

Teotihuacan Writing:

Where are We Now?

Christophe Helmke
Jesper Nielsen

Teotihuacan, the great metropolis of the Central Mexican highlands, has often been characterized as a state without a writing system. This paper redresses this notion and provides an overview of the city's writing system and weighs in on its state of decipherment. The corpus of texts is defined and outlined as are its media and contexts. The geographical distribution of the writing system is considered, identifying the localities that define the heartland of Teotihuacan writing and culture, as well as more distant sites and enclaves elsewhere in Mesoamerica where examples of Teotihuacan writing have been found. The temporal distribution is also appraised before going on to present the underlying graphic characteristics of the writing system, leading to an appraisal of the sign inventory, showing clear correspondences to other Mesoamerican logophonetic writing systems. A synopsis of previous work on the writing system is presented in a historical précis, before considering candidate languages of the script and features of the underlying language recorded in the writing system.

K e y w o r d s

*Mesoamerica,
writing systems,
Teotihuacan,
epigraphy,
state of decipherment*

No knowledgeable student of Teotihuacan art and artifacts has doubted that the Teotihuacanos had evolved a system of glyphic signs. [Yet] it has been much more difficult to sort out what rules the Teotihuacanos did observe in forming and ordering their signs, or to determine to what extent they might be said to have a writing system, compared to other Middle American peoples.
(Millon, 1973, p. 306)

Introduction

During its heyday, Teotihuacan (c. AD 0–650) was a thriving metropolis, with a population of around 150,000 (Cowgill, 2015; Smith, 2018) (Figure 1). For all its distinctive and superlative features, Teotihuacan culture shares a number of defining traits with other Mesoamerican cultures, including monumental architecture, a polytheistic pantheon, and ritual expressions involving ritual caching, scattering rituals, and human sacrifice (Headrick, 2007; Helmke & Nielsen, 2017; Sugiyama, 2005; Taube, 2006). On par with other Mesoamerican cultures, Teotihuacan also had its own writing system, and dates were recorded in an early form of the 260-day ritual calendar (better known as the *Tōnalpōwalli* from later cultures of central Mexico). Rather than a utopian enclave, Teotihuacan was the capital of a vast empire that interacted with contemporary cultures of Mesoamerica through both bellicose actions and commerce. Undoubtedly a result of these widespread interactions, a series of ethnic enclaves has been identified around the city center, demonstrating the presence of populations from the Mayan area,

Figure 1

Aerial view of Teotihuacan, showing part of the monumental epicenter with the towering Sun Pyramid (at right) and the broad Avenue of the Dead that terminates at the base of the Moon Pyramid (in the background) (photograph by Christophe Helmke).



Oaxaca, the Gulf Coast, and Michoacan. As a multiethnic city, this greatly complicates the question of language affiliation, especially as it concerns the dominant linguistic context of the city and the relationships to the majority language of the local population. This has implications for identifying the underlying language of Teotihuacan's writing system, since there are several candidate languages that are spread across several language families. Despite these difficulties, the writing system of Teotihuacan has witnessed important progress in recent decades, including the documentation of calendrical notations and the year-bearer system, as well as identifying toponyms, titles, and a selection of personal names. As a means of providing a state-of-the-art of Teotihuacan epigraphy, we consider the possible language candidates and outline the temporal and spatial distributions of the script before considering general features of the writing system and summarizing the most recent findings.

The Geographical Distribution: Teotihuacan and Beyond

In establishing the geographical distribution of the Teotihuacan writing system, the first challenge is to identify the area that can be characterized as the heartland of Teotihuacan culture. In part, this is due to the overwhelming focus on the city of Teotihuacan itself. In many ways, the archaeology of Teotihuacan is capital-centric, as though investigations of Rome were the only way to generate a picture of Roman culture. Furthermore, the continued habitation of urbanized centers of the central Mexican highlands, after the fall of Teotihuacan, means that detailed knowledge of larger settlements that once formed part of classic Teotihuacan culture is still lacking. Based on the distribution of inscribed monuments, rock art, and items of material culture bearing partial texts in Teotihuacan writing, we consider the Teotihuacan Valley (including the site itself), the wider Central Mexican Basin (including the sites of Santiago Ahuizotla and Azcapotzalco; Tozzer, 1921; von Winning, 1987) as the heartland of Teotihuacan (Figure 2). In addition, adjoining parts of the modern states of Tlaxcala, Puebla, Hidalgo, and Morelos can be said to have been well-integrated into the Teotihuacan cultural sphere (Matos Moctezuma, 2009, pp. 71–79; Cowgill, 2015, pp. 133–139, 194–203).

Figure 2

The heartland of Teotihuacan culture, showing the distribution of sites with attested Teotihuacan writing (map by Christophe Helmke).



As the Teotihuacan state prospered and expanded its influence through trade, military conquest, and networks of tributary obligations, examples of Teotihuacan writing began to appear on ceramic vessels, incense burners, and monuments outside this core region, and are now found in nearly all parts of Mesoamerica dating to the fourth to fifth centuries AD. In certain cases, Teotihuacan glyphic signs were borrowed into other scripts (e.g., at Tikal in Guatemala and Monte Alban in Oaxaca; Stuart, 2000; Taube, 2011, pp. 91–92), but in the majority of cases Teotihuacan texts, in their predictably concise format, appear alongside other characteristic expressions of Teotihuacan culture, including Teotihuacan-style iconography (Nielsen, 2003). We thus encounter Teotihuacan glyphs and texts in the Bajío-region (El Rosario, Queretaro; Nielsen et al., 2019a), and in the Mexican states of Guerrero (e.g., Acatempan and Cerro de los Monos; Nielsen et al., 2019b), Michoacan (Queréndaro; Filini, 2004; Nielsen, 2019), and Veracruz (e.g., Piedra Labrada and Soyoltepec; Taube, 2000). Further to the southeast, Teotihuacan writing appears on the Pacific coast and piedmont of Chiapas (Los Horcones and Fracción Mujular; Navarrete, 1986; Taube, 2000; García-Des Lauriers, 2005) and Guatemala (e.g., Escuintla and Tiquisate; Hellmuth, 1975; Berlo, 1984), in highland Guatemala (Kaminaljuyu and Lake Amatitlan; Kidder et al., 1946; Berlo, 1984) and across the central Mayan lowlands (e.g., Tikal and Copan; Stuart 2000, 2005). It is important to emphasize, however, that the total number of Teotihuacano texts that we have been able to document from these regions outside of Teotihuacan and its immediate hinterland is relatively small ($n = 67+$), and the majority of examples come from a limited number of sites in piedmont and highland Guatemala, such as Escuintla. The high incidence appears to reflect a local tradition of producing ceramics and incense burners in Teotihuacan style that is likely related to a warrior cult, possibly for use by a central Mexican enclave (Berlo, 1983, 1984). Having thus defined the spatial parameters, we provide further details concerning the number and nature of the texts from this Teotihuacan heartland, as well as the media on which they occur and their archaeological contexts.

The Corpus

Before introducing the graphic properties of signs and approaching the fundamental issue of the number of signs involved in Teotihuacan writing, we shall briefly discuss another important, but mostly ignored aspect of Teotihuacan literary culture: the number of known texts. German epigrapher Thomas Barthel did in fact call for a *Corpus Inscriptionum* of Teotihuacan texts already in 1987, but it never materialized. Crucial to this question is the criterion employed in defining what constitutes a text. Here we define a text as any written statement, however brief and/or fragmentary, on a single monument, artifact, or architectural unit, and note that in western Mesoamerica, there is a prevalence of very succinct texts, often reduced to a single calendrical date, anthroponym, title, or toponym. By this definition, a single glyphic compound, be it a calendrical date, a personal name, or a title, constitutes a text since each record is a single stative or declarative clause.¹ The same definition has been put to good use by the authors as part of other studies focused on Mayan writing and the writing system of the Epiclassic period (c. AD 650–1000), hence its applicability in the present case. In this respect, it is worth remarking that the central Mexican tradition of writing can be traced from the Classic period Teotihuacan through to the Epiclassic at sites such as Xochicalco and Cacaxtla, until Toltec and Aztec writing of the Postclassic period (Taube 2000, 2011; Helmke & Nielsen, in press a; Lacadena, 2008).

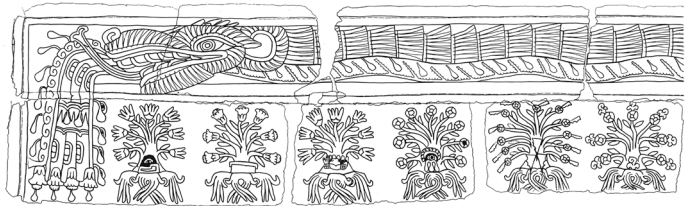
The brevity of such statements does not in itself disqualify them from being part of a phonetic writing system, and one only has to think of isolated words in present-day Western adverts, stop signs, singular toponymic indicators (road signs) or important dates highlighted on posters and banners (“9/11” or the “4th of July”) (Nielsen, 2014a, p. 179; Millon, 1973, p. 307; Berlo, 1989, p. 21). When regarded in a wider Mesoamerican comparative perspective, it is worth noting that although ancient Mayan writing was often employed to compose much longer texts, there are also numerous examples of very brief texts that do not constitute full sentences, but merely stative expressions such as nametags and individual calendrical signs. Likewise, Teotihuacan texts tend to consist of one or two glyphs in a brief horizontal row, or short columns of three glyphs or so. Frequently, such rows repeat the same sign, and such repetition, as a form of calligraphic expression, may have been a specific scribal practice at Teotihuacan (Nielsen 2014a, 180). The two longest texts known from Teotihuacan are the remarkable forty-two glyphs from the Plaza de los Glifos at La Ventilla (Cabrera Castro, 1996; Nielsen & Helmke, 2011) and the

¹ Barthel employed a different criterion for a text, requiring “at least two graphemes” forming a vertical continuum. Based on this he reached a provisional total number of texts of just 23 (Barthel, 1987, p. 11).

thirty-four glyphs in the series of repeated glyphs labelling flowering trees at Techinantitla (Cowgill, 1992; Pasztory, 1988a) (Figure 3). These provide tantalizing evidence that Teotihuacano scribes at times did produce more lengthy texts. Much as the text of the Plaza de los Glifos presents some evidence of the format, layout, and content of ancient codices at Teotihuacan (Nielsen & Helmke 2011, pp. 360–362), depictions of what could be codices paraded in processions of priests are also known from the murals of the great metropolis (de la Fuente 1995a, 87–91). This evidence makes it clear that the ancient city must have also had an important codical tradition— although at present, it is entirely lost.

