Consonant-Insertion Ligatures in Mayan Writing: Revisiting Old Types, Defining New Ones

David F. Mora-Marín

University of North Carolina-Chapel Hill

Introduction

In her work on Colonial Yucatec spellings, Bricker (1985:352; 1989:40–41) described alphabetic spelling conventions in the *Books of Chilam Balam of Chumayel* that appear to be derived from hieroglyphic spelling practices:

> Only the plain consonants, b, c, h, l, m, n, s, t, w (written as u), x, and *y,* are doubled in the Chumayel. In a number of cases, they represent the final consonant of **CVC** or **CVCVC** morphemes that are followed by inflectional suffixes of the form **VC.** Thus, for example, the words *ahau-ob* 'rulers' and *u-mul-il* 'its mound' were written as *ahau uob* and *u mul lil*, respectively, on page 16. [Bricker 1989:41]

The hieroglyphic spellings utilized by Bricker for comparative purposes are logosyllabic in nature, involving a logogram, such as **CHAN** for Proto-Mayan *kaʔŋ > Pre-Ch'olan *chaan > Proto-Ch'olan *chan 'sky', which exhibits a final /n/, and a syllabogram, such as **na**, that also provides the same consonant, /n/, in the context of a spelling like **ti-CHAN-na-li** for *ti-chaan-aal* 'above' (**Figure 1a**), where the /n/ of *chaan* 'sky', is orthographically repeated, for it is present in both the logogram **CHAN** and the syllabogram **na**, and can be explained by the need to spell a suffix, in this case, *-aal*, following that consonant.[1] These are then

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[1] I will employ linguistic transliterations corresponding to a hypothetical pre-Ch'olan stage in which vowel length contrasts were still retained. Evidence of such a stage has long been apparent in Ch'olan loanwords into Yucatecan, such as Yucatecan *tuun 'stone' (Yucatec *tùun(ich)*), from proto-Mayan *tooŋ 'stone', and Yucatecan *kuutz 'turkey' (Yucatec *kùutz*), from Greater Lowland Mayan *qootz (Justeson et al. 1985:10, 14, 18 Tables 2 and 5); the former exists in Yucatecan alongside the actual Yucatecan reflex *tòon* 'penis, testicle'. However, it is not necessarily the case that such contrasts were present in every context: contemporary Yucatec maintains contrastive vowel length in

cases of **consonant insertion** (Bricker 1989:39-40): a consonant that was already represented by a logogram is represented again by means of a syllabogram, in order to provide the vowel of a vowel-initial suffix. **Fig. 1b** provides another example discussed by Bricker (1989:40, Fig. 4.3a). To my knowledge, Bricker only described spellings of single words in connection with the consonant-insertion spelling practice and also restricted herself to cases of logosyllabic spellings, where a word was spelled in part by means of a logogram in addition to one or more syllabograms.

ti-CHAN-na-li

ʔu-K'IN-ni-le

a

b
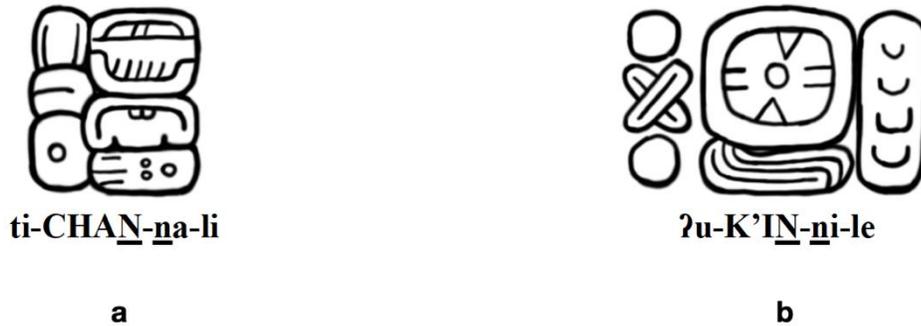
Fig. 1. Examples of consonant-insertion involving logosyllabic spellings. **a.** Yaxchilan Lintel 1, F1. **b.** Kabah Structure 1, North Jamb B. Drawings by the author after Bricker (1989:40, Fig. 4.3).

By the early 2000s, tantalizing evidence of similar conventions had also become available, only this time involving several syllabograms in a sequence, rather than logosyllabic spellings involving a logogram and one or two syllabograms. In one such convention, a CV sign with a fictitious vowel is followed by a CV sign with an intended vowel, resulting in a doubled consonant, $C_1(V_1)$-C_1V_2 to spell a …C_1-V_2… sequence. Kaufman (2004) and Kaufman and Justeson (2007:199) proposed that the **ji-chi** and **yi-chi** collocations in the Primary Standard Sequence (PSS) are spellings of an enclitic *+ich* 'already, really, indeed' (from proto-Mayan *+ik*). At a meeting involving Terrence Kaufman, John Justeson, Nikolai Grube, and Barbara MacLeod during the Texas Maya Meetings in Austin on 3/11/02, Justeson observed that **ji-chi** tended to follow **ja** and **yi-chi** tended to follow **yi** in the spellings of verbs in the PSS, while Kaufman suggested that in such contexts both **ji-chi** and **yi-chi** are spelling the same entity—the *+ich* enclitic in question—and their variation is determined by the preceding collocation: if the preceding collocation ends in **ja**, as with **K'AL-**

