# Individuality and Identity in Cuneiform

## Personalising Writing Practices in the Neo-Sumerian (Ur III) and Old Assyrian Periods

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# ABSTRACT

Writing is a product of the hand as much as of the mind; not an innate ability, it is a learned and practised skill, a combination of rules and standards performed by individuals. Inscribed objects, beyond their documentary content, materialise the writing process and the context in which it was performed.

This research aims to further our understanding of the material aspects of cuneiform writing beyond its documentary and historical nature, analysing the observable marks left on inscribed tablets by ancient writers. Understanding identity and individuality in cuneiform in terms of sameness and difference, this research investigates how idiosyncrasies and similarities can be formally expressed in writing. Individuality and identity in cuneiform are analysed through the study of two contrasting corpora: the institutionalised production of professional Ur III scribes at the epicentre of state bureaucracy in Mesopotamia in the 21st century BCE, and the practical literacy of Old Assyrian merchants trading between Mesopotamia and Anatolia in the 19th century BCE.

Considering the artefactual value of inscribed objects, this research addresses the extent to which palaeographic and material features can vary, conform, or evolve over time, across sites and between groups and individuals. By contrasting datasets, this research interrogates the relationship between inscribed artefacts and writing practices through palaeographic and diplomatic features such as sign variants, writing sequence and text layout. Illustrating the application of a new integrated approach to writing practices to study cuneiform tablets as material objects, this research reaches new layers of information through the study of features such as script density or character forms and formation, thus providing new evidence about standardisation and personalisation of writing practices in the Ur III and Old Assyrian periods.

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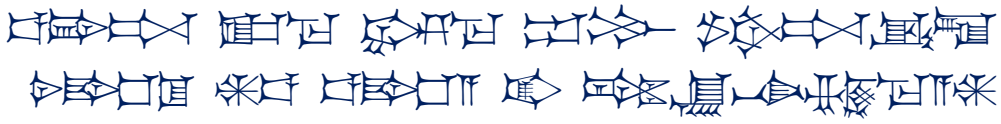
London, 5th November 2022



*before that day, there had been no putting words on clay*

*but now, when the sun rose on that day—so it was*

Enmerkar and the Lord of Aratta

(lines 504-505)

# FOREWORD

## Note to the reader

All dates are understood *Common Era* (CE) unless specified otherwise with the mention *Before Common Era* (BCE).

Cuneiform tablets are referenced by their museum numbers, e.g. BM 123456. Appendix 1 presents a concordance list of museum numbers with reference to the Cuneiform Digital Library Initiative (CDLI) where the reader can find more information about the objects, including publication references.[1]

Transcription of Sumerian is rendered in expanded plain type, e.g. santak. Transcription of Akkadian is rendered in italic, e.g. *santakku*. Transcription of cuneiform signs is rendered in capital letters, e.g. $DU_3$. Transcription of sign values is rendered between square brackets: in expanded plain type for Sumerian, e.g. [$banda_3$]; in italic for Akkadian, e.g. [*an*].

The six surfaces of a cuneiform tablet are abbreviated as:

- *o* for obverse
- *te* for upper edge
- *le* for left edge
- *r* for reverse
- *be* for lower edge
- *re* for right edge

Sign instances are indicated with the writing surface they are located on and the line number, e.g. *o.3* for obverse line 3.

Throughout this dissertation, a distinction is drawn between 'author' and 'writer'. By author is meant the person having composed the content of the text. By writer is meant the person having wielded the stylus and impressed the clay. The two functions may or may not be held by the same person.

Images of tablets from the British Museum are reproduced by courtesy of the Trustees of the British Museum. Images of tablets from the Département des Antiquités Orientales are reproduced by courtesy of the Musée du Louvre. Images of tablets from other collections are reproduced from the CDLI website.

[1] 'CDLI - Cuneiform Digital Library Initiative', (https://cdli.ucla.edu/ - accessed 31/10/2021).

## List of abbreviations used[2]

| | |
|---|---|
| **AKT** | Ankara Kültepe Tabletleri |
| **AO** | Siglum of the Département des Antiquités Orientales, Musée du Louvre, Paris |
| **BM** | Siglum of the British Museum, London |
| **CBS** | Siglum of the Collection of the Babylonian Section in the University Museum of Philadelphia |
| **CCT** | Cuneiform Texts from Cappadocian Tablets in the British Museum |
| **CDLI** | Cuneiform Digital Library Initiative |
| **CNRS** | Centre national de la recherche scientifique, Paris |
| **ETCSL** | Electronic Text Corpus of Sumerian Literature |
| **IM** | Siglum of the Iraq Museum, Baghdad |
| **Ist** | Siglum of the Arkeoloji Müzeleri, Istanbul |
| **K** | Siglum of Kuyunjik Collection in the British Museum, London |
| **KWU** | N. Schneider, *Die Keilschriftzeichen der Wirtschaftsurkunden von Ur III nebst ihren charakteristischen Schreibvarianten*, Rome, 1935 |
| **Labat** | R. Labat and F. Malbran-Labat, *Manuel d'épigraphie akkadienne*, Paris, 1995 |
| **LAK** | A. Deimel, *Die Inschriften von Fara. 1: Liste der archaischen Keilschriftzeichen*, WVDOG 40, Leipzig, 1922 |
| **MesZL** | R. Borger, *Mesopotamisches Zeichenlexikon*, AOAT 305, Münster, 2003 |
| **MSL** | Materialien zum sumerischen Lexikon/Materials for the Sumerian Lexicon |
| **NBC** | Siglum of the Nies Babylonian Collection in the Yale Babylonian Collection, New Haven |
| **TPAK** | Tablettes paléo-assyriennes de Kültepe |
| **U** | Siglum of the excavations at Ur, modern Tell-Muqayyar |
| **UET** | Ur Excavations Texts |
| **UM** | Siglum of the University of Pennsylvania Museum, Philadelphia |
| **VAT** | Siglum of the Vorderasiatisches Museum, Berlin |
| **YOS** | Yale Oriental Series. Babylonian Texts |

[2] Other abbreviations not listed here can be found on the CDLI:WiKi webpage: 'Abbreviations for Assyriology', *CDLI Wiki* (2019), (http://cdli.ox.ac.uk/wiki/doku.php?id=abbreviations_for_assyriology - accessed 22/04/2019).

## Chronological periodisation

### General periodisation

| Period | Dates |
|---|---|
| Pre-Writing | ca. 8500-3500 BCE |
| Uruk V | ca. 3500-3350 BCE |
| Uruk IV | ca. 3350-3200 BCE |
| Uruk III | ca. 3200-3000 BCE |
| Proto-Elamite | ca. 3100-2900 BCE |
| Early Dynastic I-II | ca. 2900-2700 BCE |
| Early Dynastic IIIa | ca. 2700-2500 BCE |
| Early Dynastic IIIb | ca. 2500-2340 BCE |
| Ebla | ca. 2350-2250 BCE |
| Old Akkadian | ca. 2340-2200 BCE |
| Linear Elamite | ca. 2200 BCE |
| Lagash II | ca. 2200-2100 BCE |
| Harappan | ca. 2200-1900 BCE |
| **Ur III** | **ca. 2100-2000 BCE** |
| Early Old Babylonian | ca. 2000-1900 BCE |
| **Old Assyrian** | **ca. 1970-1700 BCE** |
| Old Babylonian | ca. 1900-1600 BCE |
| Middle Hittite | ca. 1500-1100 BCE |
| Middle Babylonian | ca. 1400-1100 BCE |
| Middle Assyrian | ca. 1400-1000 BCE |
| Middle Elamite | ca. 1300-1100 BCE |
| Neo-Assyrian | 911-612 BCE |
| Neo-Elamite | 770-539 BCE |
| Neo-Babylonian | 626-539 BCE |
| Achaemenid | 547-331 BCE |
| Hellenistic | 323-63 BCE |
| Parthian | 247 BCE-224 CE |
| Sassanian | 224 CE-641 CE |

Figure 1: Cuneiform documents periodisation[3]

[3] From 'Modern Chronological Models: Chronological Periodisation in CDLI', *CDLI Wiki* (2016), (http://cdli.ox.ac.uk/wiki/doku.php?id=adopted_periodisation_in_cdli - accessed 22/02/2019).

## Corpus-specific periodisation

### *Ur III Period (2110-2003 BCE)*

As of yet, there is no established nor absolute chronology for the 3rd millennium BCE, and current research is based on relative chronologies, themselves reconstructed as a sequence of time spans established through synchronisms between events and/or names. A secure relative chronology of Mesopotamia – i.e. a sequence of events – only covers a period starting in the late 3rd millennium BCE (Ur III Period) up to the middle of the 2nd millennium BCE (Old Babylonian Period).[4] The Ur III Period corresponds to the time of the rule of the Third Dynasty of Ur in Mesopotamia.[5] The most widely accepted chronology for the Ur III Period sets it between 2112 and 2004 BCE, while recent research suggests an alternative Middle Chronology between 2110 and 2003 BCE and a lower Middle Chronology (MC II) between 2102 and 1995 BCE [Figure 2][6]. The dating in this dissertation follows the Middle Chronology, i.e. 2110-2003 BCE.[7]

| **Third Dynasty of Ur** | **2110-2003 BCE** |
|---|---|
| Ur-Namma | 2110-2093 BCE |
| Šulgi | 2092-2045 BCE |
| Amar-Suen | 2044-2036 BCE |
| Šu-Suen | 2035-2027 BCE |
| Ibbi-Suen | 2026-2003 BCE |

Figure 2: Historical chronology of the Third Dynasty of Ur (Middle Chronology)[8]

[4] Such secure relative chronology could be established from two independent reconstructions by Charpin and Sallaberger respectively (Charpin et al., *Mesopotamien: Die altbabylonische Zeit*, (2004), pp. 385-387; Sallaberger, 'Relative Chronologie von der späten frühdynastischen bis zur altbabylonischen Zeit', in Meyer et al., eds., (2004), p. 40).

[5] On the terminological distinction between 'Ur III Period' and 'Ur III Dynasty', see Sallaberger et al., *Associated Regional Chronologies for the Ancient Near East and the Eastern Mediterranean. 3: History and Philology*, (2015), pp. 4-5.

[6] For the 2112-2004 BCE chronology, see, for example, Reade, 'Assyrian King-Lists, the Royal Tombs of Ur, and Indus Origins', *JNES* 60 (2001), pp. 1-29. For the 2110-2003 chronology, see Sallaberger et al., *Associated Regional Chronologies for the Ancient Near East and the Eastern Mediterranean. 3: History and Philology*, (2015), pp. 11, 135-136.

[7] Lower Middle Chronology = Middle Chronology II = Middle Chronology reduced by 8 years.

[8] From Sallaberger et al., *Associated Regional Chronologies for the Ancient Near East and the Eastern Mediterranean. 3: History and Philology*, (2015), p. 302.

### *Old Assyrian Period (1972-1718 BCE)*

The historical chronology of the Old Assyrian Period follows the Assyrian Eponym List, while the archaeological chronology follows the stratigraphic sequence observed on the site of Kültepe in modern-day Turkey.[9] The Old Assyrians used a dating system based on eponymy, according to which each year was given the name of a member of the community appointed as eponym in the motherland's capital in Assur. Recording the names of some 255 officials, the list of year eponyms, known as the Kültepe Eponym List (KEL), has been reconstructed from various fragments excavated at Kültepe, recently studied and published together as the Revised Eponym List (REL) in 2012.[10]

The dating in this dissertation follows the historical chronology based on the Revised Eponym List, i.e. 1972-1718 BCE.

| **Revised Eponym List (REL)** | REL 1 | REL 40 | REL 55 | REL 95 | REL 105 | REL 140 | REL 255 |
|---|---|---|---|---|---|---|---|
| **Absolute Chronology (BCE)** | 1972 | 1933 | 1918 | 1878 | 1868 | 1833 | 1718 |

Figure 3: Historical chronology of the Old Assyrian Period (REL)[11]

[9] Michel, 'The Karum Period on the Plateau', in Steadman et al., eds., (2011), pp. 313-336.

[10] Veenhof, *The Old Assyrian List of Year Eponyms from Karum Kanish and its Chronological Implications*, (2003); Veenhof, 'The Old Assyrian List of Year Eponyms. Corrections, Additions and Chronology', *NABU* 2007:3 (2007), pp. 58-62; Barjamovic et al., *Ups and Downs at Kanesh*, (2012).

[11] From Barjamovic et al., *Ups and Downs at Kanesh*, (2012), pp. 91-102.

## Geographic distribution

### Overall distribution

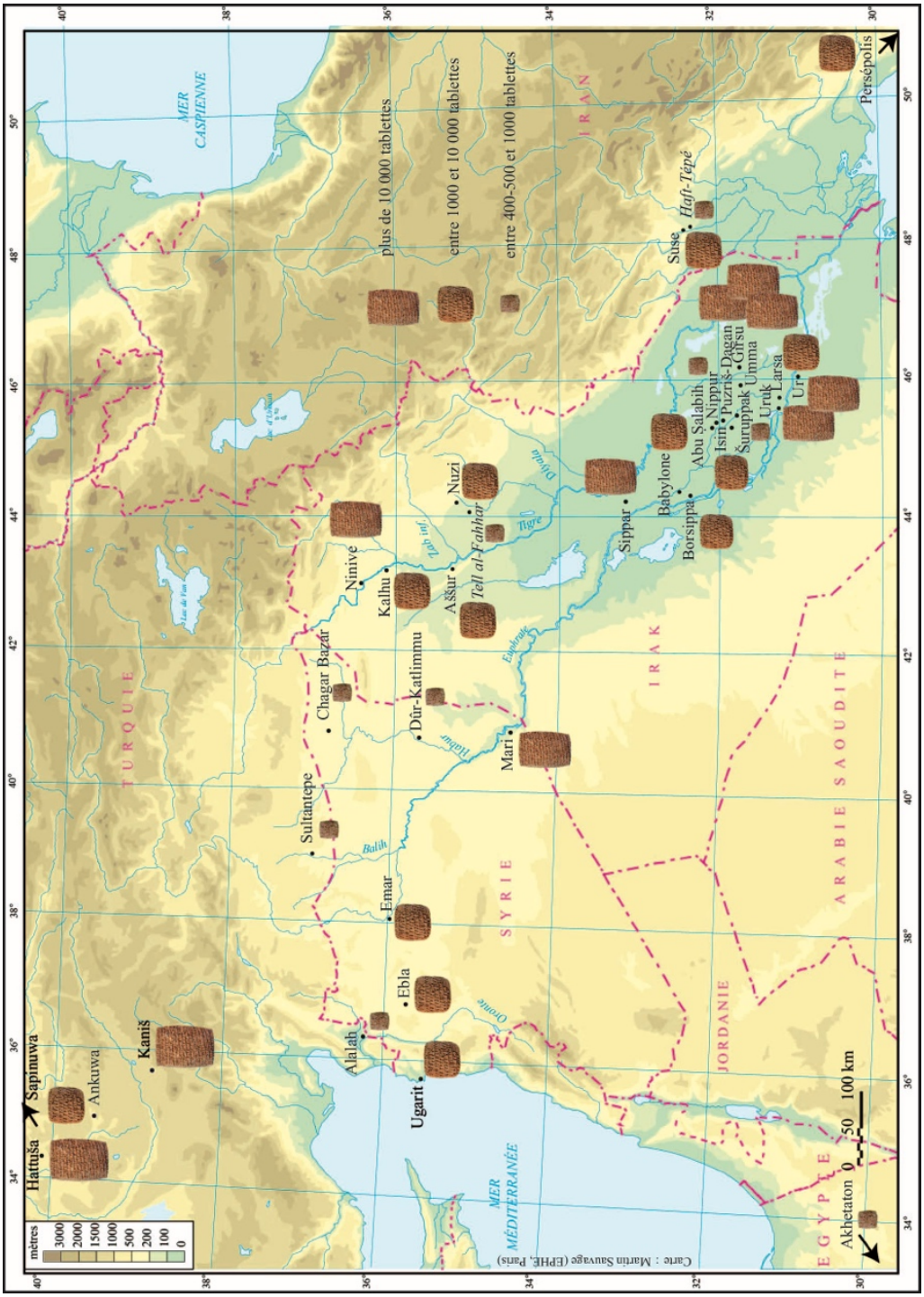



Figure 4: Distribution of cuneiform corpora across the Ancient Near East[12]

[12] M. Sauvage and X. Faivre (CNRS), 'Atlas', *CDLI Wiki* (2016), (https://cdli.ox.ac.uk/wiki/doku.php?id=cartes_atlas - accessed 31/10/2021).

## Corpus-specific distribution

### *Mesopotamia in the Ur III Period*

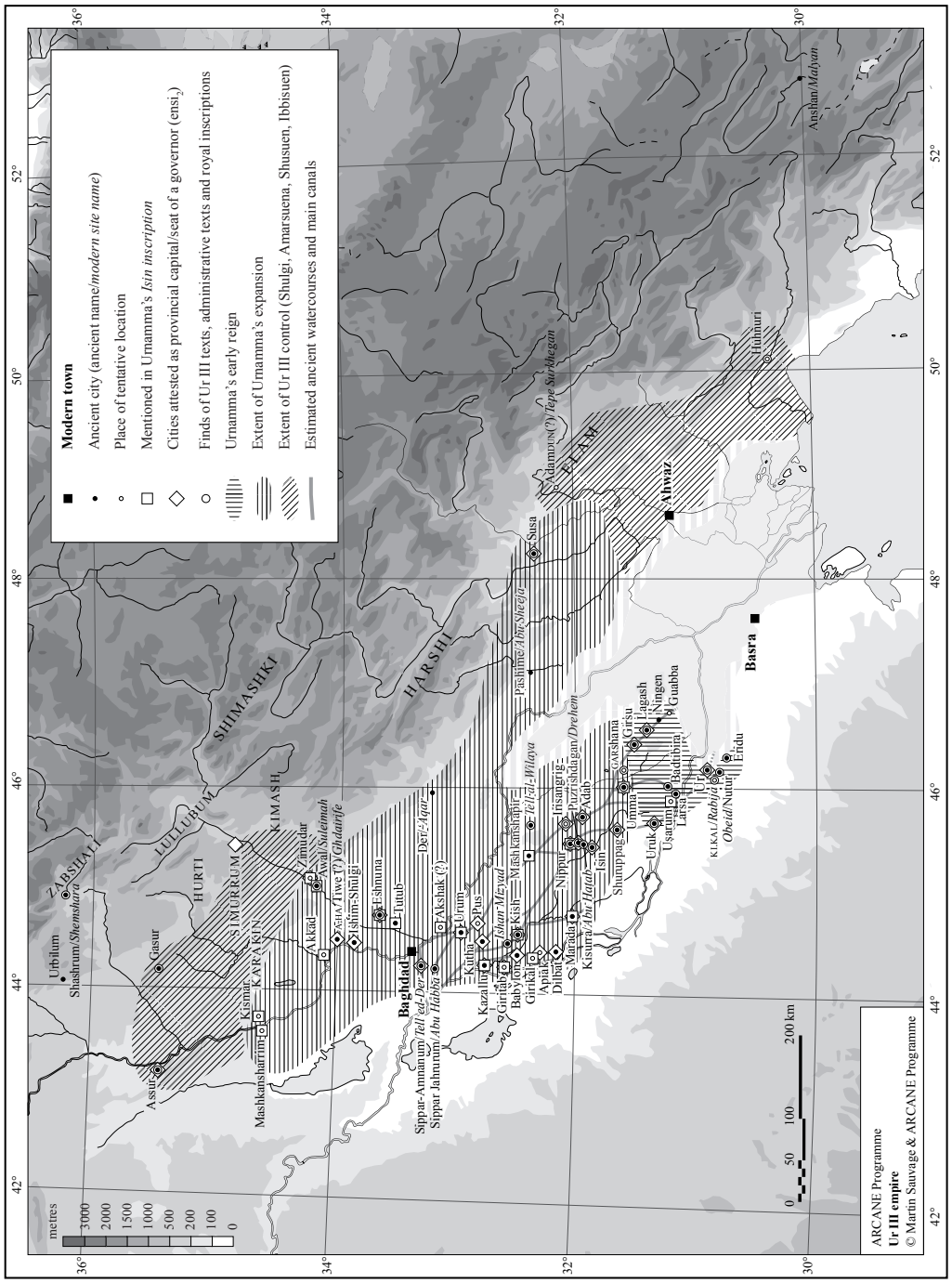



Figure 5: Map of Mesopotamia in the Ur III Period[13]

[13] Sallaberger et al., *Associated Regional Chronologies for the Ancient Near East and the Eastern Mediterranean. 3: History and Philology*, (2015), p. 132 map 14.


