

# A Ch'olti'an Explanation for Ch'orti'an Grammar: A Postlude to the Language of the Classic Maya <sup>1</sup>

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In the Mayan classificatory tradition, the Ch'olti' language, as recorded in the 1695 grammar of Pedro Morán, is generally held to be related to but separate from the modern language of Ch'orti' (see Kaufman's 1976 classification, for example). Ch'olti' is said to be extinct, having no descendent daughter languages in modern times. This paper aims to show that Ch'orti' is «extinct» in the same way that Colonial Kaqchikel or Elizabethan English are extinct: they were spoken at an earlier time, but they are not dead, for both have continued through time and are spoken today in their descendent forms. The data presented here suggest that minimally, Ch'orti' is the modern descendent of Ch'olti'; or, at most, that ancestral Ch'olti' and Ch'orti' were mere dialects of each other, as say, Southern and Standard American English are dialects of each other.

The evidence supporting this assertion grows out of a careful comparison of the grammatical paradigms of Colonial Ch'olti'an and modern Ch'orti'an, which reveals that the particulars of Ch'olti'an grammar offer the best (and probably only) hypothesis by which the unique characteristics of modern Ch'orti'an grammar can be explained. It is by comparative-historical explanation that the connection between Ch'olti' and Ch'orti' is best established.

Specifically, I will first show that the appearance of a new set of Ch'orti'an pronouns can only derive from the Ch'olti'an grammatical system. I will then give evidence that the negative future marker attested in Ch'orti' is the reflex of a future marker in Ch'olti'. Finally, I will give a series of morphemes that are unique to the two languages. These facts taken together argue persuasively that Ch'orti' descends from Ch'olti'.

## CH'ORTI' PRONOMINALS

One of the unresolved linguistic questions in Mayan linguistics is the fact that Ch'orti' has three pronominal sets, whereas Mayan languages generally have only two such sets. The provenance of Ch'orti's newly formed, third pronominal set has never been successfully explained. It is precisely the explanation, given herewith, that secures the Ch'olti'-Ch'orti' relationship.

The normal pronominal distribution for Common Mayan is typologically **ERGATIVE** and **ABSOLUTE**, with the functional distribution as follows: **ERGATIVE** signals the subject of transitives and the possessive pronoun, whereas **ABSOLUTE** references the subject of intransitives and the object of transitives, as shown in the following Kaqchikel examples:

<b>ERG:</b>	<b>Subj Tr</b> <i>x-qa-kamisaj</i> COMPL-ERG1PL-kill 'we killed him.'	<b>Poss Pr</b> <i>qa-bi</i> ERG1PL-name 'our name'
<b>ABS:</b>	<b>Subj Intr</b> <i>x-oj-war</i> COMPL-ABS1PL-sleep 'we slept.'	<b>Obj Tr</b> <i>x-oj-a-kamisaj</i> COMPL-ABS1PL-ERG2SG-kill 'you killed us.'

In some languages, however, the above schema is complicated by split-ergativity, where the **ERGATIVE** pronoun marks intransitive verbs in the **INCOMPLETE** aspect, while the **ABSOLUTE** is found in the **COMPLETE**, as shown below:

<b>ERG:</b>	<b>Subj Intrans Incomp</b> <i>u-tal-el</i> ERG3SG-come-NOMLZER 'he comes.'	<b>SubjTrans Inc</b> <i>u-sapa-n-on</i> ERG3SG-receive-INC-ABS1SG 'he receives me.'	<b>PossPr</b> <i>u-kaba</i> ERG3SG-name 'his name'
<b>ABS:</b>	<b>Subj Intrans Compl</b> <i>tal-on</i> come-ABS1SG 'I came'	<b>ObjTrans Comp</b> <i>uy-act-i-ob-ix</i> ERG3SG-abandon-aff-PL-ECENT.PAST 'he abandoned them'	

Acalán Ch'ontál ([Smailus 1973]).

<sup>1</sup> This paper has benefitted in form and content from the helpful suggestions of Stephen Houston and Robert Blair. Any remaining infelicities are mine, however, and not theirs.

