Initial glottal stop in Mayan languages

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Terrence Kaufman El Cerrito CA 94530 kaanbahlam@gmail.com

The discussion below assumes that the reader has basic familiarity with the structural properties of Mayan languages, and of the classification of the family.

Over the years it has repeatedly been brought to my attention that in all quarters for those who study Mayan languages there is a lack of full understanding of the behavior of initial glottal stop. This lack of understanding is not universal, but it is widespread. It is revealed in the off-the-cuff statements made by Mayanists in conversation with each other, and in statements made in print. To be sure, someone who does field research on a particular Mayan language may know what the phonetic facts are for that language, but still may not have achieved an understanding of the best analysis of those facts.

What I aim to do here is to lay out the facts for each recognizable batch of languages - because not all languages behave in exactly the same way - and then tell you what the best analysis of the facts is.

As far as the distribution of sounds is concerned there are three kinds of entities that are "word"-like:

[1] roots and lexemes/stems

- [2] morphological/morphosyntactic words: lexemes that have had inflexional morphemes attached to them in such a way that no more inflexional affixes are required for the relevant syntactic use of the lexeme.
- [3] **phonological words:** strings of phonemes that begin in the way that an utterance may begin, and end when a possible pause is reached.

Among these entities, which I will call words or word-like things, it is correct to say that none of them can begin with a vowel. (btw, in the interests of clarity, "word" should not be used as the equivalent of "stem" or "lexeme")

In most Mayan languages, words must end with a consonant, by default /h/. But not all Mayan languages have a requirement that some consonant must be present at the end of every word. This latter situation is an innovation.

In all Mayan languages, for at least some set of phonological phenomena, it is possible, desirable, and necessary to draw a distinction between

underlying and surface phonology. And necessarily we also need to account for allophonic versus phonemic phenomena.

Underlyingly some Mayan morphemes (but not lexemes) begin with vowels. But no word begins with a vowel. In word-initial position, what happens to underlying initial vowels? That question will be answered below.

Beyond this, from a phonological point of view, there are three special types of morphemes:

- [1] suffixes: some begin with consonants, others begin with vowels.
- [2] **prefixes/proclitics**: it is not clear whether Mayan languages have any prefixes: that is, the preposed elements

ERG++

are proclitic - unstressed and unstressable. ERGatives are agreement markers, therefore inflexional, therefore affixes/prefixes - but they are extrametrical, thus proclitics. The ERG markers *a:(w)++, *u++, *e:(r)++ begin with vowels; how are they pronounced? Not uniformly. More below.

[n.b. extrametrical means, roughly, outside the scope of stress assignment.]

There are two other preposed elements in Mayan that some think of as prefixes, but are in fact prepounds, because they are roots:

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*7aj= 'male; large'
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*7ix= 'female; small'

Unlike ERG markers, these prepounds do not have allomorphs depending on what consonant follows them.

In K'ichee7, according to the prevailing analysis, a word beginning with <V> necessarily has [7] inserted before it:

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iitz [7í:tz] 'witchcraft'
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vs aj iitz, pronounced [7àj 7í:tz] 'witch'

In some languages these prepounds lose their vowels under certain circumstansces; thus Tzeltal j=xun 'John', vs k-aj=xun-tik 'our John' or 7ab't.el 'work' vs j=7ab't.el 'worker' vs k-aj=7ab't.el 'my worker'

This vowel loss is perhaps attributable to the unstressed and word/phrase-initial original forms of *7aj= and *7ix=, but in Tzeltal the vowelful forms -aj- and -ix- are not extra-metrical in the way that {aw+} ERG2 is. More on this set of elements below.

[3] **enclitics**: these are unstressable morphemes/words that attach to what immediately precedes them; some begin with consonants, others begin with vowels.

Stress and Tones in Mayan

In some Mayan languages vowels in otherwise identical or analogous segmental environments may have a two-way tonal distinction. In Yukateko, for example, long vowels (but not short vowels) can be contrastively higher (or falling from high to low) or lower (or rising from low to high). The lower tones reflect Proto-Mayan long vowels; the higher tones reflect Proto-Mayan VhC and VjC and VhVlC sequences. Kotoke of Motozintla (Moocho7), Tzotzil of San Bartolo, and Uspanteko have also developed tonal phenomena out of segmental phenomena. In no case do the tonal phenomena require reconstruction of tones to Proto-Mayan, not even to a major branch of the family (in Colonial Yukateko, for example, the tonal phenomena can be interpreted as realizations of segmental phonemes).

