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Bivalence of Grapheme 1C2

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It has long been apparent that the Maya script is a "mixed" logo-syllabic system, in which some graphemes are logograms, representing words, while others are syllabograms, representing "abstract" consonant-plus-vowel syllables (Kelley 1976:165–167; Knorozov 1967). Some signs are also bivalent or polyvalent (also called polyphonic), representing a word (or several words) in some contexts, but a syllabic value in others. A relatively large number of graphemes have phonetically unrelated logographic and syllabic values, such as the Kawak sign ZC1, which can be either **TUN** or **ku**, as well as the day sign Kawak. However, a select group of signs have phonetically related syllabic and logographic values. An example is MR4 or its variant AV1, which are used in three ways at various times in the script history: (1) as logograms with unknown value for the day Manik';¹ (2) as logograms representing **CHIJ** (and **KEJ** in the case of AV1²) 'deer'; and (3) as syllabic **chi** (see Fig. 1, 2).

¹ For a recent discussion of signs for the day Manik', see Stuart (2024a).

² In most texts, AV1a is **CHIJ**. Only in texts from northern Yucatan is grapheme used as **KEJ**, in the toponym 'Ahkankehj', also spelled as **AKAN-na-ke-je** on a carved vessel in the National Museum of the American Indian, New York 24/8346. See also Grube (2004).

It is important to distinguish between syllabograms that are sometimes used to underspell words in contrast to signs that are truly bivalent, having logographic values that begin with the same sounds as the syllabogram, as in the example above MR4 **CHIJ/chi**. We consider a sign to be bivalent specifically when it is used extensively in a logographic manner, especially early in its history. For example, MR4 is used often as a logogram, as a day sign, early in the history of the script (**Fig. 1a**). MR4 also appears as **chi** in the earliest phases of the script (**Fig. 1b**). This supports its interpretation as bivalent. Although AV1 appears with much less frequency in the script, it is used analogously to MR4. It is attested as the day Manik' as early as 300-200 B.C.E., as **CHIJ** in the Early Classic period, and as **chi** near the end of the Early Classic (**Fig. 2a,b,c**). Both graphemes are used in the same ways in the codices (**Fig. 1c,d, 2d,e**). In contrast, a sign like XE1 appears first as **ba**. Only later, near the end of the Early Classic (ca. 577 C.E.), is it used in words that include the morpheme /bah/, particularly in the title *bahkab*. This historical development supports its designation as a syllabogram that is sometimes used in underspellings.³





			
<p>a. MR4a as day Manik' (Uaxactun Str. B-XIII Mural Ap1, ca. 396 C.E.). Drawing by Martha J. Macri.</p>	<p>b. MR4s chi in T'AB?-chi (Winged plaque, Dumbarton Oaks Research Library and Collection PC.B.538 B1, ca. 100 C.E.).</p>	<p>c. MR4a CHIJ (Madrid Codex 91a4 I2). Drawing by Martha J. Macri.</p>	<p>d. MR4s chi in chi-K'IN-ni (Dresden Codex 22b3 E1). Drawing by Martha J. Macri.</p>

Fig. 1. Bivalence of MR4.

³ One possible early usage of XE1 as the morpheme /bah/ is on the Copan "Xukpi" stone (437 C.E.) in the unique construction **ba-IB-CHA'**, but the precise morphological analysis of the intended term is not clear. XE1 is also used logographically as a variant of the day-sign Imix, based on a formal merging with XE2, which appears long before XE1.



a. AV1a as day Manik' (San Bartolo Fragment 4778, ca. 300-200 B.C.E.).	b. AV1a CHIJ in CHIJ-HA' (Bowl, Museo Arqueológico Santa Barbara 2, ca. 435 C.E.) Drawing by Dana Moot II.	c. AV1s chi (Vase, Kerr 774 D, ca. 548-615 C.E.). Drawing by Dana Moot II.	d. AV1a CHIJ (Madrid Codex 92d2 H2). Drawing by Martha J. Macri.	e. AV1s chi in chi-K'IN-ni (Madrid Codex 91a1 D1). Drawing by Martha J. Macri.

Fig. 2. Bivalence of AV1.

Only a few other bivalent signs were both syllabograms and logograms with related phonetic values at an early date.⁴ These include: 1G4, 1SA, BP5, and XQ6 (Fig. 3).⁵

a. 1G4 AJ/a	b. 1SA YOP/yo	c. BP5 MO'/mo	d. XQ6 BIH/bi

Fig. 3. Syllabograms with related logographic values, both of which appear at about the same time.

⁴ Another grapheme that could pertain to this group is ZD2, which is usually syllabic **no**, but may also be logographic **NOK'** (Dienhart 1986; Stuart 2024b:82). Both usages are attested at around the same time in the Early Classic.