Ch'orti' is unlike other all other Mayan pronominal systems, however, in that for the subject of intransitives in the INCOMPLETE, there is a third pronominal set. Notice in the following that the new, third pronominal set corresponds exactly to the split-ergativity found in other lowland languages. That is, in the lowland

languages, including the Ch'olti', the INTRANSITIVE INCOMPLETE takes the ERGATIVE pronoun, whereas in the COMPLETIVE it takes the ABSOLUTE. In Ch'orti', however, it is the new set of pronouns that marks the INTRANSITIVE INCOMPLETE, as shown below, and more fully specified in figure 1:

<b>ERG:</b>	<b>Subj Intrans Incompl</b> a-wayan ERG/ABS 2SG-sleep 'he sleeps'	<b>SubjTrans</b> u-korpes-on ERG3SG-protect-ABS1SG 'he protects/protected me'	<b>PossPro</b> u-k'ab ERG3SG-hand 'his hand'
<b>ABS:</b>	<b>SubjIntransCompl</b> wayan-on 'we slept'	<b>ObjTrans</b> u-korpes-et 'he protects/protected you'	

The entire paradigm showing the three pronominal sets is shown below, with the starred, Common Mayan ancestral forms given for the (preconsonantal) ABSOLUTE and the ERGATIVE (Fig. 1).

#### THE ORIGINS OF THE SECOND ERGATIVE PRONOMINAL SET IN CH'ORTI'

A genuine understanding of where this innovative, aspectual pronominal series came from depends crucially on Ch'olti' grammar; it alone contains the clarifying information necessary to explain the new Ch'orti' pronouns.

	ABS	NEW SET	ERG
3SG	*.. --	a-	*ru- u-
3PL	*-eb -ob	a-...-ob	*ki- u-...-ob
2SG	*-at -et	i-	*a- a-
2PL	*-ex -ox	ix-	*e- i-
1SG	*-in -en	in-	*nu- in-/ni-
1PL	*oŋ -on	ka-	*qa ka-

Figure 1. The Ch'orti' pronominal system, including the Common Mayan ancestral forms for both the ABSOLUTE and the ERGATIVE, and the new pronominal set.

The explanation for the emergence of the new pronominal series takes into account the following facts: Morán's Ch'olti' grammar describes two types of the INCOMPLETE for intransitive verbs. These two paradigms apparently fell together, yielding the hybrid pronominal set attested in modern Ch'orti'. The details of these two INCOMPLETEs and how they collapsed into a single pronominal set follows.

In the main text of that grammar, Morán calls the first intransitive INCOMPLETE the 'presente'; it takes the form of the syntagmatic construction: **ial ERG-Vin-el**, as for example, *yual in-caxi-el*; continue ERG1SG-fall-NOMINALIZER 'I fall now [me caigo]'. (This particular form is almost without exception translated 'actualmente'... 'now...') Modern linguists refer to this particular form as «split-ergative», which, it will be recalled, marks the TRANSITIVE INCOMPLETE. There is no doubt that the split-ergative INCOMPLETE came from the PROGRESSIVE (see Robertson 1992: 222, 1993: 93-95).

The second INCOMPLETE, along with a second FUTURE are also described in the grammar, although the explanation is always given in the context of the discussion of other grammatical points.

The formation of these secondary two grammatical categories is somewhat unusual, and is surely an innovation of Ch'olti'. It is accomplished by adding the particle *a-* to the so-called preterite (COMPLETIVE), which has the effect of producing a semantic INCOMPLETE. To make the second future—the so-called 'futuro en ruz'—the same *a-* is added in this case to the «presente» (INCOMPLETE). To summarize, the secondary INCOMPLETE comes from *a-* prefixed to the COMPLETIVE, while the secondary, 'futuro en ruz' comes from the very same *a-* prefixed to the INCOMPLETE, as shown in Figure 2. In both cases, the *a* has the temporalizing ef-

<b>COMPLETIVE</b> <b>Vin ABS</b> vixi en 'I went'	<b>FIRST INCOMPLETIVE</b> <b>yual ERG-Vin-el</b> yual in-vixn-el 'I go(now)'	<b>FIRST FUTURE</b> <b>x-Vin-ic ABS</b> x-chic en 'I will go'
	<b>SECOND INCOMPLETIVE</b> <b>a-Vin ABS</b> a-vixi en 'I go'	<b>SECOND FUTURE</b> <b>a-Vin-el ABS</b> a-vixn-el on 'we have to go'

Figure 2. The grammatical derivation of the **SECOND** incomplete and the **SECOND FUTURE** in Ch'olti'.

fect of moving the «préterito» to the «presente», and the «presente» to the «futuro-en-ruz» (Fig. 2).