The remaining Mayan languages have stress systems, and stress is completely predictable in native vocabulary. There are four basic types of stress systems (clitics are unstressed):

Type A: stress the heaviest syllable of every word -- e.g. Wasteko, Northern Mam;

Type B: stress the first syllable of the root on a word in phrase-medial position, stress the last vowel of a word in phrase-final position -- e.g. Tzeltal, Q'anjob'al [note that in these languages ERG proclitics are extrametrical and may not bear stress, but enclitics are not extrametrical and may bear stress];

Type C: stress the penult syllable -- Southern Mam, Nebaj Ixil;

Type D: stress the rightmost vowel of every word -- e.g. K'ichee7, Western Mam, Q'eqchi7, Poqom.

The fact that three of these four patterns are found among the dialects of a single language, Mam, shows that at least two of the patterns are either not very old, or else were borrowed by Mam from members of other Mayan branches. In my view Proto-Mayan probably had a variant of the type A stress system very like that of Wasteko. [See Fox 1978 for a less finely-graded survey of Mayan accentual systems]

What accounts for the behavior of *7aj= and *7ix= in the various Mayan languages? Is a precise phonological characterization of their original properties possible? They both definitely began with *7; because in absolutely initial position they lose their first part (7 + vowel, becoming j- and x-) in many languages, one might imagine that they were unstressed in their immediate ancestor. But virtually all languages have -aj- (and some have -ix-) in the possessed forms of such nouns, and in Tzeltal they are not extrametrical, thus simply prepounds. Probably we need to account for the

loss of vowels here otherwise than by an appeal to extrametricality. At the moment, I have not worked out a detailed historical account for the development of these morphemes in the Mayan family. Except in Tzeltalan and Q'anjob'alan Proper, where the initial syllable of a polysyllabic word can be stressed under certain circumstances, in all other Mayan languages the reflexes of *7aj= and *7ix= would (almost) never be stressed, even though they were not extrametrical like the ERG markers are. Wasteko {7aa+} is extrametrical. Perhaps a reasonable story would be that *7aj= and *7ix= were prenominal modifiers, and hence, like adjectives, less prominently stressed than the nouns they modified. In some descendant languages, because not word-final, they were never stressable; in Wasteko they became extrametrical; in Tzeltal their weak stress due to being modifiers was lost.

There are 5 relevant environments where word-final and word-initial phenomena interact --

- [1] What happens when a word beginning with a vowel is preceded by a word ending in a consonant?
 - ..C # V.. NOTHING
- [2] What happens when a word beginning with a vowel is preceded by a word ending in a vowel? or otherwise put .. What happens when a word ending with a vowel is followed by a word beginning in a vowel?
 - ..V # V.. IN MOST [but not all] LGS INSERT [7]
- [3] What happens when a word ending with a vowel is followed by a word beginning in a consonant?
 - ..V # C.. NOTHING
- [4] What happens when a word ending with a consonant is followed by a word beginning in glottal stop?
 - ..C # 7V.. NOTHING [BUT NOT ALL IS AS IT SEEMS]
- [5] What happens when an ERG proclitic precedes an entity [noun or verb] beginning with /7/?
 - ERG++ 7V... 7 => 0; AND SOME OTHER STUFF, DISCUSSED BELOW

Now for the behavior of some subsets of Mayan languages.

Q'anjob'alan minus Kotoke and Tojol 7Ab'al: Word initial V receives /h/ [h] in front of it; the scope of this is only the ERG proclitic prefixes and the ABS markers when they are postvocalic.

K'ichee7an-Poqom minus Q'eqchi7 [that is, K'ichee7, Kaqchikel, Tz'utujiil, Sakapulteko, Sipakapenyo, Uspanteko, Poqomam, Poqomchii7]: Lexemes may begin with vowels; in absolute phrase-initial position /7/ or [7] is inserted before an initial vowel. All roots lost initial /7/; this happened in no other set of Mayan languages. [The facts stated here will be restated and reinterpreted below, where I withdraw the claim that there are vowel-initial lexemes in these languages.]

This phenomenon was observed by me and Will Norman in the early 1970s as we started the research program of the PLFM and were deciding on what orthographic customs to adopt. This led us to see as good the notion of not writing initial [7], because in these languages [but these languages ONLY!] initial [7] can be viewed as inserted phonetically. Unfortunately, we unwisely adopted this custom for all the languages of the PLFM, and this custom has been wrongly followed by some Mayanists working on Mexican Mayan languages.

