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A Possible Syllable for *t'i* in Maya Writing

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Classic Mayan inscriptions (ca. AD 300-900) comprise a writing system with an inventory of both logographic and syllabic signs. The phonological contrast between glottalized and unglottalized consonants is a basic one in Mayan languages, and it is therefore possible to recognize two main types of syllabic signs: CV (plain consonant + vowel) and C'V (glottalized consonant + vowel). During the last several decades the writing system has been successfully deciphered; in particular, various signs representing CV and C'V syllables have been identified. Nevertheless, a number of *logographs* (signs used to spell words and indicate their meaning) and a smaller number of C'V syllabic signs remain undeciphered or unaccounted for. In the case of syllabic signs, the rarer a given consonant-vowel combination is in the language, the less likely that the corresponding syllabic sign will be attested, and the less likely it is that the sign will exhibit allography (which we define as the existence of several formally distinct signs which are nevertheless equivalent in either sound or meaning). That is, while highly frequent sounds such as *u* and *ba* are represented by syllabic signs (**u** or **ba**) with a large number of occurrences, in multiple different contexts, often with several allographs—thereby greatly facilitating the process of decipherment (e.g., Knorozov 1952:116; Lounsbury 1984; Stuart 1987)—less frequent sounds are not as often or as redundantly represented in the writing system, and thereby prove that much more difficult to decipher.

As one way of approaching this problem, we can consider that scholars now

postulate a hypothetical grid of either 99 or 100 syllables for Hieroglyphic Mayan. The postulate is based on the reconstructed phonological system of proto-Cholan (e.g., Kaufman and Norman 1984) because Hieroglyphic Mayan has been demonstrated to belong to the Cholan branch of the Mayan linguistic family (Campbell 1984; Justeson and Campbell 1997; Houston et al. 2000). In recent years, epigraphic data have contributed significantly to our understanding of Mayan historical phonology (Grube 2004; Houston et al. 2000). Evidence from historical linguistics implies that the glottalized bilabial stop *p'* was not an integral part of the phonological system (Wichmann 2006). Some scholars question the presence of the syllabic sign **wu** (e.g., Lacadena and Wichmann 2004:145), though the sound is nonetheless present in modern Chol. Recently, a series of mostly unpublished and still not completely verified decipherments have filled in several gaps in the grid, including potential syllabic signs for the sounds **be**, **ch'u**, **k'o**, **pe**, **so**, **t'o**, **tze**, **tzo**, **tz'o**, **we**, and **xe**. (Because these proposed decipherments remain insecure and therefore problematic, we mark them with a query when referencing them later in this article.) Most of these decipherments build on observations that **Ce** and **Co** syllabic signs do not behave in quite the same way as other syllabic signs. For instance, they do not participate in disharmonic spellings (Houston et al. 1998; Lacadena and Wichmann 2004), which suggests that any unidentified syllabic sign following a known sign will share its vowel. Despite this very useful feature of the writing

system, there remain several gaps in the syllabic grid which have yet to be filled, even tentatively, with candidate signs. These are the syllables **ch'e**, **ch'i**, **t'a**, **t'e**, and **t'i**. Notably, all of the missing signs are of the C'V type. This is only to be expected, given that glottalized consonants are generally less frequent than unglottalized ones in Mayan languages, and they are typically

absent between grammatical morphemes. Moreover, glottalized consonants are significantly less common in the final position of a word, which is historically one of the strongest contexts favoring syllabic decipherment. Consider Tables 1 and 2, which tabulate the number of occurrences of glottalized and unglottalized consonants in initial and final position.

	Initial position	%	Final position	%
p	157	6.71	24	1.03
p'	40	1.71	108	4.62
b	102	4.36	8	0.34
t	199	8.50	64	2.74
t'	37	1.58	14	0.60
k	119	5.09	114	4.87
k'	105	4.49	68	2.91
ch	118	5.04	50	2.14
ch'	119	5.09	33	1.41
tz	59	2.52	12	0.51
tz'	76	3.25	21	0.90
s	128	5.47	49	2.09
x	68	2.91	31	1.32
m	116	4.96	103	4.40
n	102	4.36	635	27.14
l	78	3.33	303	12.95
w	60	2.56	21	0.90
y	70	2.99	33	1.41
'	363	15.51	137	5.85
h	165	7.05	82	3.50
i	0	0.00	59	2.52
e	0	0.00	70	2.99
a	0	0.00	170	7.26
ä	0	0.00	15	0.64
o	0	0.00	62	2.65
u	0	0.00	40	1.71
(r)	15	0.64	14	0.60
(d)	14	0.60	0	0.00
(f)	5	0.21	0	0.00
(g)	12	0.51	0	0.00
(kw)	13	0.56	0	0.00
total:	2340	100.00	2340	100.00