Figure 6: Map of Northern Mesopotamia and Anatolia in the Old Assyrian Period[14]

[14] Barjamovic, *A Historical Geography of Anatolia in the Old Assyrian Colony Period*, (2011), supplementary map inside back cover.

# INTRODUCTION

## Writing and identity

Both *writing* and *identity* are unique terms each encompassing manifold definitions. There is no 'writology' or 'identitology' as such but a multitude of specialist fields investigating the many aspects of writing, from semantics to graphology and grammatology, and of identity, from philosophy to anthropology and psychology.

### Writing and writing practices

In general terms, as expressed in dictionary definitions, writing is both an intellectual activity, that of the writer, and an action, that of laying out characters on a writing medium. Writing is also the physical outcome of those, the actual inscription. The Oxford English Dictionary thus defines writing as "*the action of one who writes, in various senses*", "*the art or practice of penmanship or handwriting*", the "*style, form, or method of fashioning letters*", "*the 'hand' of a particular person*".[15] Interestingly, the link between writing and language is not focussed on in general definitions.

In specialist terms, writing is more closely associated with language although the nature of the association very much varies according to authors.[16] Linguists especially tend to define writing as the material transcription of spoken sounds. Hence for Coulmas, writing is "*a system of recording language by means of visible or tactile marks which relate in a systematic way to units of speech, for example alphabetic vs logographic writing*".[17] Saussure even considered writing as a by-product of language with the transcription of words as its only purpose.[18] Gelb nuanced such stance, stating that writing was at first autonomous from language, the link between the two systems only becoming increasingly close over time. Reflecting this evolution, Gelb defines writing in general as "*a system of human intercommunication by means of conventional visible*

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[15] Oxford English Dictionary.

[16] Glassner, 'Essai pour une définition des écritures', *L'Homme* 192 (2009), pp. 7-22; Harris, *Signs of Writing*, (1995); Derrida, *De la Grammatologie*, (1967); Daniels, Peter T., 'Grammatology', in Olson et al., eds., (2009), pp. 25-45.

[17] Coulmas, *The Blackwell Encyclopedia of Writing Systems*, (1996), pp. 555-556.

[18] "*Langue et écriture sont deux systèmes distincts ; l'unique raison d'être du second est de représenter le premier*" (de Saussure, *Cours de linguistique générale*, eds. Bailly, Sechehaye, and Riedlinger (1931), p. 45). In his literary essays, Rousseau also considered writing as only the representation of language (Rousseau, *Œuvres complètes. Tome II*, eds. Gagnebin and Raymond (2012), 2, pp. 1249-1252).

*marks*", drawing a distinction between "*the* semasiographic *stage of writing (expressing meanings and notions loosely connected with speech) and the* phonographic *stage (expressing speech)"*.[19] Daniels, however, emphasizes the direct link between writing and language and defines the former as "*a system of more or less permanent marks used to represent an utterance in such a way that it can be recovered more or less exactly without the intervention of the utterer*".[20]

Throughout definitions, writing thus appears essentially threefold: a mental construct, a physical activity, a material outcome. Dictionaries may depict writing in its broadest sense, they also seem to capture some of its essential traits. Conversely, specialist definitions emphasize those traits relevant to a specific field of research; so that, for example, the relation between writing and language is, unsurprisingly, the focal point of the linguistic definitions of writing. Other fields concerned with studying writing, such as epigraphy or palaeography, seem less willing to define their object of study.

Etymologically, palaeography only means *ancient writing*, from Greek *palaiós* (παλαιός) 'old' and *gráphein* (γράφειν) 'to write'. More specifically, the term is used for the study of ancient writing. But how can ancient writings be studied? And, perhaps more importantly, why should they? The answer to both questions depends on the context in which research takes place. There are probably as many ways to palaeography than there are questions to answer about the past: from deciphering the Domesday Book to dating the Fourth Gospel, and from identifying the scribes of the Cairo Geniza to disputing the authenticity of the Jordan Lead Codices. Although versatile and multifaceted, palaeography is generally considered as a branch of history, assessing primary sources for research by dating and locating manuscripts from the study of the written marks they carry.

A counterpart to palaeography, the field of diplomatics focusses on manuscripts as physical objects and text-carriers. The term diplomatics derives from *diploma* as meaning 'a document issued by an authority'; in turn, diplomatics emerged as a method to identify forgeries, first formulated in 1681 by Dom Mabillon.[21] His method rested on analysing the material aspects of a document – its extrinsic elements, including material, medium and inks; and the marks of its intellectual making – its intrinsic elements,

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[19] Gelb, *A Study of Writing*, (1963), pp. 11-13 and 252-253.
[20] Daniels, *An Exploration of Writing*, (2017), p. 156.
[21] Mabillon, *De Re Diplomatica*, (1681).

including seals, signatures and dates. Diplomatics has since developed into a discipline in its own right, related to history and working hand in hand with palaeography.[22]

This research investigates identity in writing through the study of written signs and media, thus understanding writing in palaeographic and diplomatic terms. Writing is therefore considered in this research as the material outcome of a mental construct and its study as the analysis of the visual marks left on inscribed tablets by ancient writers. To approach ancient writers relates to writing as a physical activity, that of the mediating hand laying out a text on its carrier. This in turn reveals another essential trait of writing, and more specifically of handwriting, its ambivalent nature as a conventional system of graphic marks laid down by the hand of an individual.

## Identity and individuality

Considering ancient writers from the writing they produced pertains to investigating the dynamics between the conventional nature of writing and the identity, or indeed the individuality, of the writer.

Identity is commonly accepted as the philosophical concept of the self, not only of one's self but also of others' selves. Philosophers have extensively covered the concept of identity, its many expressions and multiple definitions. In his *Essais*, Montaigne defined identity as the self and the sum of all its aspects however different from one another, thus depicting its multifaceted nature.[23] In contrast, other schools of thought relate identity to unity, sameness and persistence. Locke even equated diversity with non-identity.[24] Modern philosophy still ponders the nature of identity, between multiplicity and unity, while also contemplating its relation to time and place. Within philosophical logic, Wiggins considers the absoluteness and determinateness of identity as substance and persistence through change.[25] Unity and persistence are also central to the concept of identity developed by Hirsch, understood in terms of developmental stages of compositional and spaciotemporal continuity.[26]

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[22] Duranti, *Diplomatics: New Uses for an Old Science*, (1998); Tessier, *La Diplomatique*, (1966); Charpin, 'Esquisse d'une diplomatique des documents mésopotamiens', *Bibliothèque de l'École des chartes* 160 (2002), pp. 487-511; Charpin, 'Schriftkultur in Babylonien: Plädoyer für eine Diplomatik der Keilschrifturkunden', in Cancik-Kirschbaum et al., eds., (2018), pp. 145-160.

[23] Montaigne, *Essais*, 1588, Livre III Chapitre 2 'Du repentir'.

[24] Locke, *An Essay Concerning Human Understanding*, 1690, Book II Chapter xxvii 'Identity and diversity'.

[25] Wiggins, *Sameness and Substance Renewed*, (2001).

[26] Hirsch, *The Concept of Identity*, (1982).

In philosophical terms, identity relates to the self and therefore equates with individuality, whether in multiplicity or in unity. In anthropological terms, the two concepts of identity and of individuality appear more nuanced and more ambivalent.[27] Referring to one self or to groups of selves, identity encompasses both the individual and the group as distinct yet interrelated entities, since groups are formed of individuals. In this sense, identity can equally be expressed through sameness (of the group) and difference (of the individual).[28]

Approaching ancient writers through the study of their manuscripts may not relate to the philosophical concept of the self. Approaching the ambivalent nature of writing as a conventional system performed by an individual may yet relate to investigating the multiplicity or unity of writing in time and place as well as between groups and individuals. This research therefore understands identity and individuality in terms of sameness and difference, revealed through the analysis of sets of palaeographic and diplomatic characteristics for their composition, nature and properties. Identity in writing thus focusses on the similarities and communities of practices amongst groups, while individuality in writing more closely approaches the idiosyncrasies attached to individual handwriting.

## Literacy, writing and reading

According to Mesopotamian mythology, writing was not the fact of the gods but a human invention indeed, born of necessity to remedy the limits of memory. Enmerkar, second king of Uruk according to the Sumerian King List, entered an eloquence contest with his rival, the Lord of Aratta, and a messenger was commissioned to carry the words of the two kings back and forth the 'seven great mountains' separating Uruk from Aratta. As the contest developed, the ever longer messages soon exceeded the messenger's capacity to fully memorise the words sent. Enmerkar remedied the situation by 'putting words on clay'. Writing had been invented.

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[27] For a detailed and recent overview of the current streams of research on identity, see Schwartz et al., eds., *Handbook of Identity Theory and Research*, (2 vols, 2011).
[28] Barnard et al., eds., *Encyclopedia of Social and Cultural Anthropology*, (1997), p. 441; Coulmas, *Identity*, (2019), p. 2.

*Because the messenger's mouth was too heavy, and he could not repeat it,*
*the lord of Kulab* [Enmerkar] *patted some clay and put the words on it as on a tablet.*
*Before that day, there had been no putting words on clay;*
*but now, when the sun rose on that day—so it was:*
*the lord of Kulab had put words on a tablet—so it was!*[29]

Enmerkar's invention of writing surely did spare the messenger's memory and enabled a long message to be sent to the Lord of Aratta. While the Lord of Aratta did receive the message, he could not understand it.

*The lord of Aratta took from the messenger*
*the tablet and held it next to a brazier.*
*The lord of Aratta inspected the tablet,*
*the spoken words were mere wedges—his brow darkened.*
*The lord of Aratta kept looking at the tablet in the light of the brazier.*[30]

These are the last verses of the episode of the invention of writing. After that, there would be no more mention of writing; heavenly interventions, storms and gods would take the epic towards the resolution of the eloquence contest, leaving the reader pensive about the invention of writing, and with it of reading.

The Sumerian epic of *Enmerkar and the Lord of Aratta* thus tells how and why writing was invented, not by gods but by men as a means to overcome the limitations of human memory. More importantly, *Enmerkar and the Lord of Aratta* presents writing and reading together and, as such tells us about literacy. This research rests on analysing the technicalities of writing to reach higher levels of understanding about writing practices and contexts, and the dynamics between writers and writing.

Literacy, as the cognitive ability to read and write, relates to the social and cultural backgrounds in which it is performed.[31] There are various levels of literacy, from the ability to read and write everyday documents to the expert command of a writing system.[32] In his work on ancient literacy, Harris distinguished three levels of literacy: mass, scribal and craftsmanship.[33] In his cuneiform-specific study, Veldhuis also identified three levels of literacy, albeit different from Harris's: functional, technical,

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[29] *Enmerkar and the Lord of Aratta*, lines 502-506 (Mittermayer, *Enmerkara und der Herr von Arata: Ein ungleicher Wettstreit*, (2009), pp. 144-145; Vanstiphout, *Epics of Sumerian Kings*, ed. Cooper (2003), pp. 84-85).

[30] *Enmerkar and the Lord of Aratta*, lines 537-541 (Mittermayer, *Enmerkara und der Herr von Arata: Ein ungleicher Wettstreit*, (2009), pp. 146-147; Vanstiphout, *Epics of Sumerian Kings*, ed. Cooper (2003), pp. 86-87). The written signs are referred to as 'gag' in the original Sumerian, a word translating as 'wedge' but not traditionally associated with cuneiform wedges. As suggested by the translator, this would have been a deliberate choice of words indicating that cuneiform looks like 'mere wedges' to the illiterate (*Ibid.*, p. 96 note 57).

[31] Goody, 'Literacy and Achievement in the Ancient World', in Coulmas et al., eds., (1984), pp. 83-97; Lion, 'Literacy and Gender', in Radner et al., eds., (2011), pp. 90-112.

[32] Street, *Literacy in Theory and Practice*, (1984).

[33] Harris, *Ancient Literacy*, (1989), p. 7.

scholarly.[34] More recently, Madreiter's study of Achaemenid literacy drew on the distinction between elite, functional, technical and cultural literacy, as well as sectorial literacy (limited use of writing to specific purposes) and signature literacy.[35] It follows that, regardless of corpus-specific distinction, levels of literacy are defined by their associated specific skillsets (technical literacy, sectoral literacy, signature literacy) as much as by their relation to the context in which writing takes place (cultural literacy, craftsmanship literacy, scholarly literacy). Although literacy is about both reading and writing, the latter prevails in most studies on ancient literacy.[36] Reconstructing aspects of ancient reading is undoubtedly no easy task; while writing produces a material outcome in the form of inscriptions, there is little evidence left of the more incorporeal activity of reading. The two are closely linked, however, and this link is central to the palaeographic and diplomatic study of cuneiform, in considering the variations expressed in clay by the writer and their reception by the reader.

## Palaeography and diplomatics

The study of writing and writing practices through palaeographic and diplomatic means is well and long established in historical disciplines and used by Medievalists, Classicists and Papyrologists alike, as well as Archivists.[37] The Institute of English Studies (University of London) annually programmes its International Palaeography Summer School covering Latin, Anglo-Saxon, English, German and Greek writing.[38] The methodologies developed in these fields are tried and tested and may inspire palaeographic and diplomatic approaches to cuneiform writing.[39] However, cuneiform writing is a very specific type of writing in that it is amongst the rare three-dimensional handwritings, i.e. impressed with a stylus rather than engraved or carved.[40]

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[34] Veldhuis, 'Levels of Literacy', in Radner et al., eds., (2011), pp. 68-89.

[35] Madreiter, 'Der Raum alltäglicher weiblicher Literalität im Achaimeniden-Reich', in Kolb, ed., (2018), pp. 117-119.

[36] Larsen, 'The Mesopotamian Lukewarm Mind: Reflections on Science, Divination, and Literacy', in Rochberg-Halton, ed., (1987), pp. 203-225; Michalowski, 'Writing and Literacy in Early States: A Mesopotamianist Perspective', in Keller-Cohen, ed., (1994), pp. 49-70; Parpola, 'The Man without a Scribe and the Question of Literacy in the Assyrian Empire', in Pongratz-Leisten et al., eds., (1997).

[37] Bischoff, *Latin Palaeography: Antiquity and the Middle Ages*, (1990); Regulski, *A Palaeographic Study of Early Writing in Egypt*, (2010); 'Palaeography', *The National Archives* (2006), (https://www.nationalarchives.gov.uk/palaeography/ - accessed 14/05/2020).

[38] 'London International Palaeography Summer School', *Institute of English Studies* (2020), (https://www.ies.sas.ac.uk/study-training/study-weeks/london-international-palaeography-summer-school - accessed 20/06/2020).

[39] Including typologies of palaeographic and diplomatic features as well as terminologies.

[40] There are very few examples of two-dimensional cuneiform (Driver, *Semitic Writing from Pictograph to Alphabet*, (1976), p. 30; Edzard, 'Keilschrift', *RlA* 5 (1980), p. 567).

While palaeography and diplomatics may be less established in cuneiform studies than in other fields, both disciplines have re-emerged over the past decade after having had a momentum in the 1900s. After the early days of Assyriology and the official decipherment of the cuneiform script in 1857, the attention of scholars turned to the material aspect of writing with publications by Assyriologists and archaeologists alike focussing on writing technology. Considering cuneiform writing processes and implements, early investigations led to the first attempts at reconstructing lost styli and to the first observations about writing sequence.[41] The sequencing of the long history of cuneiform also attracted the attention of early scholars, and Fossey's list of signs, covering three millennia of graphic development, while dated, remains the most extensive work of this sort and a reference to modern palaeographers.[42] Research context and methods may have changed and developed since, the focus early scholars placed on studying ancient writing beyond its textual content is still what drives current research in cuneiform palaeography and diplomatics.

Sign lists, writing processes and implements are all topics nowadays covered in the increasingly growing body of publications dedicated to cuneiform palaeography and diplomatics. The 2010s alone saw the publication of four volumes exclusively dedicated to cuneiform palaeography.[43] Palaeographic and diplomatic approaches to cuneiform writing did not disappear between the first steps taken in the 1900s and the re-emergence of the 2010s, whether in journal articles or part of wider research projects. Publications from the past decade, however, witness to the renewed approaches to cuneiform palaeography and diplomatics and to the development of sound methodologies of investigation suitable for an autonomous stream of research.

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[41] Clay, *Documents from the Temple Archives of Nippur Dated in the Reigns of Cassite Rulers*, (1906); Messerschmidt, 'Zur Technik des Tontafel-Schreibens', *OLZ* 9 (1906), pp. 185-196, 304-312, 372-380; de Morgan, 'Note sur les procédés techniques en usage chez les scribes babyloniens', *Recueil de Travaux Relatifs à la Philologie et à l'Archéologie Égyptiennes et Assyriennes* 27 (1905), pp. 234-249; Breasted, 'The Physical Processes of Writing in the Early Orient and Their Relation to the Origin of the Alphabet', *The American Journal of Semitic Languages and Literatures* 32 (1916), pp. 230-249.