At the outset we saw that this orthographic custom was a problem for Chuj, Popti7, Akateko, and Q'anjobal, because these languages

first: have an underlying /7/ at the beginnings of all words that do not have some other consonant there;

second: insert /h/, not [7] before vowel-initial ERG and ABS markers

On the PLFM the speakers of these languages were trained to ignore and not write initial /7/, which they could hear, and write initial /h/, which is so hard to hear or focus on that it mostly gets failed to be notated.

In fact, the analysis we made of K'ichee7-Poqom was wrong. When morphemes of the shape /7VC/ are reduplicated, /7/ is present as part of the reduplication. Thus when the numeral root {7ox} 'three' is reduplicated, it is [7ox7ox] 'three by three', which it would be boneheaded to phonemicize as /ox7ox/: it must be /7ox=7ox/. Reduplication has to reduplicate something; therefore underlyingly the root is {7ox}. This being so, there has to be another way of accounting for the presence vs absence of [7] at the beginning of lexical roots in word-initial position. It is preferable to analyze these words as starting with /7/, and postulate a rule that says

..VC # 7V.. => ..VCV..

Thus point [4] above should be reformulated as below:

[4] What happens when a word ending with a consonant is followed by a word beginning in glottal stop?

..C # 7V.. [a] in K' ichee7an-Poqom 7 => 0

[b] in other Mayan languages NOTHING

The earlier example about initial [7] in K'ichee7 should be respelled:

7iitz 'witchcraft'

vs 7aj=7iitz, pronounced [7àj 7í:tz], 'witch'

K'ichee7 also has /ch+ 7ox=7ox junaab'/ 'at a frequency of every three years', where the proclitic preposition chi+ has a reduced form /ch+/, which requires the root-initial /7/ on /7ox=7ox/ '3 by 3' to be hearable and written out. In /7ox=7ox/ spoken in isolation /7/ has already "surfaced" but by custom it has wrongly not been spelled out.

How initial /7/ is copied in reduplication in Mayan, illustrated from Tzotzil of Chamula, with suffix $\{.Clun\}$

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x+ 7ach'.7un 'dampness coming out' : 7ach' 'wet'
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x+ 7aj.7un 'moaning with pain'; cf. x+ 7aj.et 'moaned once'

x+ 7an.7un 'burning': 7an (vi) 'to burn'

There are dozens of examples of parallel forms in all Mayan languages.

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To show that the suffix is indeed \{.Clun\}:
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x+ b'ik'.b'un 'wanting to kill' : b'ik' (vt) 'to swallow'

s+ b'is.b'un 'measuring' : b'is (vt) 'to measure'

To quote from tk "Mayan Comparative Studies"

The Proto-Mayan verb phrase/complex is postulated as containing a verb stem inflected with suffixes marking voice and status and Ergative proclitic prefixes marking person agreement when transitive. The inflected verb word can be followed by enclitics and preceded by proclitics. Among proclitics which may occur immediately before the verb word are the aspect markers, of which up to two may occur in a group. Absolutive person agreement markers are found in every verb phrase (and predicate) and are enclitically attached after aspect markers if there are any, and to the last inflexional suffix of a verb and before any other enclitics if no aspect markers are present.

Aspect markers are not prefixes, but preposed proclitic adverbs, written ASP+.

The ABSolutive set of person markers provides several opportunities to interact with /7/, and both generate /7/ or /h/, and efface adjacent /7/. The pM ABS markers are