lexical roots but not grammatical morphemes. Such pre-Ch'olan stage had already undergone the merger of *Vʔ, *VV > *VV, though, as another loan from Ch'olan into Yucatecan. Greater Lowland Mayan *tzoʔn 'body hair' (Kaufman with Justeson 2003:292) experienced the *oo > uu shift in Ch'olan, reconstructed to proto-Ch'olan *tzun, and is retained in Yucatecan as Yucatec *chóʔom* and Mopan *choʔom* (possibly /choʔn/, with word-final /n/ typically becoming [m]), both 'pubic hair'. Interestingly, Yucatec, exclusively, attests to *tzùun* 'tuft of hair on chest of mature turkey'. This form was borrowed from the Ch'olan reflex of GLL *tzoʔn after both the merger of *Vʔ, *VV > VV, which would have resulted in *tzoon, and the *oo > uu shift, which resulted in pre-Ch'olan *tzuun. Otherwise, if the *oo > uu shift had preceded the *Vʔ, *VV > VV merger, Yucatecan would have borrowed this form as /tzuʔn/*, which would have yielded an unattested Yucatec form *tzúʔun** (Mora-Marín 2010:169). This means that pre-Ch'olan *VʔC had already merged with *VVC, which then became proto-Ch'olan *VC, as per Kaufman and Norman (1984). Any cases of preconsonantal glottal stop will be mentioned using proto-Mayan reconstructions, as with pM *kaʔŋ 'sky'. I will transliterate the abstractivizing /-Vl/ suffixes as -VVl for pre-Ch'olan forms, as they generally are traceable to proto-Mayan *-VVl morphemes (*-aal, *-eel, *-iil). It should be noted, nevertheless, that some such suffixes did not exhibit long vowels even in languages or stages with contrastive vowel length. Thus, there is a risk, when transliterating such suffixes as -VVl, of overgeneralizing.

ja, then one gets **ji-chi** (i.e. **K'AL-ja-ji-chi** for *k'a[h]l-aj-Ø-Ø+ich* 'it was already wrapped'); but if the preceding collocation ends in **yi**, as with GOD.N-**yi**, then one gets **yi-chi** (i.e. GOD.N-**yi-yi-chi** for *GOD.N-Vy-Ø-Ø+ich* 'it was already GOD.Ned').[2]

Examples of these spelling patterns are provided in **Figure 2**.[3] **Fig. 2a** illustrates the use of **ji-chi** after **-ja** in the spelling **tz'i-b'(i)-na-j(a)-(j)i-ch(i)** for *tz'ihb'-naj-Ø+ich* (writing-DTV.PASS-3sABS+already) 'it was painted/written already'. **Fig. 2b**, **tz'i-b'(i)-na-j(a)** for *tz'ihb'-naj-Ø* (writing-DTV.PASS-3sABS) 'it was painted/written', demonstrates that the representation of the clitic *+ich* 'already' was optional (or not required in some situations).[4] It stands to reason that the spelling in **Fig. 2b** does not constitute a case in which the enclitic *+ich* is intended to be read, for there is no evidence that it was underspelled, as the syllabogram **ja** of the preceding expression does not provide the vowel needed to underspell such enclitic; a syllabogram **ji** would be expected instead.

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[2] The proposal by MacLeod (1990:252-253) that **ji-chi** ~ **yi-chi** represent a cognate of Bachajon Tzeltal *jehch*, a classifier for pages, presumably a reflex of proto-Greater Tzeltalan *jehch, is problematic on two grounds: first, she proposes that pGT *jehch experienced the Ch'olan *ee > ii shift, but such shift did not occur with *VhC cases, which were preserved as *VhC in proto-Ch'olan; and second, it would require that one propose that root-initial *j was treated as root-initial *ʔ (or the occasional weak *h, Kaufman's *H), upon addition of an ergative/possessive Set A marker, to explain the **yi-chi** spelling (as *y-ijch*), but this is never the case with roots with earlier initial *j. Though she recognized the second problem (MacLeod 1990:255), she did not present linguistic evidence to support the proposition that any cases of root-initial *j would behave like root-initial *ʔ (or even the occasional root-initial *H) upon possession even after the *j, *h > h merger.

[3] There is an important problem that must be disclosed: T17 **yi** and T88 **ji** tend to converge graphically over time, making it difficult, especially on pottery vessel texts from the Late Classic, to distinguish the two, a problem already noted by MacLeod (1990). The parallel bands of T17 **yi** were increasingly omitted, and the hooked end of the sign adopted the "fluffy" or "hairy" finish of T88 **ji** in many instances, with the only diagnostic element of T17 **yi** consisting at times of the hooked element contained within the central oval or circle of the sign. Although I have taken great care since 1999 in checking such elements in order to distinguish the two signs, my transcriptions may differ somewhat from those by other epigraphers.

[4] Grube (2004:78) describes the same distributional pattern identified by Justeson and Kaufman (Kaufman 2004), but proposes that "It may be the case that this suffix is related to the suffix *-ik* which derives verbal nouns from intransitive verbs in K'ichee', Tz'utujiil, and Kaqchikel, but this hypothesis awaits further scrutiny." This is unlikely, for the forms with **yi-chi** and **ji-chi** in PSS texts are not verbal nouns, but inchoatives (cf. Mora-Marín 2007) derived from transitive, intransitive, positional, nominal, and adjectival roots.

tz'i-b'(i)-na-j(a)-(j)i-ch(i)

a
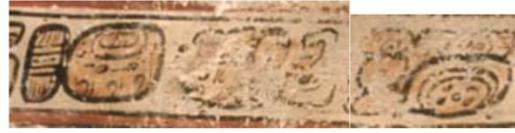
tz'i-b'(i)-na-j(a) yu-k'i-b'i

b

K'AL-j(a)-(j)i-ch(i)

c

K'AL-la-j(a) ʔu-tz'i-b'(i)-na-ja-l(a)

d
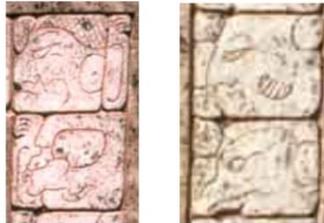
GOD.N-**yi** (y)i-ch(i) yu-lu-li

e

GOD.N[**yi**]-**yi** ʔu tz'i-b'(i)-na-j(a)

f

Fig. 2. **a.** Detail from K1227. **b.** Detail from K554. **c.** Detail from K2784. **d.** Detail from K8966. **e.** Detail from K8685. **f.** Detail from K6659. All illustrations come from Justin Kerr's Maya Vase image archive: http://research.mayavase.com/kerrmaya.html.

