both the S_A marker **w-* in participles and nominalizations and the prefixes in imperatives have been lost in some languages, but are reconstructible to Proto-Cariban. However, there was one further property uniting most S_A 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

⁶See meirazoosplit, 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_A and S_P verbs (derbyshire1965textosalves2017araratrimeira1999wayanatavaresh2005k

Language	S _A	S _P
Hixkaryána	<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!’

- a. *mi-kupi-ja*
 2>3-bathe-PRS
 ‘You bathe him/her.’ (hoff1968carib)
- b. *a-kupi-ja*
 3>2-bathe-PRS
 ‘S/he bathes you.’ (yamadaz01nevidentiality)

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?’ (courtz2008carib)
- b. *aya:woiya*
aj-awomi-ja
 2-get.up-PRS
 ‘You are getting up.’ (hoff1968carib)

Rather, *ekema* ‘to be afraid’ takes an A-oriented marker, since it is an S_A verb (2a), while the S_P 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. meiraz000split takes a sizable corpus of intransitive verbs from Tiriyó, 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. **meirazooosplit** demonstrates that those intransitive verbs which (etymologically) have a detransitivizing prefix are treated as S_A verbs, while essentially all others are S_P verbs:

Almost all verbs in the S_A class are detransitized forms of transitive verbs, either synchronically (with still existing transitive sources) or diachronically (with reconstructible but no longer existing transitive sources)

(meirazooosplit)

meirazooosplit also argues that the detransitivizing prefixes are indeed deriving S_A verbs, rather than being inflectional in nature: a) there are a few underived S_A verbs, with no detransitivizing prefix; b) S_A 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_A verb; d) some originally derived S_A verbs have lost their transitive counterparts; and e) “basic” concepts are expressed as derivations of more complex concepts, like ‘to dance (S_A)’ 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_A 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_A 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.

(meirazooosplit)

As for the form of this marker, **meirazooorigin** 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 Ti-riyó examples in (3).

(3) Tiriyo (meiraz000splittriomeira1999)

<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, 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 $1S_A$ prefix is formally identical to the $1+2P/S_P$ marker (Proto-Cariban **k-*) in three cases, to the $1P/S_P$ marker (Proto-Cariban **u(j)-*) in two cases, and to the $1>3$

Table 8: Regular Pekodian S_A verbs (**meira2003bakairialves2017araraikpengpacheco2001**)

	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>kid-əku-</i>	<i>kud-origu-</i>	<i>kw-aranme-</i>
3	<i>n-əku-</i>	<i>Ø-origu</i>	<i>Ø-aranme-</i>

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 **meira2005southern**, 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. **meira2005southern** 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_A marker *k-*, as evidenced by the paradigms in Table 8. Thus, it is possible to reconstruct a Proto-Pekodian 1S_A marker **k-*.

In the most detailed description of a Pekodian language, **alves2017arara** describes six⁷ Arara S_A 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’ (**alves2017arara**). However, its inflectional morphology features verbal Set I prefixes, including first person *w-* (5).

- | | | |
|-------------------------------------|------------------|--------------------|
| (4) Arara (alves2017arara) | <i>wi-geni</i> | ‘I said’ |
| | <i>w-iffini</i> | ‘I was, lied down’ |
| | <i>w-ebini</i> | ‘I came’ |
| | <i>w-ibini</i> | ‘I bathed’ |
| | <i>w-iptonri</i> | ‘I went down’ |
| | <i>w-idoli</i> | ‘I went’ |

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

- (5) Arara (**alves2017arara**)
- | | |
|-----|--------------------------------|
| 1 | <i>w-aptam</i> ‘when/if I was’ |
| 2 | <i>m-od-aptam</i> |
| 1+2 | <i>kud-aptam</i> |
| 3 | \emptyset - <i>aptam</i> |

In his brief discussion of Bakairi verbal person marking, **meiraz003bakairi** 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 *əku* ‘to go up’ in Table 8 above.

- (6) Bakairi (**meiraz003bakairi**)
- w-i-də*
 $1S_A$ -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 **meiraz003bakairi** does list *ge* ‘to say’, *tə* ‘to go’, and *əe(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-*.⁸ Luckily, while **von1892bakairi** did not accurately record all phonemic distinctions in Bakairi (**meiraz005bakairi**), 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 **wheatley1969bakairimeiraz003bakairimeiraz005bakairi**.

- (7) Bakairi (**von1892bakairi**)

- | | |
|--|---|
| <p>a. ⟨u-yépa⟩
 <i>u-ge-pa</i>
 $1S_A$-say-NEG
 ‘I don’t say.’</p> | <p>c. ⟨kχaewí-le⟩
 <i>k-əewi-li</i>
 $1S_A$-come-IMM
 ‘I came.’</p> |
| <p>b. ⟨wi-táki⟩ / ⟨wi-tági⟩
 <i>w-i-taki</i>
 $1S_A$-be-INT
 ‘I was.’</p> | <p>d. ⟨kχ-itaké-he⟩
 <i>k-itagi-se</i>
 $1S_A$-go.down-NPST?
 ‘I go down.’</p> |

⁸It should be noted at this point that **meiraz003bakairi** 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 **meiraz003bakairi** and **von1892bakairi**. Given the lack of data for other verbs, we will not further discuss this potential additional pattern. If the characterization by **meiraz003bakairi** is accurate, then the pattern is fully parallel to the distribution of the first person prefixes.