Figure 3

Detail of the murals of Techinantitla showing a feathered serpent slithering above a series of trees qualified by glyphic compounds (drawing by Saburo Sugiyama, after Pasztory 1988a: Fig. VI.1).



In our textual survey we have relied on published sources on the murals (Miller, 1973; Berrin, 1988; de la Fuente, 1995b), ceramics (Ratray, 2001; Séjourné, 1966; von Winning, 1987), and more general works on the material and visual culture of Teotihuacan such as exhibition catalogues, monographs, and articles (Seler, 1915; Berrin & Pasztory, 1993; Robb, 2017). In the case of murals, it can be difficult to determine the number of texts when separate glyphs are set in a larger iconographic framework or occur as diminutive captions to the associated scenes. In such circumstances, such as the individual glyphic labels appearing in the murals of Portico 2 at Tepantitla, we count this as a single text, since the textual elements are confined to the single architectural unit (Browder, 2005).

Furthermore, when glyphic signs were used as semantic determinatives (marking materials and qualities of entities or objects), most commonly affixed to or infixes in speech scrolls (Nielsen, 2014a), these are not included in the count.² Equally, cases in which a single, isolated motif can function both as an iconographic element as well as a glyphic sign—such as a flower or a human heart—are excluded from our count. James Langley (1986, 2002) provides a number of glyph-like signs from as-yet-unpublished museum and private collections, but as these are extruded from their context, it is impossible to determine whether they are part of speech scrolls, iconographic compositions, or actual texts. Finally, unprovenanced pieces that are assumed to have come from Teotihuacan

² Given these many parameters, we do not include the carved panels in pure Teotihuacan style found at the site of Las Parotas (located in the State of Mexico, c. 192 km southwest of Teotihuacan). For complete line drawings, iconographic analyses and reconstruction of their provenance, we point interested readers to the forthcoming study by Rivera and Valdez Bubnova (2017).

Table 1

The corpus of Teotihuacan writing according to provenance and supporting media.

or its hinterlands have been treated as a separate category in our count, to indicate their incidence in the total tally. With the above-mentioned criteria and caveats in mind, our survey has identified the following approximate (and conservative) numbers (Table 1).

Teotihuacan (site and heartland):	Frequency	Teotihuacan (abroad):	Frequency
Murals	52	Murals	2
Ceramics (incl. incense burners)	138+	Ceramics (incl. incense burners)	45+
Monuments	4	Monuments	15
Minor sculptures (incl. plaques)	9	Stuccoes	3
Petroglyphs and caves	4	Mirrors	2
Provenance unknown	65+		
Total	272+	Total	67+

As can be seen, if we add the numbers of securely provenanced texts and those that are likely to originate from within Teotihuacan's heartland, we reach a total number of Teotihuacan texts below 300. We also know that many more texts written in Teotihuacan writing exist in bodegas, in museum storerooms, and in private collections, just as others await archaeological discovery. A striking observation is the high number of ceramics bearing texts, making this the most common Teotihuacan media for writing as preserved in the archaeological record. Of the 138+ identified texts, the vast majority come from the residential compounds of Tetitla (n = 35+) and Zacuala (n = 14), whereas numerous other examples are reported from Santiago Ahuizotla and Azcapotzalco (von Winning, 1987). Evidently, there is enormous potential for expanding the corpus once additional ceramics, complete as well as fragmentary, are made accessible to researchers. Another interesting, although less prominent, trend is the relatively high number of carved stone monuments with Teotihuacan-style texts that occur outside the Teotihuacan heartland (n = 15) compared to the four from within. This may reflect a local preference for other types of media for inscriptions, or could be the result of the destruction of Teotihuacan since Epiclassic times. Certainly, freestanding megalithic monuments were not common in central Mexico, which probably affects the distribution of these numbers. Something similar can be said about the smaller sculptures and other portable objects such as *almenas* and plaques, of which only seven are known from the Teotihuacan core area. It is also surprising that no inscribed mirror backings have been encountered at Teotihuacan, but appear twice outside the capital area in the Cuitzeo Basin of Michoacan (Filini, 2004, p. 69) and at Copan in Honduras (Nielsen, 2006).

Temporal Distribution

Part of the fame of Teotihuacan rightly belongs to the vibrant and bold polychromatic murals found in the some of the affluent compounds of the city. Despite the intricacy and importance of these murals, their temporal placement is, for the most part, unresolved. Instead, most art historians have dated these to sometime during the apogee of the city, which is to say during a span of about five centuries or so, between the Miccaotli and Metepec phases (Berrin, 1988; Berrin & Pasztory, 1993; Cowgill, 2015, p. 206) (Table 2). This rather long temporal span is essentially useless and provides no concrete information that can be used by iconographers and epigraphers to obtain a more fine-tuned and diachronic appreciation of the stylistic features under scrutiny. Nevertheless, a close examination of the mural corpus is beginning to reveal which stylistic features can be segregated into early and later horizons. Further, intersite comparisons are also yielding good results. Thus, based on comparisons to the murals at the site of El Rosario (located 140 km to the northwest of Teotihuacan), which have been dated to AD 200–250 by calibrated AMS dates (Fenoglio & Viramontes, 2014; Nielsen & Helmke, 2014a; Nielsen et al., 2019a, pp. 17–18), we can see that some of the murals in Portico 13 at Tetitla (Séjourné, 1969, pp. 104–105) and also the Storm God murals of Techinantitla (Millon, 1988, pp. 96–104) probably date to the same range.

Table 2

The main ceramic complexes of Teotihuacan (after Rattray 2001: Fig. 2, p. 435).

Teotihuacan Chronology	Gregorian dates
Coyotlatelco	AD 700–900
Metepec	AD 550–650+
Late Xolalpan	AD 450–550
Early Xolalpan	AD 350–450
Tlamimilolpa	AD 250–350
Miccaotli	AD 150–250
Tzacualli	AD 0–150
Patlachique	150 BC–AD 0

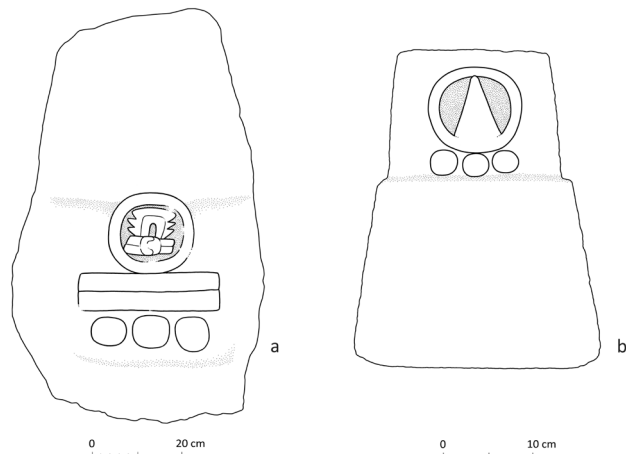
In terms of stylistic assessments, some attempts have been made to create a broad, temporally-sensitive typology of murals, arranged into periods and phases (Millon, 1972; Lombardo, 1995). Pasztory, focusing on the content and composition of the murals, suggested another sequence, with impersonality and simplicity characterizing the early history of Teotihuacan, whereas glyphs and individuals figure prominently in the late history, allegedly a sign of “a preoccupation with communication” (Pasztory, 1988b, p. 75). These attempts have, however, been met with some incredulity on the part of archaeologists since some of the categorizations run against stratigraphic evidence and ceramic-based dating, and in large measure seem to be grounded in preconceived notions about the sociopolitical trajectory of the city. Relying on paleographic features of Teotihuacan graphic conventions, we have noted that elements made of stone are

typically marked by triangular serrations as semantic determinatives, which in later examples use much duller lunate forms to denote the same material. This paleographic feature allows us to date the murals of Portico 1 of Patio 3 at Atetelco to a later phase of mural painting (Helmke & Nielsen, 2014, pp. 81–82). Furthermore, examining the paleographic features of the Mayan glyphs painted on murals in the Tetitla compound at Teotihuacan, and comparing these to well-dated monuments in the Mayan area, has allowed us to date these murals squarely to the late Xolalpan phase, or more precisely to AD 475–534 (Helmke & Nielsen, 2013a). Continued work, taking into account such paleographic features as well as available stratigraphic and ceramic data, will eventually enable researchers to produce a more informed temporal seriation of Teotihuacan murals.

Other inscribed elements are equally difficult to date, including the rock art at Chalcatzingo, in particular the painted pictographs (Apostolides, 1987, pp. 192–193), and the petroglyphs at the Cerro de la Estrella (Helmke & Montero García, 2016, pp. 69–71), Xihuingo (Galindo Trejo et al., 2002, p. 261), and Axutla (Nicolas Latsanopoulos, personal communication, 2021), although the latter include calendrical notations with highly circular cartouches. The shape of these cartouches is a paleographic feature that is temporally sensitive, with Teotihuacan day signs enclosed within circular cartouches, in squared cartouches with rounded corners in the Epiclassic, and square frames in the Postclassic (Helmke & Nielsen 2011, p. 6, in press a) (Figure 4). The shape of the circular cartouches suggests that the aforementioned examples date somewhere between the second through sixth centuries AD. These calendrical signs also compare to those incised on a finely carved statuette of a coiled snake made of *tecalli*, or travertine (Helmke, 2017a, p. 327; Taube, 2011, pp. 78–79) and to those inscribed on the monuments raised at the summit of the Cerro Xoconoch, 6.3 km southwest of Teotihuacan (Helmke et al., 2013).