Figs. 2c-d illustrate the same pattern only this time for a verbal expression based on the transitive root *k'al* 'to bind' inflected as a passive verb with the bipartite morpheme *-h-…-aj*: *k'a[h]l-aj-Ø(+ich)* (bind[PASS]-PASS-3B) 'it was wrapped/bound (already)'.[5] **Figs. 2e-f** provide support for the parallel case for the **yi-chi** instead of **ji-chi** spellings: **Fig. 2e** provides a spelling GOD.N-**yi** yi-ch(i), where the GOD.N-**yi** spelling represents some sort of dedicatory verb, more specifically, one based on a versive or inchoative or ingressive suffix *-V₁y* (Mora-Marín 2007; 2009), which could derive an intransitive verb out of any basic root type: nouns, adjectives, transitives, intransitives, positionals. The syllabogram **yi** provides only part of the suffix, its consonant; the vocalic component of the syllabogram, I believe, was utilized in the spelling of these suffix because it represented the status suffix *-i* 'completive status of intransitives' that such an intransitive verb would require, or because it was conventionalized due to the use of such status suffix, and was applied even in situations where *-i* was omissible (e.g. in non-phrase-final contexts, as is the case in Chuj, Yokot'an, Yucatec). **Fig. 2f** illustrates the spelling GOD.N**[yi]-yi** ʔu tz'i-b'(i)-na-j(a), in which the

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[5] The following abbreviations for grammatical glosses are used: [] = infixation, 3A = third person singular ergative/possessive marker, 3B = third person singular absolutive marker, CMP = completive, DAT:POSS = dative possession, EXIST = existential particle, INCH = inchoativizer, INSTR = instrumentalizer, IV.POS = intranstivizer of positionals, PASS = passivizer, STA = stative.

enclitic *+ich* was not represented, and was perhaps not intended. Unlike the case of spelling variants like **tz'i-b'(i)-na-j(a)-(j)i-ch(i)** and **tz'i-b'(i)-na-j(a)**, in the case of spelling variants like GOD.N-**yi yi-ch(i)** and GOD.N**[yi]-yi**, the syllabogram **yi** in GOD.N**[yi]-yi** could potentially be argued to be an instance of underspelling of the enclitic *+ich*. However, given the general parallel with the **tz'i-b'(i)-na-j(a)-(j)i-ch(i)** and **tz'i-b'(i)-na-j(a)** variants, it seems more likely that the GOD.N-**yi yi-ch(i)** and GOD.N-**yi** constitute a case in which the former spelling is intended to represent the enclitic, while the latter is not.

Kaufman (2004) also notes that the next day (3/12/02) he and John Justeson discussed the (logosyllabic) spelling **ma-?MAK/??AK-ja-ji-ya**, seen in **Fig. 3a**, as likely showing the same process: /ma[h]k-aj-i:y/ 'since she was betrothed', where *-i:y* was spelled **ji-ya**, also employing the same consonant as that in the preceding syllabogram, **ja**.[6] When the enclitic or suffix *-i:y* was not intended, the spelling shows **ma-ka-ja** instead, as in **Fig. 3b**. Parallel examples, shown in **Figs. 3c-d** and drawn from Wald (2007), who does not explicitly describe consonant-insertion as a spelling convention but who nonetheless applies it in his transcription and transliteration practice, are based on the verb *wa?-l-aj-Ø(+iiy)* (standing-STA-IV.POS-3B(+since)) '(since) s/he stood', spelled **WA?(LAJ)-ja-ji-ya** and **WA?-la-ja**, consisting of logosyllabic spellings of the kind discussed by Bricker (1985, 1989).[7] The cases in **Figs. 3e-f** are also logosyllabic, this time spelling the term *u-we?-ib'(-il)* 'the thing-for-eating-with for/of'.[8] Finally, the case in **Fig. 3g** is also logosyllabic, **?u-PAT-ta-ti-ji**, possibly spelling a form *u-pat-ij* 'after' (Boot 2009:146); it may constitute a case of double consonant insertion, i.e. **?u-PAT(-ta)-(t)i-j(i)**, and thus it is worth considering for further research.

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[6] Kaufman (2004) actually cites a spelling **ma-ka-ja-ji-ya**, one that I have not been able to locate; I suspect he was referring to the **ma-?MAK/??AK-ja-ji-ya** spelling from Piedras Negras Stela 8.

[7] Even if the **WA?-ja-ji-ya** spelling is analyzed as Lacadena and Wichmann (2000) and Lacadena (2004) have suggested, namely, as cases of inflection of positional roots with *-h-…-aj*, this spelling would still constitute an instance of consonant-insertion involving a syllabographic sequence. I do not agree with their identification of *-h-…-aj* with positional roots, however, but that is an issue that lies well beyond the scope of the present paper.

[8] The example in **Fig. 3f** contains the sign proposed by Tokovinine (2014) to be a logogram **?IB'** for 'lima bean'.

ma-ʔMAK/ʔʔAK-ja-ji-ya

a

ma-ka-ja

b

WAʔ(LAJ)-ja-ji-ya

c

WAʔ-la-ja

d
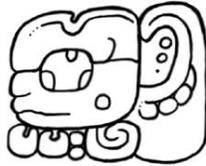
ʔu-WEʔ-(ʔ)i-b'i
u-weʔ-<u>ib'</u>-il (u-weʔ-b'(-il))
3A-eat-INSTR-DAT:POSS
'the plate for (him/her)…'

e

ʔu-WEʔ-ʔIB'/ʔib'-b'i-li
u-weʔ-<u>ib'</u>-il (u-weʔ-b'-il)
3A-eat-INSTR-DAT:POSS
'the plate for (him/her)…'

f

ʔu-PA<u>T</u>-(ṯa-)(ṯ)i-j(i)

g

Fig. 3. **a.** Piedras Negras Stela 8. Drawing by the author after drawing by John Montgomery in Wald (2007:672, Fig. 269). **b.** Piedras Negras Shell. Drawing by the author after drawing by Linda Schele in Wald (2007:576, Fig. 237). **c.** Yaxchilan Lintel 30. Drawing by the author after drawing by Ian Graham in Wald (2007:680, Fig. 277). **d.** Tonina Monument 74. Drawing by the author after drawing by Ian Graham in Wald (2007:674, Fig. 272). **e.** Spelling on pottery plate K6080. Drawing by the author after Zender (2000). **f.** Spelling on El Zotz-style pottery plate. Drawing by the author after drawing in Boot (2003:3, fig. 3). **g.** Glyph block J2 from Copan Altar U. Drawing by the author after drawing by Linda Schele.