- | | |
|---|--|
| e. ⟨úta⟩ / ⟨uúta⟩
<i>u-tə</i>
1S _A -go
‘I go.’ | f. ⟨töre-w-akine⟩
<i>təɾə w-a-kine</i>
there 1S _A -be-PST.CONT
‘I was there.’ |
|---|--|

All available descriptions of the third Pekodian language, Ikpeng, list *k-* as the only 1S_A marker (ikpengpacheco1997campetela1997analyseikpengpacheco2001alves2013verbo). However, most Ikpeng cognates of the Arara verbs with 1S_A *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>i-ge-li</i>
1-say-REC
‘I said.’ (ikpengpacheco2001) | |
| b. \emptyset - <i>effi-li</i>
1-be-REC
‘I was.’ (ikpengpacheco2001) | |
| c. <i>aŋagotpop</i> \emptyset - <i>ip-ŋfi</i> <i>ik-gwa-kŋfi</i>
always 1-bathe-NPST river-LOC.aquatic-ALL
‘I always bathe in this river.’ (ikpengpacheco1997) | |

(9) Ikpeng (ikpengpacheco2001)

- k-aran-ŋfi*
 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_A marker *i-/∅* suggests that it is cognate with Arara 1S_A *w(i)-*. Indeed, Proto-Xinguan **w* is attested as sometimes being lost in Ikpeng, as evidenced by the correspondences in Table 10. 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* (meirazo05southern) from Proto-Cariban **witoto* ‘person’ (gildea2007greenberg). Thus, we reconstruct a 1S_A prefix **w(i)-* to Proto-Pekodian, identical to the Arara one both in form and distribution.

Table 9: Verbs preserving i SA $*w$ - in Proto-Pekodian (alves2017araravon1892bakairiikpengpacheco2001ikpengpacheco1997meira2003bakairi)

	Proto-Pekodian	Arara	Ikpeng	Bakairi
‘be-1’	$*w-ap-$	$w-ap-$	–	$w-a-$
‘be-2’	$*w-effi-$	$w-iffi-$	$\emptyset-effi-$	$w-i-$
‘say’	$*wi-ge-$	$wi-ge-$	$i-ge-$	$u-ge-$
‘go’	$*w-itən-$	$w-ido-$	$k-aran-$	$u-tə-$
‘come’	$*w-epi-$	$w-ebi-$	$k-arep-$	$k-əewi-$
‘go down’	$*w-iptə-$			
‘bathe’	$*w-ipi-$	$w-ibi-$	$\emptyset-ip-$	$w-i-$

Table 10: Loss of $*w$ in Ikpeng (souza1993araraalves2013verboalves2017araraikpengpacheco2001desouza2010ar)

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

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; meira2005southern make no mention of a regular correspondence between Bakairi gi and Ikpeng η . However, the addition of a final η in Proto-Xinguan is attested elsewhere,⁹ and based on the fact Bakairi has generally lost much segmental material, we suggest that both η and gi are later additions to a root $*iptə$.

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

⁹a) Proto-Cariban $*əne$ ‘to see’, Arara and Ikpeng $ene\eta$; b) Proto-Cariban $*əta$ ‘to hear’, Arara $ta\eta$, Ikpeng $ira\eta$; and c) Proto-Cariban $*ənə$ ‘to eat meat’, Arara $o\eta o\eta$ ‘to bite’ (gildea2007greenbergalves2017araraikpengpacheco2001).

- (10) Arara (alves2017arara)
m-odebi-ni
 2S_A-come-REC
 ‘You came.’

On the other hand, both Ikpeng and Bakairi show reflexes of **ad-ebi* throughout the whole paradigm. Following the line of reasoning used by meira1998proto (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 **ad-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 **itan* when considering that Ikpeng *a* is an attested outcome of **a*.¹⁰ This attested change of **a* to *a* need only be preceded by a assimilatory lowering of initial **i* to **a*, to yield the form *aran* from **itan*. Other Ikpeng reflexes of ‘to go’ offer evidence for the suggested intermediate stage **atan*: *ero-li* ‘s/he went’ (ikpengpacheco2001).

Summing up, an innovative 1S_A marker **k-* is reconstructible to Proto-Pekodian. Seven verbs can be reconstructed as having resisted this innovation and preserving 1S_A **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 **ad-epi*, accompanied by the introduction of first person5 *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_P prefix **k-*, already innovated at the Proto-Parukotoan stage, was extended to 1S_A. For regularly inflected verbs, this created a unified 1S category, reflected in both Hixkaryána and Waiwai (Table 11).

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

¹⁰a) *akari* ‘dog’ in Table 10 above; b) *anma* ‘path’ (ikpengpacheco2001) from Proto-Cariban **atema* (gildea2007greenberg); and c) *jaj* ‘tree’ (ikpengpacheco2001) from Proto-Cariban **jaje*.

Table 11: Regular ‘to fall’ (S_A) and ‘to sleep’ (S_P) in Proto-Waiwaian (howard2001wroughthixkaryanaderby1985waiwaihawkins1998hawkins1953waiwai)

	Proto-Waiwaian		Hixkaryána		Waiwai	
	‘to fall’	‘to sleep’	‘to fall’	‘to sleep’	‘to fall’	‘to sleep’
1	* <i>k-eɸurka-</i>	* <i>ki-winiki-</i>	<i>k-ehurka-</i>	<i>ki-niki-</i>	<i>k-eɸirka-</i>	<i>ki-winiki-</i>
2	* <i>m-eɸurka-</i>	* <i>o-winiki-</i>	<i>m-ehurka-</i>	<i>o-wniki-</i>	<i>m-eɸirka-</i>	<i>mi-winiki-</i>
1+2	* <i>t-eɸurka-</i>	* <i>tit-winiki-</i>	<i>t-ehurka-</i>	<i>ti-niki-</i>	<i>tɸ-eɸirka-</i>	<i>tit-winiki-</i>
3	* <i>ɲ-eɸurka-</i>	* <i>ni-winiki-</i>	<i>ɲ-ehurka-</i>	<i>ni-niki-</i>	<i>ɲ-eɸirka-</i>	<i>ni-winiki-</i>