The fact that the irregular form *vixn* for 'to go' is used both in the split-ergative (**FIRST INCOMPLETIVE**) and the «futuro-en-ruz» (**SECOND FUTURE**) is convincing evidence that Morán's analysis is correct: with the prefixing of *a-*, the «préterito» (**COMPLETIVE**) does become the «second present» (**INCOMPLETIVE**), «first present» (**INCOMPLETIVE**) does give the «future-en-ruz» (**FUTURE**). «Nota mas, que el presente de los verbos neutros se hase futuro en -ruz, anteponiendole una *a* (Morán 1695: 55)».

However, it is important to observe that the «futuro-en-ruz» does not keep the **ERGATIVE** that normally accompanies split-ergativity, but reverts to the unmarked **ABSOLUTE**. Furthermore, it is clear that the **COMPLETIVE** form moves to **INCOMPLETIVE** by similarly adding an *a-* to the **COMPLETIVE**: «Tambien con esta *a* se hace preterito[,] presente» (Morán 1695: 55). Again, the morpheme *a-* has a similar temporalizing, semantic effect of moving the verbal action forward in time, such that the **COMPLETIVE** (which from a temporal point of view is 'time gone by') to the **GENERAL PRESENT**, and the **INCOMPLETIVE** in *-el* (split-ergative) to the **FUTURE**. This particular use of prefix *a-* is surely an innovation, but it is not far removed semantically from its use in Acalán Ch'ontal, where the translation of *a+VERB* into Spanish is almost invariably **PRESENT PERFECT**. Note that the **PRESENT PERFECT** has an effect similar to what has already been described: bringing the effect of a past action into the present, where it is currently felt<sup>2</sup>. That is why in English (and Spanish) it is improper to use the **PRESENT PERFECT** with actions that are restricted to the past: \*I have eaten yesterday at six o'clock.

<sup>2</sup> It is of historical interest that in Colonial Poqom, this same *a-* shows up as a marker of the **RECENT-PAST** (See Robertson 1992: 141.) There are many indications that Poqom was deeply influenced by Ch'olan — most likely by the ancestral language of Ch'olti'.

These two forms are attested in the Morán's (1695: 61) liturgy, as seen in the following «futuro-en-ruz»:

Ch'olti': *Tuba a-bix-el uy-anima u-muzic utzil vinic u-coc-ob u-pehcahel Dios? Ti chan.*

Analysis: where *a-go*-**NOMLZR** **ERG3SG**-souls **ERG3SG**-spirits good men [who] **ERG3SG**- keep-**ABSP3PL** **ERG3SG**-words God. To heaven.

Gloss: 'Where will the souls of good men who keep the word of God go?' 'To heaven'.

Ch'olti': *Maca a-cuxpah-el xa tuyanil chamen t-u-lo-pah-el cav-ahauil Jesuxto? A- cuxpah-el xa*

Analysis: yes/no *a-live*-**NOMLZR** again all dead at-**ERG**-return-**NOMLZR** **ERG1PL**-lord Jesus Christ? *a-live*-**NOMLZR** again.

Gloss: 'Will the dead live again when our Lord Jesus Christ returns?' 'They will live again'.

The semantic notion of the **SECOND PRESENT** is also obvious in the following instances (Morán 1695: 63):

Ch'olti': *a-quex-pa ne pa ti chohuia bactal cav-ahauil Jesuxto*

Analysis: *a-change*-**MIDDLE.VOICE** the bread at beloved body **ERG1SG**-lord Jesus Christ

Gloss: Does the bread change in the beloved body of our Lord Jesus Christ'?

Ch'olti': *a-quex-pa ne vino t-u-chobia chichel?*

Analysis: *a-change*-**MIDDLE.VOICE** the winte at-**ERG3SG**-beloved blood

Gloss: 'Does the wine change to his beloved blood'?