Table 1. Number and percentage of lexical entries where a consonant appears in initial and final position in a Chontal dictionary (Knowles 1984). Phonemes found in recent loans only are given in parentheses.

	Initial position	%	Final position	%
p	84	6.23	1	0.07
b	89	6.60	40	2.97
t	58	4.30	22	1.63
t'	19	1.41	1	0.07
k	65	4.82	43	3.19
k'	145	10.76	13	0.96
ch	125	9.27	24	1.78
ch'	100	7.42	7	0.52
tz	5	0.37	3	0.22
tz'	25	1.85	7	0.52
s	45	3.34	52	3.86
x	25	1.85	30	2.23
m	68	5.04	42	3.12
n	55	4.08	134	9.94
l+r	39	2.89	209	15.50
w	20	1.48	5	0.37
y	31	2.30	49	3.64
'	215	15.95	103	7.64
h	134	9.94	54	4.01
i	0	0.00	235	17.43
e	0	0.00	42	3.12
a	0	0.00	167	12.39
o	0	0.00	27	2.00
u	0	0.00	38	2.82
(d)	1	0.07	0	0.00
total:	1348	100.00	1348	100.00

Table 2. Number and percentage of lexical entries where a consonant appears in initial and final position in a Chorti dictionary (Hull 2005). Grammatical morphemes and composite lexical entries are excluded from counts.

Strikingly, the consonants *t'*, *tz*, *tz'*, *ch'*, and *w* are extremely rare in final position in both of these languages. This distribution is in fact characteristic of Mayan languages in general. Kaufman and Norman's (1984) proto-Cholan dictionary includes 714 reconstructed roots. Of these, only 20 include **t'* (not including derivations)—nine in initial position, nine in final position, and two in medial position: 196 **jit'* "tie crossbars of structure," 205 **jot'* "scratch (head)," 371 **nut'* "join (tv.)," 461 **set'* "cut, tear (tv.)," 472 **sit'* "swell," 476 **sot'ot'* "liver," 542 **t'äb'* "go up, rise," 542a **t'äb'-esä* "lift, raise," 543 **t'an* "word," 544 **t'el* "lying on side," 544a **t'el* "rooster's comb, coxcomb," 544b **t'ohlök* "lizard, crested," 545 **t'iw* "eagle," 546 **t'ot'* "snail," 547 **t'ox* "break, deal out,"

548 **t'uch* "perched, squatting," 549 **t'ul* "drop (n.)," 549a *t'uj* "drop (n.)," 550 **t'ul* "rabbit," 631 **xet'* "break in pieces," 658 **yot'* "massage, press on belly (tv.)," 685 **et'ok* "and, companion, with."

Brown and Wichmann's (2004) proto-Mayan wordlist includes 282 reconstructed roots, only two of which include **t'* (**looht'* "pressed, tightened, cramped," and **t'iiw* "eagle") and two others **ty'* (**nehty'* "to nibble" and **ty'il* "to toast, singe"). Given forms like *t'ul/t'uj* "drop," it is easy to see that at least some of these words belong to the onomatopoeic portion of the lexicon. Yet despite this, and despite the scarcity of *t'* in the languages, we would like to suggest in what follows that one previously undeciphered sign attested in a few

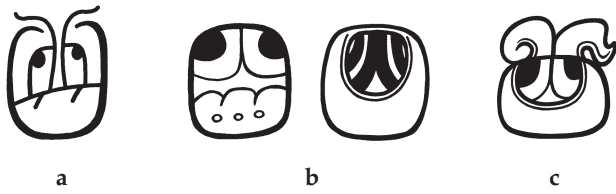


Figure 1. Similar ‘night’-related signs in Maya writing: (a) ‘Split-Akbal’; (b) Late Classic and Early Classic versions of **AK’AB** (‘Akbal’); (c) **AJ** (‘Flaming-Akbal’). Drawings by Albert Davletshin.

rare spellings is a reasonable candidate for the syllable **ti**.