⁵ It could be argued that 1G4 is used as a phonetic rebus in some contexts. In addition to being used as the male agentive **AJ**, 1G4 also appears in spellings of words like *ajaw* and *ahk* (see Fig. 6a) and provides a verbal suffix *-aj* as in *oochha'aj* 'died' ('entered water'). However, it also appears in contexts where syllabic **a** is expected, such as a syllabic spelling of *uk'aba'* (**u-k'a-ba-a**), as a representation of terms for 'water' as in *witza'*, and as the second person ergative pronoun *a-*, as in *atojoob* 'your payments'. The other sign in this set that is questionable is BP5, which features a ring of dots around the macaw's eye starting in the early sixth century (cf. Yaxchilan Lintel 18). Before this time (in the fifth century), the dotted circle **mo** and macaw-head **MO'** signs have no graphic similarity. So this may be a case of graphic merging of distinct signs over the course of the Early Classic period.

In this report, we suggest adding another sign to this list: 1C2, sometimes referred to as T257v, which usually has an oval shape, Kawak/stone and sometimes Etz'nab/flint markings and bisected on its narrow dimension by a zigzag line. The main context for this grapheme is in the name of Ruler 1 of Dos Pilas, where it is followed by **CHAN(-na) K'AWIL-la** (Fig. 4a). As noted by Houston and Mathews (1985:10), in this name, 1C2 alternates with a spelling of three syllabograms **ba-la-ja** (Fig. 4b). Later, Zender (2004:n. 83; 2010) interpreted 1C2 here as logographic **BAJ**, with the **ba-la-ja** spelling in Ruler 1's name as a form of the affective verb *bajlaj*, or 'strike'. This interpretation has been widely accepted by epigraphers ever since.

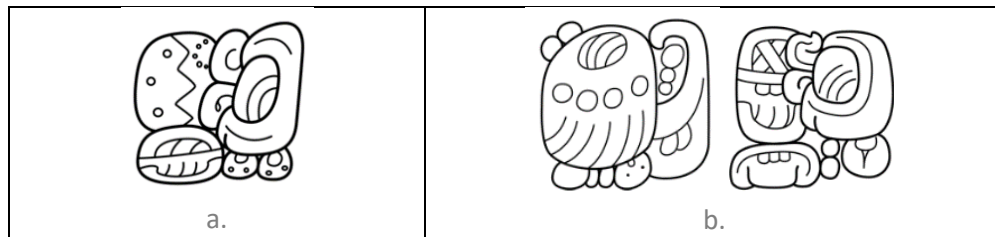


Fig. 4. Syllabic substitution of 1C2 in ruler name at Dos Pilas: **a.** Stela 9 D3 (drawing by Dana Moot); **b.** Stela 9 A3-B1 (drawing by Dana Moot).

One of the problems with the logographic reading of 1C2 appears on Copan Stela 49. Here, 1C2 appears above a clear **ki** syllabogram (Fig. 5). In this case, **BAJ-ki** seems unproductive (cf. Prager and Wagner 2017:4 n. 3). Zender (2010:1, note 1) asserted that 1C5 here is actually a different grapheme or combination of signs; however, we note that the same combination of Kawak (stone) and Etz'nab (flint) markings appear on a spelling of a name that is structurally related to that of Ruler 1 on El Chal Fragment E236-E237, *Bajlaj Chan Ahk* (Fig. 6a; Beliaev and de León 2020:95–96, 165–166, fig. 2.4; Chocón 2011:fig. 1). Another example of the sign with stone and flint markings, as well as the indentation between the two parts of the sign appears on a La Florida-style dish, K4427 (Fig. 6b). Here, the name is *Bajlaj Chan*, followed by a deity name and other titles.

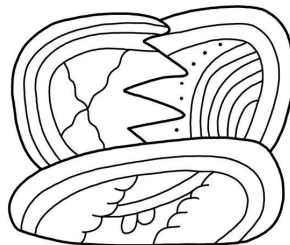
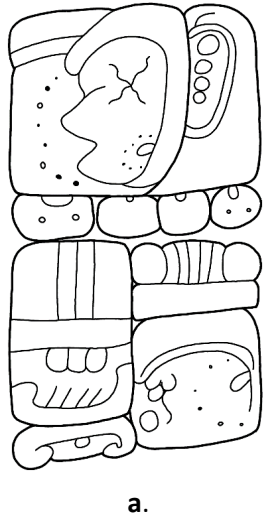


Fig. 5. 1C2 with **ki** from Copan Stela 49 A3, 514 C.E. (drawing by M.Looper).



a.



b.

Fig. 6. Examples of 1C2 similar in form to that which appears on Copan Stela 49 A3, but in structurally comparable contexts to name of Ruler 1 of Dos Pilas. **a.** El Chal Fragment E236-E237 (drawing by M. Looper); **b.** Dish, K4427 J-K (photograph by Justin Kerr).