Figure 4

Inscribed Teotihuacan monuments: a) Monument 4 found at the summit of Cerro Xoconoch, bearing the date "13 house" (after Helmke et al. 2013: Fig. 4g) and b) Monument E104 of Frente E at the Plaza de las Columnas, inscribed with the date "3 flint" (after Carballo et al. 2017: Fig. 6.44) (drawings by Christophe Helmke).

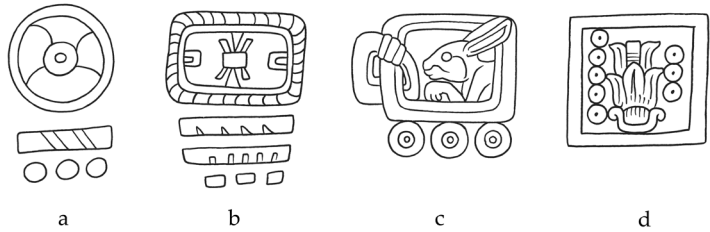


Whereas the glyphic notations recorded in the murals, on monuments, and in rock art amount for about a quarter of the total corpus, we are on much better footing with ceramics, which together represent more than two-thirds of the entire glyphic corpus for Teotihuacan. These ceramics are embellished with modelled applique and bear post-slip incised designs or detailed polychromatic scenes painted onto a thin layer of gesso applied to the exterior of vessels. Together, these provide a rich source of evidence that can be arranged in chronological sequence given the very medium that bear these. The one vexing issue is not so much the relative sequence of ceramic complexes and their distinctive typological traits, but that disagreements persist between various research projects and individual researchers as to the absolute temporal parameters for the different complexes (Cowgill, 2015, pp. 7–11; Millon, 1976, p. 213, Fig. 1; Rattray, 2001, p. 435, Fig. 2; Sugiyama, 2005, pp. 1–2). In large part, this has to do with the dating of the collapse and near-total abandonment of the site at the end of the Metepec complex, since that date is placed to anywhere between AD 550 and 750 (Mazanilla, 2003). Despite this, there is relative agreement that the ensuing Epiclassic phase occupation is subsumed under the Coyotlatelco complex (c. AD 700–900) and that the main complexes of Classic Teotihuacan occupation range from Tzacualli (after AD 0–150), to Miccaotli (c. AD 150–250), to Tlamimilolpa (c. AD 250–350), to Xolalpan (c. AD 350–550), to Metepec (c. AD 550–650) (see Table 2).

One of the very earliest decorated ceramics, found in the tunneling excavations of the Pyramid of the Sun (Millon et al., 1965, p. 69, Fig. 95), is a small effigy cup representing an archaic form of the Storm God, the precursor to the Aztec deity *Tlāloktli*—the personification of rain and meteorological phenomena (Paztory, 1974; Nielsen & Helmke, 2017; Wrem Anderson & Helmke, 2013) (Figure 5a). This specimen has been dated to the Tzacualli phase and may be one of the earliest examples of these effigy vessels, which would continue to be produced well into the Epiclassic, with some neo-Classical examples produced by the Aztec in the Late Postclassic and deposited as offerings in the Templo Mayor (Carballo, 2007). The example from the Sun Pyramid shows the Storm God with bulging eyes and a large, wavy upper lip, the headdress marked with a simple knot. This knot is an integral part of the headdress in later examples and given the use of this sign in writing, may have functioned as the logogram for “headdress” (Nielsen & Helmke, 2020). In addition to modeling, some of the Tzacualli ceramics were also decorated using resist techniques, probably employing lost wax. Some of these vessels bear dots and linear configurations, but one in particular bears a feathered eye, a distinctive element of the feathered serpent (Berrin & Pasztory, 1993, p. 236), again making it clear that some of the very earliest examples of elements of writing at Teotihuacan date some time to the first or second centuries AD (Figure 5b). By Miccaotli, the decorative modes of ceramics had shifted to post-slip incisions and the application

Figure 5

The shape of day sign cartouches as a continuously evolving paleographic feature, ranging from a) circular (Early Classic Teotihuacan), to b) rectangular with rounded corners (late Teotihuacan), to c) squared with rounded corners (Epiclassic Xochicalco), to d) entirely square (Late Postclassic Aztec) (drawings by Christophe Helmke).



of additional slip to produce chromatic zones. As part of this complex, we begin to see vases with nubbin supports bearing features of what would become the so-called “four element” group (Figure 5c), which some scholars associate with the symbolism of fire and pyrolytic rituals (Langley, 1991, pp. 291–292, Fig. 15; von Winning, 1987 II, p. 79). Incising continues into Tlamimilolpa and begins to bear examples of more elaborate elements of writing, which become more commonplace by Xolalpan, including many examples of circular cartouches containing the Reptile Eye glyph, topped by a particular headdress (probably a record of a date) alternating with other motifs, including reptilian heads drawn from Mayan iconography (Taube, 2003, pp. 303–308) (Figure 5d). By Late Xolalpan, the most highly embellished ceramics are painted polychromatically on gesso underlay, displaying supernatural entities, fallen warriors, complex mythological scenes, and more. It is amidst these scenes that writing is found, naming deities and places and providing titles of warriors (Conides, 2018). Another ceramic medium where glyphs frequently appear are the theater-type censers, where especially the so-called Reptile Eye glyph (Beyer, 1921; Caso, 1961; von Winning, 1961) is commonly represented on *adornos* (Berlo, 1984, pp. 27–75). By the Metepec phase, molding had become the preferred form of decoration, either applying elements produced by stamps such as the Xi-9 Vase found cached in the Aztec Templo Mayor (López Luján et al., 2000) (Figure 5e), or as whole bowls cast in wooden molds, such as the renowned Calpulalpan bowl, and additional fragmentary specimens found at Teotihuacan and its environs (Linné, 1942, Fig. 128; Rattray, 2001, p. 587, Fig. 189; Taube, 2000, p. 12; von Winning & Gutiérrez Solana, 1996, pp. 21–27) (Figure 5f).

Graphic Characteristics

Much as with other Mesoamerican writing systems, the glyphic signs of Teotihuacan writing are highly figurative. This is to say that the pictorial qualities of the signs are drawn according to the graphic conventions—or artistic canons—of the culture in question. On par with other Mesoamerican writing systems, the glyphs of Teotihuacan writing thereby serve as referents to elements in the tangible world (Valdez Bubnova, 2012). We can

therefore readily identify signs that depict animals of the region, including the heads of raptorial birds, snakes, and coyotes, as well as seashells, including bivalves and gastropods, and plant life is represented by flowers and *pencas*—leaves of the maguey plant—as well as the ripening boles of cotton (Langley, 1991, pp. 287–289) (Figure 6). Elements drawn from the cultural world include torches, woven mats, headdresses, nose pendants, mirrors, shields, obsidian blades, and small paths marked by footprints, to name a few. Some of the signs that appear to be highly abstracted or even geometric are undoubtedly so on account of years of graphic evolution and owing to general unfamiliarity with Teotihuacan cultural conventions of graphic representations (Langley, 1986). That being said, some of the most abstracted signs, such as the aforementioned Reptile Eye glyph, exhibit some of the greatest degree of graphic diversity, owing to the prevalence of its use and its graphic evolution over the centuries, from at least the Early Classic to the Epiclassic (Helmke & Nielsen 2011, p. 16, in press a). As such, this is one of the signs that deserves a more thorough paleographic study to disambiguate and better attribute temporal spans to its many variants (Peñafiel, 1890, p. 186; von Winning, 1961; Langley, 1991, Fig. 14). As with any hieroglyphic writing system, the degree of figurativeness conveys nothing as to the function of signs, and cannot be used to distinguish logograms from phonograms, for instance.

Figure 6

Teotihuacan ceramics from successive phases that exhibit elements of writing. a) Tzacualli Storm God effigy vessel (after Berrin and Pasztory 1993: 241, n. 117), b) Feathered Serpent eye rendered in resist technique on a Tzacualli vase (after Berrin and Pasztory 1993: 236, n. 108b), c) Miccaotli vase with nubbin feet with “four element” group (after Sugiura 2008: 51), d) Xolalpan stuccoed tripod vase recording a title and place name (photograph © Los Angeles County Museum of Art), e) The Fine Orange Xi-9 Vase found cached in the Aztec Templo Mayor (after Cowgill 2008: 26), f) the mold-made Calpulalpan bowl of the Metepec phase, showing a procession of high-ranking dignitaries, each named by accompanying glyphs (after Robb 2017: 212, n. 7).

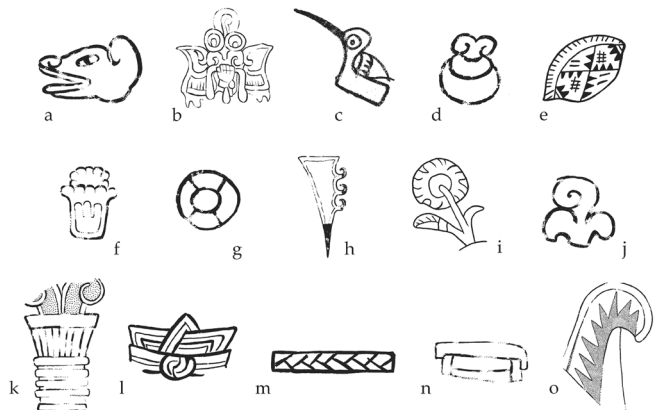


Based on comparisons to other Mesoamerican writing systems, such as that of the Mayan and Aztec, we can see that glyphs can be rendered according to three basic variants, which we designate as geometric, head variants, and full-figure glyphs (Helmke & Nielsen, 2013b; Zender, 1999, pp. 47–48). This means that signs can be rendered in any three of these forms, depending on context, without change in function or meaning, ranging from more compact and stylized forms to highly figurative renditions that in large measure take on attributes of iconographic scenes. It is thereby necessary to isolate discrete signs in order to parse more complex scenes and identify the constituent glyphic elements. It is largely in part from the use of full-figure glyphs that Teotihuacan writing has been deemed as “emblematic” (Langley, 1986, 1991), especially since comparisons to the graphic properties of other writing systems have been lacking.