Although the semantic difference between the **FIRST INCOMPLETIVE** (of the form *iuval ERG-Vin-el*) and the **SECOND INCOMPLETIVE** (derived from the **COMPLETIVE**, *a-Vin-ABS*) is difficult to assess completely, one could say that it seems to be the difference between definiteness versus an indefinite statement of some general truth (e.g. «water boils at 212 degrees»). Note that the **FIRST INCOMPLETIVE** is almost always translated *actualmente*, whereas the semantic environments for the use of the **SECOND COMPLETIVE** seem to be statements of gnomic or unchanging truths.

With the two Ch'olti'an **INCOMPLETIVES** identified, it is now possible to show graphically how these two pa-

	Ch'olti' First Incomplete	Ch'orti' Incomplete	Ch'olti' Second Incomplete
3(PL)	u...el (ob)	a...(ob)	a...(ob)
2SG	a...el	i-	a...et
2PL	i...el	ix-	a...ex

Figure 3. A description of the shift from Ch'olti' to Ch'orti'.

radigms collapsed, yielding the single so-called third paradigm we find in Ch'orti', as shown in Figure 3 (Fig. 3).

These data indicate that in third person, the old *a... (ob)*, the GENERAL INCOMPLETE was formally mistaken for the THIRD PERSON pronoun. Since the INCOMPLETE and the ERGATIVE 2SG have the identical form, *a-*, the reanalysis of the INCOMPLETE *a-* to 3SG would have resulted in an unacceptable homonymy, with both 3SG and 2SG having the same form, *a-*. This potential homonymy brought about a domino effect. That is, the old ERGATIVE 2PL would move to replace the old ERGATIVE 2SG *a-*. This would again have resulted in another unacceptable homonymy, in that ERGATIVE 2SG and 2PL would have both been *-i*. Apparently this prompted the final «domino»: ERGATIVE 2PL *-i-* remained, but was disambiguated by the addition of the *x* of the ABSOLUTE 2PL *-ex*, yielding a new form for 3PL, *ix-*. Thus *u- > a-*, *a- > i-*, and *i- > ix-*, in a succession of changes.

This remarkable chain of events meant that (a) the distinction between the two Ch'olti'an INCOMPLETE was lost, and (b) a new set of pronominals came into being. Whereas it is the norm in Mayan languages for the old nominalizing form *-el* to mark INCOMPLETE (from the PROGRESSIVE), in this case it was lost with the collapse of the two INCOMPLETEs, and furthermore split-ergativity was marked simply by the bare, newly-devised pronominal set, with no trace of the historical nominalizer.

### CONTINUATION OF THE FUTURE

There is more evidence that the above analysis appropriately represents the connection between Ch'olti'

and Ch'orti'. Ch'olti' had a future that took the form **x-Vin-ik** for intransitives and **x-CV<sub>1</sub> C-V<sub>1</sub> and x-CVCV-n** for the transitives:

*xpacxic en* [š-pak š i-k en], 'voluereme [I will come back]'

*xucolo et* [š-u-kol-o] 'Dios te librara [God will free you]'

*xaubin sermon* [š-aw-ubi-n sermon] 'oiras sermon [you will hear the sermon]'

*xinuilan* [š-inw-ila-n] 'yo lo vere [I will see it]'

In Chorti' the FUTURE has been lost. The INCOMPLETE takes its place, except in the NEGATIVE FUTURE, which is *mi-x-Vin-ik* for intransitives and *mi-x-CVC-i-'k* for the transitives:

*mi-x-chamay-en-ik en* 'I will not die'

*mi-x-u-xur-i-'k* 'he will not cut it'

Figures 4 and 5 show the NEGATIVE FUTURE is a continuation of the earlier x-FUTURE (Figs. 4 and 5).

Given the fact that Ch'olti' has *ma + x* [maš] as negative FUTURE markers while Ch'orti' has *mi + x* [miš], it seems inescapable to suppose that Ch'olti' *š* is ancestral to Ch'orti' *š*<sup>3</sup>. This hypothesis is bolstered by the

		Cholti'	
		INCOMPLETE	FUTURE
POSITIVE		<i>aquepa</i> [a-k'eš-pa] a-change-MIDDLE.VOICE 'it changes'	<i>xcaxic en</i> [x-k'aš-ik en] FULL-fall-OPTATIVE ABS1SG 'I will fall'
	NEGATIVE	<i>ma u-choco et</i> [ma u-o et-] not ERG3SG-send-aff ABS2SG 'he does not send you'	<i>ma xcaxic et</i> [ma š-k'aš-ik et] NEG FUT-fall-OPT ABS2SG 'you will not fall'

Figure 4. Ch'olti'an FUTURE, positive and negative.