- (11) a. Waiwai (waiwaihawkins1998)
wiikekɲe
wi-ka-jakɲe
 1-say-PST
 ‘I said.’
- b. Hixkaryána (hixkaryanaderby1985)
roxehra nay hami Kaywerye ikekoni
ro-ɸe-hira n-a-je hami kajwerɸe i-ka-jakoni
 1-DES-NEG 3-be-NPST.UNCERT EVID K. 1S_A-say-REM.CONT
 ‘I said (to myself), “Kaywerye evidently doesn’t like me.”’
- c. Hixkaryána (hixkaryanaderby1985)
i-koroka-no
 1>3-wash-IMM
 ‘I washed him.’
- d. Waiwai (waiwaihawkins1998)
wiɸyesɪ
wi-jo-jasi
 1>3-boil-NPST
 ‘I will boil it.’

This correspondence allows us to establish Hixkaryána *i-* a reflex of **w(i)-*, with a similar phonological reduction as in Ikpeng (Section 2.1). Notably, **hixkaryanaderby1985** does not see this *i-* as an irregular 1S_A prefix, but as the regular 1>3 prefix, because he considers Hixkaryána *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 Hixkaryána has the expected *i-*, Waiwai seems to have combined innovative *k-* with the old **w-*, an etymological analysis also considered by **gildea1998**. Alternatively, this form might have been influenced by deverbalized

Table 12: Verbs preserving 1S_A *w- in Proto-Waiwaian (hixkaryanaderby1985hixkaryanaderby1979waiwaihawkins1998)

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

forms of ‘to go’, where a reflex of the S_A class marker *w- has become fossilized (12).

(12) Waiwai reflexes of the S_A class marker *w-

- a. o-wto-topo-nho ‘my trip’ (waiwaihawkins1998)
- b. o-wto-ŋhe ‘after I went’ (waiwaihawkins1998)
- c. ki-wto-me ‘for us to go’ (waiwaihawkins1998)

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_A 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. meira1998proto 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_A *w- seem to have switched places. This resulted in a regular 1S_A marker of the form *ŋ / __e, *t / __ə (Table 13).¹¹ The question of how this switch happened in detail (meira1998proto) 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 (meira1998proto).¹² Regarding S_A verbs unaffected by the spread

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

¹²In 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, meira1998proto 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_A verbs (**gildea1994akuriyotriomeira1999**)

	‘to bathe (INTR)’			‘to sleep’		
	Proto-Tiriyoan	Tiriyo	Akuriyó	Proto-Tiriyoan	Tiriyo	Akuriyó
1	* <i>f-epi-</i>	<i>s-epi-</i>	<i>f-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_A **w-* in Proto-Tiriyoan (**meira1998prototriomeira1999**)

	Proto-Tiriyoan	Tiriyo	Akuriyó
‘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>

of **t-*, **meira1998proto** 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* [**meira1998proto**]) can be added, which has first person *w-*, at least in Tiriyo.

We agree with **meira1998proto** identification of the idiosyncratic Akuriyó 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. Akuriyó (**gildea1994akuriyo**)
 (*w*)*i-toka*
 1>3-hit
 ‘I hit him/her.’
 b. Akuriyó (**meira1998proto**)
 kəʔ-eepi
 1+2-come
 ‘We came.’

For ‘to come’, **meira1998proto** 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 Akuriyó. Akuriyó (and Carijona) then levelled this original distribution, 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 **æpi*.

In addition, **gildea1994akuriyo** recorded four more Akuriyo 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_A verb in taking *s-* (14b). Further, these verbs are not mentioned by **meira1998proto**, who was also working with **gildea1994akuriyo** data. Given that this data potentially has strong Tiriyo and/or Wayana influence (**gildea1998**) and the lack of support by the available part of **meira1998proto** data, we cannot reconstruct these verbs as not being affected by the extension of Proto-Tiriyoan **t-*.

- (14) a. Akuriyo 1S_A **w-* (**gildea1994akuriyo**)
 ‘return’ Ø-*erama-*
 ‘get up’ Ø-*eokahta-*
 ‘jump’ *w-ejahka-*
 ‘go out’ *w-ekirika-*
 b. Tiriyo *s-erama-* (**triomeira1999**)

2.4 Akuriyo *k-*

After the split-up of Proto-Tiriyoan, when **t-* had largely replaced **w-*, Akuriyo innovated yet another 1S_A marker: *k-*. It seems to have replaced **t-* only in specific environments, with the two markers showing a clear phonologically conditioned distribution in the Akuriyo data available to us (**gildea1994akuriyo**), with all relevant verbs shown in Table 15. **meira1998proto** largely confirms the distribution shown here, but mentions “several cases of first person *t-* in Akuriyo” (on *æ*-initial verbs), albeit without any examples. He also suggests that *k-* might be more recent, with which we agree: since the distribution **t-* / *æ* / **tʃ-* / *e* is reconstructible to Proto-Tiriyoan, the most likely scenario is *k-* replacing **t-* but not **tʃ-*. The few *t-* mentioned by **meira1998proto** 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, *æ*-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 Akuriyo, although we do not know the first-person form of the copular verb *e?i*. In addition, there is an S_A verb *i(h)tæ* ‘to go down’, which has an irregular first person marker *p-* in Akuriyo, also reconstructible to Proto-Tiriyoan (15). It was not affected by the extension of Akuriyo *k-*, but whether it was an S_A verb when Proto-Tiriyoan **t-* was extended is unclear (see Section 3.5).