Thus, a common title for warrior-priests at Teotihuacan is written as a human heart that is being bitten, eaten, or is at least clenched within the mouth or maw of an entity. In its full-figure form, for instance, we see coyotes and so-called reticulated felines in the murals of Atetelco devouring human hearts, oozing blood rendered as stylized drops below (Figure 7a). As a head-variant, we see the same title represented on a stuccoed tripod vessel, where a feline bites into a bleeding heart (Figure 7b). And finally, in what may be the most conventionalized representation at Tetitla, we see a juxtaposition between a grinning mouth, replete with speech scrolls, besides a stylized heart (Figure 7c). Clear survivals from Teotihuacan, the same title is also represented in the Epiclassic, in the murals of Cacaxtla, on the frieze decorating the *tablero* of the Temple of the Feathered Serpents at Xochicalco, and on incense pouches of warrior-priests at Palenque (Helmke & Nielsen, 2011, pp. 26–27). The heart-devouring eagles rendered on the panels of the much later (c. AD 950–1150) Structure B at Tula probably express comparable “heart-eater” titles (de la Fuente et

Figure 7

Figurativeness of glyphs used in Teotihuacan writing. Glyphs drawn from the animal world: a) head of a canine, b) a butterfly with additional qualifying elements, c) a hummingbird, d) a bivalve seashell, and e) a marine gastropod (possibly *Olivia porphyria*). The realm of plants: f) lateral flower, g) four-petaled flower, h) *penca de maguey*—maguey leaf, i) waterlily and its bud, j) cotton boll. From the human realm: k) lit torch, l) year-sign headdress, m) woven mat or *petate*, n) *tlapechtlī*—bench or platform, o) obsidian blade (drawings by Christophe Helmke).

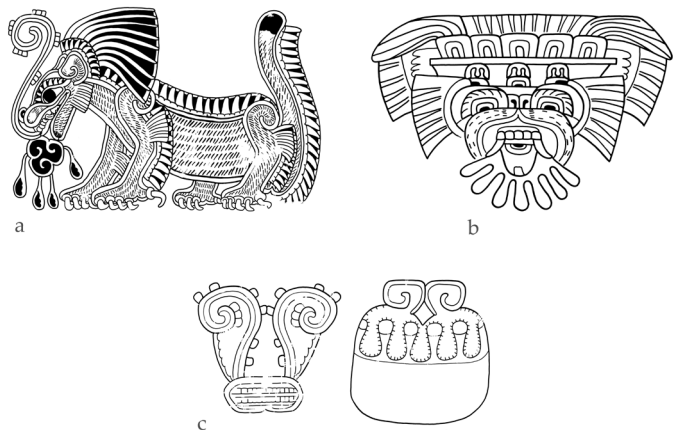


al., 1988, pp. 138–149, lám. 92-95a; Helmke & Nielsen, 2013b). This graphic diversity has generally been overlooked, and we can now recognize it as a fundamental feature of Teotihuacan writing—one shared with other writing systems of Mesoamerica, both contemporaries and descendants.

One of the most widespread graphic principles of Mesoamerica is that of *pars pro toto*, wherein any larger entity or object can be referred to by its most diagnostic feature. Thus, at La Ventilla in Teotihuacan, we see a reference to deer through its antlers (Nielsen & Helmke, 2011, 355–357) (Figure 8a). In the supernatural realm, the highly distinctive “goggles” of the Storm God serve as its identifying elements (Figure 8b), and the feathered serpent is identified by its distinctive feather-rimmed eye (Figure 8c), whereas the netting characterizing the reticulated felines from Tetitla and Atetelco can be reduced to a single pair of woven strands (Figure 8d).³ From the cultural realm, we can see a house abbreviated to a single *almena*—a distinctive decorative merlon of typical flat central Mexican rooves (Nielsen & Helmke, 2014b) (Figure 8e). Necklaces in particular, and jewelry in general, are simplified to a single strung bead (Taube, 2000, pp. 19–20, 2011, pp. 84–85) (Figure 8f). A lone footprint may equally designate a more substantive path of travel, or roadway (Taube, 2000, p. 30; von Winning, 1987 II, pp. 41–46) (Figure 8g). Concerning headdresses, their depictions in writing serve, by metonymy, to embody commensurate social stations and ranks, and their constituent parts thereby point not only to whole headdresses, but also to corresponding titles. Thus, a distinctive tassel of the eponymous Tassel Headdress designates the title of that office (Millon 1988) (Figure 8h), whereas elongated knots—quite possibly a logogram for “headdress”—served to name particular headdresses in writing (Nielsen & Helmke, 2020).

Figure 8

The “heart-eater” title in Teotihuacan writing, written in a) full-figure form, b) as a head-variant, and c) in geometric form (drawings by Christophe Helmke).



3 The woven strands on the body of the “Net Jaguar” may well serve as semantic determinatives, qualifying these creatures as having certain abilities indicated by the interlaced woven lines.

This brings us to the question of glyph blocks and sign combinations. Unlike Eastern Mesoamerican writing systems (such as Mayan and Isthmian) where glyphic elements are preferentially presented in squared forms called glyph blocks, in Western Mesoamerican writing systems, sign compounds are generally freer. This is to say that these are both unbounded and that the internal reading order, or sequencing of the grouping, is non-linear—much as with Aztec writing, as well as earlier Toltec and Epiclassic writing. The result is that the constituent parts have to be identified on first perusal and potential combinations evaluated introspectively, before the reader opts for the most plausible solution and/or intended coda. The combination of signs is also partly motivated by the manner in which these may fit together, and thereby qualifying items can be placed beside, atop, or below that which is being modified (Taube, 200, Fig. 23; Colas, 2011; Nielsen, 2014a). For instance, the glyphic label to a figure represented in the murals of Techinantitla includes a single tassel above the head of a coyote, yet the reading order is unclear (Figure 9a). Should it be read from bottom to top, and as such with a syntactic order of *name* followed by *title*, or the reverse? In this case, resolution requires knowledge of the underlying syntax and basic word order of the language recorded in the glyphs. In other instances, combinations can be made by placing signs within the syntactic head by infixing it within the main sign. This is what is seen in a series of different toponyms, naming particular mountains and their qualifiers infixed within, including a *nopal* cactus for “nopal-mountain,” a howling coyote for “coyote-mountain,” or a star for “star-mountain” (Helmke & Nielsen, 2014). Another interesting feature of Teotihuacan writing is that groupings of glyphs are often repeated across murals, as though the combinations of signs together constitute decorative elements (Figure 9b), adhering to what may be described as heraldic aesthetics (see Langley 1986). This is a feature shared by Cotzumalhuapan writing along the Pacific piedmont of Guatemala (Chinchilla, 2011), which suggests to us that the latter may be derived from the former.

Figure 9

Examples of the use of the *pars pro toto* principle in Teotihuacan writing, wherein the most distinctive element is used to represent a larger entity (drawings by Christophe Helmke).



Much of our ongoing work involves identifying the signs used in Teotihuacan writing, and ascribing them provisional semantic values is based on knowledge of the culture and sign usage in other Mesoamerican writing systems. At times, however, we have been able to benefit from rare biscripts, functioning essentially as the famed Rosetta Stone of Egypt, wherein parallel entries are made in two different writing systems, each recording their own language. One fascinating instance are the stucco friezes on the lower terraces of Structure 2 (the Temple of the Cormorants) at the Mayan site of Dzibanche in modern Quintana Roo, where large Teotihuacan-style mountains are represented, that enclose a series of qualifying elements drawn from Teotihuacan writing. Yet in addition to the elements of writing from Teotihuacan, the Classic Mayan glyph *witz* “mountain” has also been added, making the semantic equivalence clear and confirming the identification of the sign in Teotihuacan writing (Helmke & Nielsen, in press b).

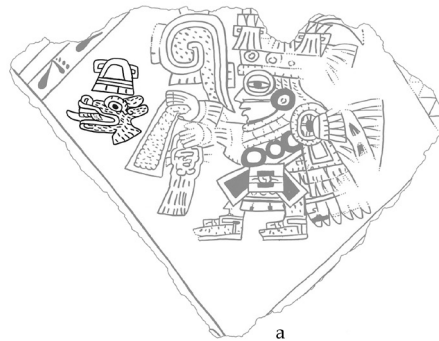
Regarding calendrical notations, these have also been identified at Teotihuacan, and these provide calendrical signs of the 260-day religious calendar, the precursor of the *Tōnalpōwalli* or “count of days” of the Aztec. In that system, twenty named days are distinguished from all the other signs in the writing system by enclosing these off in circular cartouches, to indicate their calendrical function. The underlying parameters of this calendar is a set of twenty individually named days, which occur in a fixed sequence, and combine with thirteen numerical coefficients. It is this pairing of named days and coefficients that produces a greater sequence of 260 uniquely named days, before the cycle begins anew. Despite decades of research, only 8 of the days’ signs have been identified for Teotihuacan (Helmke & Nielsen, 2013b; Urcid, 2012, p. 857) (Figures 10a–h).