Based on the formal similarity of 1C2 at Copan and in rulers' names at El Chal and on dish K4427, we maintain that all these signs represent the same grapheme but, because of the **ki** below it at Copan, in this context 1C2 must have a different value. Fortunately, a solution appears in the El Zotz' ceramics corpus produced during the late sixth and early seventh centuries. This style is noteworthy in that the artists frequently broke up syllabic spellings of certain terms into separate blocks. In addition, El Zotz' ceramic texts often employed unusual allographs of some signs, many identified long ago in early studies of the Dedication Sequence or Primary Standard Sequence of pottery (Coe 1973; Grube 1991; MacLeod 1990). For example, in spellings of *utz'ihbal* 'its painting', spelled **u-tz'i-ba-li**, several different **ba** graphemes were used. Most common is the skull SJ1s, followed by XE1s, both of which were also noted in syllabic spellings for *baak* 'bone/captive' (Stuart 1985). Rarer is the spiky-skull-plus-Kawak SD6, followed by a head with a vertical zigzag, PG8 (Grube 1991:226; 1994:181).⁶ These variants can merge with each other in this pottery style; for example XE1s (abstract or personified) can replace the skull element of SD6 (**Fig. 7a,b,c**). It can also be reduced to a simple Kawak (**Fig. 7d**).

⁶ In their discussion of the text of Copan Stela 49, Prager and Wagner (2017) stated that "the graph ZZ9 is known to have been used to spell the syllable **ba** as in **tz'i-ba-li** on the vessel Grolier 39." It is evident from the context that they meant 1C2 instead of ZZ9, but the example that they provided from Bowl K5465 ("Grolier 39") is actually the spiky-skull-plus-Kawak SC6. Thus, although they seem to imply that 1C2 is bivalent **BAJ/ba**, the example they provide to support this is incorrect.

a. SD6 (Bowl, Kerr 1901 F).	b. SD6 merged with XE1s (Vase, Fralin Museum of Art 1980.5.8 B6).	c. SD6 merged with XE1s (Bowl, Los Angeles County Museum of Art M.2010.115.855 M).	d. SD6 reduced to Kawak sign (Bowl, Portland Art Museum 1998.42.11 G).

Fig. 7. Merging and simplification of SD6 **ba**.

Yet another **ba** allograph is included in the text of an atole bowl at the Brooklyn Art Museum, 1996.116.17. Photographed by Yuriy Polyukhovych for the MHD and drawn by Dana Moot II (Moot 2021), this bowl spells **u-tz'i-ba-li** with 1C2 in the position of **ba** (Fig. 8). This context means that 1C2 can be syllabic **ba** in addition to **BAJ**. The **ba** reading is also supported by the graphic similarity of 1C2 to PG8, which represents a human head bisected by a vertical zigzag (Fig. 9). Indeed, we propose that PG8 could be the personified (“head variant”) of 1C2. The spiky-skull-plus-Kawak SD6 may also be graphically related to 1C2, though Looper and Polyukhovych consider them to be distinct enough to merit separate classification.

Fig. 8. 1C2 as **ba** in **u-tz'i-ba-li** sequence on El Zotz'-style bowl (Brooklyn Art Museum 1996.116.17). Photographs by Yuriy Polyukhovych, drawings by Matthew Looper.



Fig. 9. Examples of PG8 in **u-tz'i-ba-li** spellings from various El Zotz'-style ceramic texts. **a.** Bowl, Boca Raton Museum of Art 2000.198. Photograph by Yuriy Polyukhovych; **b.** Vase, Fundación La Ruta Maya 1.2.144.855. Photograph by Yuriy Polyukhovych; **c.** Plate, LC.p2.158 (reordered). Photograph by Nicholas Hellmuth.

The example of 1C2 **ba** from the Brooklyn bowl provides a way to understand the usage of this sign on Copan Stela 49, which likely spells **ba-ki**, or *baak* (**Fig. 5**). This sign appears in a toponymic sequence parallel to the text of Copan Structure 10L-11 sub Step (CPN3033; Prager and Wagner 2017:4–6). While the complete analysis of these texts is beyond the scope of this note, for the purposes of this argument, it is enough to suggest that interpreting 1C2 as a syllabogram makes more sense than a logogram on Stela 49.

In conclusion, 1C2, previously read as **BAJ**, was also sometimes **ba**. These usages are relatively early, with the earliest example being Copan Stela 49, followed by the Brooklyn Art Museum bowl (1996.116.17). Later, during the mid-seventh century, the sign is used frequently as **BAJ** in royal names, particularly at Dos Pilas. This pattern of a relatively early syllabic use followed somewhat later by a phonetically related logographic use of the sign justifies its consideration as a bivalent grapheme. It should be noted, however, that overall 1C2 is a somewhat rare sign, meaning that with more excavated examples, a clearer picture of its history may come into focus.



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