- (15) First person forms of ‘to go down’
 Tiriyo *p-ihitæ-* (**triomeira1999**)
 Akuriyo *p-itæ-* (**gildea1994akuriyo**)

Table 15: Regular Akuriyó 1S_A markers (**gildea1994akuriyo**)

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>æiwa</i> - ‘to tremble’	<i>entapo</i> - ‘to yawn’
<i>æmami</i> - ‘to enter’	<i>etonema</i> - ‘to lie down’
<i>ætajiŋka</i> - ‘to run’	<i>ewai</i> - ‘to sit down’
<i>æturu</i> - ‘to talk’	<i>ehpa</i> - ‘to bathe (INTR)’
<i>æniki</i> - ‘to sleep’	

Table 16: Regular Carijona verbs (**robayo2000avancemeira1998proto**)

	‘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_P marker *j(i)*-¹³ to S_A verbs (**meira1998proto**). Combined with the extension of 2S_A *m*- and 1+2S_A *kit*-/*kis*- to S_P 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_A verbs can be identified by the presence of a detransitivizer, like *ehinəhi* ‘to fight’, derived from *hinəhi* ‘to kill’ (**robayo2000avance**), shown in (16).

- (16) Carijona (**koch1908hiana**)
həŋə(x)tonoko-máŋə y-e-hənə(x)yaɪ
hinəhtono-ko=marə j-e-hinəhi-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_A marker **t*-. However, it did not fully eclipse the old 1S_A 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).

¹³Since all affected S_A verbs are V-initial, only the / _V allomorph *j*- occurs in that context.

Table 17: Regular Yukpa verbs (**largo2011yukpameiraz006syntactic**)

	‘to wash self’	‘to sleep’	‘to fall’
1	<i>j-otum-</i>	<i>ji-ni-</i>	<i>j-ata-</i>
2	<i>m-otum-</i>	<i>mi-ni-</i>	<i>m-ata-</i>
3	<i>n-otum-</i>	<i>ni-ni-</i>	<i>n-ata-</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 Hixkaryana, 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 (**meiraz006syntactic**). 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_A *m(i)-* to (former) S_P verbs like *ni* ‘to sleep’. These verbs share their first person marker *j(i)-* with former S_A 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_P marker **u(j)-*.

(18) Yukpa (**meiraz006syntactic**)

- 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_A **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 (meiraz006syntactic)
aw Ø-to
 1PRO 1S_A-go
 ‘I went.’

3 Resistant verbs from a comparative perspective

In Section 2, we introduced six distinct extensions of personal prefixes into 1S_A 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 *(ə*t*)*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 meiraz009propertygildea2018reconstructing

as originally meaning ‘to dwell, live’, but serving as a copula in Proto-Cariban.¹⁴ Various modern languages use reflexes of these two roots in a suppletive manner, conditioned by person and/or TAM value. Both roots preserved 1S_A *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 (**meirazo06**syntactic)

	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!’
 (**koehn1986**apalai)

Table 18 shows a comparison of the longest attested forms for each language.¹⁵ 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*.

As briefly mentioned in Section 2.2, **hixkaryanaderby1985** analyzes this verb as transitive in Hixkaryána. This analytical choice is not only motivated by the desire to avoid an

¹⁴Such a stative, locative source is also suggested by the existence of *iffi* ‘to lie down’ in Arara (**alves2017arara**).

¹⁵Cognate 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’ (meiraz003bakairifranchetto2008absolutivoikpengpacheco2001alves2017a)

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[t]</i> k a i
Apalaí	<i>ka[ʔ]</i> k a ʔ 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

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.’ ([hixkaryanaderby1985](#))
- b. *moro ha, ketxkoná hatá.*
moro ha ka-jafkoni hati
 MED.DEM.INAN INTS say-REM.CONT.PL HSY
 ‘“That one there” they said.’ ([derbyshire1965textos](#))

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 Tiriýó cognate shows the same pattern, albeit inconsistently so ([triocarlin2004](#)).

Derivational suffixes also point to **ka[ti]* ‘to say’ being transitive: Tiriýó *ka* is characterized as the only intransitive verb being able to take the causative suffix *-po* and the agentive nominalizer *-ne* ([triomeira1999](#)). The exceptionality of *ka* ‘to say’ taking *-po* ‘CAUS.TR’ has also been noted for Kari’ña ([courtz2008carib](#)) and Wayana ([wayanatavares2005](#)). The agent nominalizer **-ne* gave rise to the Panare gnomic verbal suffix *-je* on transitive verbs ([gildea1998](#)). The occurrence of *-je* on *ka* likely led [panarepayne2013](#) to categorize it as transitive, contrasting with the intransitive analysis by [mattei1994diccionario](#). Finally, reflexes of the causativizer **-metipo*, usually restricted to transitive verbs ([gildea2015valency](#)), are found with *ka* in Apalaí ([koehn1986apalai](#)) and Waiwai ([waiwaihawkins1998](#)).

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’ ([courtz2008carib](#)).¹⁶ 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_A* prefixes by the presence of *i* ([meira2010origin](#)) show no *i* for this verb, see (24a) as well as [triomeira1999wayanatavares2005ikpengpacheco2001alves2017ararahoff1968carib](#) for the verb’s inflection in individual languages. Finally, the *S_A* class marker *w-* occurs on nominalizations in Kari’ña (24b), and it is probably reflected as vowel length in the Tiriýó ([triomeira1999](#)) and Wayana ([wayanatavares2005](#)) participles.

¹⁶Interestingly, the Kari’ña causativized form *kapo* ‘to make say’ does not have the regular 1>3 prefix *s(i)-*, but irregular *w(i)-* ([courtz2008carib](#)).

- (24) a. Akuriyó (meira1998proto)
mi-ka
 2-say
 ‘You said.’
- b. Kari’ña (courtz2008carib)
Òmakon ‘wa oti ywykàpo kaiko.
o-ʔma-kon ʔwa oti i-wi-ka-ʔpo kai-ko
 2-child-PL OBL greeting 1-S_A-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’ (hixkaryanaderby1985), Tiriyo *təkə* ‘go!’ (triomeira1999), or Wayana *kuptəm* ‘we went’ (wayanatavares2005). 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’.¹⁷ 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 *ətepi 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, *jepi, or *jəpi for the *epi 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.