*iin ABS1
*at ABS2
*0 ABS3
*o7nh ABS4
*ex ABS5
*eb' ABS6

In Tzotzil-Q'anjob'alan Proper-Chuj-Awakateko-Q'eqchi7 ABS are second position clitics: if a verb word begins with an aspect clitic (ASP), ABS follows ASP; if a verb word begins with the verb and no ASP, ABS comes after the verb. This I take to be the original pM situation. The remaining languages have fixed the position of ABS to either before ERG, if present, or directly after the verb with its status suffixes. Languages with preverbal ABS include Eastern Mayan (-Ixl, -Q'eq) and Wasteko; languages with postverbal ABS include Greater Lowland, i.e. Greater Tzeltalan + Yukatekan + Tojol 7Ab'al + Kotoke + Ixil. In the latter case, ABS is attached to the end of a verb, and no pronunciation adjustments are made. In these languages ABS function like suffixes, not clitics: they are not extrametrical. However, in Ixil, postverbal ABS is a separate phonological word, and begins with inserted /7/. Languages with preposed ABS have ABS interact with an intransitive verb that begins with /7/, but in a non-uniform way. In K'ichee7an-Poqom after ABS+ initial glottal stop is effaced; in other languages initial /7/ is preserved. The same behavior of initial /7/ of intransitive stems is observable with ASP+ markers that end in a consonant. In Q'anjob'alan Proper-Chuj when ABS+ are the first morphemes in a phonological phrase they have /h/ inserted before them. In K'ichee7an-Poqom initial /7/ of an intransitive lexeme after ASP+ or ABS+ ending in C $(C+ 7V \Rightarrow CV)$ behaves like any word-initial /7/ directly after a C in the preceding word (C # 7V => CV). /abc+/ marks the morph as proclitic and unstressable, but this seems to pose a cognitive problem for the ERG+ proclitics, because except for K'ichee7an-Poqom, /7/ does not drop after ASP+ or ABS+, while it does drop after ERG+ in all languages but Wasteko. So ERG must have some additional phonological specification. My proposal is to spell them ERG++.

A false garden path

Since word boundary is a linguistic entity, which we customarily symbolize by SPACE, a linguist might think that Mayan languages -- apart from K'ichee7an-Poqom -- have vowel-initial lexemes that acquire /7/ after word-boundary, as well as ERG proclitics that acquire /7/ after word boundary. But the Q'anjob'alan Proper + Chuj set of languages has vowel-initial ERG proclitics that acquire /h/ after word boundary. Thus a statement that Mayan languages in general have lexemes that begin with vowels is falsified. Were it not for another fact raised in the last sentence of this discussion, one might imagine three versions of a /7/-insertion rule:

- [a] K'ichee7an-Poqom: phrase initially, insert /7/ before a vowel
- [b] all other Mayan but Q'anjob'alan Proper-Chuj: word initially insert /7/ before a vowel, but phrase medially do not insert /7/ before vowel-initial clitics
- [c] Q'anjob'alan Proper-Chuj: word initially insert /7/ before a vowel that begins a root/lexeme
- [d] Q'anjob'alan Proper-Chuj: phrase-initially, insert /h/ before an ERG proclitic that begins with a vowel

However, these formulations come up against and are vitiated by the fact that generally in Mayan when a $\{7VC\}$ morpheme is partly or completely reduplicated, /7/ shows up in the reduplicated material.

Throughout my time as a Mayanist field-worker I have always written wordinitial glottal stop wherever I heard it. In a few things I published after 1971 I followed the PLFM custom of not spelling out word-initial /7/, but this was an error that I have tried to correct in later writings. Consequently, this means that when I cite data from Mayan languages I do NOT spell them in the official Guatemalan orthography. Another way that I do not follow the Guatemalan orthography is that for me glottal stop is <7> and glottalization of C is <'>. The official Guatemalan orthography uses <'> for both. For most Mayan languages, figuring out whether official orthographic <'> represents glottal stop or glottalization is not difficult. But there are several languages [like Mam and Awakateko] that experience dropping of medial vowels where this results in ..CC.. clusters that are not original or underlying. Among these .. CC.. clusters are instances of plosive + 7 that are NOT glottalized consonants. Reduplication can create plosive + 7 clusters in all Mayan languages. Writing them <C'> would be wrong. My recommendation for this impasse in the official orthography is to write <C-'V>, but I do not know who, if anyone, has followed it. btw, I was delighted when a version of the PLFM orthography was made official in Guatemala; it is a uniform, adequate, and esthetically acceptable system -

but it has some problems when used for technical linguistic work, which can be readily fixed, by using /7/ for glottal stop and writing <7> at the beginnings of all words where it is pronounced.

Apart from K'ichee7an-Poqom, when analyzed as having V-initial words, lexemes in all other Mayan languages begin only with consonants; the /7/ is not a default, it is simply one of the consonants. /7/ is deletable, though, by ERG proclitic prefixes. Some cases of word-initial *h are treated like /7/ -- symbolized *H -- but words showing this phonemenon are cognate across branches, such as *Ha7 'water', *Ho7 'five', *Hu7nh 'paper', *Haty 'face, surface', maybe *Huul 'to arrive here'. In one language or another, the reflex of *H may simply be /h/. To repeat, H is a morphophonemic symbol that says: this word begins with /h/ when it occurs without an ERG marker; with an ERG marker, the /h/ disppears just like /7/ would.