In this paper I suggest that there exist several types of consonant-insertion strategies, some of which consist of cases where a syllabogram of the shape **jV** or **hV** with a fictitious consonant *j* or *h* is inserted to provide a necessary vowel. In addition, I also provide examples of consonant-insertion ligatures that serve to link two separate words. I further compare these strategies to vowel-insertion ligatures described in a separate paper (Mora-Marín n.d.). I begin with a review of Kaufman's (2004) formulation of this strategy, and reanalyze it based on a more comprehensive dataset compiled by Mora-Marín (1999; 2001; 2004). I begin with a reexamination of the **ji-chi** and **yi-chi** variants discussed by Kaufman (2004).

The *ji-chi* and *yi-chi* Variants

A closer look at Terrence Kaufman's analysis of spellings of the *+ich* 'already, really, indeed' enclitic, from proto-Mayan *+ik* 'already' is in order. An examination of a database of over 800 examples of PSS (dedicatory) texts described in Mora-Marín (2004), the majority on pottery vessels, can be used to assess the facts more systematically. Before proceeding, though, it is necessary to address two important points.

First, this enclitic is rare outside of the context of texts on portable objects. There is at least one instance of the spelling of this enclitic on a stone monument, found on the Early Classic Tikal Stela 7, shown in **Fig. 4a**. It shows the spelling **TZUTZ-yi[chi]**, in which the syllabogram **chi** is shown graphically infixed within the syllabogram **yi**. Spellings of the *+ich* enclitic, at least explicit ones, are not typical of texts on stone monuments. Instead, such texts typically conclude with the verbal suffix, as seen on **Fig. 4b**, an example from the Tablet of 96 Glyphs at Palenque, where one finds **TZUTZ-yi**, a spelling that is otherwise equivalent to that on Tikal Stela 7. There exist spellings in which the presumed verbal logogram is immediately followed by **chi**, like the Late Preclassic Dumbarton Oaks quartzite pectoral with its spelling of STEP**-chi** in **Fig. 4c**, and the Blom Plate (Blom 1950) also with the spelling STEP**-chi** in **Fig. 4d**. Most texts on portable objects typically spell this enclitic either as **ji-chi** or **yi-chi** as already illustrated in several cases in **Figure 2**. Either way, texts on portable objects are much more likely to exhibit the spelling of this enclitic than monumental texts. Certainly, a contextual factor is at work, one that can be speculated at: perhaps the "dedication" of public monumental texts was witnessed by many, leaving no doubt that the dedicatory action had already taken place. Conversely, the "dedication" of portable objects such as pottery vessels or pendants may not have been witnessed by many, or if intended as gifts, may have been "dedicated" prior to the process of gifting, which in some cases may have involved travel from one site to another, and thus such dedicatory act may not have been witnessed by its intended recipient. The enclitic *+ich* 'really, already' would have served to emphasize that such action had been *already* carried out. In other words, a difference in social context could have restricted the use of the enclitic in some texts and promoted it in others.


ʔi-TZUTZ-yi[chi]   **TZUTZ-yi**   STEP**-chi**   STEP**-chi**

     a   **b**   **c**   **d**
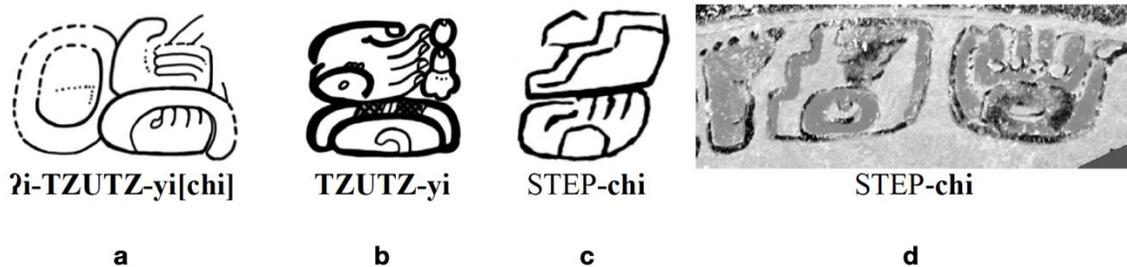
Fig. 4. **a.** Detail from Tikal Stela 7. Drawing by the author. **b.** Detail from the Palenque Tablet of 96 Glyphs. Drawing by Linda Schele (http://research.famsi.org/uploads/schele/hires/01/IMG0040.jpg). **c.**

Detail from the Dumbarton Oaks quartzite pectoral. Drawing by the author. **d.** Detail from the Blom Plate (Blom 1950). Photograph from Reents-Budet (1998:278).

Second, I recognize several different roots/lexemes that may be spelled with the sequence **yi-chi**, and the present study focuses only on the form that is consistently spelled either **ji-chi** or **yi-chi** after verbs or predicates. I have excluded a few instances in which **ji-chi** occurs in clause-initial context, and thus must be spelling a stem functioning on its own as a predicate, as well as several cases of **yi-chi** where it is spelling the Greater Lowland Mayan (diffused) positional root *ʔiky- 'facing someone(/something)' (Kaufman with Justeson 2003:304) in the expression **yi-chi-NAL/nal** for *y-ich-nahl* 'in his/her/its presence'. I have also excluded a few instances of **ji-chi** and **yi-chi** in unclear contexts, primarily cases where the signs preceding and/or following the sequence are unclear and thus their function cannot be defined with confidence. After culling and considering only cases that could be spelling the suffix or enclitic in question, 162 examples remain, 71 for **ji-chi**, 88 for **yi-chi**. I then examined the immediately preceding environment and defined eight basic environments overall, four for the **ji-chi** sequence, four for the **yi-chi** sequence. **Table 1** summarizes and illustrates the relevant data; "LOG" designates a spelling of a verb preceding either **ji-chi** or **yi-chi** that is realized by a single logographic sign with no syllabograms—more on such spellings is discussed below.