The sign in question is not registered in Thompson’s (1962) catalog of Mayan signs, and is instead known to epigraphers by the nickname ‘Split-Akbal,’ which was coined by fellow epigraphers in order to distinguish it from the well-known logogram **AK’AB** “night” (long referenced in the literature as ‘Akbal’) and the ‘Flaming-Akbal’ sign (Figure 1) recently deciphered by Marc

Zender (2005) as logographic **AJ**.

As far as we know, the ‘Split-Akbal’ sign occurs only five times in the extant corpus: twice in texts from Comalcalco (Armijo et al. 2000, 2001; Zender 2004) and thrice on painted Codex-style ceramics (Figure 2):

1. Comalcalco, Urn 26, Pendants 8a-8b:
ti-nu₁-‘Split-Akbal’-**li ti**-DATE VERB,
2. Comalcalco, Urn 26, Stingray Spine 4:
DATE **nu₁**-‘Split-Akbal’-**li** VERB,
3. Painted Codex-style vase K1815:
DATE **nu₂**-‘Split-Akbal’-**li** VERB,
4. Painted Codex-style vase K2208:
DATE **nu₂**-‘Split-Akbal’-**li** VERB,
5. Painted Codex-style vase K1370:
DATE **nu₂**-‘Split-Akbal’-**li** VERB.

The sign designated here as **nu₂** and depicting a tied knot of cloth deserves some commentary. It is attested