Interestingly, the numerical coefficients in Teotihuacan writing are systematically placed below the named day, a pattern that may be linguistically significant. The numerals at Early Classic Teotihuacan employ a combination of dots (for units) and bars (for groups of five), which could be paired together to yield higher numerals, up to 14. Outside of the more formal contexts of writing, painted cursive forms are documented wherein units are marked with dashes and fives as striped, elongated rectangles (Arreola, 1922) (Figure 10i). Based on the mechanics of the calendars, the first named day of the *Tōnalpōwalli*, at the start of the solar year, can only be one of four evenly spaced days. These are known as the Year Bearers and theoretically form one of five different sets (Broda de Casas, 1969, pp. 27–29; Caso, 1967, pp. 40–41; Helmke & Nielsen, 2011, pp. 12–20). Based on patterns of ubiquity, the days most often named in the glyphic inscriptions are those that refer to named years, and thereby give an indication of the set of Year Bearers recognized in a particular culture. Based on these features, we find that there is good evidence to suggest that the dominant set of Year Bearers in Central Mexico went unchanged from

at least the Early Classic to the Late Postclassic, and involved the four days named “house” (3), “rabbit” (8), “reed” (13), and “flint” (18) (Helmke & Montero García, 2016, pp. 66, 73; Helmke & Nielsen, 2011, p. 15; Helmke et al., 2013). That one of these days was named using the Reptile Eye sign is also highly significant for inferring the narrow lexeme that this sign cues, with “reed” emerging as the most plausible (Helmke & Nielsen, 2011, pp. 11–12). This also accounts for the fact that the sign functions in a toponymic capacity to designate Teotihuacan (Stuart, 2000, pp. 501–506), and abroad, such as in the corpus from Escuintla, serves in an emblematic function (Hellmuth, 1975; Berlo, 1984).

Figure 10

The question of sign combination and reading order: a) Mural fragment of Techinantitla showing an individual bearing a tassel headdress, named in the accompanying glyptic caption by a singular tassel and the head of a coyote with a lolling tongue (drawing by Saburo Sugiyama, after Millon 1988: Fig. V.2). b) The toponym “Star Mountain,” written as a repetitive sequence in the murals of Zona 5A (drawing by Christophe Helmke, after Helmke and Nielsen 2014: Fig. 7a).

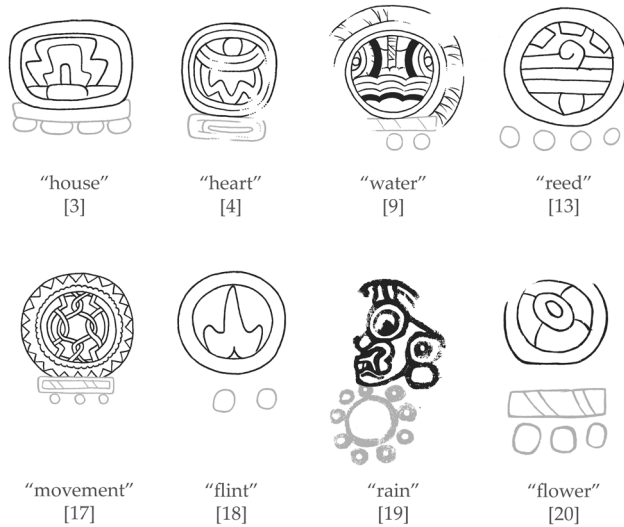


Glyphic notations at Teotihuacan writing are generally quite terse, being reduced to a single glyph block and providing a single date, toponym, or caption to a person depicted. As such, one can say that the verbal complex is greatly deemphasized in Teotihuacan writing as long glyptic sentences are essentially unknown. This is an inherent feature of western Mesoamerican writing systems, where weight is placed on logographic spellings (as for instance with the Tenochtitlan school of Aztec writing; Lacadena, 2008, 2019). When verbs are recorded, these appear as logograms, as uninflected verbal roots, often serving as captions that qualify the iconographic scenes that these accompany. Thus in the texts of Tetitla, we see a procession of priestly figures in the murals around Patio 1, performing scattering rituals with the glyptic notations that qualify the scene spread across various murals (Figure 11). These glyphs provide a toponym (possibly naming the site of the pilgrimage), as well as what may be the names of historical individual and the action itself is recorded as a pair of disembodied

hands that scatter, thereby recording the verb of the action depicted in the iconography (Helmke & Nielsen, 2014, pp. 91–94; Taube, 2000, pp. 23–24). With this more holistic understanding of these murals, we can see that the predicate and its main arguments are recorded in writing, although their spatial dispersal across the mural has stymied the efforts of earlier scholars. The combination of these scattering hands with an element referred to as an “enclosure sign” suggests that the latter may specifically function in verbal contexts, and distributional patterns in the writing of Teotihuacan, and the ensuing Epiclassic, support this observation (Helmke & Nielsen, 2011, pp. 34, 45–46; Helmke et al., 2017, pp. 100–101).

Figure 11

The calendrical signs of the Teotihuacano 260-day calendar, with approximate glosses and day sign number in square brackets (drawing by Christophe Helmke).



At times when a sequence of glyph blocks does occur in a linear sequence, a small space is introduced between them to separate parts of speech. This is seen, for instance, in the glyphic notations on the floor of La Ventilla. At the southern end of the courtyard is a combination of nine signs arranged in three columns, and given the regularity of the sign sequencing, we have been able to propose that these ought to be read in boustrophedon, which is to say sinuously in alternating directions by column (Nielsen & Helmke, 2011, p. 363) (Figure 14). Interestingly, boustrophedon is a feature of early writing systems and appears to speak of a more experimental phase, particularly before more standard reading orders were devised and established for a given writing system (see, for instance, the place of boustrophedon in early Greek, Etruscan, and Latin texts [Bonfante, 1996; Woodard, 2008]). Nevertheless, precisely the same type of boustrophedon is also known for Aztec codices, such as the Codex Boturini (Nielsen & Helmke, 2011, pp. 361–363), suggesting some continuity in this practice within the codical tradition.

Sign Inventory

The first attempt to produce a complete signatory for Teotihuacan writing took place as part of the doctoral work of epigrapher James Langley. This was eventually published in 1986 and appeared as a compendium of what he termed “notational signs,” in which he included 193 “confirmed and probable signs,” with an additional 36 “problematic signs” (Langley, 1986, pp. 223–228). In 2002, Langley published a revised version containing only 95 signs. The relatively high number of the initial signatory was induced by the inclusion of iconographic elements, such as feather arrays and fringes, but mostly due to his separation of signs that were obvious variants of the same sign (e.g., the “shell” sign that was presented as eight distinctive entries). There are still some examples of this in his much-reduced list, for example sign no. 232 that he identifies as a “frond”—although it probably represents an antler (no. 234)—or when he segregates a “butterfly” (no. 36), from a “butterfly head” (no. 109) and a “butterfly wing” (no. 228) into three separate signs. In the latter case, we analyze all the constituent signs, including the head and wing as *pars pro toto* variants of the greater butterfly logogram.

For the present study, we have prepared a new sign count, based on the textual corpus described above (not including signs from later periods that emulate Teotihuacan writing, such as the inscription from Temple 26 at Copan; Stuart, 2005). In so doing, and making conservative estimates by grouping possible variants of a sign together, we have obtained a total count of circa 116 signs. Examples that may turn out to be discrete signs are those involving footprints and hands. From Mayan and Aztec writing, we know that specific hand and finger positions, as well as alternate orientations, can cue completely different words and/or sounds, and we can expect similar conventions for Teotihuacan writing. In our count we also group head variants and full-figure variants of the same sign, as for instance felines represented in full-figure vs. head variants, and examples of *pars pro toto* where a diagnostic feature stands in for the complete sign. It is equally possible that some of the identified signs are polyvalent, functioning as logograms and phonetic signs depending on their context, although these differences cannot be adequately established at present.

Regardless, the count of signs is highly conservative and speaks of a general unity with other Mesoamerican writing systems, especially considering the other commonalities outlined above. These features together suggest that Teotihuacan writing had essentially the same workings and functioned in much the same way as any other Mesoamerican writing system. The 116 signs of Teotihuacan writing can be compared to the writing system of the ensuing Epiclassic which used c. 200 signs (Helmke & Nielsen, 2011, p. 1), to Mayan writing, which used anywhere between 300 and 400 signs in any given century (Knorozov, 1958, p. 289; Mathews & Bíró, 2008), and to Aztec writing, which most commonly used c. 450 signs (Cases

Martín & Lacadena García-Gallo, 2013). As the number of signs in a script says something of the type of writing system (i.e., whether it is logographic, syllabic or alphabetic) (Coe, 1992, pp. 32–43; Daniels & Bright, 1996, pp. 142–143, 155), and acknowledging that both Mayan and Aztec scripts are mixed logo-phonetic writing systems, it stands to reason that likewise, Teotihuacan writing (and the intervening writing of the Epiclassic) were equally logo-phonetic. The caveat must evidently be made that a greater emphasis is placed on logograms and logographic spellings in Western Mesoamerica, since that is a characteristic feature of the writing systems in that part of the world. Nevertheless, these are important conclusions to reach, which we hope will continue to guide future investigations. Turning to a retrospective, we will now provide a précis of previous research before concluding about the current state of decipherment.