[42] Fossey, *Manuel d'Assyriologie. 1. Fouilles, écriture, langues, littérature, géographie, histoire, religion, institutions, art*, (1904); Fossey, *Manuel d'Assyriologie. 2. Évolution des cunéiformes*, (1926).

[43] Devecchi, ed., *Palaeography and Scribal Practices in Syro-Palestine and Anatolia in the Late Bronze Age*, (2012); Devecchi et al., eds., *Current Research in Cuneiform Palaeography*, (2015); Weeden, 'Review of: Current Research in Cuneiform Palaeography. Proceedings of the Workshop organised and the 60th Rencontre Assyriologique Internationale Warsaw 2014. Edited by Elena Devecchi, Gerfrid G. W. Müller, and Jana Mynářová. Gladbeck: PeWe-Verlag, 2015.', *Journal of Near Eastern Studies (JNES)* 77 (2018), pp. 122-125; Devecchi et al., eds., *Current Research in Cuneiform Palaeography 2*, (2019); Homan, *Mittani Palaeography*, (2019).

## Contexts and aims

Palaeography and diplomatics each focus on different aspects of writing, the written forms and their laying out. In practice, the boundaries between palaeography and diplomatics are not set, most often they dovetail. The two approaches have either been taken separately or combined, depending on the research context and aims.

In a traditional sense, palaeography is a method of dating manuscripts based on the formal analysis of signs. Palaeographic analysis as a dating method has not been as much developed in Mesopotamian studies as it has been in Hittite studies, especially because a wide proportion of the Mesopotamian administrative material is either dated or datable.[44] In the absence of a date or of datable evidence, scholars can rely on the shape of the script to locate a text in the chronology. Identifying the age of a text with even precision, for example within a 10- or 20-year timeframe, is yet more challenging since it rests on clearly identifying sometimes progressive and tenuous developments.[45] The dating of manuscripts can also rely on diplomatic analysis, albeit more rarely.[46] Dating can also participate in authenticating documents. Palaeography is, for example, part of Gelb's argument to deem the Cruciform Monument a forgery, an ancient forgery, that is, inscribed in the Old Babylonian Period to look like an Old Akkadian inscription.[47]

Palaeography and diplomatics are, however, rarely combined to date manuscripts; furthermore, they are also used separately and exclusively for two other specific aims, that of handwriting identification and for typological and taxonomic purposes. Unsurprisingly perhaps, studies aiming at identifying scribal hands have exclusively relied on palaeographic analysis, i.e. the analysis of written forms.[48] Meanwhile, diplomatics have exclusively served the purpose of identifying typologies of

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[44] Charpin, *Lire et écrire à Babylone*, (2008), p. 108.

[45] Finkelstein, 'The Hammurabi Law Tablet "BE" XXXI 22', *RA* 63 (1969), pp. 11-27.

[46] Waal, 'Chronological Developments in Hittite Scribal Habits and Tablet Shapes', in Devecchi, ed., (2012), pp. 217-227; Waal, *Hittite diplomatics. Studies in ancient document format and record management*, (2015).

[47] Gelb, 'The Date of the Cruciform Monument of Maništušu', *JNES* 8 (1949), pp. 346-348. Palaeography is also briefly mentioned in Paulus's appraisal of the authenticity of the Kassite Agum-kakrime Inscription (Paulus, 'Fraud, Forgery, and Fiction', *JCS* 70 (2018), pp. 115-166).

[48] Müller et al., 'Current Research in Cuneiform Palaeography 2', in Devecchi et al., eds., (2019), pp. 177-209; Jursa, 'Late Babylonian Epigraphy: A Case Study', in Devecchi et al., eds., (2015), pp. 187-198; Beyer, *The Identification of Scribal Hands on the Basis of an Old Assyrian Archive*, (PhD Dissertation, 2019). A recent study on scribal identification proposed to draw a distinction between 'palaeography' and 'chirography', according to which: palaeography is a systematic collection and analysis of all signs in a corpus in order to understand sign development and variation over time or within socio-professional groups; chirography is understood as the direct comparison of sign forms attached to an individual between small sets of documents at one given time (Stratford, 'Old Assyrian Literacy: Formulating a Method for Graphic Analysis and Some Initial Results', in Kulakoğlu et al., eds., (2015), p. 119).

documents.[49] This matter of facts may reflect the ambivalent nature of writing as a conventional system and an individual performance and assumes that the former is expressed in the shape of tablets and the latter in the shape of signs.

While palaeographic and diplomatic methods can be taken separately for the topical purposes of dating, authentication, scribal identification and typology, they have also been implemented independently to approach wider trends relating to writing, including archival practice, scribal transmission and literacy.[50] Although a holistic approach, encompassing the joint study of both written forms and their carriers, would appear best suited to investigate writing practices as a whole, palaeography and diplomatics are rarely openly combined in the study of cuneiform.[51]

The remit of both cuneiform palaeography and diplomatics is not defined *tout court* and there is no digest for scope or method of either or both approaches. To investigate the relation between identity and writing and how idiosyncrasies and similarities can be formally expressed, this research undertakes to investigate cuneiform writing practices in both palaeographic and diplomatic terms. The methodology developed for the present study therefore relies on analysing written script, text layout and writing medium, and how these three autonomous yet not independent components of writing interact and what their variations mean to further our understanding of the cuneiform script.[52]

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[49] Radner, 'The Relation Between Format and Content of Neo-Assyrian Texts', in Mattila, ed., (1995), pp. 63-77; Taylor, 'Form and Formatting of Assyrian Prisms and Cylinders', in Maul et al., eds., (forthcoming); Eidem, 'The Clay They Wrote On: Old Babylonian Letters as Artefacts', in Al-Gailani Werr et al., eds., (2002), pp. 74-81; Waal, 'Chronological Developments in Hittite Scribal Habits and Tablet Shapes', in Devecchi, ed., (2012), pp. 217-227.

[50] Diplomatic approach: Warbinek, 'Current Research in Cuneiform Palaeography 2', in Devecchi et al., eds., (2019), pp. 137-155; Lecompte, 'Observations on Diplomatics, Tablet Layout and Cultural Evolution of the Early Third Millennium: The Archaic Texts from Ur', in Balke et al., eds., (2016), pp. 133-164; Cancik-Kirschbaum, 'Middle Assyrian Administrative Documents and Diplomatics: Preliminary Remarks Towards an Analysis of Scribal Norms and Habits', in Devecchi, ed., (2012), pp. 19-32. Palaeographic approach: Paoletti, 'The Lexical Texts from Ebla: Palaeography, Sign Identification and Scribes in the Early Dynastic Period', in Devecchi et al., eds., (2015), pp. 49-70; Mynářová, 'Egyptians and the Cuneiform Tradition. On the Palaeography of the Amarna Documents', in Devecchi et al., eds., (2015), pp. 89-102; Shibata, 'The Local Scribal Tradition in the Land of Mari and Assyrian State Scribal Practice: Paleographical Characteristics of Middle Assyrian Documents from Tell Taban', in Yamada et al., eds., (2016), pp. 99-118; Weeden, 'Hittite Scribal Culture and Syria: Palaeography and Cuneiform Transmission', in Yamada et al., eds., (2016), pp. 159-193; Bramanti, 'Current Research in Cuneiform Palaeography 2', in Devecchi et al., eds., (2019), pp. 1-12; Pirngruber, 'Current Research in Cuneiform Palaeography 2', in Devecchi et al., eds., (2019), pp. 157-175; Weeden, 'Assyro-Mittanian or Middle Assyrian?', in Devecchi, ed., (2012), pp. 229-251.

[51] Maiocchi, 'From Stylus to Sign: A Sketch of Old Akkadian Palaeography', in Devecchi et al., eds., (2015), pp. 71-88; Biggs, 'On Regional Cuneiform Handwritings in Third Millennium Mesopotamia', *OrNS* 42 (1973), pp. 39-46.

[52] This methodology is further introduced and developed in Chapter 2.

## Methods and methodologies

Regardless of its contexts and aims, the palaeographic and diplomatic study of cuneiform should rely on sound methods of investigation, including the careful selection of analysis criteria and how they are collected.

The blurred boundaries between palaeography and diplomatics is mirrored by the varying classification of analysis criteria and their allocation to one or the other approach. This especially applies to features related to text layout mediating between palaeography as strictly applying to signs and diplomatics as strictly applying to tablets. Daniels, for example, devised and advocated a cuneiform-adapted version of the constant features of penmanship identified by modern typographer Johnston, including stylus marks, arrangement of wedges, their number and writing sequence.[53] These cuneiform-adapted criteria constitute a selection of a longer list suggested to Daniels by Parpola: stylus marks, angle of incidence and depth of impression, basic wedges and basic wedge clusters, their number per sign and their sequence of impression, relative size of signs and their horizontal distribution, horizontal and vertical alignment of signs, distribution of text on the tablet, evidence of the writing speed.[54] Examining the existing publications focussing on the material aspects of writing reveals the extent and diversity of observable features a cuneiform tablet can display and how differently analysed and interpreted they can be. Such features either relate directly to the written signs, the text layout, or the writing medium [Figure 7]. Although the selected palaeographic features for analysis differ from study to study and are adapted to the available material and the aims pursued, their selection process appears to rest on a set of overarching principles – composition, frequency, relevance – determining the palaeographic potential of a sign. Again, even these principles are subject to adaptation from one study to the other. In terms of composition, complex signs are usually preferred on the principle that the multiplication of component wedges in turn multiplies the possibilities for variation.[55]

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[53] Daniels, 'A Calligraphic Approach to Aramaic Paleography', *JNES* 43 (1984), pp. 55-68. The seven constant features devised by Johnston are: pen angle, weight, basic shape of the letter 'o', number of strokes, order of strokes, direction of strokes, speed of writing (Johnston, *Formal Penmanship and Other Papers*, ed. Child (1971), p. 120).

[54] Personal communication reported in Daniels, 'Cuneiform Calligraphy', in Mattila, ed., (1995), pp. 81-90.

[55] The opposite approach has recently been applied by Stratford who advocated the selection of simpler forms (Stratford, 'Old Assyrian Literacy: Formulating a Method for Graphic Analysis and Some Initial Results', in Kulakoğlu et al., eds., (2015), pp. 117-128).

| Signs | Layout | Writing medium |
|---|---|---|
| • Complexity of signs<br>• Ratio and relationship between wedge head and tail<br>• Number of variants per sign<br>• Wedge arrangements<br>• Angle of wedges<br>• Order of impression<br>• Size of signs | • Script leaning<br>• Use of the writing space (including sign elongation)<br>• Symmetrical positioning of the leading horizontal wedge of a sign in relation to line height<br>• Relation of script to ruling<br>• Line ruling<br>• Line spacing<br>• Layout and formatting: columniation, tabulation, indentation | • General shape<br>• Dimensions<br>• Corner and edge profiles<br>• Material (nature, colour)<br>• Manufacturing technique |

Figure 7: Overview of palaeographic and diplomatic features

Collected from existing publications

Considering the nature of the corpus under study may also help determine how complex or simple a sign should be, with specific thresholds of variability.[56] In terms of frequency, how frequent is enough is yet again dependent on the material available and the aims pursued. In this research, thresholds of frequency are adapted to the level of investigation so that, for example, signs may be disregarded to outline synchronic palaeographic developments to later on become central to analysing the idiosyncrasies of scribal hands. Assessing the relevance of a sign form in palaeographic terms, beyond its composition or frequency, implies the ability to determine what a variant is, based on similarity or dissimilarity, grouping or distinction. For example, both Ernst-Pradal and Homan each recently developed bespoke systems of categorisation, defining different levels to classify script variation in their respective Ugaritic and Mittanian study corpora, e.g. sign, sign-form, variant.[57]

Current palaeographic analysis thus relies on adapted sets of features, the selection of which responds to the overarching principles of sign composition, frequency and relevance. This research is no exception, while also considering the clearly identifiable and measurable nature of variations another guiding principle, and this for the selection of both palaeographic and diplomatic features. The basis of both identifiability and

[56] Such thresholds of variability are related to the development of cuneiform, from formal complexity in the 3rd millennium BCE to formal consistency in 1st millennium BCE script.

[57] Ernst-Pradal, *Scribes d'Ougarit et Paléographie Akkadienne*, (PhD Dissertation, 2008); Ernst-Pradal et al., 'Les écritures mises au jour sur le site d'Ougarit (Syrie) et leur déchiffrement: 1930-2010', in Bordreuil et al., eds., (2013), p. 219; Homan, *Mittani Palaeography*, (2019), pp. 21-24.

measurability relies on detailed typologies of features and accompanying terminology, to systematically compare them and minimising the inherent subjectivity of the human eye. Observable features, their classification into typologies and attached terminology are presented in Chapter 1 in and Appendix 4.

The subjectivity of the observing eye is one of the major obstacles faced by cuneiform palaeographers and diplomatists. As early as 1973, Biggs pointed out the importance of formulating investigation criteria beyond the level of impression, with the re-usability of such criteria by others in mind.[58] Computer-aided methods of investigation are now presented as potential solution to reach new levels of objectivity, either by augmenting the number of features to be observed or by providing enhanced processing tools to interpret. In 2015, Cammarosano advocated a quantitative approach to cuneiform palaeography as a means to implement traditional Assyriological methods and its potential for join recognition, handwriting identification and tablet dating.[59] By producing measured parameters for wedge components, stylus components, script and handwriting descriptions, along with the ability to process large data sets, the quantitative approach would thus objectify both typology and terminology for both inscription and object features.[60]
Palaeographic and diplomatic approaches to studying cuneiform writing pursue varied aims, from dating manuscripts to retracing scribal transmission. Diverse methods have been devised to investigate writing, since the experiments of early scholars in the 1900s to the advent of digital technologies in the 2000s. Regardless, the scope of cuneiform palaeography and diplomatics remain broad and diverse, the two approaches frequently used exclusively, more rarely combined, and often dovetailing.

The appreciation of the three aspects gathered on any cuneiform tablet – written signs, layout, writing medium – is central to this research on identity and individuality in writing. Palaeography and diplomatics are therefore integrated into a combined methodology, including typologies of features and their terminology, using mixed digital and traditional methods of analysis, outlined hereinafter in Chapter 2. Such combined

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[58] Biggs, 'On Regional Cuneiform Handwritings in Third Millennium Mesopotamia', *OrNS* 42 (1973), pp. 39-46.
[59] Cammarosano, '3D-Joins und Schriftmetrologie. A Quantitative Approach to Cuneiform Palaeography', in Devecchi et al., eds., (2015), pp. 145-186.
[60] The 'Cuneiform: 3D-Joins und Schriftmetrologie Projekt' has been developing specialist terminologies and methodologies for the past few years, along with a specialist software (CuneiformAnalyser) for the digital investigation of palaeographic features, available on the project website: 'Terminology', *Cuneiform: 3D-Joins und Schriftmetrologie Projekt* (n.d.), (http://www.cuneiform.de/fortschritte/terminologie.html - accessed 03/12/2016).

palaeographic and diplomatic methodology also considers the two study corpora selected for this research, Ur III and Old Assyrian, adapting its overarching principles to their specificities.

## Individuality and identity in cuneiform?

The term 'cuneiform' designates a type of script developed in Southern Iraq and used across the Ancient Near East for over three millennia.[61] Its characteristic wedge-shaped marks gave it its modern name, from Latin *cuneus* 'wedge'.[62] It also gave it its ancient name, santak in Sumerian and *santakku* in Akkadian, both meaning 'triangle', 'wedge'. Developed in Mesopotamia to write down the language of the Sumerians and adopted by their Semitic successors to write Akkadian, cuneiform was also adapted from Anatolia to Iran to write down some 15 other languages, e.g. Hittite, Ugaritic, Elamite, Persian, etc. The earliest versions of cuneiform, at the end of the 4th millennium BCE, were hand-drawn signs composed of curved and straight lines, and as such not yet wedge-shaped. By the middle of the 3rd millennium BCE, the curved and continuous lines of proto-cuneiform signs evolved into combinations of wedges, each stroke of the writing implement producing a single wedge. The sign $LU_2$, for instance, originally represented a stylised human figure, reduced to a body and a head, evolving over time into distinct combinations of wedges evermore distant from the original human figure [Figure 8].

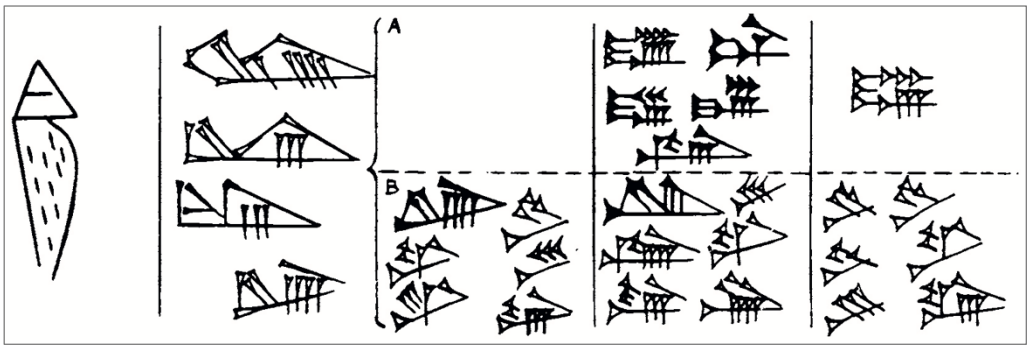


Figure 8: Evolution and development of the cuneiform script

The sign $LU_2$ from the end of the 4th millennium BCE to the end of the 1st millennium BCE[63]

[61] Finkel et al., *Cuneiform*, (2015).

[62] While 'cuneiform' may be used to describe anything wedge-shaped, such as the cuneiform bones in the human foot, the earliest occurrence of the term applied to this script would date to 1818, published in *The Monthly Review*: *"A very interesting appendix to Vol. i. contains a dissertation by G.F. Grotefend on the cuneiform characters of the Persepolitan inscriptions; a name which he has substituted for the more common phrases of nail-headed and arrow-headed (…)"* ('Heeren's Ideas on Nations of the Ancient World', *The Monthly Review* 85, p. 485).

[63] Labat et al., *Manuel d'épigraphie akkadienne*, (1995), p. 151.

The cuneiform script is thus based on one single element, the wedge, resulting from pressing a stylus, typically reed, on a soft surface, typically clay.[64] Cuneiform is also a three-dimensional script. This characteristic not only sets cuneiform apart from other ancient writings, mostly bidimensional, it also offers unique opportunities for palaeographic investigation with features such as depth and angle of impression or the sequence of impression of individual wedges composing a sign.