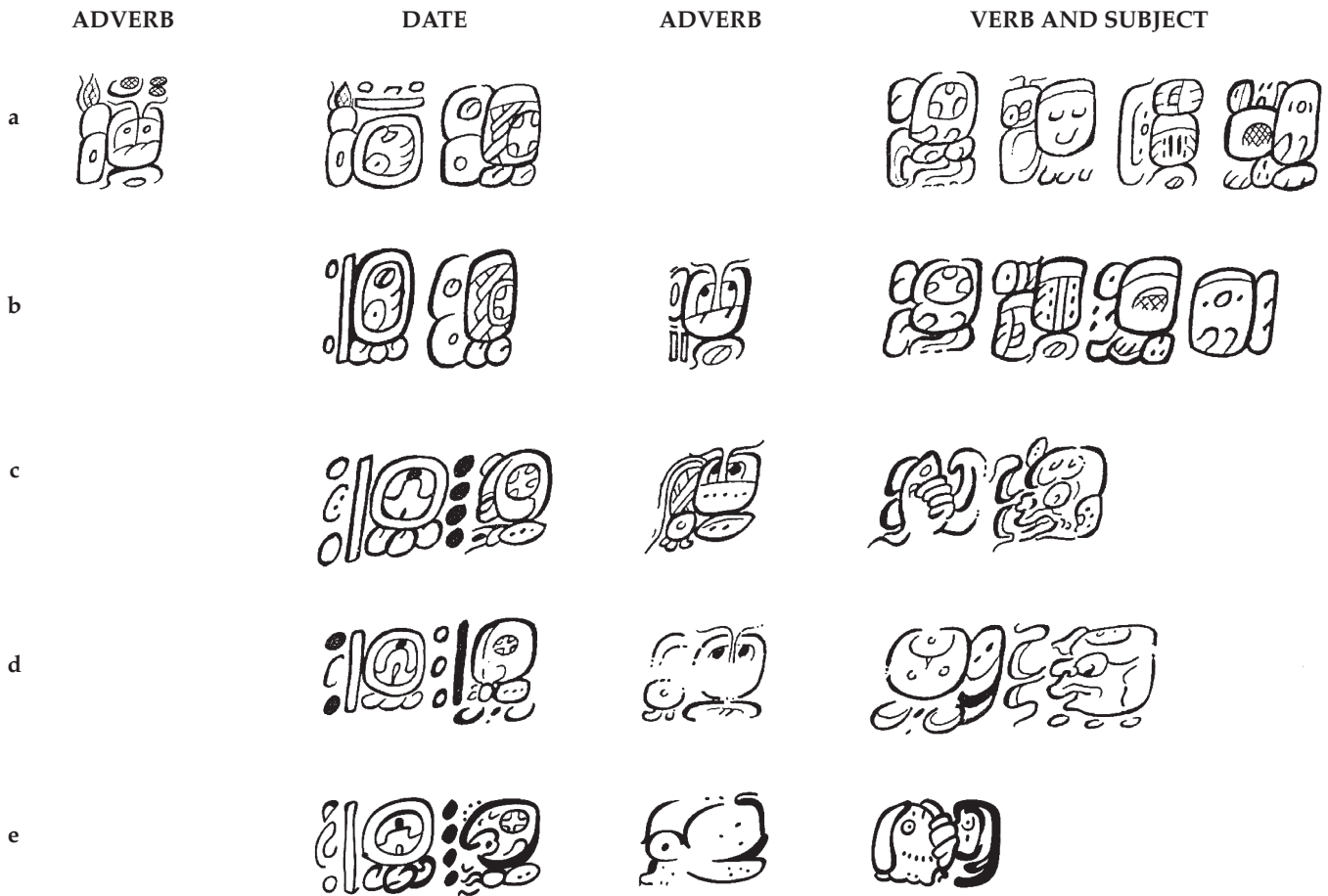


Figure 2. The ‘Split-Akbal’ sign in its contexts: (a) Pendants 8a and 8b, Comalcalco Urn 26 (Armijo Torres et al. 2001:Fig. 13); (b) Stingray Spine 4, Comalcalco Urn 26 (Armijo et al. 2001:Fig. 14); (c) codex-style vase, K1815; (d) codex-style vase, K2208; (e) codex-style vase, K1370. Drawings courtesy of Marc Zender (a-d) and Philip Galeev (e).

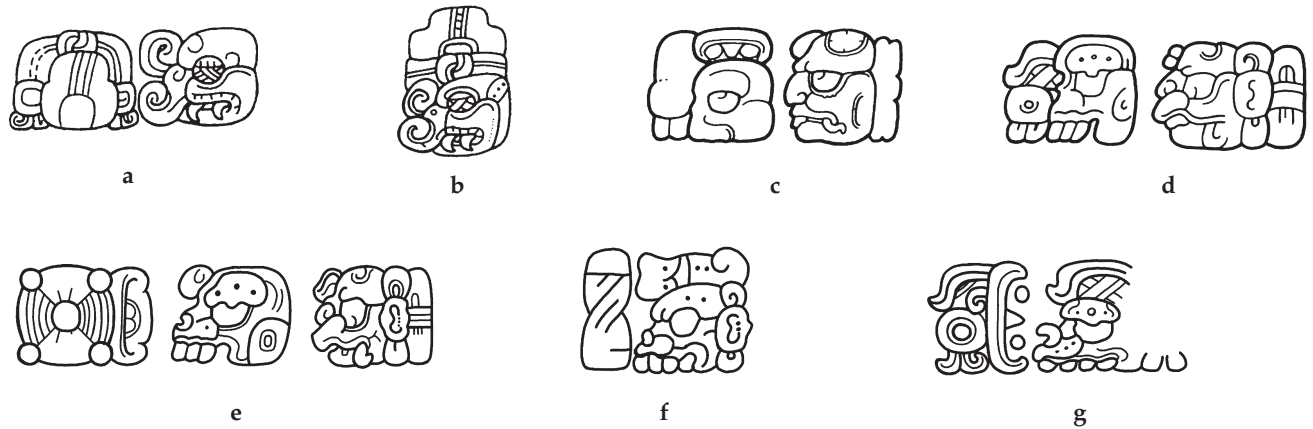


Figure 3. The *nu*, syllabic sign in the names of Nu'n Ya'x Ahiin, Nu'n Ujo'l Chahk, and Nu'n Ujo'l K'inich: (a) *nu*/NU'N-YA'X-AHIIN, Tikal Stela 31:I3-J3; (b) *nu*/NU'N-YA'X-AHIIN, Tikal Stela 31:N2; (c) *nu*/NU'N-u-JO'L-K'INICH, Tikal Lintel 2 of Temple III:D17-C18; (d) *nu*/NU'N-JO'L-CHAHK-ki, Dos Pilas Stairway IV:C2-D2; (e) *nu-na*-JO'L-CHAHK-ki, Dos Pilas Stairway IV:I2; (f) *nu-u*?-JO'L[CHAHK], Dos Pilas Stairway IV:F2-H1; (g) *nu*/NU'N-u-JO'L-CHAHK, Dos Pilas Stairway IV:Step 6. After William R. Coe's drawings in Jones and Satterthwaite (1982) and Ian Graham's drawings in Houston (1993:109).