Previous Research and State of Decipherment

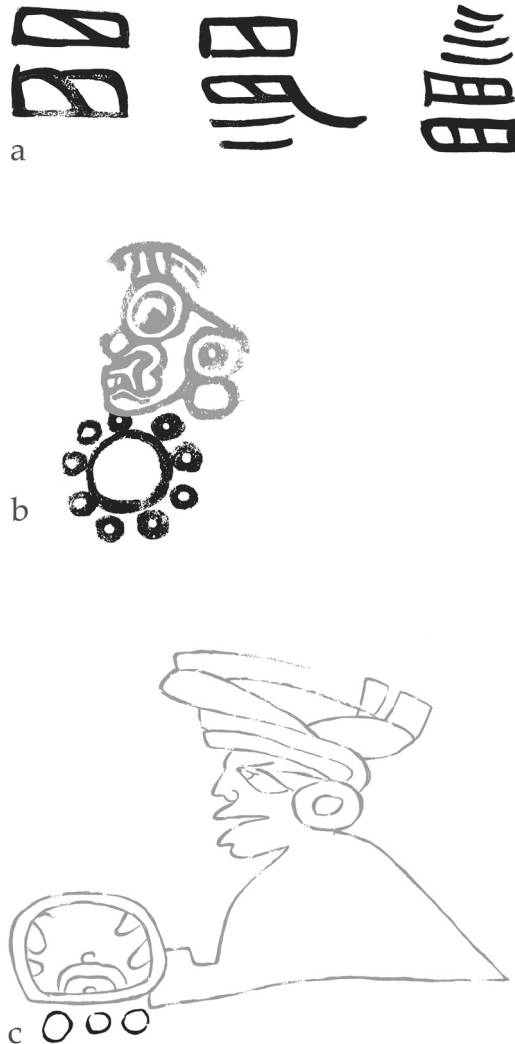
Given that Teotihuacan writing has only recently been identified as such, the state of decipherment is evidently still in its infancy. In short, the writing system of Teotihuacan has yet to succumb to a complete decipherment, but important progress has been made in identifying features of the writing system, especially with the growing realization that this script shares many features with other Mesoamerican writing systems (Taube, 2000, 2011; King & Gómez Chávez, 2004; Nielsen, 2004; Nielsen & Helmke, 2008, 2011, 2014b, 2020; Helmke & Nielsen, 2013b, 2014, in press b; Urcid, 2012). Among these are the advances made in identifying calendrical signs, anthroponyms, titles, and toponyms, even though these results have yet to be embraced in broader syntheses of Teotihuacan culture, most of which have been published by archaeologists and art historians. Cowgill's (2015) recent introduction to Teotihuacan, for instance, gives the impression that there was no real writing, and the script is compared to what he erroneously describes as the "pictographic signs" of the later Aztec (pp. 213–217). Similarly, Robb's (2017) substantial catalogue for a major Teotihuacan exhibition is strangely silent on the topic of writing.

Looking back into the research history of the field, the current situation is hard to understand, as scholars had already recognized the basic features of the writing systems by the early twentieth century. Thus, early work by Arreola (1922) and Beyer (1922) discussed examples of writing at Teotihuacan, and in the following decades Caso (1937, 1959, 1961, 1966, 1967) was, with his characteristic pan-Mesoamerican and comparative approach to the material, the great catalyst in presenting evidence

for writing and the calendar at the ancient metropolis (Figure 12). In a time where Mayan writing had yet to be proven to be logophonic, Caso (1966) understandably classified the writing of Teotihuacan as “ideographic” (p. 249). From the 1940s and onwards, von Winning (1947, 1948, 1961, 1979, 1987) published numerous and invaluable studies on Teotihuacan iconography and “signs,” although von Winning himself appears to have been somewhat ambivalent on the subject of writing.

Figure 12

The graphic variation and placement of numerals in Teotihuacan writing: a) numerals painted on slate slabs found in the Templo de Tláloc (after Arreola 1922: Fig. 97). b) Single digit embellished with small peripheral dots, painted floor Plaza de los Glifos, La Ventilla. c) Numeral “three” below the so-called Reptile Eye sign, here used in its calendrical capacity (drawings by Christophe Helmke).



In 1973, Millon published a seminal paper in *American Antiquity* where she insightfully concluded that “the writing system of the Teotihuacanos may not have been so completely different from other Middle American writing systems, as superficially it appears to be” (p. 311). Millon (1988) would later pick up on some of these initial observations in a study of the Tassel Headdress. In two brief and largely overlooked papers, epigrapher Barthel (1982, 1987) insisted on the phonetic quality of some of glyphs at Teotihuacan, pointed out the existence of texts, and called for a more systematic approach, involving a sign inventory and a corpus of texts. Barthel (1987, p. 10) also emphasized the relationship between the script and a single language, stating that:

— A wholly “visual approach” tempts one to conceive of the graphemes as interculturally understandable signals. Clearly the next step leads to postulate that the signs of the Teotihuacanos formed a corpus of signals intelligible to all Mesoamericans—“airport pictograms,” as it were, or “religious propaganda” for arriving pilgrims in a multi-ethnic metropolis. In contradiction to this, I take the view that the total stock of signs (as used by the “senders” and as understood by the “receivers”) by necessity was firmly rooted into the *lingua franca* of Teotihuacan.

In Barthel’s view, the language of the texts were most likely to be “Proto-Nahua.” Nawatl was also favored by Cowgill (1992) in his interpretation of the Techinantitla texts. Likewise, King and Gómez Chávez (2004) have proposed readings of the text from La Ventilla, suggesting linguistic affiliations to proto-Nawatl-Pochutek, which have been recently taken up by Whittaker (2012, 2019). Their suggested readings are not, however, based so much on script internal evidence, but consist mostly of applying Nawatl lexemes to the glyphs, most of which appear to be logograms. For example, the “arm” glyph at La Ventilla and in the murals of Techinantitla are attributed the value **AKOL** given its resemblance to the Aztec logogram for “shoulder, arm” (King & Gómez Chávez, 2004, pp. 218–219; Whittaker, 2019). Yet, matching lexemes to the graphic appearances of signs is not the proper method for positing a phonetic decipherment, as in the absence of additional evidence, it is an exercise that could be undertaken on the basis of any other Mesoamerican language. The similarities of the logograms are such that one can indeed posit a continuity in the inventory of logograms from Classic to Postclassic times, but it does not necessarily imply a continuity in the encoded language. Despite our caveats, an early form of a Southern Yuto-Nawan language, remains a valid candidate for the language recorded in Teotihuacan writing (Nielsen & Helmke, 2011, pp. 345–349; Pharaoh Hansen, 2021)—something we return to below.

As already mentioned, Langley had published his valuable compendium of so-called “notational signs” in 1986 (followed by additional articles in 1992, 1993 and 2002), which for the first time provided a large collection of Teotihuacan glyphs to the scholarly community, and approached the subject in a consistent and systematic manner. Langley did less in terms of decipherment and did not attempt to group the signs into semantic categories. A few years later, however, in 1989, Berlo greatly contributed to the field with a seminal study that demonstrated that writing in central Mexico can be traced all the way back to Teotihuacan and that the later Epiclassic and Late Postclassic scripts were inheritors of the same “basic principles,” thereby convincingly demonstrating how several signs were in use for at least ten centuries. In 2000, Taube (2000a) published *The Writing System of Ancient Teotihuacan*, which initiated a new period of research and kick-started our own interest in the topic. Having worked on Teotihuacan iconography for nearly two decades (Taube, 1983, 1986, 1992a–b), and accounting for his familiarity of other Mesoamerican writing systems, Taube’s approach was inexorably comparative. This productive approach allowed him to outline different semantic categories of signs (calendrical signs, names, titles and toponyms), just as he pointed out substitutional patterns and the occurrence of several Teotihuacan-style texts outside Teotihuacan itself. In 2011, Taube followed up on his seminal study with a chapter in which he added more examples and once more emphasized the role Teotihuacan had had in developing a script tradition in central Mexico.

The past two decades have seen an increase in publications related to Teotihuacan writing, including several of the above-mentioned sources. Others include de Guerrero’s (2005, 2014) two flawed publications purporting to provide a partial sign catalogue, which have added little or nothing new to the existing literature—not least of which since the later publication is a duplicate of the former. Of much greater merit was careful examination by Colas (2011) of Teotihuacan speech scrolls and their affixed and infixing glyphic signs. In addition to identifying logographic signs, Colas (2011) also suggested that some of the signs were examples of “semasiographic writing,” a proposal that runs counter to most recent suggestions (for a critique, see Nielsen, 2014a, pp. 177–182). In 2012, Urcid presented a new and welcome attempt to relate Teotihuacan writing to other central Mexican and western Mesoamerican writing systems. Importantly, following Berlo and others, Urcid (2012) emphasized the historical content of the texts, thereby distancing his work from the continued tendency to regard Teotihuacan as an impersonal and ahistorical “utopia” in Mesoamerica. Most recently, a surprisingly lucid study of Teotihuacan writing has appeared by Italian archaeologist Domenici (2017), drawing on the continuities between the Late Postclassic writing of the Aztec to further our understanding of particular textual compositions and glyphic combinations. It is hoped that further studies of this kind will appear in the future, further refining our

understanding of Teotihuacan writing and the complex interplay between text and imagery.

Surprisingly, Mexican scholarship has not been much concerned with writing at Teotihuacan, possibly a result of the notion of “pictographic writing” that has come to dominate the field and given the reluctance to regard central Mexican scripts as actual writing. Nevertheless, it is hoped that recent work by Valdez Bubnova (2008, 2012), who has focused on the glyphs and text from La Ventilla, Teopancazco, and Zacuala and shows how the glyphs are representations of cultural entities inherent to Teotihuacan culture, will inspire a renewed effort among Mexican scholars to intensify research on Teotihuacan writing. An all-important step in this process will be the increased availability of Teotihuacan ceramics housed in storerooms and bodegas across the world. As our survey of texts clearly shows, this appears to have been the preferred media for writing, and further progress in the decipherment requires access and integration of this dataset.