## Research corpora

Used over three millennia and across territories from Iran to Turkey to transcribe a multitude of languages, the cuneiform script can be as diverse as the cultures that used it across the Ancient Near East. To address the questions of identity and individuality in writing, this research draws on two of the largest corpora available for study, Ur III and Old Assyrian cuneiform, and the contrast they offer. Each corpus is different from the other, whether in terms of geography and chronology, or with regard to the context in which cuneiform writing was used and practiced. On the one hand, Ur III cuneiform represents the institutionalised production of professional scribes at the epicentre of state bureaucracy in Mesopotamia during the Ur III Period in the 21st century BCE. On the other hand, Old Assyrian cuneiform testifies to the practical literacy of merchants trading between Mesopotamia and Anatolia in the 19th century BCE.

While intrinsically different, Ur III and Old Assyrian also present similarities on which this research draws. Both offer the greatest wealth of material available for study in terms of quantity while also being two of the shortest chronological periods in cuneiform history. From the hundred years the Ur III Period lasted, from 2110 to 2003 BCE, more than 120,000 texts are preserved, concentrated over a period of 65 years between ca. 2090 and 2025 BCE [Figure 9].

[64] Although attested on hard materials, such as stone or metal, cuneiform maintained its fundamentals as they were developed on clay.

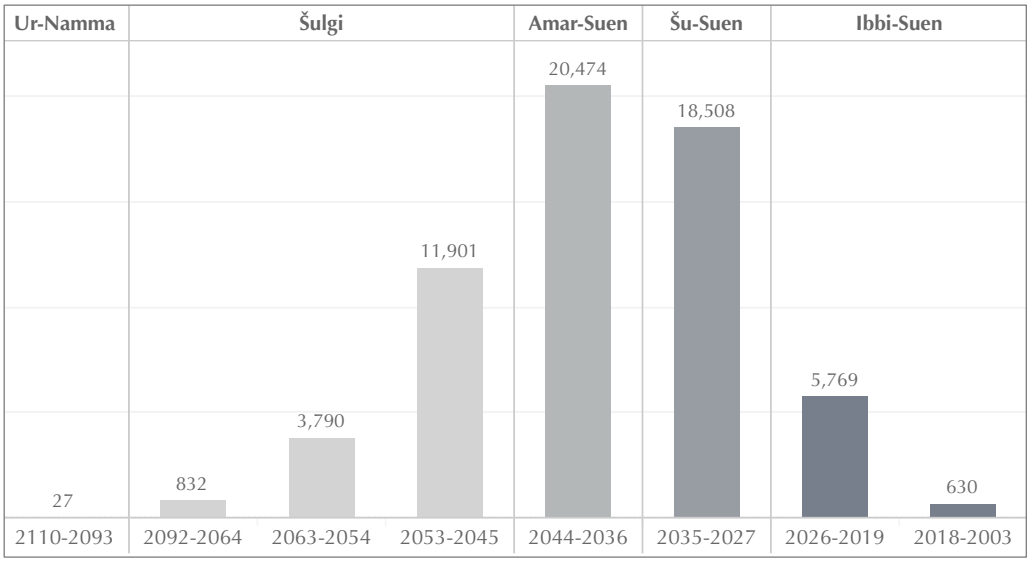


Figure 9: Chronological distribution of preserved Ur III texts[65]

Number of texts (y-axis) over time (x-axis). All dates BCE.

Similarly, the 23,000 Old Assyrian preserved texts are concentrated over a period of 40 years between ca. 1890 and 1850 BCE [Figure 10].

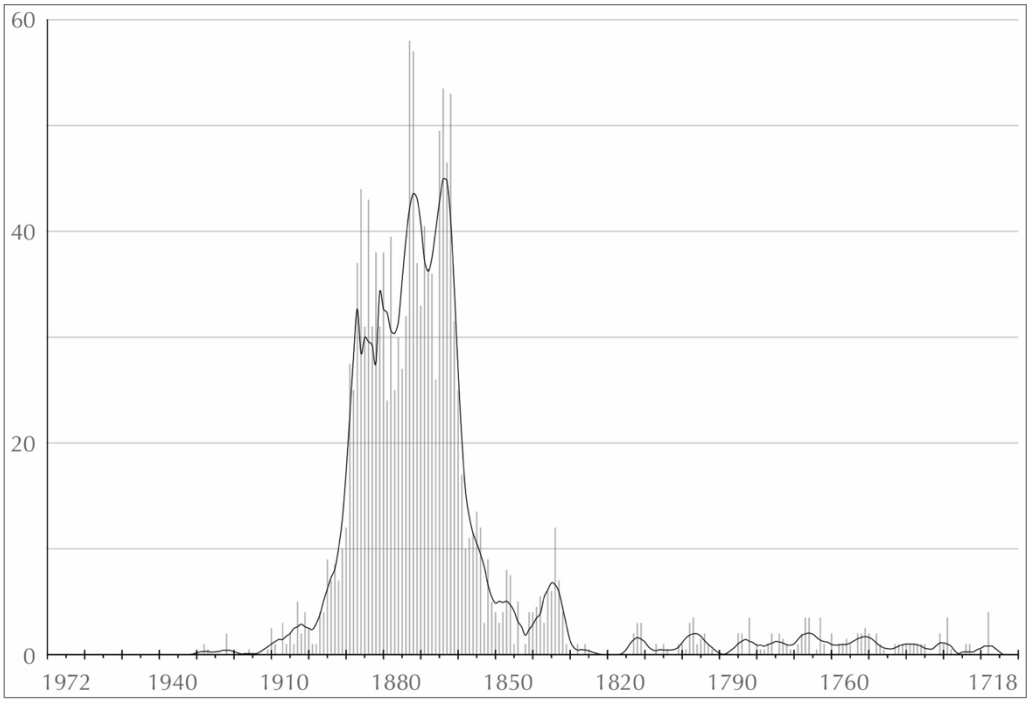


Figure 10: Chronological distribution of preserved Old Assyrian texts[66]

Number of texts (y-axis) over time (x-axis). All dates BCE.

[65] Adapted from Molina, 'Archives and Bookkeeping in Southern Mesopotamia during the Ur III period', *Comptabilités* 8 (2016), p. 7.

[66] Adapted from Barjamovic et al., *Ups and Downs at Kanesh*, (2012), p. 56.

While the Old Assyrian Period historically lasted more than 250 years according to the Kültepe Eponym List, from 1972 to 1718 BCE, the reference site of Kültepe attests of only two levels having yielded cuneiform texts, albeit unequally. Of the 22,500 Old Assyrian texts discovered at Kültepe, ca. 22,000 were found in level II (1920-1835 BCE) and ca. 420 texts in level Ib (1810-1730 BCE).[67]

This research being interested in assessing variation and similarity in writing practices to investigate identity and individuality in cuneiform therefore benefits and draws upon the wealth of Ur III and Old Assyrian available material.

Although the scale of the available tablets to investigate presents an advantage, this may also be hindered by the relatively short time spans covered by each corpus. As Finkelstein noted, while external features displayed by cuneiform tablets may clearly enable the experienced observer to date them, "*it is infinitely more difficult, however, to formulate and express these distinctions with any precision*".[68] From a palaeographic perspective, this matter of facts renders the sequencing of Ur III and Old Assyrian cuneiform arduous, especially when trying to identify progressive and tenuous developments. It may not come as a surprise, therefore, that the detailed palaeographic sequence of either Ur III or Old Assyrian cuneiform is yet to be fully established. However, the nature of the Ur III corpus in particular, mostly dated, is especially suited for palaeographic and diplomatic analysis and sequencing, and to assess variation and similarity in writing over time. That the corpus principally consists of administrative tablets would also be an asset, according to Finkelstein who considered such texts, including letters, especially appropriate for palaeographic purposes, at least in Old Babylonian cuneiform.[69] The development of the cuneiform script as attested in Ur III administrative texts and in Old Assyrian letters is analysed and discussed further in Chapters 3, 4 and 5.

In addition to the contrast between Ur III and Old Assyrian cuneiform with regard to writing context, chronology and geography, each corpus has also inspired different research. On the one hand, Ur III cuneiform has rarely been considered in palaeographic or diplomatic terms, considered as a uniform corpus produced by scribes trained *en masse* in state scribal schools, or, as Veldhuis summarised it: "*Each Ur III document is very carefully executed, with sign forms so standardized that no attempts*

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[67] Michel, 'The Karum Period on the Plateau', in Steadman et al., eds., (2011), p. 319. As of 2011, Old Assyrian texts from Kültepe amounted to 22,506 (Michel, 'Old Assyrian Bibliography 2', *AfO* 52 (2011), p. 416).

[68] Finkelstein, 'The Hammurabi Law Tablet "BE" XXXI 22', *RA* 63 (1969), p. 21 note 2.

[69] *Ibid.*, p. 22 note 2.

*have been made so far to distinguish between individual hands.*"[70] Conversely, Old Assyrian studies have focussed on individual handwriting, with a particular focus on the widespread practical literacy of merchants and their need to communicate for trading purposes rather than state-related or scholarly activities, or, as Larsen put it: "*The system of writing was highly simplified (…) and many of the outrageously hideous private documents constitute clear proof of the amateurishness of their writers.*"[71] Albeit contrasting, these two corpora present interesting characteristics and potential to research identity in cuneiform writing through palaeography and diplomatics.

## Research questions and method

Over its long and diverse history, cuneiform adapted and evolved while maintaining characteristically consistent features. Writing, as a conception as well as a process, is a combination of rules and standards performed by individuals, an ambivalence between norm and variability that this study aims to question, and along with it, the place of the writing hand at its centre. Cuneiform objects also display a variety of sizes, shapes and writing styles, revealing their social, geographical, and chronological contexts of production. This research aims to further our understanding of the material aspects of cuneiform writing beyond its documentary and historical nature, and to investigate identity and individuality in cuneiform in terms of sameness and difference.

To investigate the dynamics of writing between communities of practice and idiosyncrasies, this research therefore asks the following questions:

- What does variation mean?
- What freedom did scribes have to express variations?
- What does variation tell us about the different contexts of writing, and possibly also about scribal education and knowledge transmission?
- How did the practical literacy of merchants differ from the institutional literacy of professional scribes?
- To what extent is it possible to detect identity and/or individuality in cuneiform?
- Did the scribes' choices reflect their identity as members of a group, or their individuality within groups?

Idiosyncrasies and similarities in writing practices are therefore analysed through the study of Ur III and Old Assyrian cuneiform, drawing on the wealth of material that both

[70] Veldhuis, 'Cuneiform: Changes and Developments', in Houston, ed., (2012), p. 12.
[71] Larsen, *The Old Assyrian City-State and its Colonies*, (1976), p. 305.

corpora offer, and benefiting from the contrast they produce with regard to the context in which writing was used and practiced.

The integrated palaeographic and diplomatic approach developed for and applied in this research relies on data collected exclusively on objects inspected in the original.[72] To reflect this integrated aspect of the methodology, the material condition of the tablets had to be considered to ensure that both diplomatic and palaeographic features were accessible on any selected item. In addition to material condition, the availability of both diplomatic and palaeographic features guided the data sampling process since this research investigates writing practices in an all-encompassing approach considering together tablet, layout and script. This integrated methodology is further introduced in Chapter 2.

The resulting dataset consists of 694 tablets, representing 9,292 sign instances, assessed and recorded [Appendix 1]. The data is mixed in nature – categorical and numerical – and inherently not equally distributed between items: diplomatic features are unique – one value for each tablet; palaeographic features are multiple – many values for each tablet. In order to systematise this dataset, palaeographic and diplomatic features were segmented into ca. 30 data points per tablet and 10 data points per sign instance, resulting in ca. 20,000 diplomatic data points and 90,000 palaeographic data points. In order to enable the manipulation and processing of such amounts of data of a mixed nature, a bespoke relational database was developed for this project. To investigate individuality and identity in cuneiform, this research relies on revealing hidden patterns in writing practices by assessing similarities and differences. In statistics studies, Exploratory Data Analysis (EDA) aims to visualise data in order to reveal underlying patterns, whereas Initial Data Analysis (IDA) checks assumptions through the application of statistical models.[73] In order to harness the mixed nature and vast amounts of data points collected for this study, the assembled dataset of palaeographic and diplomatic features was analysed following the guiding principles of the Exploratory Data Analysis model, plotted and clustered using a visualisation software. Resulting data plots are presented throughout this dissertation to illustrate the inherent patterns of similarity or difference within and across cuneiform tablets.

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[72] I would like to thank the staff in the British Museum and the Musée du Louvre for giving me to access their collections and welcoming me in their study rooms.

[73] Upton et al., *A Dictionary of Statistics*, (2008).

## Dissertation outline

The following dissertation unfolds over five chapters, addressing taxonomic questions about palaeographic and diplomatic variation in cuneiform and the methodological approach taken in this dissertation, to further analyse and discuss what variation can mean in Ur III and Old Assyrian cuneiform with regard to individuality and identity.

While it may be assumed that writing can identify individuals and groups, this dissertation first investigates what features of writing may be available to the researcher, and how they may be collected and exploited. Since this research aims to investigate identity and individuality in terms of sameness and difference, corresponding thresholds are first identified by means of benchmarking both Ur III and Old Assyrian corpora, thus providing a backdrop against which to assess similarities and idiosyncrasies.

Chapter 1 – *Palaeographic and diplomatic variation in cuneiform writing* – identifies palaeographic and diplomatic variation observable on cuneiform objects and systematises them into typologies.
Chapter 2 – *Crafting cuneiform: a structural approach to writing practices* – responds to Chapter 1 by presenting a methodology to collect and measure palaeographic and diplomatic variation in cuneiform.
Chapter 3 – *Outline of writing practices in Ur III and Old Assyrian cuneiform* – applies the typological framework and the methodology introduced in Chapters 1 and 2, and analyses benchmark datasets for Ur III and Old Assyrian cuneiform in order to map variation in both research corpora.
Chapter 4 – *Identity and individuality in Ur III cuneiform* – assesses case studies drawn from the Ur III cuneiform production against the benchmark presented in Chapter 3 in order to discuss communities of practice and idiosyncrasies against the assumed professional literacy of Ur III scribes.
Chapter 5 – *Identity and individuality in Old Assyrian cuneiform* – discusses writing practices and the assumed practical literacy of Old Assyrian merchants by analysing palaeographic and diplomatic patterns against chronology, gender and social context in dedicated case studies.

# CHAPTER 1

# PALAEOGRAPHIC AND DIPLOMATIC VARIATION IN CUNEIFORM WRITING

Whether in broad or specialised definitions, writing is essentially threefold, involving an intellectual process and a physical performance to produce a material outcome. In investigating identity in writing, this research considers the study of writing in palaeographic and diplomatic terms. Despite an increasing amount of studies dedicated to cuneiform palaeography and diplomatics, such approach is still in development, especially regarding what features to investigate on cuneiform tablets, not to mention how to record, measure and name them. Furthermore, whether a general methodology could apply throughout cuneiform studies is a question yet to be posed and answered.
In order to address the main research question *What does variation mean?* it is essential to investigate the subsidiary question *What is variation?*, considering the practice of writing as a whole and the cuneiform tablet as its outcome. What are the features that can be observed on inscribed tablets and to what extent do they vary? What information have they yielded already and what more could they potentially reveal?
From the clay cuneiform tablets are made of to the way cuneiform wedges are impressed, this chapter explores the material features of writing in an attempt to catalogue, categorise and name them as a prelude to developing the research methodology in the next chapter. This chapter develops from general to specific, assessing first the text-carrier and the features displayed on clay tablets, to then move on to text layout and the features relating to inscribing clay tablets, to finally investigate the written signs.

## 1.1 Writing medium

At a first glance, the eye may, consciously or unconsciously, assess a cuneiform tablet from its most obvious external characteristics: the nature of its clay, coarse or fine; its colour, reddish or brownish; its silhouette, tall and thin or short and stout. When

Finkelstein pointed out that "*(…) cuneiformists with more or less long exposure to tablets of relatively limited provenance but spanning many centuries have usually been able to distinguish at sight, on the basis of external criteria alone, the relative age of any given tablet within that span*", he might have focussed on palaeographic criteria although such a statement also more broadly encompasses the idea that a tablet can be 'read' before its written signs are.[74] More recently, Charpin also remarked that most Assyriologists do undertake diplomatic analyses, albeit unknowingly.[75] While there are many external features to be observed on any cuneiform tablet before even reading its text, the diplomatic analysis of tablet goes beyond that first observation step and relies on a sound methodology starting with identifying and categorising features readily available to the observer's eye.

### 1.1.1 Material

While cuneiform is attested on a variety of material such as stone, metal and wax, clay has been its preferred medium throughout its three-millennium long history. Although the material does not vary, tablets come in different types of clay. To the naked eye, that difference is expressed in texture and fabric, whereas difference in clay composition is not readily observable and requires scientific analysis to be identified. As regards clay fabrics, there is currently no classification system set for cuneiform tablets and the description of such features, when at all attempted, relies on the observer's direct experience of the material. Much inspiration could be taken from ceramics to devise systematic criteria to describe clay types, such as the Vienna system used to classify Egyptian clays.[76] As regards clay composition, it is mostly concealed from the naked eye, and while inclusions of stones or shells may be visible on the surface of a tablet or in breaks, methods that can reach micro-levels of observation are best suited. Recent projects have already revealed the potential of raw material analysis to inform clay sourcing by cuneiform scribes and in turn to potentially help grouping tablets of uncertain or unknown provenances.[77] Current projects investigating clay compositions

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[74] Finkelstein, 'The Hammurabi Law Tablet "BE" XXXI 22', *RA* 63 (1969), p. 21 note 2.

[75] Charpin, *Lire et écrire à Babylone*, (2008), p. 97.

[76] Bourriau et al., *New Kingdom pottery fabrics*, (2000); Aston, *Egyptian pottery of the late New Kingdom and Third Intermediate Period*, (1996), pp. 1-9. See also Hein et al., 'Automated classification of archaeological ceramic materials by means of texture measures', *Journal of Archaeological Science: Reports* 21 (2018), pp. 921-928.