as part of such names as Nu'n Ya'x Ahiin, Nu'n Ujo'l Chahk (also written as Nu'n Jo'l Chahk) and Nu'n Ujo'l K'inich. In these examples it can perhaps be interpreted as a logograph for NU'N "mute" (Figure 3). Nevertheless, this sign is clearly used as a phonetic complement in a glyphic passage from Tikal Stela 9 (Figure 4) recording the well-known 'deity impersonation' formula as: *u-BAAH-li (a)-A'N-(nu)...*, *u-b'aahil a'n ...*, "it is his image impersonating X." In this example, the sign in question must clearly be phonetic. Perhaps what was originally a logogram for NU'N "mute" later gained a *nu* syllabic reading via the principle known as acrophony (see Houston et al. 2000:328; Zender 1999:38-41).

Given its preverbal position in all five of its occurrences, Marc Zender (personal communication 2001;

see also Armijo et al. 2001:396) and Alfonso Lacadena (personal communication 2003) have independently proposed that the glyphic collocation *nu*-Split-Akbal'-li must function as some kind of temporal adverb. They have further suggested that 'Split-Akbal' is a logogram referring to a period of time, possibly, "twilight" or "sunset." Indeed, the sign seems to be a graphic modification of the logogram AK'AB "night" and the glyphic collocation always follows dates and precedes verbs, adequately filling the slot occupied by temporal adverbs in Mayan languages and Mayan hieroglyphic writing. Indeed, it behaves rather similarly to the well-known glyphic expression *pas'aj*, meaning "sunrise, dawn," as on Pendants 11a and 11b from Comalcalco Urn 26 (Figure 5):

ti-1-PAS ti-*7-CHIJ? 10-CHAK-AT-ta t'o?-xa-ja a-pa-ka-la-TAHN-na ...

ti ju'n pas[aj] ti huk chij? laju'n chak at t'ohxaj? aj pakal tahn ...

"at daybreak on the day 7 Manik 10 Zip, Aj Pakal Tahn was cut(?) ..."¹

The sign **PAS** "sunrise, dawn" is a compound sign consisting of the otherwise independent logographs **CHAN** "sky," **K'IN** "sun," and **KAB** "earth," combined in such a manner that the sun appears between the earth and sky, yet with substitution patterns clearly demonstrating the reading value of **PAS** (Stuart 1998; Zender 1999). *Pas'aj* "sunrise" (literally "uncovering, opening") would be a verbal noun derived from the transitive

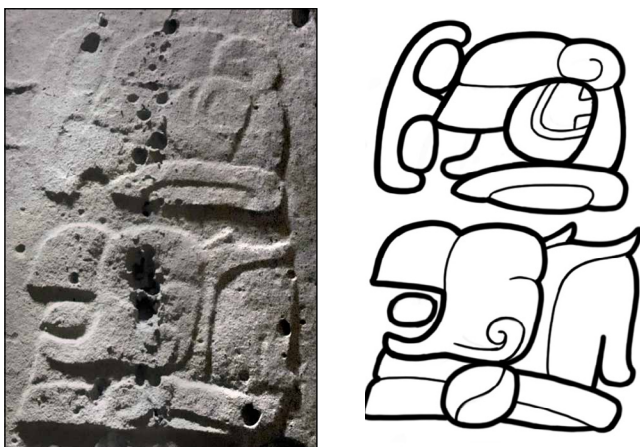


Figure 4. The *nu*, syllabic sign as a phonetic complement on Tikal Stela 9 (B1-2). Photo courtesy of the "Atlas Epigráfico de Petén" project, drawing courtesy of Philippe Gaelev.

¹ As Zender (2004:254) has shown, this annual ritual bloodletting rite took place in March of AD 773, in the presence of one of Comalcalco's patron deities, an aspect of the storm god Chahk.