		Chorti'	
		INCOMPLETE	FUTURE
POSITIVE		<i>a-wayan</i> ERG3-sleep 'he sleeps'	<i>a-wayan</i> ERG3-sleep 'he sleeps'
	NEGATIVE	<i>ma'chi a-wayan</i> NEG ERG3-sleep 'he does not sleep'	<i>mi-x-wan-ik</i> NEG FUT-sleep-OPT 'he will not sleep'

Figure 5. Ch'orti'an FUTURE, positive and negative.

<sup>3</sup> This form is probably from the Common Mayan incomplete marker \**kV-*, which shows up as *š-* in many of the Common Tzeltalan languages (Robertson 1992: 186-187).

fact that Ch'olti' had an irregular FUTURE form for the verb 'to go,' *chix*, which continues as the negative FUTURE marker in Ch'orti'.

In the COMPLETIVE, the form is *vix* [BIX], whereas in the FUTURE, the form is *chi*:

	COMPLETIVE	
Ch'olti'		Ch'orti'
<i>Vixi en</i> [bixi en] 'yo fui [I went]'		<i>ixy-e'n</i> 'I went'
<i>vixi et</i> [bixi et] FUTURE 'tu fuiste [you went]'		<i>ixy-e't</i> 'you went'
	FUTURE	
Ch'olti'		Ch'orti'
<i>xchic en</i> [x-chi-k] 'yo ire [I will go]'		<i>mix chik-en</i> 'I won't go'
<i>xchic et</i> [x-chik] 'tu iras [you will go]'		<i>mix chik-et</i> 'you won't go'
	INCOMPLETIVE	
Ch'olti'		Ch'orti'
<i>yual u-vixnel</i> [iwal a-bix-n-el] 'actualmente se ba [now he goes]'		<i>a-xin</i> 'he goes'
<i>auixi en</i> [a-bixi en] 'uoi [I go]'		<i>in-xin</i> 'I go'
<i>auixi</i> <sup>4</sup> [a-bixi] 'va [he goes]'		

In Ch'orti', the NEGATIVE FUTURE takes the same irregular FUTURE form found in Ch'olti': *chi*. This is strong evidence that the *x* of Ch'orti' *mix* is a reflex of the Ch'olti' FUTURE marker *x*. It is also significant that although Ch'orti' does not have the initial *b* of the root, it does preserve the *-(i)n* of the INCOMPLETIVE. Again, taken together, these data strongly support the claim that Ch'orti' descends from Ch'olti'.

## FURTHER EVIDENCE

Although the innovation of the two INCOMPLETIVES is new from Classic Maya times, and although there is no known evidence of an *x*- FUTURE in Classic Maya (probably due to rhetorical style), there are several grammatical elements that are shared by all three languages. All of these are discussed in detail in Houston *et al.* (1998):

•*-V<sub>1</sub>y*. This morpheme in Common Mayan marked the INTRANSITIVE POSITIONAL in Common Tzeltalan, but subsequently became a passive marker in Preclassic Maya, and then a middle voice marker by Classic Maya times, and then a marker of certain intransitive verbs by Ch'olti'an times, and finally a more general-

ized intransitive marker by Ch'orti'an times. No other Mayan language has this form as a marker of intransitives (or of the middle voice).

•*-h-...aj* PASSIVE. Like *-V<sub>1</sub>y*, this morpheme was also in Common Mayan a marker for the INTRANSITIVE POSITIONAL and became a passive marker in Classic Maya, and has persisted through Ch'olti' down to Ch'orti'.