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_A’, since

¹⁷As 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’ (triomeira1999galves2017arara) 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’ (cruz2005fonologiatrimeira1999wayanatavares2005gildea1994akuriyoalv)

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[mi]</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]ti</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’ (macushiabbott1991alvarez2000construccionesakawaiocaesar2003cru)

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>	æ		-		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		

the S_A 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_A verbs do not show *j*-, but Ø (25d). Thus, the best explanation for this *j* is that 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_A-come-PROG
'You are coming.'
- c. *i-nki-ri*
3-sleep-PROG
'S/he is sleeping.'
- d. *Ø-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 (**meiraz010origin**). 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 **meira1998proto** 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 20,¹⁸ the distribution within the family is rather chaotic.

¹⁸Apart from aforementioned Akuriyó *eepi*, another diachronically irregular form is Apalaí *oepi*, where one would expect **ət-epi* to yield *os-epi* (**meiraz010origin**). Similarly, while *oepi* would be a regular outcome of hypothetical **ə-jəpi*, the / __C allomorph of the detransitivizer is *e*- in Apalaí. One possibility is that the form is due to borrowing from Tiriyó, which has lost intervocalic **t* to create *əepi*. Alternatively, Apalaí *oepi* could be a

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 Tiriyó (and Proto-Taranoan). To illustrate, the Tiriyó Set I paradigm shows a reflex of **ətepi* (< **ətjəpi*) for first, but of **epi* (< **jəpi*) for the other persons (26).¹⁹ It should be noted that forms with and without **ət-* in different languages are not triggered by the same person values.

(26) Tiriyó (triomeira1999)

- | | |
|-----|----------------|
| 1 | <i>w-əpi</i> |
| 2 | <i>mən-epi</i> |
| 1+2 | <i>ke-epi</i> |
| 3 | <i>n-epi</i> |

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_P* verbs are attested as adding the detransitivizer to become *S_A* verbs. For example, the Proto-Cariban *S_P* verb **winiki* ‘to sleep’ becomes Tiriyó *əniki* (triomeira1999) and Kari’ña *əʔniki* (courtz2008carib), both *S_A*. Also, Waiwai ‘go to sleep’ can be *winik* (waiwaihawkins1998) or *et-winik* (hawkins1953waiwai). The parallels to ‘to sleep’ end here, since bare **jəpi* ‘to come’ apparently already was an *S_A* verb, as evidenced by its status in Werikyana, Kari’ña, Arara, Tiriyó, and Panare (27).

(27) Panare (panarepayne2013)

- ju-w-əəpi-n* *ka=m* *kanoʔ*
 3-*S_A*-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_A* 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 **ətjəpi*, but not on the Arara reflex of **jəpi*. Reflexes of **ətjəpi* (Tiriyó) and of **ətjəpi* and/or **jəpi* (Akuriyó) resisted the introduction of Proto-Tiriyoan **t-*. Carijona *ehi* shows innovative *j-*, rather than 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-*.

fossilized loan from Wayana, which has replaced its reflex of **ətjəpi*, but where intervocalic **t* was also regularly lost (wayanatawares2005).

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

- (28) Carijona (guerrero2019carijo)
aji-wa-e j-eh-i
 2-search-SUP 1-come-PFV
 ‘I came looking for you.’

3.5 **ipitə* ‘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.)
irə wafɪnakano tae j-ehitə-e
 INAN.ANA body.of.water along.bounded 1-go.down-NPST
 ‘...I go down through that guachinacán.’
- b. Yukpa (meiraz003primeras)
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 **ipitə*, including verb class membership where applicable; parenthesized forms indicate uncertainty about cognacy status. It turns out that while a form **ipitə* 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_A* and *S_P*.

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_P* markers *j-* and *əw-* (wayanatawares2005), but the 1+2*S_A* marker *kut-* (wayanatawares2005). It also shows the *S_A* class marker *w-* in nominalizations (30a), but behaves like an *S_P* verb in taking a second person prefix in imperatives (30b).

Table 21: Reflexes of **ipita* ‘to go down’ (meirazo3primerashixkaryanaderby1979waiwaihawkins1998guerrero2003)

Language	Form	Class								
Proto-Parukotoan	<i>*ipito</i>	S _P		i	ɸ	i	t	o		
Werikyana	<i>ihito</i>	S _P		i	h	i	t	o		
Proto-Waiwaian	<i>*hto</i>	?			h		t	o		
Hixkaryána	<i>hto</i>	?			h		t	o		
Waiwai	<i>hto</i>	–			h		t	o		
Proto-Pekodian	<i>*iptə</i>	S _A		i	p		t	ə		
Arara	<i>iptɔŋ</i>	S _A		i	p		t	o	-	ŋ
Ikpeng	<i>iptɔŋ</i>	?		i	p		t	o	-	ŋ
Bakairi	<i>itəgi</i>	S _A		i			t	ə	-	g i
Proto-Taranoan	<i>*ihitə</i>	S _A		i	h	i	t	ə		
Proto-Tiriyóan	<i>*ihtə</i>	S _A		i	h		t	ə		
Tiriyó	<i>ihitə</i>	S _A		i	h		t	ə		
Akuriyó	<i>ihitə</i>	S _A		i	h		t	ə		
Carijona	<i>ehitə</i>	–		e	h	i	t	ə		
Wayana	<i>iptə</i>	S _A / S _P		i	p		t	ə		
Apalaí	<i>ihito</i>	S _P		i	h		t	o		
Kariña	<i>oni?to</i>	(S _A)	o - n -	i	?		t	o		
Ye'kwana	<i>ə?tə</i>	S _P		ə	?		t	ə		
Kapón	<i>(u?tə)</i>	–								
Pemón	<i>(u?tə)</i>	–								
Macushi	<i>(auti)</i>	–								
Panare	<i>əhtə</i>	S _A		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 (**wayanatavares2005**)

- a. *ĩwĩptěě*
ĩ-w-ipta-ri
 1-S_A-go.down-NMLZ
 ‘my going down’
- b. *əw-ipta-k*
 2-go.down-IMP
 ‘Go down!’