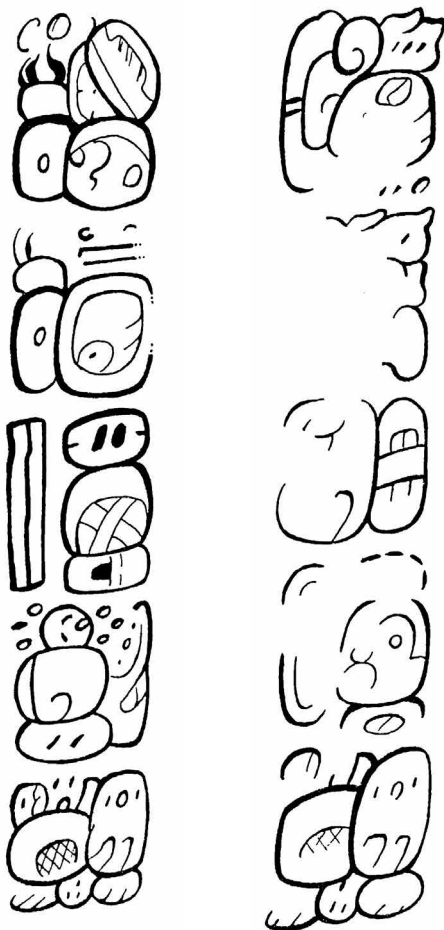


Figure 5. A sunrise event on Pendants 11a and 11b, Comalcalco Urn 26. Drawing courtesy of Marc Zender.

verb root *pas-* “to open, show, uproot, uncover,” in the same way as the distance number introductory glyph *u-tz’ak’aj* “the counting of (days, months, years, etc.)” is derived from the transitive verb *tz’ak-* “to count.” The etymology of the suffix in question is unknown, but its meaning is recoverable from the examples mentioned if we suppose that both derived forms contain the same suffix: one deriving verbal nouns from transitive verb roots. From this interpretation comes the glottal stop reconstructed for *pas’aj*, because a glottal stop seems to be indicated by many attested spellings of the distance number introductory glyph, such as **u-TZ’AK-ka-AJ-ja**, **u-TZ’AK-ka-AJ**, and **u-TZ’AK-AJ** (Table 3).

On Comalcalco Pendants 8a and 8b (Figure 6), the **nu-Split-Akbal’-li** glyphic collocation precedes a date, but it also receives the preposition **ti** “at,” further highlighting its role as the marker of a period of time:

ti nu-?-li ti-7-CHIJ? CHUM-[K’AN]JAL-wa wa-WA’-wa-ni ...

ti nu...l ti huk chij? chum k’anjalaw wa’waan ...

“at twilight(?), on the day 7 Manik 0 Pop, he stood up ...”²

Even from these two spellings, crucial observations can be made. First, the ‘Split-Akbal’ sign only appears in the context of the spelling **nu-Split-Akbal’-li**. Second, this compound always occurs in the same context: following a date and preceding an intransitive verb. In one context it precedes a date, but then it receives the preposition **ti**. The structure of the spelling is CV(C)CVC. Taking into account that the last sign in the glyphic collocation is **li**, we should suspect that one of the frequent **-VI** suffixes is involved in derivation of the word. In Hieroglyphic Mayan various **-VI** suffixes are used to derived nouns, adjectives, and participles from verbal and nominal stems (see Houston et al. 2001). If these observations are correct, then the structure of the spelling is CVCVC, and ‘Split-Akbal’ either represents a logograph (of the form **NUC**, where **C** represents an unknown consonant) or an unknown CV syllabic sign. Although one cannot be certain, given that only five examples are known, it is surely relevant that both preposed (**nu-**) and final (**-li**) phonetic signs are present in all cases, making it perhaps unlikely that ‘Split-Akbal’ is a routinely-complemented logograph of the shape **NUC**, particularly given that initial **nV** phonetic complements are very infrequent in the script (Grube 2010). For this reason, we entertain the idea that ‘Split-Akbal’ is instead a syllabic sign. As the sign apparently does not substitute in any context for one of the known syllabic signs, we conclude that it probably refers to one of the still missing glottalized syllables—that is, either **ch’e**, **ch’i**, **t’a**, **t’e**, or **t’i**. (The previously mentioned problematic syllables **b’e?**, **ch’u?**, **k’o?**, **tze?**, **tzo?**, **tz’o?**, **we?**, and **xe?** may also be added to this list.)