[77] Goren et al., 'Petrographic Investigation of the Amarna Tablets', *Near Eastern Archaeology* 65 (2002), pp. 196-205; Cartwright et al., 'Investigating Technological and Environmental Evidence from Plant Remains and Molluscs in Cuneiform Tablets', *The British Museum Technical Research Bulletin* 5 (2011), pp. 67-72; Watanabe, 'Tablet Analysis in the Context of Paleoenvironmental Reconstruction', *Scienze dell'Antichità* 17 (2011), pp. 379-391; van Buylaere et al.,

on Old Assyrian tablets promise to shed new light on trading settlements across Anatolia and to corroborate and supplement textual information on the geography of trade in the early 2nd millennium BCE.[78]

### 1.1.2 Colour

Although clay types and composition may not be readily available to the naked eye, the colour of the clay is obvious and tablets come in all shades of red, brown, beige or grey [Figure 11]. Whether the colour of a cuneiform tablet can be as accurately assessed as it is obvious to see is another matter. The factors affecting clay colours are indeed multiple and the observable shade on a tablet is the result of a combination of chemical transformations whose sequence and interaction may be difficult to trace.[79]

Figure 11: Cuneiform tablets in shades of clay colours

Raw material composition may determine clay colour, especially naturally present metal oxides so that, for example, clay charged in manganese (iron) displays reddish shades while lead produces yellowish hues. The process of firing or baking clay also enhances the effects of metal particles in the raw material in addition to changing its

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'"Clay Pit, You Are the Creator of God and Man!": Textual Evidence for the Sources of Raw Clay Used in Mesopotamia', in Nakata et al., eds., (2019).

[78] Stratford, 'Caravans, Cuneiform, and Clay: Beginning a Social Geography of Anatolian Geography during the Old Assyrian period through pXRF Analysis', (March 2015). On the different methods of analysis, especially X-ray fluorescence (XRF) and Neutron Activation Analysis (NAA), see: Sterba et al., 'NAA and XRF Analyzes and Magnetic Susceptibility Measurement of Mesopotamian Cuneiform Tablets', *Scienze dell'Antichità* 17 (2011), pp. 403-450; Müller et al., 'The effect of inter- and intra-source variation: A comparison between WD-XRF and NAA data from Cretan clay deposits', *Journal of Archaeological Science: Reports* 21 (2018), pp. 929-937; Goren et al., 'Non-destructive provenance study of cuneiform tablets using portable X-ray fluorescence (pXRF)', *Journal of Archaeological Science* 38 (2011), pp. 684-696; Tykot, 'Using Nondestructive Portable X-ray Fluorescence Spectrometers on Stone, Ceramics, Metals, and Other Materials in Museums: Advantages and Limitations', *Applied Spectroscopy* 70 (2016), pp. 42-56.

[79] Reade, 'The Manufacture, Evaluation and Conservation of Clay Tablets Inscribed in Cuneiform: Traditional Problems and Solutions', *Iraq* 79 (2017), pp. 163-202.

internal structure. Most cuneiform tablets were not intentionally fired by their primary users, apart from some exceptional documents.[80] Those tablets that were not accidentally baked during a fire outbreak, for example, would have therefore most likely been unearthed raw. Nowadays, raw clay tablets in museums are a rare feature and most were baked either in the field or upon entering the collections or during conservation campaigns.[81] Clay colour may still be a reliable criterion, especially for those tablets and objects fired in Antiquity, and recent projects have remarked on clay colour variation as part of a broader study of the material aspect of cuneiform writing.[82]

### 1.1.3 Manufacture

The making of a tablet really begins when a lump of clay is formed and intended to carry an inscription. Three manufacturing methods are attested for cuneiform tablets: hand moulding; folding or rolling; wrapping a sheet of clay around a core [Figure 12].[83]


Figure 12: Tablet manufacturing techniques

Just like manufacturing techniques can help locate ceramics in time and place, methods of forming cuneiform tablets might also be characteristic, either of a period or even maybe of a scribal tradition. Such claims are, however, yet to be evidenced by a systematic study of tablet manufacturing techniques.

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[80] Veenhof, 'Cuneiform Archives. An Introduction', in Veenhof, ed., (1986), p. 1; Charpin, 'Corrections, ratures, annulations : la pratiques des scribes mésopotamiens', in Bady et al., eds., (1989), p. 60; Taylor et al., 'The Making and Re-Making of Clay Tablets', *Scienze dell'Antichità* (2011), p. 300.

[81] Delougaz, *I. Plano-Convex Bricks and the Methods of Their Employment; II. The Treatment of Clay Tablets in the Field*, (1933); Crawford, 'Processing clay tablets in the field', in Bateman (1966), pp. 1-17.

[82] See, for example, Taylor, 'Form and Formatting of Assyrian Prisms and Cylinders', in Maul et al., eds., (forthcoming).

[83] Taylor, 'Tablets as Artefacts, Scribes as Artisans', in Radner et al., eds., (2011), pp. 11-12. See also Reade, 'The Manufacture, Evaluation and Conservation of Clay Tablets Inscribed in Cuneiform: Traditional Problems and Solutions', *Iraq* 79 (2017), pp. 172-173.

### 1.1.4 Shape and profile

The shape of a cuneiform tablet directly relates to writing practices as it determines the available writing surface and as such, the shape of a tablet equates to the format of a document. There is a great variety of shapes across cuneiform documents over time and place, including non-tablets such as cones and cylinders as well as round tablets [Figure 13]. Nevertheless, quadrangular tablets are the most common throughout. Alongside its shape, the profile of a tablet is amongst the features first observed when picking an object for study and participates in the first impression given to the observer. The profile impression of a tablet is in fact given by the combined profiles of its six faces – obverse, reverse, upper and lower edges, left and right edges – and four corners.

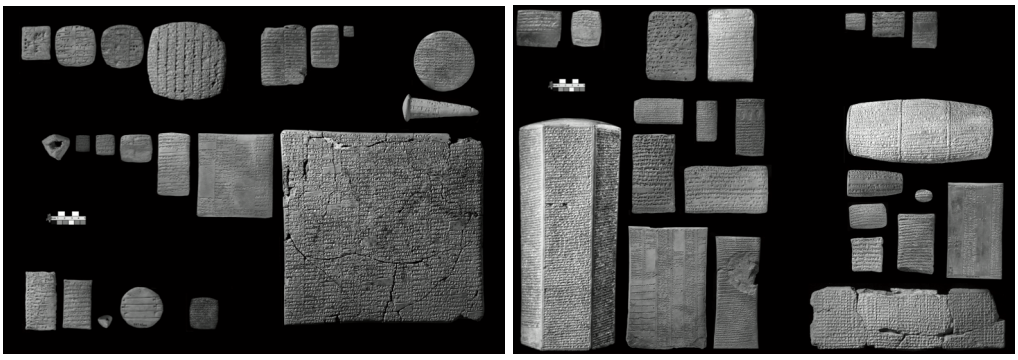

Figure 13: Cuneiform documents shapes and formats[84]

The overall shape of a tablet also relates to writing practices in terms of handling. The characteristically lenticular shape of Old Babylonian school exercises, for example, is thought to have facilitated the practice of both handling and writing by student scribes. Previous studies on document taxonomy have used tablet shapes to reveal corpus- and genre-related formalisms.[85] In the Old Assyrian corpus, it has been suggested that shape and profile may help distinguish between tablets written by Anatolians and those written by Assyrians.[86] The variations in shape observed on Old Babylonian letters from Mari contrasting with the consistent format of letters from the royal chancellery of Larsa – many of which not fully inscribed either – have been interpreted as indications of the writing processes of Old Babylonian scribes: the adapted formats of the Mari letters suggesting a prior knowledge of the text to be written; the consistency of the Larsa letters

[84] Taylor, 'Tablets as Artefacts, Scribes as Artisans', in Radner et al., eds., (2011), pp. 9-10 figures 1.2 a and 1.2 b.

[85] Radner, 'The Relation Between Format and Content of Neo-Assyrian Texts', in Mattila, ed., (1995), pp. 63-77; Waal, 'Chronological Developments in Hittite Scribal Habits and Tablet Shapes', in Devecchi, ed., (2012), pp. 217-227; Jursa, *Neo-Babylonian Legal and Administrative Documents: Typology, Contents, and Archives*, (2005).

[86] Michel, 'The Private Archives from Kaniš Belonging to Anatolians', *AoF* 38 (2011), p. 105, and figure 5.

suggesting the opposite.[87] Beyond its potential to materialise writing processes and modes, tablet format also relates to provenance as suggested by Eidem's study of the Old Babylonian letters from Šušarra, Šubat-Enlil and Mari.[88]

This aspect is especially relevant to the unprovenanced or undocumented tablets at the centre of this research and will be further investigated in the following chapters. Tablet shape will also reveal aspects of the writing process through patterns of symmetry between faces and the interrelation between edge profiles and text layout.

## 1.2 Inscription

Interest in the material aspect of writing has long been present in Assyriology, especially after an increasing number of cuneiform tablets became available for study and posed the question of writing processes. In the early 1900s, archaeologist De Morgan explained the wedge-shaped and rounded marks on Proto-Elamite tablets from Susa by suggesting that scribes used two different styli.[89] Meanwhile, the coincidentally named Albert T. Clay was pairing with the Science Department at Yale University in a bid to measure the depth and angle of impression of cuneiform wedges.[90] Just a decade later, orientalist Breasted studied representations of cuneiform scribes trying to understand how they practiced their craft, held their styli, took notes and handled documents.[91] Even more recently, Biggs envisaged a list of analysis criteria considering the writing stylus, its kind and shape as well as its angle of impression into the clay, the formatting and layout of the text, including the leaning of the script, the vertical script density and spacing as well as the position of the characters in relation to the line rulings.[92]

If diplomatics relates to the writing medium and palaeography to the written signs, features relating to how the signs are inscribed on their medium stand in-between, even, belong to both. Whether it be writing devices, line ruling or script size, inscription features complement and connect both text and text-carrier. Their combination creates the overall impression of an inscription, just as fabric, colour and shape for a tablet. The

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[87] Charpin, *Lire et écrire à Babylone*, (2008), pp. 109-110; Stol, ed., *Letters from Yale*, (1981), p. 126. A prior knowledge of the text length could also suggest writing from copy, thus enabling the addition of the customary epistolary formula (Charpin, *Lire et écrire à Babylone*, (2008), pp. 163-165).

[88] Eidem, 'The Clay They Wrote On: Old Babylonian Letters as Artefacts', in Al-Gailani Werr et al., eds., (2002), pp. 74-81.

[89] de Morgan, 'Note sur les procédés techniques en usage chez les scribes babyloniens', *Recueil de Travaux Relatifs à la Philologie et à l'Archéologie Égyptiennes et Assyriennes* 27 (1905), pp. 234-249 esp. p. 240.

[90] Clay, *Documents from the Temple Archives of Nippur Dated in the Reigns of Cassite Rulers*, (1906).

[91] Breasted, 'The Physical Processes of Writing in the Early Orient and Their Relation to the Origin of the Alphabet', *The American Journal of Semitic Languages and Literatures* 32 (1916), pp. 241-246.

[92] Biggs, 'On Regional Cuneiform Handwritings in Third Millennium Mesopotamia', *OrNS* 42 (1973), p. 40.

following paragraphs present inscription features relating to textual arrangements and writing implements.

### 1.2.1 Mise-en-page

Inscription features dovetail with tablet and sign features. How the text is oriented on a tablet, for instance, complements how the tablet is shaped. In the case of rectangular tablets, shape and orientation combined thus differentiate portrait-oriented from landscape-oriented tablets. Text orientation may be characteristic of a text genre or date. While rectangular tablets across corpora are most commonly portrait-oriented, it can also be the case that text orientation is unrelated to wider trends and may therefore relate to the individual scribe instead, as can be observed in Old Assyrian letters.[93]

Text orientation relates to how the text is arranged on its carrier and as such belongs to text layout in its broad sense of mise-en-page, along with the direction of writing, the sequence of inscription over the writing surface, the alignment of the text as well as columniation. As such, these features are rarely studied individually but rather as the elements of a whole. Textual arrangement features can be especially relevant for the study of early tablets in trying to understand the development of cuneiform writing and its relation to language.[94] A recent study of archaic texts from Ur could thus identify an intermediary period in the development of writing in the Early Dynastic I-II Period in terms of text layout, with tablets showing a combined use of randomly placed strings of signs along with set clusters.[95] Variation in text layout also informs writing practices in later corpora, revealing standardisation and formatting conventions per date or text type and potentially enabling to assign fragments of tablets whose remaining text cannot identify.[96] The potential of text layout variation to reveal conventional patterns is especially relevant to researching identity and individuality in cuneiform and to identifying practices related to time and place as well as idiosyncrasies.

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[93] This point is developed further in the next chapters of this dissertation, especially Chapters 3 and 5.

[94] Green, 'The Construction and Implementation of the Cuneiform Writing System', *Visible Language* 15 (1981), pp. 345-372; Bauer et al., *Mesopotamien: Späturuk-Zeit und Frühdynastische Zeit*, (1998), pp. 56-64.

[95] Lecompte, 'Observations on Diplomatics, Tablet Layout and Cultural Evolution of the Early Third Millennium: The Archaic Texts from Ur', in Balke et al., eds., (2016), pp. 133-164.

[96] Waal, 'Chronological Developments in Hittite Scribal Habits and Tablet Shapes', in Devecchi, ed., (2012), pp. 217-227; Taylor, 'Form and Formatting of Assyrian Prisms and Cylinders', in Maul et al., eds., (forthcoming); Reade, 'The Manufacture, Evaluation and Conservation of Clay Tablets Inscribed in Cuneiform: Traditional Problems and Solutions', *Iraq* 79 (2017), pp. 163-202.

### 1.2.2 Script size and density

The size of the script and how densely it unfolds on a tablet also varies from corpus to corpus. The extremely small script size displayed by some late tablets was colourfully captured by Strindberg, a polymath teaching himself cuneiform in the 1910s: "*And people must have had magnifying glasses built into their eyes, given that they could engrave or press into clay such microscopic signs*".[97] In more practical terms, script size may be referred to as 'module' following the usage in medieval palaeography where it is defined as "*the distance between the base of the* minim *strokes on one line and the base of the* minim *strokes on the next line*".[98] Transposed to cuneiform writing, the module would therefore correspond to the distance between the base of upright wedges on one line and the base of upright wedges on the next line [Figure 14].

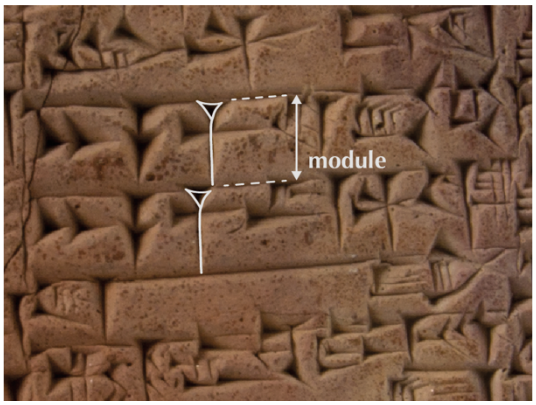


Figure 14: Script size expressed as 'module'

Script size variation across corpora and tablets may depend on multiple and variable factors and may directly relate to tablet size and shape as well as text layout so that comparison between manuscripts may not be relevant to investigate writing practices between groups and individuals. Not only does the size of the script vary between corpora and between tablets, it may also vary per tablet between, for example, obverse and reverse [Figure 15].

[97] As found in Barjamovic, *Assyriological Peripheries, Early Mesopotamian Studies in Scandanavia*, p.43 citing and translating from *Samlade skrifter av August Strindberg* vol. 55, (Stockholm: Bonniers, 1912-25).
[98] Parkes, *Their Hands Before Our Eyes*, (2008), p. 153.

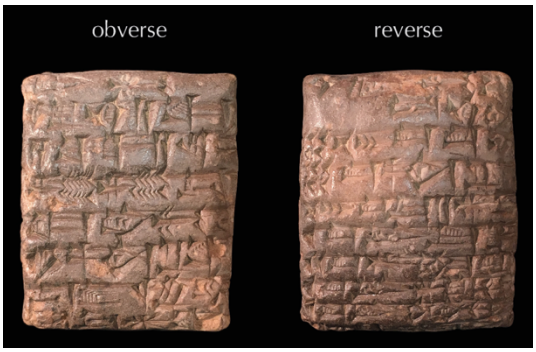


Figure 15: Inconsistent script size on the obverse and the reverse of a tablet

An inconsistent script size may, however, inform the writing process and, in particular, aspects of text planning. A smaller script on the reverse may thus betray a lack of anticipation. It might also reveal the mode of writing and whether the text was inscribed with or without prior knowledge of its content and length, in the same way tablet format may suggest it, as mentioned earlier about the Mari and Larsa letters.

Script size considers the distribution of characters on a vertical axis but may also take into account how the script spreads horizontally. Horizontal script density, or how spaced out or cramped are signs along a line of text, also varies between inscriptions as well as within inscriptions. While horizontal script density relates to the inscription and therefore to diplomatics, it is caused by palaeographic variations. Horizontal script density depends on multiple and variable factors such as the use of logographic or syllabic signs, and the choice of wider or narrower sign forms. In a recent study on Esarhaddon's Succession Treaty, horizontal script density revealed aspects of text production and whether Neo-Assyrian scribes would have produced manuscripts by copy or by dictation.[99]

Script size and density overlap with related inscription features. Horizontal density as such is close to text layout, especially to text alignment, while script size complements line ruling. This overlap and how features can be measured is presented in more details in the next chapter [§2.2.2].

### 1.2.3 Line ruling

Line ruling presents two aspects of inscription features and sits between text layout and writing implement. On the one hand, line ruling participates in framing the text on its carrier either by marking sections or by materialising lines of text to be inscribed. On

[99] Lauinger, 'Neo-Assyrian Scribes, "Esarhaddon's Succession Treaty", and the Dynamics of Textual Mass Production', in Delnero et al., eds., (2015), pp. 299-306.

the other hand, variations in line ruling relate to the writing process and implement in how the rulings are impressed in the clay. In terms of text layout, how line ruling may segregate sections of text varies between corpora and text types as well as within one inscription. Line ruling as an umbrella term also covers multiple usages [Figure 16].
On Ur III administrative texts, for example, two usages can be observed: a line ruling may separate each line of text, or a line ruling may separate units of text regardless of lines. In the latter case, more than one line of text may unfold unruled, usually within the most formulaic sections of the text such as the date.[100]

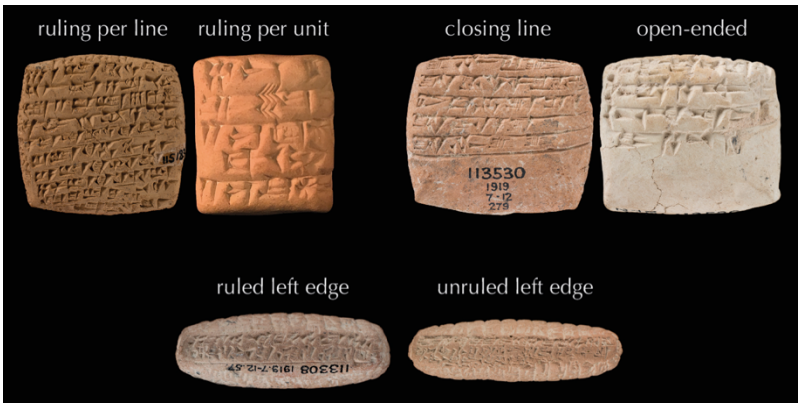


Figure 16: Line ruling usages

Conversely, line rulings on Old Assyrian administrative texts are consistently impressed between each line of text, regardless of text units. It can also be observed that the small edges may or may not be ruled, even if the obverse and reverse are. In addition, when tablets are partially inscribed, a line ruling may or may not underline the last line of text. Finally, line ruling usage also varies between tablets whose left edge is inscribed. The left edge would typically be inscribed after the upper edge and therefore after the tablet has made a full turn, in which case the last line of the upper edge may meet the first line of the obverse. As a result, the text between the upper edge and the obverse may be seamless or partitioned. All such variation in line ruling usage can be observed across corpora and text types and whether patterns can be identified and assigned to groups or individuals is treated in the next chapters of this dissertation [§3.2.1; §5.1.1; §5.1.2; §5.2.1; §5.2.2].