The ERG markers have 2 allomorphs each; one that is attached to stems beginning with 7, which is deleted, and one that is attached to any other consonant. I attribute the loss of /7/ to a rule that is linked to the fact that ERGs are proclitic. Four of the ERG markers have variants that can be subsumed under a single underlying form; two do not. Besides 7-loss, we have to note that //qa+ 7V2..// gives /qV2../ and //ki+ 7V2..// gives /kV2../, that is, a+V2 and i+V2 are contracted to V2. In other circumstances //V V// clusters are resolved as long vowels; only languages that delete word-final /h/ tolerate /VV/ combinations. The VV contractions with ERGs must be attributed to their proclitic status.

_C	_7	underlyingly				
nu++	W++	??				
a:++	a:w++	//a:w++//				
u++	r++	??				
qa++	q++	//qa++//	qa++	7V2	=>	qV2
e:++	e:r++	//e:r++//				
ki++	k++	//ki++//	ki++	7V2	=>	kV2

There is nothing like "glide insertion" here; that is a goofy notion, especially if two different "glides" are under consideration. /r/ is not a glide, so the fact that it changes to /y/ in some languages is totally irrelevant.

In $\{a:w++\}$ and $\{e:r++\}$, /w/ and /r/ are deleted pre-consonantally. Why, since otherwise CC clusters are not simplified? We may again appeal to their membership in a proclitic morpheme. /w/ and /r/ are NOT glides. In general,

Mayan sounds do not include anything that can be properly categorized as glides, though Ch'orti7 may have cases of glide insertion. (This is apart from the fact that many phonologists, for many languages, overuse the concept and term **glide**, and incorrectly define the contexts where the term would be appropriately applied. For example, semivowels, if they are a class of consonants, are NOT glides.)

In my interpretation, a glide is a non-syllabic element inserted inside of underlying //V1V2// sequences; the glide has features of one of the flanking vowels; it will resemble [i], [u], or [i"]; depending on the rest of the phonological patterning of the language it will be analyzed as ZERO, or as a semivowel /y//w/ or /q-/. Other phonological behavior of the language will help decide whether semivowels are one type of consonant, or a category neither of consonants nor of vowels), Another kind of glide is [y] inserted word-initially before front vowels, and [w] inserted word-initially before rounded vowels. This is just a special case of the V1V2 cluster phenomenon. Apart from cases like like these, there is no reason to accord structural/technical status to the term/notion glide. For example, to call a weakly articulated semivowel a glide, or to use glide as a synonym for semivowel is otiose and reveals that the writer is chasing after novelty. It is an entirely language-specific fact whether semivowels are consonants, or neither consonants nor vowels. Semivowels are non-syllabic vowels that are phonemes or stable allophones.

Although the pre-glottal allomorph of ERG1 ends in, and consists of, /w/, it does not delete. To be sure, if it did delete, there would be no pronounced manifestation of ERG1, but that is probably irrelevant. The relevant factor is probably the fact that the /w/ and /r/ that disappear are postvocalic.

Why ERG1 /nu++ \sim w++/ and ERG3 /u++ \sim r++/ have two allomorphs each is a mystery that I cannot unravel. The answer must lie in the prehistory of proto-Mayan. To my knowledge, neither Mije-Sokean nor Totonakan has any morphemes in play that might relate to this phenomenon. A heads-up, if relevant, would be appreciated. [We might explore uniting nu++ and w++ under an underlying form //nw++//; this would require vocalizing/syllabifying //w// as /u/, not something that I am comfortable with. Mije-Sokean has ERG1 *na+ and ERG3 *7i+, which, if we are seeking cognates, are comparable to Mayan *nu++ and *u++]

In Wastekan, the ERG markers have one allomorph each, and though they are proclitic, they do not cause stem-initial /7/ to drop; this means that the part of the clitic attachment rules that delete stem-initial /7/ has been lost in Wastekan [and preserved in all other Mayan languages!]; perhaps we should say that ++ => +.