Table 1. Frequency of **ji-chi** and **yi-chi** by contexts. The first image comes from Velázquez Valadez and García Barrios (2002). The remaining figures are details of images from Justin Kerr's Maya Vase image archive: http://research.mayavase.com/kerrmaya.html.

Contexts	Cases	Representative Example	Semitotal	Total
1. LOG **ji-chi**	4	Oxkintok shell pendant **?NAL/??IXIM ji-chi** K5646 **GOD.N ji-chi**	74 cases of **-ji-chi**	162 cases of +*ich*
2. LOG[yi] **ji-chi**	2	K1892 **STEP[yi] ji-chi**		
3. **-ja ji-chi**	68	K5064 **tz'i-b'(i) na-j(a) (j)i-ch(i)**		
4. **-b'i ji-chi**	5	K1335 **tz'i-b'(i) (j)i-ch(i)**		
5. LOG **yi-chi**	68	K4962 **?T1017 yi-chi**	88 cases of **-yi-chi**	
6. LOG[yi] **yi-chi** (or LOG:yi **yi-chi**)	10	K4976 **STEP:yi yi-chi**		
7. LOG**-ja yi-chi**	9	K5070 **K'AL-ja yi-chi**		
8. LOG**-yi yi-chi**	1	K8685 **GOD.N-yi yi-chi**		
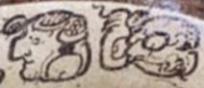
The data are revealing. First, regarding Context #3, it is clear that **ji-chi** follows **-ja**, used to partially spell a suffix of the shape -*aj*, in 68 out of 74 instances, or 92% of the cases. This is without a doubt the strongest determinant of the **ji-chi** spelling of +*ich* by means of consonant-insertion (i.e. of a /j/ by means of the

syllabogram **ji** after a syllabogram **ja**), supporting the observations and explanations by Justeson and Kaufman; this of course provides strong support that the idea that the /a/ of **ja** is silent, since the **ji** syllabogram is inserted to provide a continuation of the /j/ of the preceding suffix *-aj*.

Second, the strongest determinant of the **yi-chi** spelling is Context #5, with 68 out of 88 instances, or 77.3% of all cases. Context #5 involves a dedicatory verb, whether passive (in *-h-…-aj*) or inchoative/versive (in *-V₁y*), spelled by means of a logogram alone, without any partial spelling of the intended suffix—whether **ja** to indicate the *-aj* suffix, or **yi** to indicate the *-V₁y* suffix). Context #6 may actually represent a subtype of Context #5: in it, a syllabogram **yi** is either infixed (9 cases) or conflated (1 case) with the logogram representing the derived inchoative/versive/ingressive stem. Given that scribes on occasion doubled the **yi** syllabogram, yielding spellings such as STEP**[yi]-yi** and GOD.N**[yi]-yi** (MacLeod 1990), and that graphic infixation and conflation could lead in some instances to amalgamation of distinct graphemes into a single pseudologographic or logographic grapheme (e.g. *ch'ok* 'youth' spelled **ch'o[ko]-ko** instead of **ch'o-ko**), it can be argued that in fact the infixed **yi** syllabogram had become reanalyzed as part of the logogram.[9] If we assume that Context #6 is a subtype of Context #5, and the two contexts are merged, then the total of LOG(**[yi]**) **yi-chi** spellings would be 78 out of 88, or 88.6% of all cases. In other words, it would seem that the **ji-chi** spelling is largely the result of consonant-insertion after a syllabogram (87.14%), while the **yi-chi** spelling is mostly the result of a consonant-insertion after a logogram (86%), one that likely represented an inchoative/versive/ingressive in *-V₁y*. In all of these cases it is possible to argue that the [y] of the syllabogram **yi** was there to spell the /y/ of the *-V₁y* suffix of the verb preceding the *+ich* enclitic.

As it turns out, there is only one clear case, in my dataset, of Context #8, i.e. a spelling sequence LOG-**yi yi-chi**, one that does not involve graphic infixation or conflation of the first **yi** with the logographic sign spelling the verbal root, the one used to represent the *-V₁y* derivational suffix of the verb; this case was illustrated in **Fig. 2e** above. There likely are more, but they probably make up a very minute fraction of the total. Even if we merge Contexts #6 and #8 into one, they would amount to 11 cases out of 88, or 12.5%. At first glance, these cases would seem to be consistent with the proposal for the conditioning of the **yi-chi** in Kaufman (2004). However, Context #7, **-ja yi-chi**, consisting of 9 cases out of 88, or 10.2%, exhibits a comparable frequency to Contexts #6 and #8 combined, suggesting that scribes were not really using **yi-chi** preferentially after an explicit **-yi**. This conclusion is dramatically strengthened if one assumes that Context #6 is equivalent to Context #5; if so, there would only be one clear case of the sequence **-yi yi-chi** versus 9 cases of **-ja yi-chi**.

In other words, while the claim that **ji-chi** is conditioned by a preceding **-ja** in Kaufman (2004) is amply supported by the data, the claim that **yi-chi** is conditioned by a preceding **-yi** does not hold as strongly: a verb spelled with **-yi** is at best as likely to be followed by **ji-chi** as **yi-chi**. Instead, **yi-chi** appears to be the preferred way of spelling the *+ich* enclitic after a logographic spelling of the verb. That said, most of the verbs that were spelled exclusively logographically in these contexts were also verbs that would typically take *-V₁y*, spelled partially with **-yi**, for example, in cases where no +ich enclitic was spelled out. This distribution strongly favors consonant-insertion as the strategy for the use of **yi-chi** after such logograms. Only two *possible* examples of **ji-chi** appear immediately after a logogram, suggesting that some scribes deviated from the norm of up to 88.6% preference for **yi-chi** after a logogram. Clearly a convention existed, however such convention was arrived at.