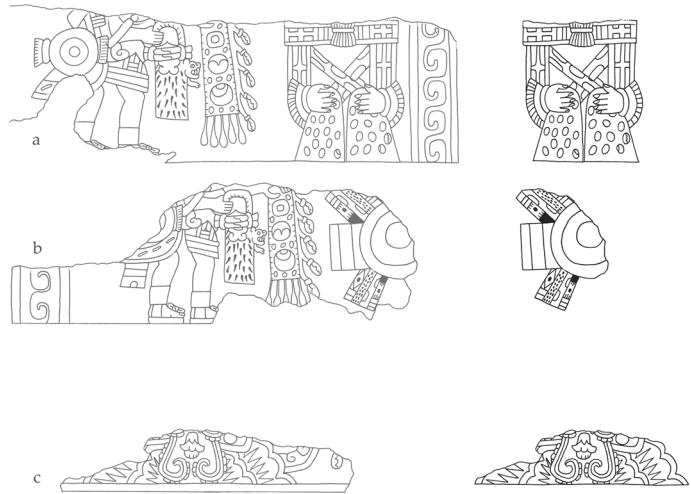
Candidate Languages

The question of language at Teotihuacan is inevitably a highly thorny and contentious issue. This is due to the fact that Teotihuacan was a large multi-ethnic metropolis, as has been demonstrated by excavations since the 1920s revealing evidence of ethnic enclaves or barrios (“neighborhoods”) along the perimeter of the monumental city center. These include the Oaxacan enclave to the west, with evidence of Zapotecan funerary urns and burial practices, Oaxacan grey ceramics, and a stela bearing a Zapotec date (Millon, 1973, pp. 41–42, Figs. 60a–b; Ortega Cabrera & Archer Velasco, 2014; Ortega Cabrera et al., 2016; Rattray, 1993); a Mayan enclave in the east in what is usually known as the merchant’s barrio, with polychromatic ceramics from the Mayan lowlands and circular residential structures typical of northern Veracruz (Clayton 2005; Rattray 1987); a Western Mexican enclave, adjacent to the Oaxaca barrio, with ceramics and figurines and burials typical of Michoacan (Gómez Chávez & Absaolo Hernández, 2011). Based on such overwhelming evidence, it is clear that Teotihuacan was a multi-ethnic metropolis where many different languages were spoken in antiquity (Figure 13). Yet, the question remains as to what language the local population spoke, and whether this served as the primary *lingua franca* of the site for administrative, commercial, and religious activities. In this view, can we speak of Teotihuacan as having one dominant and highly codified H (high) language used by the ruling elite and functionaries of the state versus other vernacular and foreign languages considered as L (low) languages? The alternative would be to posit a multilingual continuum of exoglossic

languages or a situation of polyglossia. Regardless of these models, what language did Teotihuacan writing record? Given the multi-linguistic situation, is it not most likely that Teotihuacan writing recorded the dominant H language of the site, in much the same way that Latin was the dominant language of Rome?

Figure 13

Murals of Patio 1 at Tetitla showing a pilgrimage of priestly figures accompanied by a series of glyphic captions (highlighted in the column to the right). Together these glyphs comprise a larger clause: a) Portico 1, Mural 1, with the scattering verb referring to the action depicted in the imagery, b) Portico 1, Mural 3, with what may be an anthroponym and c) Portico 2, Mural 1, with the toponym where the pilgrimage is thought to have culminated (drawings by Christophe Helmke).



Faced with these uncertainties and the comparatively little corpus of texts that are terse and fragmentary in the extreme, it is understandable that the writing system of Teotihuacan has not attracted the attention of many scholars. Some have also chosen to abandon attempts altogether and have instead labeled all decipherment efforts as “adventurous” (Valdez Bubnova, 2014). Given the evident importance of Teotihuacan and the uniqueness of its culture and place in Mesoamerican culture-history, other researchers have turned their backs on the manifest monumental architecture (Murakami, 2010; Trigger, 1990) and have begun to weave highly unusual and as-yet-undocumented social structures, imagining Teotihuacan as a type of utopia where governance was by deliberative assembly or quadrumvirate or the like (Manzanilla, 2007; Pasztory, 1997; for a critique see Nielsen, 2014b; Nielsen & Helmke 2020; Smith, 2017). In this atmosphere, some are now suggesting that Teotihuacan writing did not record language after all, but was instead designed from the onset to convey extra-linguistic messages to a multi-ethnic population without making any recourse to language (Pasztory, 1997, pp. 192–194); or as, Houston (2004, pp. 275–276) formulated it, an “open” script that could “probably be understood across language boundaries.”⁴ Whereas these ideas may be attractive to some, finding their social dreams in an imagined prehistory, none of these are met with correspondences in attested early civilizations (Trigger, 2003).

4 In contrast to the “closed” writing systems, like Mayan writing, that were characterized by a “fuller commitment to linguistic transparency” (Houston, 2004, 275).

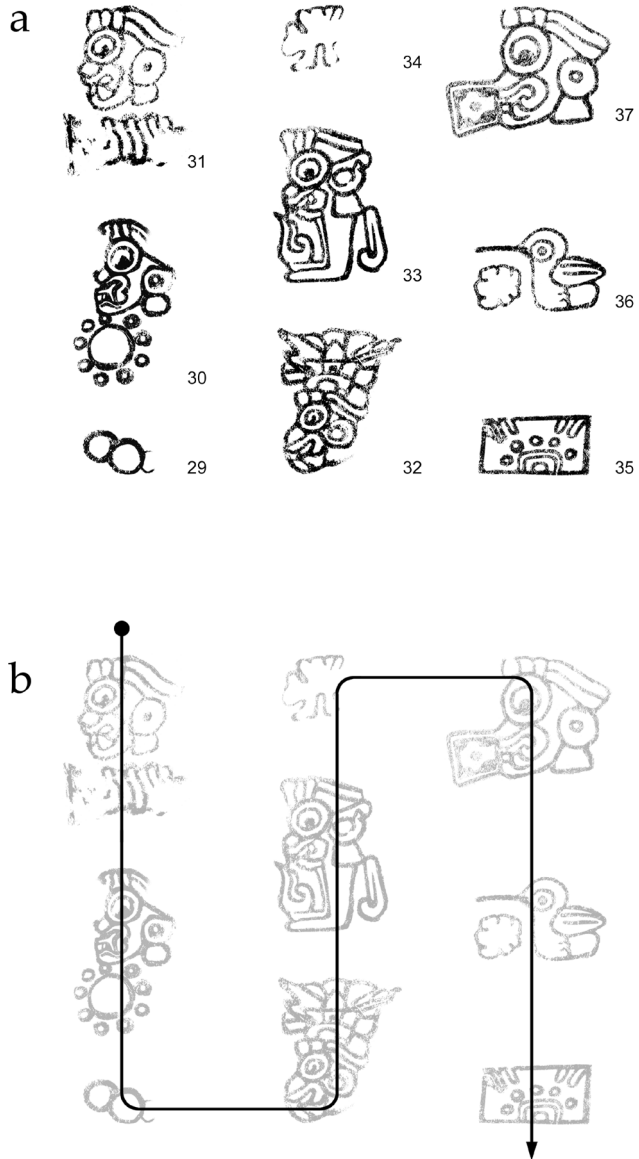
Other researchers have instead made clear attempts to identify elements in Teotihuacan writing and to pair these to Native American languages, known from the region around the time of the Spanish conquest. The one language that has consistently been highlighted in this regard is Nawatl, the language of the Aztec, with the assumption that an early stratum of this language may have been present in Central Mexico from at least the Early Classic onwards. These suggestions have been met with staunch criticism from linguists, especially Kaufman (2001, pp. 6–7, 28–29), who proposes that Nawatl arrived late to Mesoamerica, no earlier than the collapse of Teotihuacan. Nevertheless, one of the early suggestions posits that Teotihuacan writing was closely linked to one language, proto-Nawatl in this case, as suggested by Barthel (1987, p. 10), who went on to propose readings on the basis of this hypothesis (Barthel, 1987, pp. 16–17). Taube (2000), in his seminal paper on Teotihuacan writing, did not make any claims as to language affiliation, although in an endnote one can see an attempt to parse the so-called “twisted root” sign by analogy to Nawatl (pp. 9, 51). As we have touched upon above, King and Gómez Chávez (2004) as well as Whittaker (2012, 2019) have also attempted to read combinations of signs in Nawatl at La Ventilla and Tetitla, in both cases suggesting that these record ancient toponyms of the area.

Considering script-internal evidence, we can reflect on the constituent order of clauses and the order of modifiers in a noun phrase. The numerical coefficient in calendrical contexts is interesting in this regard, since it is systematically placed below day signs in Teotihuacan writing, a pattern also found in the Otomanguan writing systems of Oaxaca (Zapotec and Nùíñe) (Prem, 1973) and in the Epiclassic writing system of central Mexico (Helmke & Nielsen, in press a). This scribal convention may codify a feature of basic word order, demonstrating affiliation to a distinct language family, as numerals in Classic Mayan texts as well as Isthmian writing are preferentially set before, or atop of the signs that they qualify, in keeping with the syntax of the languages recorded in these writing systems (i.e., Mayan and Mije-Sokean, respectively). The conclusion is that the positioning of the numerals may signal affiliation to an Otomanguan language. Likewise, examination of the linear sequence of text at La Ventilla suggests that each of the three segments exhibits a syntactic head (each naming a particular aspect of the Storm God) followed by two qualifying elements (Figure 14). This suggests a syntactical order wherein these clauses are subject-initial, and qualifiers close the noun phrase. These are underlying features that should be accounted for when evaluating the language candidates against one another.

Linguists have also advanced their own theories, which for the most part espouse language families other than Yuto-Nawan. These include Lyle Campbell, who has suggested that Totonakan played a key role in the founding of this metropolis (Campbell, 1997, p. 161); whereas

Figure 14

Example of boustrophedon writing in the glyphic texts of the Plaza de los Glifos at La Ventilla:
a) reflecting original disposition and b) with proposed reading order superimposed (drawing by Christophe Helmke, after Nielsen and Helmke 2011: Fig. 16).



Kaufman and Justeson (2008, p. 65) have suggested that the dominant language at Teotihuacan was a now-extinct branch of a Mije-Sokean language. At present, these linguistic proposals have to be considered as highly tentative. More cautiously, Nielsen and Helmke (2011, pp. 345–349), have attempted to outline the various language candidates that are most likely for Teotihuacan and have used epigraphic evidence to assess their respective merits. Whereas the matter is far from resolved, we can only urge researchers to keep an open mind and to consider the probable role and presence of early Otomanguan languages, especially that of proto-Otomi-Masawa (or even a later western branch Oto-Pamean), since that language family has not been conclusively evaluated for its potential with regards to language candidates. At present, none of the languages listed above should be discarded, and all should be treated as viable candidates, in spite of the clear preference that scholars have given to Nawatl.