How to precede to narrow down this list? We can begin with a review of the **-VI** suffixes of different shape found in the script:

- V₁l** ‘adjectives from nouns,’
- VV₁l** ‘stative participles from transitive and positional verbal stems,’
- aal** ‘nouns from nouns,’
- il** ‘adjectives from compound nouns,’
- il** ‘abstract nouns,’
- il** ‘nominalizer (from compound verbs),’
- e’l** ‘nominalizer (gerundival nouns),’
- u’l ~ -iil ~ -al** ‘place-names from nouns.’

(The symbol “**V₁”** is used above to designate the

² See Zender (2004:254) for more details on this text.

proto-Cholan	<i>*pas-</i>	tv.	to show, uproot, uncover	Kaufman and Norman 1984
Chol	<i>pasel</i>	iv.	salir (el sol), brotar (una planta)	Aulie and Aulie 1996
	<i>Päs</i>	tv.	mostrar, enseñar	
Chontal	<i>paso' k'in, pasib k'in</i>		oriente	Keller and Luciano 1997
	<i>Pas</i>		salir, quitarse; ensuciarse	
	<i>Päse'</i>		sacar debajo de la tierra, desenterrar, arrancar	
	<i>päskab</i>		al día siguiente, al otro día	
Cholti	<i>pasek'in</i>		oriente, este	Morán 1695
	< <i>pascael</i> >		amanecer	
	< <i>pazcab</i> >		de mañana	
Chorti	< <i>upascael upehcahel dios</i> >		se nos manifiesta la palabra de dios	Hull 2005; Pérez Martínet et al. 1996
	<i>pas-i</i>	tv.	abrir, destapar / open, uncover	

Table 3. The *pas* root in Cholan languages.

so-called “synharmonic” or “echo” vowel of the suffix, which repeats the vowel of the root when the suffix is used for derivation.) Given the characteristics of these suffixes (from which we require a derived noun that can function like the attested temporal adverb *pas'aj*, as discussed above) and the previously-stated stipulation that **Ce** and **Co** signs cannot typically appear in disharmonic contexts, we can therefore discount the syllables **ch'e** and **t'e** from consideration. (We can also discount the problematic syllables **b'e?**, **k'o?**, **tze?**, **tzo?**, **tz'o?**, **we?**, and **xe?**.) At this point, we have greatly reduced the feasible candidates for ‘Split-Akbal’ to either **ch'i**, **t'a**, or **t'i** (among the unidentified syllables) or perhaps **ch'u?** (among the problematic ones). Interestingly, the four potential spellings—**nu-ch'i**, **nu-t'a**, **nu-t'i**, and

nu-ch'u—would cue only two roots: *nuch'* or *nut'*.

In searching for a promising dictionary entry in modern Mayan languages, we were unable to find any relevant entries for *nuch'*, but *nut'* is rather widespread and may fit the context admirably (Table 4).

The examples support the reconstruction of a proto-Cholan root **nut'*- “to join, close.” Further, it is reasonable to suppose that a derived noun of the form *nut'il* would have meant “joining, closing.”

The putative derived noun *nut'il* “joining, closing” bears a semantic resemblance to the previously-discussed expression *pas'aj* “sunrise (lit. opening, uncovering).” Just as *pas'aj* indicates the beginning of the day, referring to the climbing of the sun from the horizon or its ‘detaching’ from the horizon, *nut'il* may indicate the



Figure 6. A sunset event on Pendants 8a and 8b, Comalcalco Urn 26. Drawing courtesy of Marc Zender.