Line ruling may also present variation related to the writing process and implement. Just like signs, rulings would have been made with a stylus although the use of string is also

[100] On ruling practices in Ur III, see also Tsouparopoulou, 'Reflections on Paratextual Markers and Graphic Devices in Ur III Administrative Documents', *Textual Cultures* 8 (2013), pp. 7-9.

attested.[101] Stylus marks can be observed at the beginning of rulings although they are mostly not readily available. When they are, the ruling presents a mark comparable to a wedge head left by the tip of the stylus [Figure 17]. Stylus marks may also be observed inside the ruling, especially if it was made with a reed stylus and the characteristic striations of the reed are preserved in the clay. Variation in line ruling making may be hindered by the signs written over. The distortion of the clay created by the writing implement may thus reveal the order of impression of rulings and signs [Figure 18]. It seems to have been common to impress line ruling and signs as the inscription unfolded on the tablet, i.e. one ruling, one line of signs, one ruling, one line of signs, and so on.

Figure 17: Line rulings impressed with a stylus

Figure 18: Order of impression of line rulings and signs

Line ruling therefore relates to text layout as a framing device and presenting variation of text visual organisation. It also closely relates to writing processes, especially as regards ruling making techniques and writing implements. In addition, line ruling also directly relates to the written signs as a positioning guide. As such, cuneiform signs tend to hang from the ruling although lines of signs may also be found floating between two rulings [Figure 19].

[101] Taylor, 'Tablets as Artefacts, Scribes as Artisans', in Radner et al., eds., (2011), p. 15.

Figure 19: Sign placement with relation to line ruling

Floating between lines (left, upper line) and hanging from upper line (right)

### 1.2.4 Writing implement

Research on writing technology has focussed on the writing stylus that was used to impress cuneiform on clay since the early years of Assyriology.[102] The identification of the shape and material of styli may help understand writing processes and the relation between the writing implement and the positioning of both hand and tablet in the process of writing.[103] With the advent of computer-aided and 3D modelling of cuneiform tablets, current research on cuneiform styli and their effect on written forms are also opening new routes of investigation for the identification of individual, regional and chronological variations in writing [Figure 20].[104]

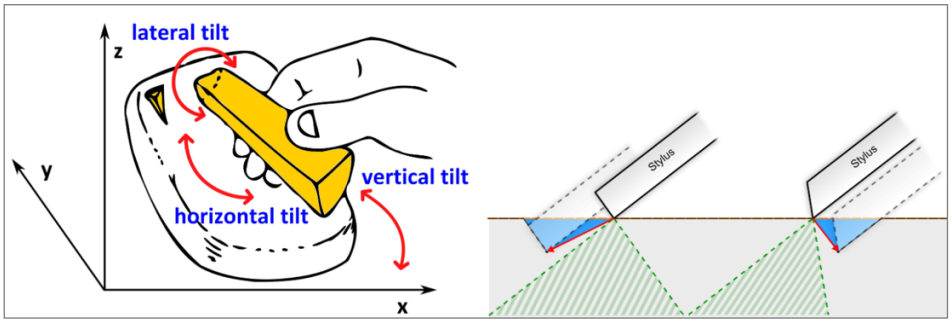


Figure 20: Writing process: stylus, hand and tablet[105]

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[102] Zehnpfund, 'Über Babylonisch-assyrische Tafelschreibung', in 'Über Babylonisch-assyrische Tafelschreibung', (1893), pp. 267-273; de Morgan, 'Note sur les procédés techniques en usage chez les scribes babyloniens', *Recueil de Travaux Relatifs à la Philologie et à l'Archéologie Égyptiennes et Assyriennes* 27 (1905), pp. 234-249; Clay, *Documents from the Temple Archives of Nippur Dated in the Reigns of Cassite Rulers*, (1906); Messerschmidt, 'Zur Technik des Tontafel-Schreibens', *OLZ* 9 (1906), pp. 185-196, 304-312, 372-380; Falkenstein, *Archaische Texte aus Uruk*, (1936).

[103] Powell, 'Three Problems in the History of Cuneiform Writing: Origins, Direction of Script, Literacy', *Visible Language* 15 (1981), pp. 425-433; Cammarosano, 'The Cuneiform Stylus', *Mesopotamia* 49 (2014), pp. 53-90; Bramanti, 'The Cuneiform Stylus. Some Addenda', *Cuneiform Digital Library Notes (CDLN)* (2015), (http://cdli.ucla.edu/pubs/cdln/php/single.php?id=65 - accessed 26/11/2016); Daniels, 'Cuneiform Calligraphy', in Mattila, ed., (1995), p. 83; Ellison, *A Paleographic Study of the Alphabetic Cuneiform Texts from Ras Shamra/Ugarit*, (PhD Dissertation, 2002), pp. 85-141; Saggs, 'The Reed Stylus', *Sumer* 37 (1981), pp. 127-128.

[104] Cammarosano et al., 'Schriftmetrologie des Keils: Dreidimensionale Analyse von Keileindrücken und Handschriften', *WO* 44 (2014), pp. 2-36; Cammarosano, 'The Cuneiform Stylus', *Mesopotamia* 49 (2014), pp. 53-90; Cammarosano, '3D-Joins und Schriftmetrologie. A Quantitative Approach to Cuneiform Palaeography', in Devecchi et al., eds., (2015), pp. 145-186; Bramanti, 'The Cuneiform Stylus. Some Addenda', *Cuneiform Digital Library Notes (CDLN)* (2015), (http://cdli.ucla.edu/pubs/cdln/php/single.php?id=65 - accessed 26/11/2016).

[105] Cammarosano, '3D-Joins und Schriftmetrologie. A Quantitative Approach to Cuneiform Palaeography', in Devecchi et al., eds., (2015), p. 157 figure 5.

Striations inside cuneiform wedges and line ruling identifies the writing tool as a reed stylus, relating to the vernacular name of the tool as 'writing reed', Sumerian gi-dub-ba and Akkadian *qan ṭuppim*. It is estimated that only 10% to 20% of tablets would have preserved a visible reed pattern, which can also be hindered by the size of the script and the condition of the tablet.[106] When preserved, the reed pattern typically appears on the left inner face of a cuneiform wedge and the lower inner face of a line ruling [Figure 21]. The variation in reed pattern is also helpful to identify wedge types and, in turn, sign variants. Clay and reed were plentiful in the Sumerian marshlands and the development of cuneiform would naturally have made use of these resources. There is also archaeological and textual evidence of styli made from other materials such as bone or metal.[107] The Anatolian climate has been suggested as a possible factor of the consistent absence of reed patterns in Hittite cuneiform.[108] However, the Old Assyrian corpus, predating the Hittite, shows an even distribution between tablets where the reed pattern is preserved and clearly observable, and tablets where it is positively absent.[109]

Figure 21: Reed pattern visible inside cuneiform imprints

## 1.3 Written signs

### 1.3.1 Sign formation and wedge order

A cuneiform sign is composed of individual wedges impressed one by one as the writing progresses. The internal sequence of impressing wedges within signs, henceforth referred to as 'wedge order', has been used as a means to delimiting writing practices along geographical and chronological axes.[110] Synchronic and diachronic studies of

[106] Powell, 'Three Problems in the History of Cuneiform Writing: Origins, Direction of Script, Literacy', *Visible Language* 15 (1981), pp. 425-433.
[107] Cammarosano, 'The Cuneiform Stylus', *Mesopotamia* 49 (2014), pp. 71-72.
[108] *Ibid.*, pp. 72-73; Wilhelm, 'Remarks on the Hittite Cuneiform Script', in Singer, ed., (2010), pp. 256, 260.
[109] Data relating to reed patterns was collected on Old Assyrian tablets studied for this research but not further exploited in this dissertation.
[110] Biggs, 'On Regional Cuneiform Handwritings in Third Millennium Mesopotamia', *OrNS* 42 (1973), pp. 40-41 note 9.

wedge order have revealed its relevance in understanding the evolution of the cuneiform script and its standardisation process as well as the study of individual handwriting.[111] The cuneiform writing sequence was first noticed by Assyriologists in the early 20th century in relation to research on the writing process and stylus.[112] Methodologies of investigating the wedge order, relying on the observation of clay distortion, have mainly been developed by Sallaberger and more recently by Taylor.[113]

*schematic representation of the movement of clay caused by the pressure of the stylus* | *the inner* winkelhaken *have moved the clay over the ridge of the lower horizontal wedge* | *original position of the lower horizontal wedge*

Figure 22: Effects of clay distortion on the sign LUGAL

Considering the three-dimensional nature of the cuneiform script, the writing sequence is primarily observable from the distortion of the clay surrounding individual wedges, on the principle that the force exerted by the writing stylus upon penetration into the clay pushes the latter away [Figure 22]. The distortion is more visible around the deeper part of the wedge, the head, where the pressure of the writing tool is more important than around the tail. This enables the identification of the writing sequence regardless of the depth of impression of wedges. Although Daniels described the identification of the writing sequence of wedges as "*the easiest feature of cuneiform writing to discover and describe*", in practice, its discoverability relies on different factors, such as the arrangement of the wedges or the wetness of the clay at the time of impression.[114] Wedge order is often more visible on 'sticky' tablets, i.e. when the wetness of the clay made it more prone to distortion. Overall, not every tablet shows traces of the wedge order, and it is estimated that one in three tablets can be subject to such observations.[115]

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[111] Sallaberger, 'Sign List: Palaeography and Syllabary', in Ismail et al., eds., (1996), pp. 33-67; Bramanti, 'Rethinking the Writing Space: Anatomy of Some Early Dynastic Signs', in Devecchi et al., eds., (2015), pp. 31-48; Taylor, 'Wedge Order in Cuneiform: A Preliminary Survey', in Devecchi et al., eds., (2015), pp. 1-30.

[112] de Morgan, 'Note sur les procédés techniques en usage chez les scribes babyloniens', *Recueil de Travaux Relatifs à la Philologie et à l'Archéologie Égyptiennes et Assyriennes* 27 (1905), p. 245; Messerschmidt, 'Zur Technik des Tontafel-Schreibens', *OLZ* 9 (1906), pp. 185-196, 304-312, 372-380.

[113] Sallaberger, 'Sign List: Palaeography and Syllabary', in Ismail et al., eds., (1996), pp. 33-67; Taylor, 'Wedge Order in Cuneiform: A Preliminary Survey', in Devecchi et al., eds., (2015), pp. 1-30 The 'Cuneiform Digital Palaeography Project' (University of Birmingham) used to have a webpage dedicated to the subject (offline at the time of writing, February 2019).

[114] Daniels, 'Cuneiform Calligraphy', in Mattila, ed., (1995), pp. 84-85.

[115] Taylor, 'Wedge Order in Cuneiform: A Preliminary Survey', in Devecchi et al., eds., (2015), p. 2.

### 1.3.2 Cuneiform wedge types

The cuneiform writing system is based on one single element, the wedge, resulting from pressing a stylus on soft clay. On hard materials, such as stone or metal, the cuneiform wedge, whether chiselled or incised, maintains its fundamentals as they were developed on clay. The combination of cuneiform wedges begets a cuneiform sign, in the same way as combined pen strokes form a letter. The following section presents the variations observed on cuneiform wedges as the elementary components of the script, as a preliminary to the analysis of variation found in cuneiform signs.

Cuneiform signs are formed by combining wedges, whether of similar or of different types, so that, for example, TAB 𒌋 is made of two parallel horizontal wedges and MAŠ 𒈬 is formed of a vertical and a horizontal wedge crossing at an angle. Although horizontal and vertical wedges are easily identified, the distinction between other types of wedge, neither horizontal nor vertical, appears less straightforward. This is at least the case in cuneiform sign lists, developed from the beginnings of Assyriology to classify the hundreds of signs and the many more values they can each carry.

Cuneiform sign lists have generally adopted a classification system of signs according to the type of their leading wedge. This system thus lists all the signs starting with, for example, one leading horizontal, followed by all the signs starting with two leading horizontals, then three, and so forth, until all combinations are exhausted. Then moving on to the next type of wedge in the same fashion. This system is traditionally adopted by general and corpus-specific lists alike.

Published in 1874, de Chossat's *Classification des Caractères Cunéiformes Babyloniens et Ninivites* took a singularly different approach to wedge typology. De Chossat indeed considers four types of wedge: *clou*, *coin*, *crochet*, *trait*.[116]

Significantly, these types are not determined by their orientation. Rather they are defined by their appearance: the *clou* is a long wedge, composed of a head and a tail; the *coin* is formed of a wedge head only; the *crochet* is a corner-wedge, different from the *coin* in angle of impression and width; the *trait* is formed of a wedge tail only. As such, the *clou* can be "*droit, horizontal ou oblique*", and so can be the *coin*, the *crochet* and the *trait*.[117] De Chossat does not enunciate whether his system implies that the *coin* and the

[116] de Chossat, *Classification des caractères cunéiformes babyloniens et ninivites*, (1874), pp. I-III.
[117] *Ibid.*, pp. I-II.

*crochet* are two distinct wedge types or variations of the same type. Although both may look like a *winkelhaken* to the modern observer, the merits of distinguishing the wider (*crochet*) from the narrower one (*clou*), as outlined by De Chossat, are nowadays applied to modern cuneiform palaeography, especially quantitative digital approaches considering wedges in terms also of depth of impression and angle of incidence.[118]

Published less than 20 years after cuneiform had officially been deciphered, the approach taken by de Chossat envisaged cuneiform characters as graphic shapes more than written forms. This approach to wedge typology was not taken up by subsequent authors, and two decades later, cuneiform lists such as Amiaud and Méchineau's or Brünnow's had adopted the classification system per leading wedge that would prevail throughout modern scholarship, based on wedge types defined by their orientation rather than their appearance.[119] The two main general cuneiform sign lists, Labat and MesZL, differ in the number of wedge types they each consider. Labat considers four types: vertical, horizontal, diagonal, *winkelhaken*.[120] Borger distinguishes five types in MesZL by differentiating two types of diagonals: horizontal, top-to-bottom diagonal (downwards), bottom-to-top diagonal (upwards), *winkelhaken*, vertical.[121] Corpus-specific sign lists sometimes also differ. Mittermayer's list of Old Babylonian signs, for example, distinguishes four types of wedge: vertical, horizontal, diagonal, *winkelhaken*.[122] However, the four-wedge typology is most commonly adopted throughout cuneiform sign lists.[123] Most lists do not clearly state the typology they follow, although it can be deduced from the classification system they adopt. Those lists that enunciate what types of wedge existed, and how many they are based on, do so as an introduction and a justification to the classification work they present [Figure 23].

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[118] Cammarosano, '3D-Joins und Schriftmetrologie. A Quantitative Approach to Cuneiform Palaeography', in Devecchi et al., eds., (2015), pp. 145-186.

[119] Amiaud et al., *Tableau comparé des écritures babylonienne et assyrienne archaïques et modernes avec classement des signes d'après leur forme archaïque*, (1887); Brünnow, *A Classified List of All Simple and Compound Cuneiform Ideographs Occurring in the Texts Hitherto Published with Their Assyro-Babylonian Equivalents, Phonetic Values, Etc*, (1889).

[120] Otherwise known as corner-wedge, the *winkelhaken* is commonly referred to by its German name. In this dissertation, *winkelhaken* is invariable and written in lowercase italic.

[121] Labat et al., *Manuel d'épigraphie akkadienne*, (1995), p. 5; Borger, *MesZL*, (2004), p. 1.

[122] Mittermayer, *Altbabylonische Zeichenliste*, (2006), p. ix.

[123] For instance Amiaud et al., *Tableau comparé des écritures babylonienne et assyrienne archaïques et modernes avec classement des signes d'après leur forme archaïque*, (1887); Fossey, *Manuel d'Assyriologie. 1. Fouilles, écriture, langues, littérature, géographie, histoire, religion, institutions, art*, (1904); Ellermeier, *Sumerisches Glossar*, (1979), 2 See also 'Sign Lists', *CDLI Wiki* (2016), (http://cdli.ox.ac.uk/wiki/doku.php?id=sign_lists - accessed 27/02/2019).

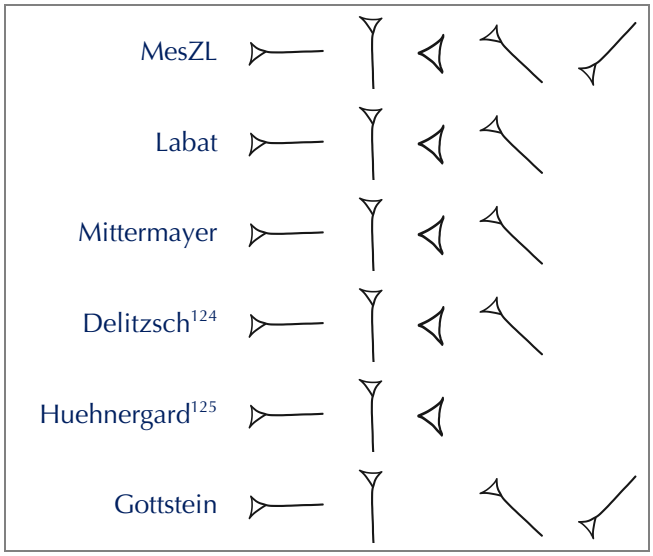


Figure 23: Typologies of cuneiform wedges as enunciated in selected sign lists

Whether three, four, or five elementary wedges are considered, all are determined according to their direction; all bar the *winkelhaken*, whose characteristic tail-less shape is determining. The Gottstein system, applied to Middle- and Neo-Assyrian cuneiform, differs from all other sign lists in this regard in that although it also considers four types, it only takes directional wedges into account, so that the *winkelhaken* is not a type per se, but a sub-type of the diagonal wedge.[126]

The many typologies developed by Assyriologists commonly adopt the four-wedge system. These typologies, however, do not consider, nor do they apply to, the earliest phases of cuneiform writing.