•*-bu*. This morpheme is attested in the hieroglyphic script, in Ch'olti', and in Ch'orti'. It is Ch'orti', however, that gives the best picture of the nature of *-bu*. In Ch'orti', where we have more expansive data than in Ch'olti' and Classic Maya, it turns out that there are two morphemes, *-bu* and *-ba*. *-Bu* appears with positional roots whose root vowel is *a*, as for example, *in-pak-b'u*, 'I folded it.' *-Ba*, on the other hand appears only with those positional roots whose root vowel is not *a*, as for example, *u-kot-ba* 'he turned it up-side-down.' Because the limited corpus of Classic Maya and Ch'olti' has only the root vowel *a*, there are no examples of the other form, *-ba*, that was surely a congener of *-bu*. More data would very likely reveal the second form, *-ba*, amply attested in modern Ch'orti'.

•Pronoun system. Although conservation of a grammatical feature cannot be used as evidence for subgrouping in a family tree, it is nonetheless useful, after all the innovations have already established a sub-

<sup>4</sup> Although the form for 'he goes,' *auixi* [a-bixi] is not attested in Morán, by paradigmatic prediction this would have to be the form: *auixi* [a-bix-i].

grouping, to consider grammatical conservatism. It turns out that *all* lowland languages, and even all Greater Tzeltalan languages, except for Classic Maya, Ch'olti', and Ch'orti', have innovated by analogically forming an inclusive/exclusive *we*. Even those languages most closely related to Ch'olti' —Ch'ol and Ch'olan— so innovated. These three languages, related by lineage, preserved almost intact the Common Mayan system of pronouns (see Robertson 1982).

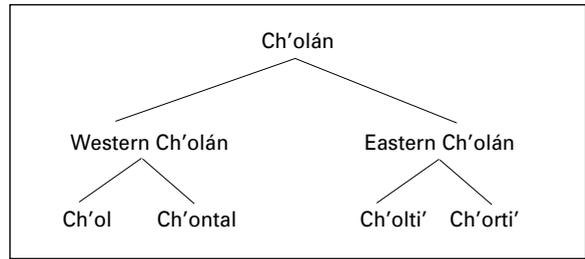


Figure 6. The traditional view of the relationship between Ch'olti' and Ch'orti'.

**CONCLUSION**

Given this explanation of the shift from Ch'olti' to Ch'orti', the traditional view that the genetic relationship between Ch'olti' and Ch'orti' is a sister relationship (Kaufman 1976), as shown in Figure 6, must be questioned (Fig. 6).

The entire Mayan tree in Figure 7 shows, in bold face, the revisions suggested in this paper indicating that Classic Maya, Ch'olti', and Ch'orti' form a lineage that has heretofore not been properly delineated (Fig. 7).