Wasteko	Kabil		pMayan
u+	u+	ERG1	*nu++ ~ *w++
a+	a+	ERG2	*aa(w)++
in+	i+	ERG3	*u++ ~ *r++
i+ < ya+	ku+	ERG4	*q(a)++
i+	?	ERG5	*ee(r)++
i+	?	ERG6	*k(i)++

A number of Mayan languages [Kab, Chl, Ixl, pre-Qeq, ?pre-Awk, ?pre-Usp] use {i++} as the preconsonantal allomorph of ERG3. This is a borrowing from Mije-Sokean *7i+ ERG3. The in+ of Wasteko is probably part of this story, but a morph shape {7in} is fairly widespread in Mayan as a demonstrative 'this, that', so overinterpretation should be steered clear of.

It is unlikely that the Wasteko situation reflects an earlier pMayan situation better than all other Mayan languages combined, but the interested party may engage in thought experiments based on such an assumption.

Mayanists! It is your responsibility to find and notate all clitics in whatever language you work on in all the text material and sentences that you collect! Clitichood is a phonological property of a morpheme; thus proclitics should be spelled <abc+> and enclitics should be spelled <+abc>. No alternative is acceptable in a linguistic dicussion.

There is an additional phenomenon regarding /7/ after ERG. While in any Mayan language virtually all nouns beginning with /7/ delete /7/ after ERG, there will be a handful of nouns beginning with /7/ that choose the allomorph of ERG that occur with all other consonants. Ever since I noticed this in 1960 while working on Tzeltal, I have symbolized/notated this "firm" glottal stop as //77//. Why there are any such words is a problem interesting to contemplate, but one thing is sure: there are no cases of firm glottal stop that agree across languages, and each language has only a small number of firm glottal stops. This is not an ancient trait.

A couple of examples:

Ixil of Nebaj **770lib' pom '**incense burner' takes the ERG allomorphs that normally precede consonants other than 7, while the verb **70li (vt)** 'to swing something' begins with an effaceable /7/.

Ixil [all varieties] 77ah=tzo7 'tom turkey'; 20 other Ixil words beginning
with {7ah=} have an effaceable /7/.

Typically, a morpheme with firm //77// also has a variant with deletable /7/; one motive for this might be to exploit the polysemy that some nouns have.

Do not obsess over "firm" initial glottal stop, and do not be misled by Lyle Campbell's take on word-initial glottal stop in Mayan. The reality is more complex than he seems to think it is. But you may compare what he has said with what I say here. See below.

In "Mayan history and comparison" [in press], Lyle Campbell says:

Most Mayan morphemes are monosyllabic, and PM had the possible syllable shapes (canonical forms): CVC, CV:C, CVC1C2, and CV1?V1C, where in CVC1C2 the C1 of the consonant cluster was limited to h, ?, or a fricative s, š, or x. In each of these, the initial consonant is in fact optional. That is, traditionally Mayanists have followed Terrence Kaufman in repeating these canonical shapes with an initial C under the belief that the vowel initial ones really had a glottal stop as their onsets. However, since Proto-Mayan has a different set of possessive and ergative pronominal markers that attach to vowel-initial roots distinct from the set that attaches to consonant-initial forms, it is clear that not all Mayan morphemes should be considered consonant-initial, that PM also had vowel-initial morphemes, so that in the conventional canonical forms, the first C should be understood as optional, as (C)VC, (C)VC1C2, and (C)V12V1C. (Kaufman sometimes interprets CV12V1C as equivalent to CV2C.)

I am glad to know that Mayanists have repeated my formulation, but I have shown above that they have not necessarily done so blindly.

To summarize:

All Mayan languages require that the first syllable of any independent phonological word begins with a consonant. If a consonant is not there underlyingly, [7] or [h] will be inserted.

The ERG markers induce deletion of stem-initial /7/, and simplification of VV clusters, because they are proclitic.

It is crucial to identify, and notate appropriately, the clitic morphemes of every Mayan language that is documented.

There are two additional phenomena, which have orthographic choice consequences, but are not part of the above discussion.

What happens when word or stem final /7/ is followed by a word or suffix beginning in a consonant?

 $7 + 7 \Rightarrow 7$ because geminate consonants are non-existent or disfavored

For 7 + C there is a variety of outcomes:

- [a] do nothing, e.g. Tzeltal, Tuzanteco, etc.
- [b] $/7/ \Rightarrow /:/$, e.g. Mochó, K'ichee7, etc.
- [c] /7/ => 0 ...