The Early Dynastic script from Fara, ancient Šuruppak, for instance, used other types of wedge, defined by their orientation [Figure 24]: the leftward horizontal wedge (with its head pointing to the right) (b); the downward leftward diagonal (with its head pointing to the right) (c); the upward vertical (with its head pointing down) (a). The upward vertical was only ever used in a few signs, mainly ŠU and DA, two signs related through their early pictographic representations of a hand and an arm respectively.[127] The upward vertical is also attested, for instance, in the early forms of LIL and of TU.[128] By

[124] Delitzsch, *Assyrische Lesestücke mit den Elementen der Grammatik und Vollständigem Glossar*, (1912), p. 2.

[125] Huehnergard, *A Grammar of Akkadian*, (1997), p. 563.

[126] Gottstein et al., *Cuneiform spotlight of the Neo- and Middle-Assyrian signs*, (2014); Panayotov, 'The Gottstein System Implemented on a Digital Middle and Neo-Assyrian Palaeography', *Cuneiform Digital Library Notes (CDLN)* (2015), (http://cdli.ucla.edu/pubs/cdln/php/single.php?id=70 - accessed 26/09/2016).

[127] On the diachronic evolution of ŠU and DA, see Fossey, *Manuel d'Assyriologie. 2. Évolution des cunéiformes*, (1926), pp. 712-716 and 662-673.

[128] LIL (LAK 94), e.g. AO 13343 r.iii.1; TU (LAK 141), e.g. VAT 12761 o.v.24.

the end of the 3rd millennium BCE, with the Ur III Period, the leftward horizontal and the upward vertical had become very rarely used.[129] The downward leftward diagonal, however, would be maintained during the Ur III Period in signs such as KI, NA or $ŠA_3$, before straightening up to become a vertical wedge with the advent of the 2nd millennium BCE.

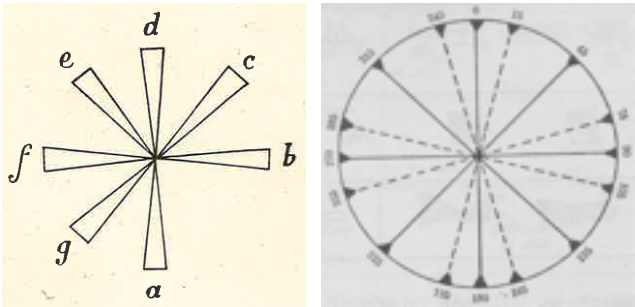


Figure 24: Typologies of cuneiform wedges according to direction

Synchronic typology (Early Dynastic corpus from Fara) (left)[130]

Diachronic typology (right)[131]

Having discussed how Assyriologists envisage cuneiform wedges, it seems relevant and necessary to address how insiders, the cuneiform scribes, would have envisaged their own writing system. One of the main sources available to approach such considerations is the lexical corpus, bearing witness to how scribes would have learned and practiced cuneiform writing.[132] Composed of various lists and compilations of the usages, forms and readings of cuneiform signs, the lexical corpus would have been used by scribes throughout their scholarship. Directly related to the lexical tradition, the practice tablets, what Veldhuis calls 'signs exercises' since they are the "*simple drills in properly handling tablet and stylus and drawing correct sign forms*", give us an insight on how scribes might have contemplated cuneiform and its types of wedge [Figure 25].[133]

[129] Deimel, *LAK*, (1922), p. 12; Edzard, 'Keilschrift', *RlA* 5 (1980), pp. 551-552.

[130] Deimel, *LAK*, (1922), p. 12.

[131] Edzard, 'Keilschrift', *RlA* 5 (1980), p. 551.

[132] On the cuneiform lexical corpus, see Veldhuis, *History of the Cuneiform Lexical Tradition*, (2014); Civil, *The Lexical Texts in the Schøyen Collection*, (2010); 'Digital Corpus of Cuneiform Lexical Texts', *oracc.museum.upenn.edu* (n.d.), (http://oracc.museum.upenn.edu/dcclt/index.html - accessed 12/02/2019).

[133] Veldhuis, *History of the Cuneiform Lexical Tradition*, (2014), p. 144.

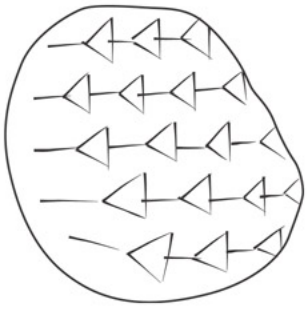

Figure 25: Practice tablet (Archaic, Ur)

(BM 128990)[134]

A group of Old Babylonian tablets found in Tell ed-Der, ancient Sippar-Amnanum, displays repeated impressions of DIŠ, AŠ and U, representing three types of wedge: vertical, horizontal, *winkelhaken*.[135] These tablets were used to practice handling the stylus as well as to introduce the scribe to the elementary graphic components of cuneiform prior to learning the signs themselves.[136] The tablet IM 80023, for instance, is inscribed with lines of elementary wedges – vertical, horizontal, *winkelhaken* – followed by extracts from the exercise known as Syllable Alphabet A, a list of signs grouped by graphic features designed for wedge combination practice [Figure 26].[137] Interestingly, the Syllable Alphabet A extracts include signs with diagonal wedges, such as PAB 𒁹, whereas the diagonal type is not included in the lines of elementary wedges that precede.

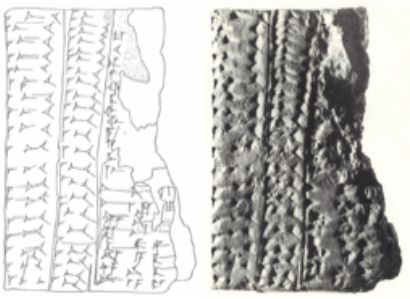

Figure 26: Practice tablet (Old Babylonian, Sippar)

(IM 80023)

[134] Nissen et al., *Archaic Bookkeeping*, (1993), pp. 105-106. See also Bauer et al., *Mesopotamien: Späturuk-Zeit und Frühdynastische Zeit*, (1998), pp. 84-85.

[135] Tablets 1 to 5 in Tanret, *Per aspera ad astra*, (2002), pp. 25-30.

[136] *Ibid.*, p. 27.

[137] The Syllable Alphabet A is an "*Elementary exercise dealing with the simplest cuneiform signs grouped by contrasting pairs (rarely triplets, or combinations of pairs). The contrast is purely graphic, e.g. KAK vs. NI, with no attention whatsoever paid to phonology or semantics (...) This exercise cannot be considered strictly Sumerian or Akkadian; it involves only the learning of the material arrangement of the cuneiform wedges previous to any application of the signs to either language.*" (Civil, *The Lexical Texts in the Schøyen Collection*, (2010), p. 280).

Another group of Old Babylonian tablets from Nuffar, ancient Nippur, also suggests that the practice of writing began with mastering the impression of elementary cuneiform wedges before introducing piecemeal increasingly complex wedge combinations.[138] As such, CBS 6043 and UM 29-15-846 display exclusive impressions of vertical wedges and *winkelhaken* respectively, while CBS 10517 introduces combinations of verticals [Figure 27 and Figure 28].

Figure 27: Practice tablets: simple wedge exercise (Old Babylonian, Nippur)
(left: CBS 6043; right: UM 29-15-846)

Figure 28: Practice tablets: wedge combination exercise
(Old Babylonian, Nippur)
(CBS 10517)

In Neo-Babylonian times, the first phase of elementary education was devoted to mastering the impression of elementary wedges on clay, followed by learning and copying syllabaries and various lists of names and objects.[139] The large square multi-column tablets used by pupils would begin with lines of DIŠ, AŠ and U, followed by combinations of wedges such as A, a sign made of one vertical sided to a broken vertical.[140] Even more relevant to determining ancient wedge typology are the practice

[138] Tinney, 'Texts, Tablets, and Teaching. Scribal Education in Nippur and Ur', *Expedition* 40 (1998), pp. 40-50.

[139] Gesche, *Schulunterricht in Babylonien im ersten Jahrtausend v. Chr*, (2001), pp. 44-48. Lists of personal and divine names, lists of object names, extracts from the Ura thematic list (Hh, or $Ur_5$-ra = *hubullu*, or HAR-ra = *hubullu*). See also Veldhuis, 'On the Curriculum of the Neo-Babylonian School', *JAOS* 123 (2003), pp. 627-633.

[140] Type 1c in Gesche, *Schulunterricht in Babylonien im ersten Jahrtausend v. Chr*, (2001), pp. 44-49 esp. p. 48. See, for example, tablets from the Yale Babylonian Collection (e.g. EAH 197) and from the British Museum (e.g. BM 72827, BM 68632, BM 50620). The sequence DIŠ-AŠ-U is referred to as '1.BAD' by Gesche.

tablets inscribed with lines of single wedges, dedicated to stylus practice and elementary wedges.[141] BM 66657, for example, is a small rectangular tablet (2.9 x 4 cm) inscribed with randomly distributed wedges and would have been a stylus holding exercise [Figure 29, left]. BM 65680, on the other hand, is a large square multi-column tablet (13 x 12 cm) with repeating lines of DIŠ, AŠ and U [Figure 29, right].

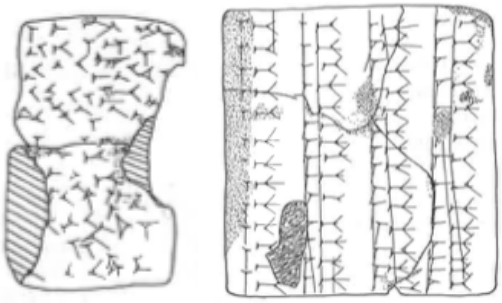

Figure 29: Practice tablets: elementary wedges (Neo-Babylonian)
(left: BM 66657; right: BM 65680)

In Old Babylonian Sippar and Nippur as well as in the Neo-Babylonian tradition, the practice tablets used for cuneiform scholarship attest of three elementary cuneiform wedges – vertical DIŠ, horizontal AŠ, *winkelhaken* U – whose many possible combinations and repetitions create cuneiform signs.

The many approaches taken to categorise cuneiform wedges, ancient and modern, stem from the need to understand cuneiform as a graphic system, whether it be towards deciphering its signs, learning to write them, or, in the case of palaeography, describing them. The many categories of cuneiform wedges each serve one of these objectives. For ancient scribes, three elementary wedges are attested on beginners practice tablets, so that mastering the impression of the vertical, the horizontal and the corner-wedge (*winkelhaken*) would have been the first step towards becoming a professional writer. After all, these three wedges are also stand-alone signs – the vertical wedge renders the sign DIŠ, the horizontal renders the sign AŠ, and the *winkelhaken* renders the sign U – whereas the diagonal wedge is not. For modern scholars, three (vertical, horizontal, *winkelhaken*), four (vertical, horizontal, diagonal, *winkelhaken*) or five wedges (vertical, horizontal, diagonal up, diagonal down, *winkelhaken*), have been considered. Most sign lists, however, are based on typologies of four wedges, including the *winkelhaken*.

[141] Type 3 in Gesche, *Schulunterricht in Babylonien im ersten Jahrtausend v. Chr*, (2001), p. 207.

Cuneiform wedge typology is rarely considered in modern scholarship outside of sign lists, and they remain the main sources available to address questions pertaining to the elementary components of the cuneiform script. Recently, however, Cammarosano enunciated a typology of wedges designed with cuneiform palaeography in mind.[142] Considering four types of wedge – vertical, horizontal, diagonal, *winkelhaken* –, Cammarosano's categories meet those traditionally found in sign lists.

The practice tablets record the approach scribes took to cuneiform writing, as insiders, and give us an insight into how they would analyse their own writing system. Their lines of single wedges show three types – vertical 𒁹, horizontal 𒁺, *winkelhaken* 𒁻 – repeated until the hand mastered how to form them properly. This 3-wedge typology combines types determined by orientation (vertical and horizontal) and by shape (*winkelhaken*). The 5-wedge typology developed in MesZL – vertical, horizontal, *winkelhaken*, downward diagonal, upward diagonal – distinguishes types of wedge based on the two-dimensional imprint left by the stylus in the clay.
It seems, then, that typologies of cuneiform wedges are bound to the purpose they pursue, whether focused on praxis or on analysis. Furthermore, categories of cuneiform wedge are also dependent on considering the cause as well as the effect of writing: the cause is the stylus impressing the clay and the position of the writing hand; the effect is the graphic imprint left in the clay. If considering the latter, a diagonal and a *winkelhaken* often do look different, namely in that the diagonal has a tail that the *winkelhaken* has not. If considering the former, however, the hand adopts the same position to write a diagonal and a *winkelhaken*.

### 1.3.3 Cuneiform signs

Cuneiform developed from signs where the pictographic origin was still visible to more and more abstracted forms. The sign UŠ, for instance, saw its characteristic *winkelhaken* gradually rise, from 𒌋 in the Old Babylonian Period to 𒌋 in Neo-Assyrian times. Similarly, the sign MA evolved from an open box outline to a stack of three horizontal wedges connected by a vertical [Figure 30]. The main systematic study of the graphic

[142] Cammarosano, '3D-Joins und Schriftmetrologie. A Quantitative Approach to Cuneiform Palaeography', in Devecchi et al., eds., (2015), p. 151.

development of cuneiform is Fossey's *Évolution des Cunéiformes*.[143] There are few other works like Fossey's and although almost 100 years old, it remains the most comprehensive diachronic palaeographic list to date.[144]

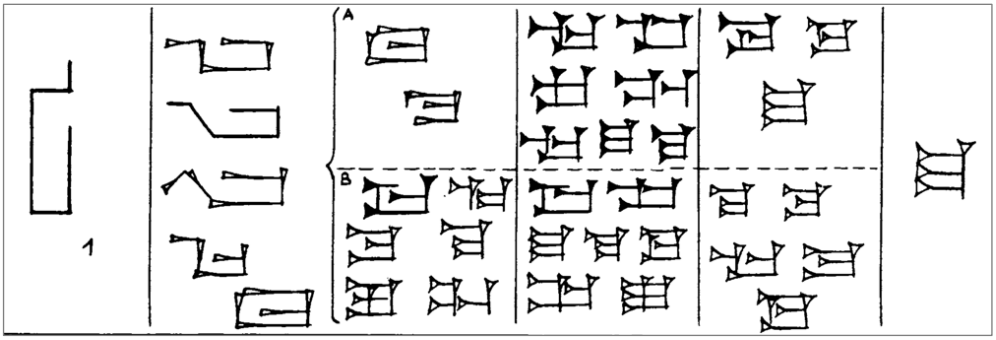


Figure 30: Graphic evolution of the sign MA

From the end of the 4th millennium BCE to the end of the 1st millennium BCE[145]

Ancient scribes also used palaeographic lists, a type of lexical texts presenting signs declined in different graphic variants. The preparation and use of such lists in the scribal curriculum would have had the double purpose of training scribes in reading ancient inscriptions and enabling them to produce archaic-looking inscriptions.[146] The Palaeographic Syllabary A, for instance, derived from the Old Babylonian Syllabary A sign list, is attested from the Late Bronze Age (Middle Babylonian and Middle Assyrian) to Neo-Assyrian [Figure 31].[147] The Middle Assyrian exemplar lists signs variants in their Old Babylonian form, whereas the Neo-Assyrian manuscript displays archaic graphic variants.[148]

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[143] Fossey, *Manuel d'Assyriologie. 1. Fouilles, écriture, langues, littérature, géographie, histoire, religion, institutions, art*, (1904). *Évolution des Cunéiformes*, published in 1926, forms the second volume of Fossey's *Manuel*.

[144] See, for instance, Barton, *The Origin and Development of Babylonian Writing*, (1913), pp. 1-138.

[145] Labat et al., *Manuel d'épigraphie akkadienne*, (1995), p. 156.

[146] Meissner, Bruno, 'Ein assyrisches Lehrbuch der Paläographie', *AfO* 4 (1927), p. 71.

[147] See MSL 3 §5.1.3. On manuscripts from Emar, Ugarit and Assur, see Roche-Hawley, 'On the Palaeographic "Syllabary A" in the Late Bronze Age', in Devecchi, ed., (2012), pp. 127-146 See also Michel, 'Une liste paléographique de signes cunéiformes. Quand les scribes assyriens s'intéressaient aux écritures anciennes...', in Wateau, ed., (2011), pp. 245-257.

[148] The archaic variants on the Neo-Assyrian exemplar have been interpreted as fanciful (Michel, 'Une liste paléographique de signes cunéiformes. Quand les scribes assyriens s'intéressaient aux écritures anciennes...', in Wateau, ed., (2011), pp. 245-257).

Figure 31: Two manuscripts of the Palaeographic Syllabary A
(left: Middle Assyrian, Ist A 29; right: Neo-Assyrian, K 8520 + IM 59264)

In parallel with variation related to the evolution of the cuneiform script over time, variations and variants are also found within corpora. As such, a distinction can often be drawn between monumental and cursive script, or with chancellery script. The correspondence of Kiru, daughter of the king of Mari Zimri-Lim in the 18th century BCE and married at the court of Ilanṣura, reveals a shift in style from elaborately written tablets to grossly shaped and inscribed ones. According to Durand, this shift would mark the fall from power of Kiru in Ilanṣura and her losing access to the scribes of the court, thus resorting to local scribes or writing her own letters.[149] Graphic variants of cuneiform have also been related to the language the script is transcribing, between tablets from a same provenance and date. Documents from the sukkalmah Ṣiwe-Palar-Khuppak, from early 2nd millennium BCE Elam, use different variants whether they are written in Akkadian or in Elamite.[150] According to Steve, Elamite documents display more archaic forms.[151]

A variant is an alternative form of a given sign. Yet, an alternative can only be appreciated as a deviation from a convention, or as one of two or more options. Benefiting from the standardisation process operated throughout the development of the cuneiform system, synchronic sign lists, such as Labat or MesZL, use the Neo-Assyrian version of the sign as an umbrella form.[152] Earlier sign lists adopt various approaches and, while Fossey also sorted signs according to their Neo-Assyrian forms, Amiaud and

[149] Durand, 'Trois études sur Mari', *MARI* 3 (1984), p. 167.
[150] Farber, 'Eine elamische Inschrift aus der 1. Hälfte des 2. Jahrtausends', *ZA* 64 (1974), pp. 74-86; de Mecquenem, *Épigraphie proto-élamite*, (1949), pp. 151-167.
[151] Steve, *Syllabaire Elamite : histoire et paléographie*, (1992), p. 5.
[152] Fossey, *Manuel d'Assyriologie. 1. Fouilles, écriture, langues, littérature, géographie, histoire, religion, institutions, art*, (1904); Labat et al., *Manuel d'épigraphie akkadienne*, (1995); Borger, *MesZL*, (2004).