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[9] This phenomenon of logographicization via graph(em)ic amalgamation has been described by previous authors (Bricker 1986; Matsumoto 2017; Mora-Marín 2010; Tokovinine and Davletshin 2001; Zender 1999) with regard to spellings like **chu[ku]-ka-ja** for *chu[h]k-aj* 's/he was seized/captured', **ch'o[ko]-ko** for *ch'ok* 'youth', among others.

There is one context that I have not commented on yet: Context #4. All 5 instances correspond to cases of the sequence **tz'i-b'i ji-chi** instead of the more common (45 instances) **tz'i-b'i na-ja ji-chi**. I suspect this is either the result of error or optional elision. That it could be the latter, optional elision, finds support in one of the five texts exhibiting the **tz'i-b'i ji-chi** spelling sequence: Vase K1335 also provides a spelling **yu-b'i** instead of **yu-k'i-b'i**, the typical spelling for *y-uk'-ib'(-il)* 'his/her cup' (or 'the cup for (someone)'), a spelling that appears 405 times in the aforementioned database of 860 inscribed objects. In contrast, the abbreviated form **yu-b'i** appears in four instances only. I do not consider linguistically probable a form *tz'ihb'(j)ich**, which would not function as a verb (since *tz'ihb'* 'writing' is an active noun, and requires a suffix *-a/-ä* to be transitivized or *-n-aj* to be passivized). Instead, I would argue that **tz'i-b'i ji-chi** is an abbreviated spelling of **tz'i-b'i na-ja ji-chi** for *tz'ihb'-naj-Ø+ich* 'it was painted/written already/really'.

Word-boundary Consonant-Insertion Ligatures
Perhaps the most interesting cases of consonant-insertion spellings are those that cut across word boundaries. And perhaps unsurprisingly, the two cases that are clear so far in this regard involve spellings of the *u-* 'third person singular ergative/possessive' proclitic or prefix, a morpheme whose spelling is also the primary motivation for vowel-insertion word-boundary ligatures (Mora-Marín n.d.).

The example in question is found on a stone cylinder mentioned by Houston and Stuart (1998) in connection with the spelling of the expression *u-b'ah(-iil)* 'his/her portrait/image', based on a reflex of proto-Mayan *b'ah 'head'. This expression is often spelled **ʔu-B'AH ~ ʔu-B'AH-hi ~ ʔu-B'AH-li ~ ʔu-B'AH-hi-li**, with T757/AP9 **B'AH/b'ah/b'a₂** likely used for the phonetic value based on its sourceword *b'ah* 'gopher' from proto-Mayan *b'aʔh, and thus likely functioning as a CVC syllabogram, i.e. **b'ah**. **Figs. 5a-b** illustrate two typical Late Classic examples of this expression. Much less often, the expression is spelled with T501/XE1 **b'a** in place of T757/AP9 **b'a/b'ah/B'AH**, as in **Fig. 5c**. It is important to note that during the Late Preclassic and Early Classic periods it is common to find T121/1M3 infixed within or conflated with T757/AP9, as in **Figs. 5d-e**. In a couple of instances, one of which (**Fig. 5f**) was noted by Houston and Stuart (1998:83, Fig. 9c), T121/1M3 precedes T757/AP9; and in one clear case (**Fig. 5h**), also documented by Houston and Stuart (1998:83, Fig. 9a), it is replaced by the syllabogram sequence **wi-ni**. (An additional example of the spelling **wi-ni-B'AH/b'ah** appears at F46 on Palenque Temple 18 Stucco, Bodega 174). Mora-Marín (2012) has proposed that T121/1M3, in this context, has a logographic value **WIN** based on Mixe-Zoquean *win 'eye, face', and that together, *win* 'eye, face' and *b'ah* 'head', functioned as a compound 'eye/face=head', perhaps originally a couplet, to refer to 'portrait', as attested in Colonial Yucatec <winba> 'imagen, figura y retrato en general (image, figure and portrait in general)' (Barrera Vásquez, et al. 1980:923).[10] For the purposes of this paper, it is not relevant whether a root *win* precedes *b'ah* or not. What matters is that either way, whether the term begins with /w/ or with /b'/, it would have to be possessed with *u-* 'preconsonantal third person singular ergative/possessive' agreement marker instead of *y-* or *uy-*, the prevocalic allomorph.

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[10] While I used to believe that the diagonal "mirror" or "polished stone" bands were part of the Late Preclassic and Early Classic design of T757/AP9 (Mora-Marín 2008:208), the evidence presented in Mora-Marín (2012) now suggests that it is instead a separate sign that was typically conflated with the T757/AP9, but in principle separable.