Its causativized form is *ipta-ka* (**wayanatavares2005**); the restriction of **-ka* to S_P verbs in Proto-Cariban (**gildea2019overview**) points to S_P membership. These patterns lead us to posit the hypothesis that the verb was a regular member of the S_P class in pre-Wayana, but partially switched to the S_A class, reflected only in its 1+2 prefix and the S_A class marker. This in turn implies that reflexes of this verb with S_A membership in other languages fully switched from S_P at some point.

Wayana-external comparative evidence supports this hypothesis: The Arara causativized form is *enipton* (**alves2017arara**), and Kari’ña has a cognate form *eni?to* (**courtz2008carib**); *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_P 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-* (**triomeira1999**). Thus, it seems that this verb was originally S_P, 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_A 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_P 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_A verb. Likewise, it seems very likely that the class switch took place before the extension of Proto-Pekodian **k-*. Otherwise, the newly-turned-S_A 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 1S_A prefixes in Proto-Tiriyoan (Tiriyo *s-epi-*, Akuriyó *tʃe+pi-* [triomeira1999gildea1994akuriyo]) and Proto-Waiwaian (Hixkaryána *k-ewehti-*, Waiwai *k-ejeɸu-* [hixkaryanaderby1985waiwaihawkins1998]). 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_A 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’
(hixkaryanaderby1979waiwaihawkins1998alves2017araraikpengpacheco1997campetela1997analisemeira2003)

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

It is astonishing that the same 1-7 verbs retain their old first person marker in 6 distinct developments, while a plethora of regular $S_{(A)}$ verbs take on innovative markers. This suggests that there is some strong motivation for these verbs to not be affected by innovative markers. The question arises what properties unite these verbs and make them so conservative across different Cariban languages. We will discuss possible answers to this question in Section 4.1, using **bybee1985morphology** network model of morphology.

4.1 Reasons for conservativeness

Perhaps the most well-known contribution regarding conservativeness, innovativeness, and (ir-)regularity in the lexicon is **bybee1985morphology** with her network model of morphology, which seems well-suited for the data at hand. It aims “to account for cross-linguistic, diachronic and acquisition patterns in complex morphological systems” (**bybee1995regular**). It does so by modeling shared morphological properties such as inflectional patterns as emerging from connections of differing strength between lexemes. A classic example is a network of “strong” English verbs with *striŋ–straŋ* at the center and pairs like *riŋ–raŋ*, *spiŋ–span*, or *stik–stak* at its periphery. This network is attracting new verbs in certain dialects, like *sni:k–snak* or *brŋ–braŋ* (**bybee1985morphology**). These verbs are recruited based on the lexical connection they form with prototypical members of the group, and accordingly develop irregular or “strong” past tense forms.

As possible bases of these connections between lexemes, **bybee1985morphology** suggests the criteria of semantic, phonological, and morphological similarity; the English strong verbs are an example for a phonologically motivated network. Another important factor in the model is frequency, since more frequent words have a higher lexical strength (**bybee1985morphology**). This higher lexical strength diminishes the influence from other lexemes, meaning that high-frequency items are more likely to resist innovations. For our diachronic study of Cariban inflectional patterns, the model would predict that a) semantically/phonologically/morphologically similar verbs will be affected by person marker extensions, and b) high-frequency verbs will tend to resist these extensions and thus remain conservative.

When one considers the groups of verbs with innovative first person markers (those not

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

	<i>*ka[ti]</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

in Table 23), one can perceive multiple factors potentially serving as the thread connecting a lexical network. Perhaps the most obvious one is that they all have a reflex of the detransitivizer **ate/e-*, a hallmark of S_A verbs (Section 1.2.3). This also has a phonological consequence: all affected S_A verbs begin with reflexes of **ə* or **e*, meaning that networks with a phonological basis are also plausible. A more trivial connection between these other verbs is that they are all S_A verbs, and thus share inflectional morphological patterns. To make this potential network factor more specific, we will restrict it to the $1S_A$ prefix (pre-innovation). These two criteria based on inflectional morphology predict the exact same verbs except in Akuriyó, where there was already innovative $1S_A$ morphology, with *k-* and idiosyncratic *p-* on 'to go down'. There are no semantic patterns that would be obvious, which is not unsurprising given the lack of semantic patterns in the split-S system overall (Section 1.2.3). For each extension, this leaves us with three hypotheses as to what connected the members of the responsible network: a reflex of DETRZ, their stem-initial phoneme, or a specific $1S_A$ prefix.