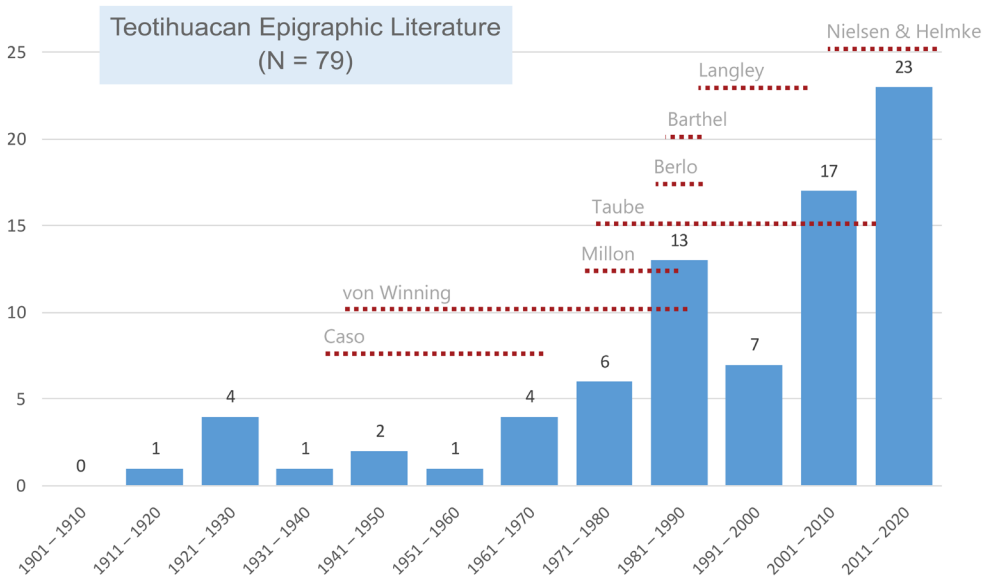
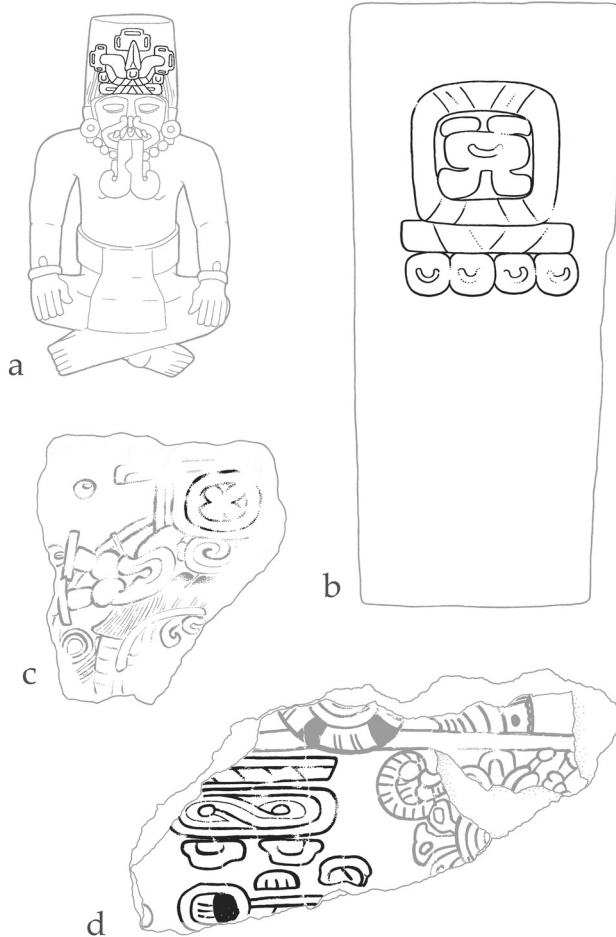


Figure 15:

Chart showing the number of publications on Teotihuacan writing that have appeared over the last century, arranged by decade, with the publication spans of major researchers also presented (chart by Christophe Helmke).

Figure 16:

Samples of foreign writing at Teotihuacan, including: a) Zapotec ceramic urn (drawing by Allen Sellen, after Sellen 2005: MNA 9-4878), and b) the Zapotec stela, both found in Tlailotlacan, the Oaxacan barrio. c) Maya-style mural fragment found at the Plaza de las Columnas (after Sugiyama et al. 2016: 8), and d) partial Maya text on a mural fragment found at Tetitla (after Helmke 2017b: Fig. 1a) (drawings by Christophe Helmke).



Conclusion

In the overview of Teotihuacan writing provided above, we can see that the system was in use at least during the apogee of the great metropolis (between the first and seventh centuries AD), although antecedents can perhaps be traced back to the incipient writing documented at sites such as Tlatilco and Tlapacoya in the Middle Preclassic (Coe, 1965, p. 33; Paradis, 2017, pp. 120–139). Likewise, the writing system of Teotihuacan subsisted and was inherited by the city-states that arose during the Epiclassic, where the script maintained in use and continued its development (Berlo, 1989; Helmke & Nielsen 2011, in press a). Although the writing system was used predominantly at the great capital and also within the central Mexican heartland of Teotihuacan cultures, the same script was also used within the farther reaches of the realm under Teotihuacan influence and remarkably so within what may have been a Teotihuacano enclave on the Pacific piedmont of Chiapas and Guatemala.

The graphic features of Teotihuacan wholly agree with analogous traits of other Mesoamerican writing systems, perhaps most noteworthy being the high degree of figurativeness. Other graphic features, such as logography, graphic variation between “geometric” head-variants and full-figure forms, the recourse made to *pars pro toto*, compounding, and infixation, are among the features shared between the Mesoamerican scripts. The number of signs identified as part of this research are also wholly in keeping with the known mixed logo-phonetic writing systems of Mesoamerica. Despite the relative terseness of texts and the relatively small size of the glyphic corpus, we have a few key examples wherein linear texts are written in columnar format, in keeping with contemporary Early Classic scribal practices across Mesoamerica. Likewise, the use of bars and dots at Teotihuacan is a shared Mesoamerican feature of the Classic period, much as the use of an early form of the *Tōnalpōwalli*, although the particulars of the calendar were specific to Teotihuacan culture.

To briefly summarize, despite some hearty disagreements and decades of definitional confusion, there is again a growing consensus among epigraphers and other scholars that Teotihuacan developed a writing system (or at least inherited it from the as-yet poorly understood scripts of earlier Preclassic forebears at Tlatilco and Tlapacoya). At present, it is difficult to distinguish between logograms (which are plainly overrepresented) and phonetic signs (which are at least grossly underrepresented). In our own work (Nielsen, 2004; Nielsen & Helmke, 2008, 2011, 2014b, 2020; Helmke & Nielsen, 2014), we have opted for semantic rather than phonetic decipherments, and believe this is the best way to proceed, until the issue of language affiliation has been resolved and the provisional readings can be tested.

Future studies of individual signs should ideally include all known occurrences and variants across time, and should carefully evaluate their context (other signs as well as any accompanying iconography). At the present stage of decipherment, careful and comprehensive documentation and comparison must have higher priority than premature and highly tentative phonetic readings. What also remains is continued work in producing a revised and more formalized sign catalogue or signatory that is both based on, and builds upon, that initially produced by Langley (1986, 2002). Given the enormous importance of decorated ceramics as a medium for recording writing in Teotihuacan cultures, their documentation needs to be systematized to prepare a corpus that is accessible to the academic community so that researchers may scrutinize these and the advances made. Examining sign compounds, we should note patterns of presence and absence to identify which signs appear to be optative, as this identifies signs as potential phonetic complements. Working with historical linguistics, prospective rebus usage of a selection of signs should be tested against candidate languages. This is an essential approach, as rebuses can only be resolved in a single language, given the demands of the semantics coded by the figurative features of a particular logographic sign, and the meaning of the homophony of the resultant utterance. Although it remains within the purview of hypothesis, it is hoped that the results of these tests may bundle together to a single language family, thereby enabling us to identify the most promising language candidate. In so doing, great progress may at last be made in the study of ancient Teotihuacan writing.

Acknowledgements:

Our heartfelt thanks to Nikolai Grube for his kind invitation to present an earlier version of this paper at the University of Bonn in June of 2019. Likewise, we would like to thank Davide Domenici, Magnus Pharao Hansen, and Karl Taube for reading earlier versions of this paper and offering their characteristic insights and comments. We would also like to extend our thanks to David Carballo for allowing us to draw and include here Monument E104 that he found as part of the investigations of Frente E. Likewise, our thanks to Iván Rivera Guzmán on the panels of Las Parotas, to Nicolas Latsanopoulos for information concerning the petroglyph of Axutla, and our gratitude to Saburo Sugiyama for allowing us to reproduce two of his drawings of the Techninatitla murals. To Allen Sellen, our thanks for permission to reproduce his drawing of a Zapotec urn, and to Sergio Gómez Chávez for allowing us to draw the graffiti of La Ventilla. Last, but certainly not least, we would like to thank our two anonymous reviewers and Mike Zender for seeing this paper to publication in the pages of *Visible Language*.

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Authors

Christophe Helmke (Ph.D.) is Associate professor of Native American Languages and Cultures at the Institute of Cross-cultural and Regional Studies, University of Copenhagen, Denmark. Trained as an archaeologist, his work focuses on Mesoamerican writing systems, researching the hieroglyphic writing of the ancient Maya, as well as that of Teotihuacan and the Epiclassic city-states of Central Mexico. Other research interests include the Pre-Columbian use of caves, as well as rock art and comparative Amerindian mythology.

Jesper Nielsen (Ph.D.) Associate Professor of Native American Languages and Cultures at the Institute of Cross-cultural and Regional Studies, University of Copenhagen, Denmark. His research focuses on Mesoamerican iconography, epigraphy and religion, especially that of Maya, Teotihuacan and Epiclassic cultures of Central Mexico. He is also interested in the early Colonial era in Central Mexico and the Maya area, as well as research history in Mesoamerica.