ʔu-B'AH-hi-li

a

ʔu-B'AH-hi

b

ʔu-b'a-hi

c

ʔu-[ʔWIN]B'AH

d

ʔu-ʔWIN:B'AH

e

ʔu-ʔWIN-B'AH-hi-li

f

ʔu-wi-ni-B'AH

g
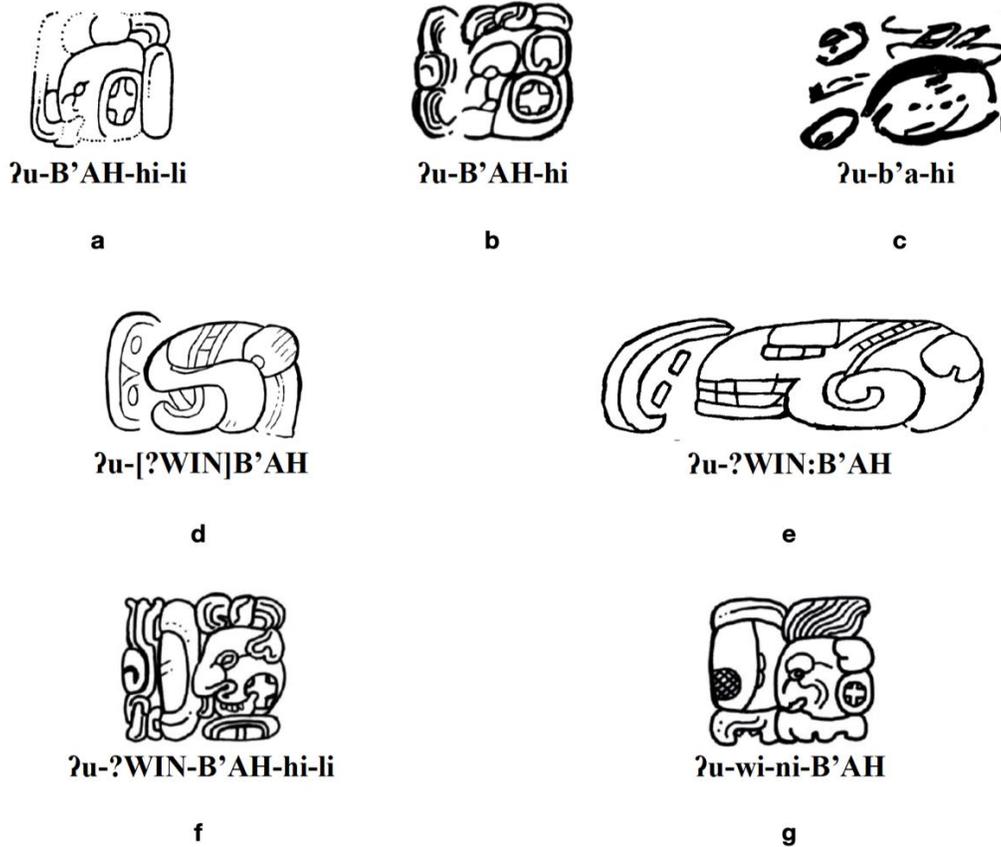
Fig. 5. **a.** Drawing by the author after drawing by Ian Graham. **b.** Expression from Tikal Stela 5:D4. Drawing by the author after drawing in Zender (2004). **c.** Drawing by the author after Stuart (2005:73). **d.** Spelling on Bagaces Slate Disk (Costa Rica), at B1. Drawing by the author. **e.** Spelling on Brooklyn Museum of Art Olmec-style maskette with Mayan text. Drawing by the author. **f.** Glyph block from Copan Stela 4. After drawing in Houston and Stuart (1998:83, Fig. 9c). **g.** Glyph block from Palenque Temple XVIII. After drawing in Houston and Stuart (1998:83, Fig. 9a).

In the case of interest, a text carved on an Early Classic stone cylinder, the expression is found spelled **yu-[ʔWIN]B'AH** instead of **ʔu-[ʔWIN]B'AH** following the dedicatory STEP verb, and preceding the name of the possessor of the 'portrait', as in **Fig. 6a**. Usually, the STEP glyph appears as a verb inflected or derived with a -$V_1 y$ suffix, and it commonly has as its subject a possessed noun, as in the example in **Fig. 6b**; a more typical example from vessel K4018 is transcribed, transliterated, glossed, and translated in (1), while the excerpt from the stone cylinder is in (2).

ʔAY(AL)-ya	STEP	yu-[ʔWIN]B'AH	ch'a-?	?-ʔYAX

a

ʔa-ʔAY(AL)-ya	STEP[yi]-yi	ʔu-tz'i-b'a	li

b
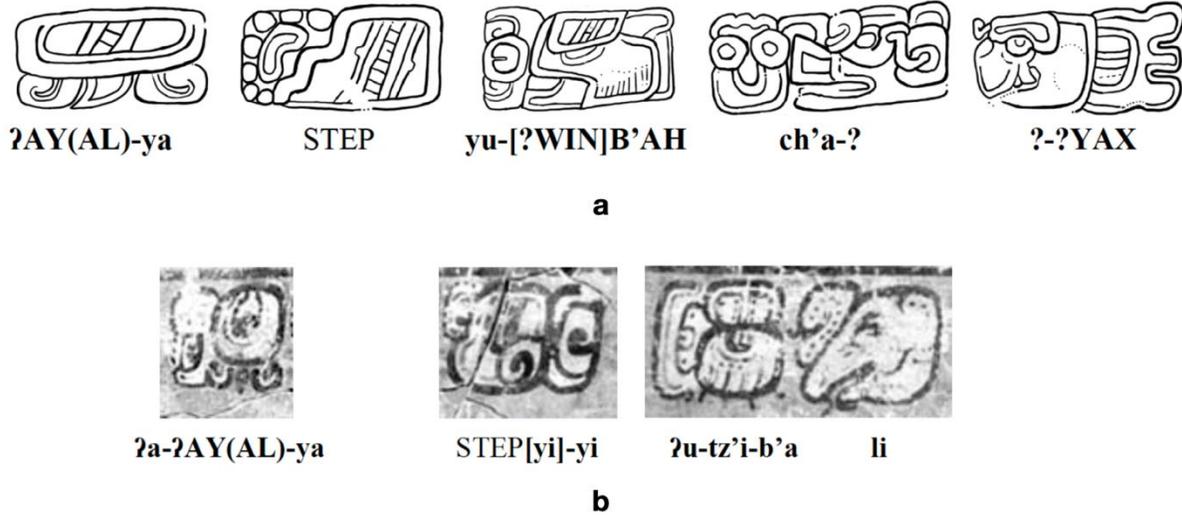
Fig. 6. **a.** Stone cylinder at the Metropolitan Museum of Art. Preliminary drawing by the author after photographs provided by Donald Hales. **b.** Detail of K4018, after image in Justin Kerr's Maya Vase image archive: http://research.mayavase.com/kerrmaya.html.