What happens when word or stem final /h/ is followed by a word or suffix beginning in a consonant?

when not $\qquad \qquad \text{when followed} \qquad \qquad \log \text{ exemplifying} \\ \text{followed by C} \qquad \qquad \text{by C}$

[a] [kept] do nothing Poqom, etc.

[b] [dropped] restore it Tzeltal, etc.

[c] [inaudible] $//h// \Rightarrow /:/$ K'ichee7, etc.

What do I attribute to proto-Mayan?

Every phonological word begin and ends with a consonant. (Some languages tolerate word-final V due to loss of final *h.)

Every syllable begins with a C. (Some languages currently have non-initial V-initial syllables due to loss of intervocalic *h, but not of *7.)

For clitics that begin with vowel, at the beginning of a phonological word/phrase /7/ or /h/ is inserted, plausibly specifically /7/. (The languages that insert /h/ may have innovated this based on the fact that the vowel-initial clitics in the middle of a phonological phrase definitely begin with vowels.) At the same time, those clitics are not pronounced/pronounceable in isolation, and use the preceding C to form a CV.. syllable.

Stem-initial /7/ is deleted after ERG++. Resultant V1V2 clusters are simplified to V2.

The handful of roots that begin with ${}^{\star}{\rm H}$ delete this after ERG++, with simplification of resultant V1V2 cluster.

What do I attribute to Epigrapic Mayan?

On the basis of phenomena attributable to Greater Tzeltalan and Ch'olan, EpMayan was like pMayan, having no V-initial words, and using /7/ as the consonant inserted before V-initial clitics in phrase-initial position.

That means that all syllabograms (or phonograms -- not a good term) have the structure CV(C). There are no syllabograms that represent simple vowels or syllables beginning with vowels. Where pCh'olan and pGTzeltalan have initial /7/, EpMayan had AND WROTE /7/.

The syllabograms <7i 7e 7a 7o 7u> are used not only initially, to spell those syllables, but also medially and finally to spell /7/, usually synharmonically.

A final admonition

Assuming that the official Guatemalan orthography for Mayan languages is acceptable **IFF** it is applied adequately, so that everything that is phonemic is spelled out unambiguously, it is NOT an adequate system -- because it is not straightforward -- for presenting structural information about Mayan languages in a scientific discussion. I therefore urge Mayanists writing *linguistics* to adopt a more adequate structural analysis, and use more unambiguous orthographic practices for spelling Mayan words. I have indicated above what I think those practices should be.

A note on Mije-Sokean

In Mije-Sokean, /7/ is just another of the consonants. Every word begins with a consonant. A word-initial or stem-initial /7/ is not deletable under any circumstances. In MAR and SOT enclitics always begin with consonants. In case of a clitic-initial /7/, it is not deletable. In SAY and MIG some enclitics begin with vowels; these can never begin a phonological phrase, so no consonant is ever inserted before a vowel-initial clitic.

Whether an orthography deviser decides not to write word-initial /7/ in a Mije-Sokean language is a purely political or esthetic issue. It is not a scientific or linguistic issue, and should never be defended as being one, because scientifically and linguistically it is WRONG.

Those of you who receive this from me:

I would appreciate it if you would point out places where my discussion has not been clear, or if there are things I should have discussed, but overlooked to do. A lot of facts are covered, and some may not have been presented in the best order for comprehension of the larger/whole picture.

In case you disagree with me, that might be of some political interest to third parties -- but I don't care, because I have been thinking about this issue since 1960, and in the process worked with live speakers of all living Mayan languages but 7Itzaj and Tojol 7Ab'al. Nobody's differing opinion is likely to change mine. It is important to recognize that ALL of the factors that I have mentioned need to accounted for in a viable fomulation, and before I will pay attention to it as possibly correct.

If you think you've nailed it, and that I haven't, please let me know. But please don't appeal to other peoples' *opinions* or *practices*, or the need to be a good guy and not a bad guy, as a rationale for disagreeing with me. Just the facts. And don't trot out bogus phonological explanations — though I concede that not everybody is in agreement about what kinds of phonological "explanations" are bogus. I'm just asking not to be drawn in to fruitless dicussions. Not that I expect anyone I've sent this to to try to involve me in a fruitless discussion — but I am confident that some of the folks who read this will not have been on the original mailing list.

Thanks to John Justeson for bringing to my attention data that show that K' ichee7an-Poqom languages in reality have root initial /7/ underlyingly -- which is effaced after a C that is at the end of a preceding word.

tk