Lowland Mayan	*nut'-	tv.	to join	Wichmann and Brown n.d.		
proto-Cholan	*nut'-	tv.	pegar juntura, juntar	Kaufman and Norman 1984		
Chol	ñut'ul	adj.	pegado (una juntura)	Aulie and Aulie 1996		
Cholti	<nutu>		juntar	Morán 1695		
	<nutul>		junto			
Chorti	nut'	Root	a joining or splicing, cluster, bunch	Wisdom 1950		
	nut' e b'ujk		sew patch (to cloth)			
	nut'i takar		to attach to			
	nut'i e te'		to join timbers (end to end)			
	nut'i		juntar (las manos), cerrar (la boca)		Schumman n.d.	
	nut'-u	tv.	conectar, unir, comparar, igualar			
	nut'-r-u	iv.	andar con los pies cerrados (un juego)			Wichmann 1999
	nut'pe'n	iv.	cerrar, topar			
Itzaj	nuut'	Root	estrechadura/narrowing	Hofling and Tesucún 1997		
Yukatek	nut'-	tv.	to close, snap together (feet)	Bricker et al. 1998		
	nú'ut'	adj.	tight, narrow			
	nú'ut'chah	incv.	to become tight, constricted			
	nùut'ul	adj.	closed			

Table 4. The *nut'* root in Cholan and Yukatekan languages.

end of the day (dusk, sunset) when the sun is 'closing the horizon' or 'joining to it' and beginning its journey to the underworld. Apparently, in addition to recording that some rituals took place at dawn (*pas'aj*) and at night (*ti-ihk'k'in*), the Classic Maya also noted that at least some events had taken place at dusk. In the Comalcalco inscriptions found in Aj Pakal Tahn's funerary urn, two rituals are thus said to have taken place at sunset (*ti-nut'il*), and three others at sunrise (*ti-pas'aj*) (see Zender 2004:246-263 for details). Interestingly enough, and perhaps not accidentally, both of the Comalcalco texts referring to possible sunset events do so in the context of a ritual where a priest (*yajawk'ahk'*) represents and possibly impersonates a 'bat-being' (*suutz'il*). Thus, on

the aforementioned pendants 8a and 8b (Figure 6):

ti-nu-t'i?-li ti-7-CHI? CHUM-[K'AN]JAL-wa wa-WA'-wa-ni ?-na-ji u-su-tz'i-li a-pa-ka-la-TAHN-na yi-chi-NAL-la ch'o²-ko u-UNE[K'AWIIL]

ti nut'il? ti huk chij? chum k'anjalaw wa'waan ...naah usuutz'il Aj Pakal Tahn yichnal ch'och'ok unen k'awiil

"at twilight(?), on the day 7 Manik 0 Pop, the 'bat-being' (of) Aj Pakal Tahn stood before very young Unen K'awiil (the god) in/at ... house"³

³ Again, see Zender (2004:254) for the initial reading, context and dating of this interesting text.



Figure 7. A mythological event taking place at sunset. Codex-style vase. Photograph K2208 © Justin Kerr.

Intriguing as they are, however, the Comalcalco texts remain the only known Mayan inscriptions where sunset rituals are mentioned, while rituals taking place at sunrise are attested throughout the Maya Lowlands. Interestingly, at least one mythological event is explicitly mentioned as taking place at sunset. Often called the ‘throwing of Baby-Jaguar’ (see, for example, Robicsek and Hales 1988), these scenes probably represent the discovery of maize by the Storm God, who seems to use the Baby Jaguar to crack open the mountain where the first maize seeds were hoarded (Figure 7).

Given the rarity of the ‘Split-Akbal’ sign, it is difficult to find additional support for our proposed *t'i* reading. However, it might be worth considering a possible acrophonic origin of the sign in question (e.g., Houston et al. 2000:328; Zender 1999:38-41). The sign’s appearance possibly represents something with a hollow interior that is cracked or split open.⁴ If this visual interpretation is correct, it is possible to suggest the following lexical entries from Tzotzil as a likely source for its origin: *t'ij* tv. “to break top off egg,” *t'ijan* tv. “break eggs,” *t'il* iv. “fray (ribbon, edge of clothing), split or crack (wood),” *t'illajet* av. “splitting open (bean pods),” *t'illuj* av. “splitting apart suddenly (wood)” (Laughlin 1988). We will require additional contexts to test our proposal, yet if we are correct in our proposal these will prove hard to come by; the syllable *t'i* is very rare in Lowland Mayan languages.

⁴ Philippe Galeev (personal communication 2014) usefully suggests to us that the similarity between ‘Split-Akbal’ and ‘Akbal’ may be spurious, and mostly due to the ‘crack’ element bifurcating the sign.

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