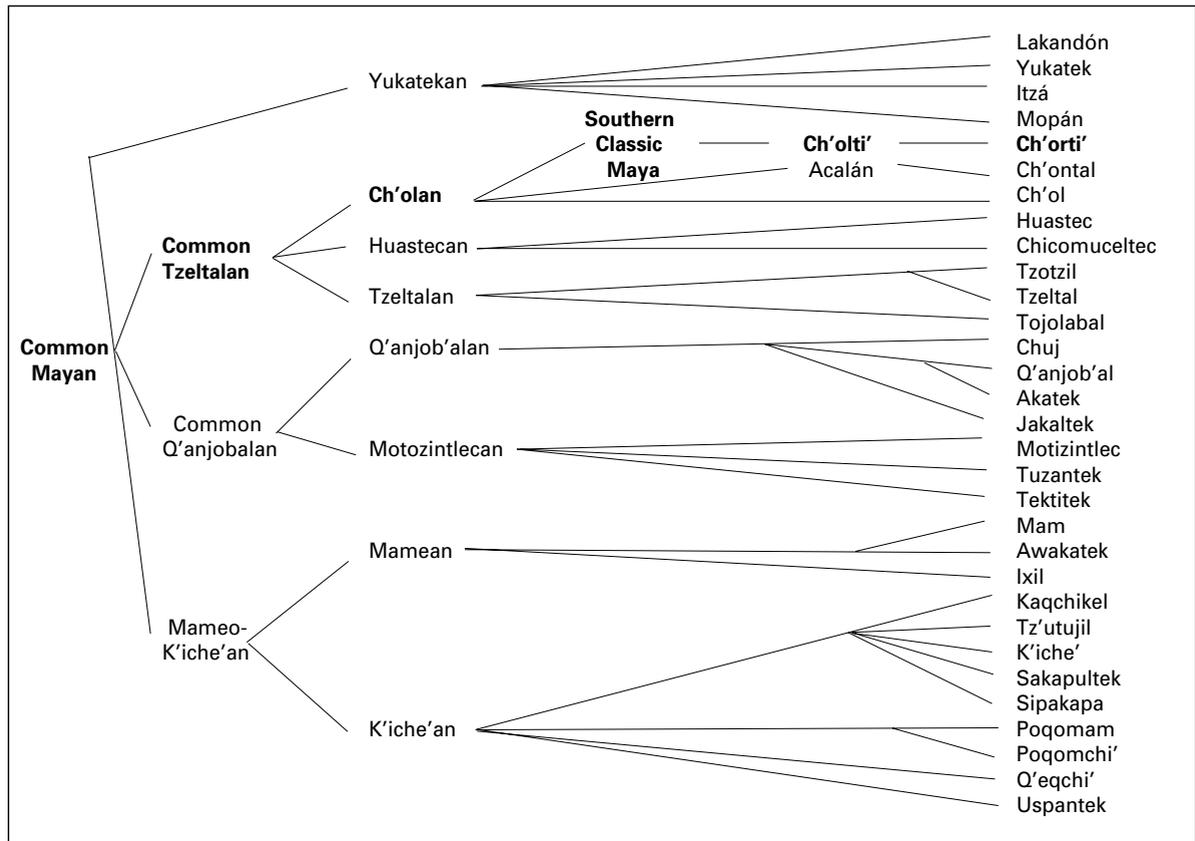


Figure 7. The Mayan family tree, corrected for the relationships between Classic Maya, Ch'olti', and Ch'orti'.

The evidence that Ch'orti' is a descendant of Ch'olti' is overwhelming. It cannot be by chance that the new, ergative set of pronouns is systematically reconstructable to the pronouns and the markers of the Ch'olti'an dual INCOMPLETIVES. It cannot further be accidental that the ancient X- FUTURE marker shows up in Ch'orti' as a negative FUTURE marker, even though the distinction between INCOMPLETE and FUTURE is lost elsewhere in Ch'orti'. Finally, it is not fortuitous that there are a series of unique, grammatical markers shared by the three languages, which are so unique, and which have developed historically along such natural lines, as to confirm with surety that Ch'olti' and Ch'orti' are diachronically related.

Since Houston *et al.* (1998) have shown that Classic Maya is ancestral to Ch'olti', then the lineage Ch'olti'-to-Ch'orti' constitutes a completing link, making Ch'orti' the ultimate descendant Classic Maya. In other words, the logic of transitivity says that if Classic Maya is the ancestor of Ch'olti', and if Ch'olti' is the ancestor of Ch'orti', then Classic Maya is the ancestor of modern Ch'orti', making Ch'orti' the only modern language in the world with such a pedigree. If Classic Maya civilization is important for its intellectual, physical, and spiritual achievements, then the data presented in this paper should promote Ch'orti' to a level of historical interest enjoyed by no other Mayan language.

#### REFERENCES

- HOUSTON, Stephen, John ROBERTSON and David STUART. 1998. The Language of Classic Maya Inscriptions. Unpublished paper. Brigham Young University-Harvard University.
- KAUFMAN, Terence S. 1976. «Archaeological and Linguistic Correlations in Maya-land and Associated Areas of Mesoamerica», *World Archeology* 8: 101-118.
- MORÁN, Francisco. 1695. *Arte en lengua Cholti que quiere decir lengua de milperos*. Box 42, Folder 1, William E. Gates Collection, H. B. Lee Library. Brigham Young University.
- ROBERTSON, John S. 1983. «From Symbol to Icon: The Evolution of the Pronominal System of Common Mayan to Modern Yucatecan», *Language* 59 (3): 529-540.
- \_\_\_\_\_. 1992. *The History of Tense/Aspect/Mood/Voice in the Mayan Verbal Complex*. University of Texas Press. Austin.
- \_\_\_\_\_. 1993. «The Origins and Development of the Huastec Pronouns», *International Journal of American Linguistics* 59 (3): 294-314.
- SMAILUS, Ortwin. 1973. *Das Maya-Chontal von Acalan: Sprachanalyse eines Dokumentes aus den Jahren 1610/12*. Dissertation from the Universität Hamburg.