It is intuitively obvious that many of the conservative verbs in Table 23 are high-frequency verbs, which would mean high lexical strength and conservativeness according to the network model. A major obstacle to confirming this intuition is the lack of frequency counts for individual lexemes for any Cariban language. We are only aware of **courtz2008carib** claim of Kari'ña underived S_A verbs being the most frequent ones: "It is difficult [...] to imagine an intransitive or transitive origin for some of the most frequent middle verbs". This claim is supported neither by frequency counts nor accompanied by a list of verbs, although it seems

Table 24: Frequency counts of S_A verbs in three Apalaí texts from **koehns1994textos** (163 S_A verbs, 1070 words)

Verb	Count	% S _A 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-enakũnu?</i> ‘choke’	2	1.23%
<i>e-unopi</i> ‘laugh’	1	0.61%
<i>at-akĩma</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%

likely that these underived S_A verbs refer to the two roots for ‘to be’, as well as ‘to say’, ‘to go’, and ‘to come’. Given this dearth of data, we conducted a count of S_A verbs in three glossed texts from **koehns1994textos**, the results of which are shown in Table 24. The Apalaí data agree with our interpretation of **court22008scarib** claim; defining “high frequency” as having an above average count produces the exact same five verbs. While it is not at all certain that this small Apalaí sample is really representative of discourse patterns in the Cariban (proto-)languages under discussion, the absence of alternatives led us to use it as a tool for categorizing verbs as high-frequency.

Thus, in addition to the three hypotheses for possible network factors, each can be combined with frequency; high-frequency verbs are predicted to not undergo innovation, even though the factor under investigation would put them in the same lexical network as regular S_A verbs. For each extension, this leaves us with six possible explanations for which verbs are affected and which are not. First, we established for each explanation what behavior it

Table 25: Predictions for Proto-Tiriyóan

	<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 26: Evaluating predictions for Proto-Tiriyóan

	<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	✓	✓	✓	✓	✓	✓	100.0%
phono+freq	✓	✓	✓	✓	✓	✓	100.0%
infl+freq	✓	✓	✓	✓	✓	✓	100.0%
DETRZ	✓	✓	×	✓	✓	✓	83.3%
phono	✓	×	×	✓	✓	✓	66.7%
infl	×	×	×	×	×	✓	16.7%

would predict for each verb, illustrated in ?? for Proto-Tiriyóan. For example, **eʔi* 'to be' is expected to participate in innovations spreading in a phonologically defined network, being **e*-initial, as well as in an inflectionally defined one, since it shared **w-* with other S_A verbs. However, it would not have belonged to a network defined by the presence of a detransitivizer; if frequency is taken into account, it is expected to remain conservative regardless of the nature of the network. We then checked these predictions against the data in Table 23, to see how many potentially conservative verb each explanation predicted correctly. This gave us a score of what proportion of potentially conservative verbs had their behavior predicted accurately, illustrated for Proto-Tiriyóan in Table 26 and summed up in Table 27.

It is important to understand that the scores in Table 27 only refer to the group of seven verbs in Table 23, i.e. those that are attested as resisting at least one extension. For each extension, there were also many run-of-the-mill S_A verbs, all taking on the new person marker, except for the Akuriyó *e*-initial verbs.²⁰ To illustrate, if one adds 1'000 regular S_A verbs –

²⁰While there are a few S_A verbs not transparently derived from transitive verbs (*triomeira*₁₉₉₉*meira*₂₀₀₀*splitgildea*₂₀₀₇*greenberg*), which are not featured in Table 23, these are mostly **ə*-initial and were likely productively derived at some point. The verbs to which this does not apply, like Tiriyó *wa* 'to dance' (*triomeira*₁₉₉₉), are all instances of S_P verbs switching classes. Since none of them is

Table 27: Overview of prediction accuracy

	DETRZ	DETRZ+freq	phono	phono+freq	infl	infl+freq
Proto-Waiwaian <i>*k-</i>	100.0%	100.0%	60.0%	100.0%	20.0%	100.0%
Proto-Pekodian <i>*k-</i>	100.0%	100.0%	71.4%	100.0%	0.0%	71.4%
Proto-Tiriyóan <i>*t-</i>	83.3%	100.0%	66.7%	100.0%	16.7%	100.0%
Akuriyó <i>k-</i>	83.3%	83.3%	100.0%	100.0%	100.0%	100.0%
Carijona <i>j-</i>	60.0%	60.0%	100.0%	60.0%	40.0%	60.0%
Yukpa <i>j-</i>	33.3%	33.3%	100.0%	33.3%	66.7%	33.3%

a conservative estimate based on **courtz2008carib** Kari’ña dictionary – all six explanations consistently predict the behavior of 99.99+% verbs correctly. However, the available data simply does not allow such large-scale tests for Cariban languages, so we restrict our investigation to the edge cases.

The extent of the extensions in both Proto-Waiwaian and Proto-Pekodian is fully predicted by the presence or absence of a detransitivizer. In both cases, only the underived²¹ S_A verbs were not affected, all other S_A verbs taking **k-*. Not shown in ?? are subsequent evolutions in the Pekodian daughter languages, which can largely be argued to also be due to the detransitivizer: First, we argued that both Ikpeng and Bakairi regularized the paradigm to use forms with detransitivizer for first person, which in both languages led to an introduction of *k-*.²² Second, the subsequent introduction of *k-* to Ikpeng *aran* ‘to go’ (< **itan*) potentially suggests a reanalysis of *ar* as a detransitivizer.

Three extensions are fully predicted by phonological criteria, those in Akuriyó, Carijona, and Yukpa. We have already discussed Akuriyó *k-* (Section 2.4), which only appears on *ə*-initial verbs. In Carijona, the extension of *j-* affected *e-* and *ə*-initial verbs, including *eh* ‘to come’ or *effi* ‘to be’, which do not have a detransitivizing prefix. Only *ka* ‘say’, *təmə* ‘go’, and *a* ‘be-1’ did not take on *j-*. Similarly, the extension of Yukpa *j-* can succinctly be characterized as affecting all vowel-initial verbs; the only verb attested as unaffected is C-initial *to* ‘to go’. Inflectional morphology as a network basis only played a potential role in the case of Akuriyó, but it must be noted that we treated the first person markers *t-* and *ʃ-* as distinct, which were of course phonologically conditioned.