(1)　　　K4018
ʔa-ʔAY(AL)-ya　　　　　　　　　STEP**[yi]-yi**
ʔay-Ø　　　　　　　　　　　　　"DEDICATE"-V_1**y**-Ø-Ø
EXIST-3B　　　　　　　　dedicate-INCH-CMP-3A

ʔu-tz'i-b'a-li
u-tz'ihb'-al
3A-writing-DAT:POSS
'It is the case that his/her/its writing became dedicated'

(2)　　　Stone Cylinder
ʔAY(AL)-ya　　　　　　STEP　　　　　　　　**yu-[WIN]B'AH**
ʔay-Ø　　　　　　　　　DEDICATE-V**y**-Ø-Ø　　**u**-win=b'ah[-iil]
EXIST-3B　　　　　　　dedicate-INCH-CMP-3B　　3A-eye/face=head[-DAT:POSS]

ch'a-?　　　　**?-YAX**
Name　　　　Name
'It is the case that the portrait of [Proper Name of Individual] became [dedicated]'

Regarding the stone cylinder text, previously I had suggested that the **yu** syllabogram in this text may have been intended to be read with a value **ʔu** (Mora-Marín 2003). It is now clear, though, that it is in fact read as **yu**, and that the [y] consonantal value is intended to provide the final consonant of the -V_1y that goes with the preceding expression, while the [u] vocalic value is intended to provide the vowel of the *u*-proclitic or prefix for the third person singular, as indicated in (2). The **yu** syllabogram thus functions as *a word-boundary ligature*, one that inserts a consonant that at first sight seems out of place, but has to be

interpreted as corresponding to the final consonant of a preceding word. This analysis further indicates that the inchoative/versive/ingressive stem ended in the [y] of the suffix -V_1y, rather than -*i* 'completive status of intransitives'; this lends support to the possibility that such suffix was omissible, perhaps in non-phrase-final contexts, as is the case in contemporary Yokot'an (Ch'olan) and Yucatec (Yucatecan), for example.

Revisiting *yi-chi*

These examples raise an important question about the **yi-chi** spelling of the *+ich* 'already, really' clitic discussed by Kaufman (2004). As proposed above, the data suggest that the **yi-chi** spelling was most strongly determined by a preceding logographic (rather than logosyllabic or syllabic) spelling of a verb, but more specifically, preceding logograms that can be assumed to represent a word that required a -V_1y suffix. Thus, the [y] of **yi** in **yi-chi** functions as a consonant-insertion word-boundary ligature as well, especially since its context of use is similar to the case of **yu** with the 'portrait' expression, namely, after an inchoative/versive/ingressive verb in -V_1y. If correct, then, such ligature spellings would seem more common than previously thought, and therefore worthy of further research.

One difference lies in the enclitic status of *+ich*, unlike the case of the sequence STEP + **yu-b'ah/B'AH**, where the vowel of **yu** spells the proclitic *u-* of *u-b'ah(-iil)*, which makes up a separate word. However, in both cases the -V_1y suffix is followed by a clitic, whether the enclitic *+ich* or the proclitic *u-*. Whether clitichood is an important condition for this spelling convention remains to be seen. In principle it is no different from the word-internal cases of consonant insertion already defined by Bricker (1985, 1986, 1989), but a clitic is more loosely connected to a root or stem and may instead be thought of as connected to a phrase.[11]

Conclusions

This paper has expanded on the definition of consonant-insertion spelling practices in Mayan writing by Bricker (1985, 1989). In her original description, such practices are conceived as a phenomenon of word-internal logosyllabic spellings, and as one applicable primarily in logosyllabic spellings. In this paper I have reviewed evidence, based on the work by Justeson and Kaufman detailed in Kaufman (2004), that consonant insertion is applicable to syllabographic sequences, a finding that has already been applied in practice even if not explicitly problematized by other scholars (e.g. Wald 2007). I have offered a slight revision to Kaufman's (2004) analysis of the conditioning environments for the **ji-chi** and **yi-chi** spellings of the *+ich* 'already, really' enclitic, one that points to **yi-chi** being primarily conditioned by a preceding purely logographic spelling rather than a preceding **yi** syllabogram, but such purely logographic verbs are the kind that would take a -V_1y suffix spelled partially by a **yi** syllabogram, and thus, in the end, the spelling practice is consistent with Kaufman's (2004) analysis.

In addition, and this is what I consider to be this paper's most important contribution, I have described one clear case of what I have dubbed consonant-insertion word-boundary ligatures: an instance in which a seemingly out of place syllabogram **yu**, present where one normally expects the syllabogram **ʔu**, is used to spell the final consonant of one word and the first vowel of a second word. The context involves a stem derived with -V_1y 'inchoative/versive/ingressive' (Mora-Marín 2007), followed by a possessed noun, with the **yu** syllabogram providing the [y] of the -V_1y suffix that ends the first word, as well as the [u] of the possessive proclitic *u-* that begins the following word. In this light, I have suggested that the primary context for the **yi-chi** spellings of the enclitic *+ich*, following a logographic spelling of a verb, can be more

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[11] In the case of the proclitic *u-* (i.e. *u+*), it is phonologically dependent on either a preceding or following phrase, and can in fact be phonologically attached to a phrase preceding that to which it belongs morphologically.

fruitfully explained as cases of the same convention, consonant-insertion word-boundary ligature. Incidentally, the example of the use of **yu** as a consonant-insertion word-boundary ligature suggests that verbs in *-Vy* did not take an explicit suffix *-i* 'completive status of intransitives', but its null allomorph instead, at least phrase-internally. Given the behavior of intransitives in contemporary Yokot'an/Chontal and Yucatec, it is possible that the *-i* status suffix may have been applied phrase-finally.

Future research along these lines would benefit from examining more instances of initial uses of the syllabogram **yu** (e.g. Sacchana Stela 2, Yaxchilan Lintel 23:F2), especially, due to the relatively high frequency of occurrence of verbs in *-V$_1$y*, as well as the very high frequency of occurrence of the third person singular possessive *u-*.

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