When additionally considering putative conservatory frequency effects, prediction accuracy was improved in 8 cases, stagnated in 7 cases, and worsened in 3 cases. The three cases where our rough model of verb frequency arrives at incorrect predictions are found in Cari-

attested as being an S_A verb at the time of a person marker extension, they are not relevant for our discussion of conservative verbs.

²¹Note that for Proto-Pekodian, we assumed that the idiosyncratic evolution of **e-pi* ‘to bathe (INTR)’ to **ipi* made the verb morphologically opaque.

²²If one instead assumes that first person **w-ebi-* and **k-əd-ebi-* already co-existed in Proto-Pekodian, the clear correlation between **k-* and the detransitivizer remains.

jona and Yukpa, the only languages to feature innovative markers on the reflexes of **eti* ‘be-2’, Yukpa also on **a[p]* ‘be-1’. Including frequency in the model led to overall improvements, resulting in a 100% prediction accuracy for all three potential factors in Proto-Tiriyoan, as well as for the inflection criterion in Proto-Waiwaian.

Overall, the patterns of most extensions are correctly predicted not by a single explanation, but usually between 3 and 4, except those in Carijona and Yukpa. Here, a lexical network with a phonological basis emerges as an unambiguous winner, while frequency-based explanations fare much worse. For the other extensions, the network model gives no unambiguous answer to the question of what combination of factors caused the innovative markers to spread the way they did. This in turn is due to the fact that three of the factors we used to account for morphological behavior – detransitivizer, phonology, frequency – largely converge in their predictions: The most frequent verbs are at the same time those without a detransitivizer, and therefore mostly of a different phonological shape than regular S_A verbs.

4.2 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!

A Predictions for the behavior of individual verbs

Table 28: Predictions for Proto-Waiwaian

	<i>*ka[s]</i> 'say'	<i>*efi</i> 'be'	<i>*ah</i> 'be'	<i>*[t]to[m]</i> 'go'	<i>*eeφi</i> 'bathe (INTR)'
DETRZ	×	×	×	×	✓
DETRZ+freq	×	×	×	×	✓
phono (/ _— <i>*o, e, a</i>)	×	✓	✓	×	✓
phono+freq	×	×	×	×	✓
infl (<i>*w-</i>)	✓	✓	✓	✓	✓
infl+freq	×	×	×	×	✓

Table 29: Evaluating predictions for Proto-Waiwaian

	<i>*ka[s]</i> 'say'	<i>*efi</i> 'be'	<i>*ah</i> 'be'	<i>*[t]to[m]</i> 'go'	<i>*eeφi</i> 'bathe (INTR)'	Score
DETRZ	✓	✓	✓	✓	✓	100.0%
DETRZ+freq	✓	✓	✓	✓	✓	100.0%
phono+freq	✓	✓	✓	✓	✓	100.0%
infl+freq	✓	✓	✓	✓	✓	100.0%
phono	✓	×	×	✓	✓	60.0%
infl	×	×	×	×	✓	20.0%

Table 30: 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 31: 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	✓	✓	✓	✓	✓	✓	✓	100.0%
DETRZ+freq	✓	✓	✓	✓	✓	✓	✓	100.0%
phono+freq	✓	✓	✓	✓	✓	✓	✓	100.0%
phono	✓	×	×	✓	✓	✓	✓	71.4%
infl+freq	✓	✓	✓	✓	×	✓	×	71.4%
infl	×	×	×	×	×	×	×	0.0%

Table 32: Predictions for Akuriyó

	<i>ih̥tə</i> 'go down'	<i>epi</i> 'bathe (INTR)'	<i>[ə]tə[m̥i]</i> 'go'	<i>ka</i> 'say'	<i>ee̯pi</i> 'come'	<i>a</i> 'be'
DETRZ	×	✓	×	×	×	×
DETRZ+freq	×	✓	×	×	×	×
phono (/ _ə)	×	×	×	×	×	×
phono+freq	×	×	×	×	×	×
infl (<i>k</i> -)	×	×	×	×	×	×
infl+freq	×	×	×	×	×	×

Table 33: Evaluating predictions for Akuriyó

	<i>ih̥tə</i> 'go down'	<i>epi</i> 'bathe (INTR)'	<i>[ə]tə[m̥i]</i> 'go'	<i>ka</i> 'say'	<i>ee̯pi</i> 'come'	<i>a</i> 'be'	Score
phono	✓	✓	✓	✓	✓	✓	100.0%
phono+freq	✓	✓	✓	✓	✓	✓	100.0%
infl	✓	✓	✓	✓	✓	✓	100.0%
infl+freq	✓	✓	✓	✓	✓	✓	100.0%
DETRZ	✓	×	✓	✓	✓	✓	83.3%
DETRZ+freq	✓	×	✓	✓	✓	✓	83.3%

Table 34: Predictions for Carijona

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

Table 35: Evaluating predictions for Carijona

	<i>ehi</i> 'come'	<i>ka</i> 'say'	<i>effi</i> 'be'	<i>təmə</i> 'go'	<i>a</i> 'be'	Score
phono	✓	✓	✓	✓	✓	100.0%
DETRZ	×	✓	×	✓	✓	60.0%
DETRZ+freq	×	✓	×	✓	✓	60.0%
phono+freq	×	✓	×	✓	✓	60.0%
infl+freq	×	✓	×	✓	✓	60.0%
infl	✓	×	✓	×	×	40.0%

Table 36: 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 37: Evaluating predictions for Yukpa

	<i>to</i> 'go'	<i>a</i> 'be'	<i>e</i> 'be'	Score
phono	✓	✓	✓	100.0%
infl	×	✓	✓	66.7%
DETRZ	✓	×	×	33.3%
DETRZ+freq	✓	×	×	33.3%
phono+freq	✓	×	×	33.3%
infl+freq	✓	×	×	33.3%