Méchineau distinguished earlier signs from later forms, sorting their sign list by Early Dynastic or Lagaš II forms before presenting their Babylonian (Old Babylonian to Neo-Babylonian) and Assyrian (Neo-Assyrian).[153] In their attempt at portraying the evolution of cuneiform over time, Amiaud and Méchineau even included a column of reconstructed archaic forms of cuneiform signs deduced from their later Babylonian and Assyrian examples.

Diachronic sign lists dealing with earlier periods face the issue of sorting signs in different ways. In Deimel's *Keilschrift-Palaeographie*, variants are separately listed opposite their corresponding Neo-Assyrian forms and including variants presenting different outlines or wedge count. Conversely, Rosengarten's list of Sargonic signs from Lagaš does not consider a standard form as such. Rather, variants of a recognised sign are listed together in a same column. As Rosengarten explains: *"(...) il arrive que la présence d'un clou de plus ou de moins, que l'orientation ou l'inclinaison d'un ou de plusieurs clous, que la prolongation de quelques traits changent l'aspect d'un signe. Comment donc choisir avec pertinence le signe type ?"*[154] Furthermore, Rosengarten's list refers to Neo-Assyrian forms, as does Smith's Old Assyrian list of 'Cappadocian' forms, whereas the recent 'Late Babylonian Sign' initiative (LaBaSi) assembles sign forms under handcopies of "*abstracted standard graphemes of the signs as attested in texts from the first millennium*".[155]

### 1.3.4 Typology of written signs and their components

The primary typology applied in this dissertation serves a descriptive purpose and considers four primary types of wedge based on the data collected for this study and determined by orientation and shape [Figure 32].


Figure 32: Primary typology of cuneiform wedge

[153] Amiaud et al., *Tableau comparé des écritures babylonienne et assyrienne archaïques et modernes avec classement des signes d'après leur forme archaïque*, (1887).

[154] Rosengarten, *Répertoire Commenté des Signes Présargoniques Sumériens de Lagaš*, (1967), p. 4.

[155] Smith, ed., *CCT 1*, (1921), plates A-B; Pirngruber, 'LaBaSi: Late Babylonian Sign: About', (n.d.), (https://labasi.eos.arz.oeaw.ac.at/ - accessed 25/11/2016).

Three of them are determined by their orientation: vertical, horizontal, diagonal; and one is determined by its shape: *winkelhaken*. The diagonal type is defined by what it is not: neither a vertical nor a horizontal.

The orientation of a wedge is determined by the direction towards which the tail of the wedge points, thus forming sub-types, either downward or upward, and leftward or rightward [Figure 33]. Leftward downward diagonals are not common in the Ur III and Old Assyrian corpora on which this research focusses, and mainly used in Ur III signs descending from an archaic diamond shape such as KI, NA or $ŠA_3$.

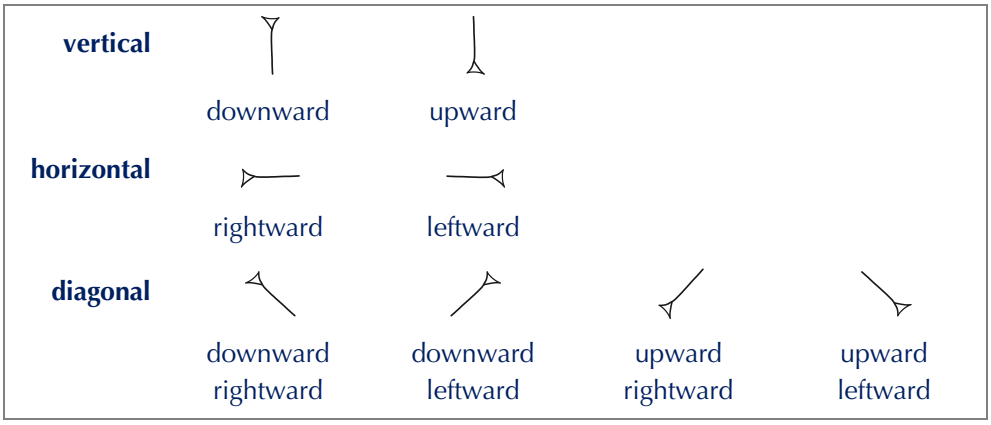


Figure 33: Cuneiform wedge types according to direction

The tilting movement of the writing hand or the angle of incidence of the stylus on the tablet impacts the resulting wedge shape. Modern typologies describe the two-dimensional figure of a wedge as it appears on the writing plan. Intrinsically three-dimensional, cuneiform wedges possess inner components corresponding to the negative print left by the writing stylus below the tablet surface, like an inverted pyramid. Any wedge imprint is indeed composed of the same elements as a pyramid. Three vertices delimit the base of the pyramid and a fourth one stands at its apex. Three outer edges are segments interlinking the base vertices, and three inner edges connect each base's vertex to the apex. Finally, three outer angles are at the intersection of each pair of base segments, and three inner angles evolve around the apex [Figure 34].

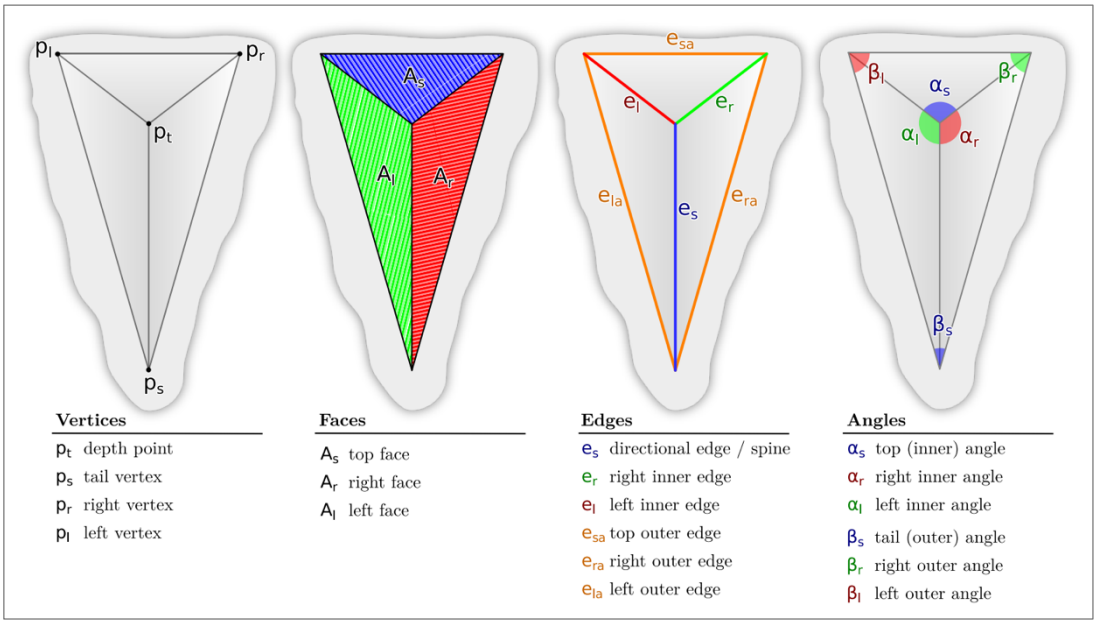


Figure 34: Terminology for primary wedge components[156]

Although no cuneiform imprint is a perfectly symmetrical pyramid, the effects produced in the clay by the way the stylus is being handled range from minuscule and invisible to shape changing. As such, shading wedges characteristically display dissymmetrical left and right faces, and a correspondingly wide aperture angle inclination. If the angle is wide enough, shading wedges are visible to the naked eye, albeit solely measurable by computer-aided tools.

Whilst vertical and diagonal are primary types of wedge, the slanting wedge is a variation of the former. Slanting happens on an intended vertical when the spine, the segment connecting the tail vertex to the apex or depth point, is not perpendicular to the writing line. Although slanting and diagonal wedges are morphologically alike, they are typologically distinct. The slanting wedge is a deviated vertical and a vertical wedge is intended to be perpendicular to its writing line, whereas the diagonal wedge is purposely not. For instance, the rightmost wedge in KI evolved from being a diagonal in the earliest stages of the script  to becoming a vertical in latest developments  . Conversely, the rightmost wedge in MA consistently remained a vertical throughout the evolution of the cuneiform system, from  to  . What is more, the slanting wedge usually appears within a generally slanting handwriting.

[156] Cammarosano et al., 'Terminology: Components of the Wedge', *Cuneiform: 3D-Joins und Schriftmetrologie Projekt* (2013), (http://www.cuneiform.de/uploads/media/terminology.pdf - accessed 03/12/2016).

The primary types of wedge as presented above display variations affecting the shape and positioning of the wedge onto and into the writing surface and from which two variants emerge. There are parallels in Latin palaeography, for instance, where a typological distinction is drawn between morphologically similar strokes: "*Shading means that a script has contrasting thick and thin strokes. It results, at least in writing as distinguished from lettering, either from a change of direction in the path of a broad-nibbed writing instrument or from a change in pressure on a flexible writing instrument. (…) This angle, the result of several variables, should be distinguished from a script's slant, which refers to the departure from the vertical, either to the left or to the right, of a script's minims and especially of its ascenders and descenders*".[157] Even though three-dimensional cuneiform does not compare to two-dimensional penmanship, such distinction of variants between shading and slanting strokes applies to cuneiform wedge and is relevant to the present study.

The primary types of wedge presented in the previous section are determined by their appearance on the writing surface. The following paragraphs further develop typologies of cuneiform wedge according to factors other than their appearance, such as the function wedges can assume in the formation of a sign, how they can be associated and combined, and how they interact.

As elements of a whole, cuneiform wedges each have specific functions in the formation of a sign. These functions can either be assumed by one element alone or by a combination of two or more. Furthermore, each cuneiform wedge can assume one or many functions within a same sign. Such functional typology of wedges forms the basis of the typology of cuneiform sign variants presented below, as it enables the identification of variable factors upon which variants are determined [Appendix 4]. Connecting and character-spanning wedges respectively meet and cross other wedges composing a sign and are most commonly found to be vertical or horizontal wedges. The vertical wedges in RU 𒊩 all stand on the horizontal wedge which effectively connects them. While in ŠU 𒋗, the connecting function is taken on by the vertical wedge, against which the horizontals abut. As for the horizontal wedge in NUN 𒉡, it is character-spanning as it crosses the other inner verticals composing the sign. In AŠ$_2$ 𒀭, this function is assumed by the vertical wedge running across the stack of

[157] John, 'Latin Palaeography', in Powell, ed., (1992), p. 8.

horizontals. The distinction between connecting and character-spanning is induced by the interaction of the wedges, whether meeting or crossing. When connecting and character-spanning wedges are horizontals, they frequently also assume the function of basal wedge, as is the case in RU where the horizontal wedge stands in lower position and carries, so to speak, the other wedges.

In the formation of cuneiform signs, a distinction can be drawn between structural and minor wedges. Structural wedges form the frame of a sign, with such function comparable to that of the beams of a building so that they cannot be omitted without compromising the formation of a sign. Conversely, minor wedges do not shape the outline of a sign, nor do they support its frame. For instance, the horizontals and *winkelhaken* or diagonals in BI are all structural wedges, framing its characteristic outline. The inner verticals in BI are, however, minor wedges since their quantity may vary without impeding the identification of the sign. Conversely, all wedges in GAG, NI and IR are structural and none are minor since the distinction between these three very similar signs is based on the number of inner vertical wedges. Although this applies at the upper theoretical level, it is not unusual to observe instances of IR written with two vertical wedges instead of three. The function of cuneiform wedges can also be taken on by a combination of elements rather than only one component wedge. This is the case in box signs, where wedges are arranged so as to delimit a container and are as such functionally distinct from the contained wedges. The sign LU, for instance, is composed of four container wedges and two contained wedges. Early forms of MA are also composed of container and contained wedges.

In parallel to the above typology of component wedges based on their function within signs, associations and combinations of clusters are found to be recurring in the formation of cuneiform signs. The vertical pile of horizontal wedges in ŠU is a horizontal stack. The horizontal alignment of vertical wedges in LUH is a vertical sequence. $U_2$, for instance, is composed of two overlapping combinations of wedges: a horizontal stack and a vertical sequence. Wedges of the same type overlapping on a same axis can form broken horizontals, like in HAL and I, or broken verticals, like in ZA. ŠE is formed of a cluster of *winkelhaken* that are both stacked and in sequence. Depending on signs, the *winkelhaken* cluster can be leading as in IN or trailing as in GAB. Finally, the way wedges interact with each other

in the formation of a sign also calls for labelling. Three main types of interaction can be observed on cuneiform signs and are considered in the present study. Wedges can be crossing one another, as is the case with the vertical and horizontal in MAŠ 𒈬. In ŠU 𒋗, the horizontals and vertical are meeting. The *winkelhaken*, vertical and horizontal in IGI 𒅎 are abutting or meeting, as are the vertical and horizontal in LAL 𒃲.

Considering cuneiform signs and their component wedges in typological terms therefore forms the basis of palaeographic variant identification. Within each group, variants are determined against their respective outlines, themselves identified according to their major variables. There is a limited set of variables which can be observed in sign instances and this study considers wedge count, wedge placement, wedge type and, to a lesser extent, wedge order.

Wedge count can be understood in relative as well as in absolute terms. The wedge count in certain clusters is not precisely set and can thus vary from one instance to another. The variants observable on ŠE, whether as a standalone sign or a component cluster, are, for instance, determined by the relative quantity of *winkelhaken* and not the exact number, so that one form is characterised by two equal rows of *winkelhaken*, ranging from four to seven, whereas another variant is typically formed with two unequal rows of four to seven and two *winkelhaken* respectively. However, wedge count also participates in distinguishing similar forms of different signs, such as KI and DI, and, in this case, a minimum number of wedges is required.[158] The basic outline of a form, i.e. the figure shaped by structural wedges varies between sign instances and multiple outlines can coexist in the same corpus, even within the same inscription. The ŠA sign, for instance, may either display two diagonals or two *winkelhaken* on the right-hand side. The variable factor distinguishing between the two variants is therefore wedge type. Another variable factor may be wedge placement. In the UŠ sign for instance, the *winkelhaken* can be placed at the right tip of the lower horizontal or just below the lower horizontal. Here, the variation in positioning the wedges does not affect the basic outline of the form. Finally, the number of wedges impressed per form, as well as per element within a form, can be a distinctive feature. The BI sign, for example, can

[158] Biggs, 'On Regional Cuneiform Handwritings in Third Millennium Mesopotamia', *OrNS* 42 (1973), p. 42; Daniels, 'Cuneiform Calligraphy', in Mattila, ed., (1995), p. 86.

either be found in its simple expression, four wedges distributed as two horizontals and two *winkelhaken*, or in a more elaborate form, eight wedges distributed as two horizontals, two *winkelhaken* and four verticals. This applies to the two corpora studied in this research, Ur III and Old Assyrian cuneiform.

Variants are thus determined against these variables, of which one usually prevails in affecting the outline of a form; it can also be a combination of variables but rarely more than two [Figure 35]. This approach to palaeographic variations and typology will be further developed in the next chapter, which also contends that palaeographic variants should also be envisaged in terms of structure and morphology.

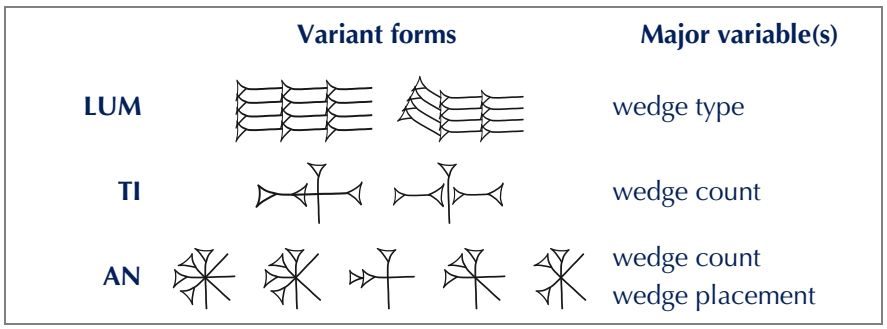


Figure 35: Examples of variable factors determining variant sign forms

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Identifying and describing all that can be observed on an artefact has always been the challenge of the palaeographer and the diplomatics scholar, in all fields. The present work draws from the direct observation of cuneiform tablets as primary sources, as well as on the existing literature on tablet, sign and wedge description, as applied throughout the history of cuneiform studies. The approach taken for this work considers two main questions. What graphic and artefactual features are displayed on cuneiform documents? To what extent can they underpin the fundamental questions posed by this research on individuality and identity in cuneiform?

The present typology of cuneiform variations has been developed for the study of Ur III and Old Assyrian cuneiform. While special attention is consequently given to these, this typology is not limited to them since examples are drawn from across cuneiform corpora. Also, this typology focusses on cuneiform as written on clay tablets and does not encompass cuneiform on other material such as stone or metal, although most of it

could probably be applied to such cuneiform. This research considers diplomatics as the study of all features of tablet and inscription and palaeography as the study of cuneiform signs in form and construction and relies on a combined approach to investigate writing practices and how they can relate to identity and individuality in cuneiform. Veenhof's statement that "*such features are also helpful to the present-day Assyriologist, who would derive much profit from a well-illustrated, diachronic* Urkundenlehre *of cuneiform tablets, which is a serious desideratum*" remains relevant.[159] Given the length and breadth of cuneiform documents, such endeavour can only be achieved by combining efforts. This research hopes to contribute by identifying, assessing and categorising the many features available to the observer's eye on a cuneiform tablet based on the two corpora under study [Appendix 4].

This chapter aimed at defining and naming the hierarchy of elements underpinning the assessment and analysis of inscribed objects, from the largest to the smallest feature, from tablet profile to cuneiform wedge alone. In the next chapter, features relating to tablet, inscription and signs as observed on Ur III and Old Assyrian tablets are assessed in terms of measurability and exploitability and the resulting methodology applied in two benchmark study samples.

[159] Veenhof, 'Cuneiform Archives. An Introduction', in Veenhof, ed., (1986), p. 15.

# CHAPTER 2

# CRAFTING CUNEIFORM: A STRUCTURAL APPROACH TO WRITING PRACTICES

While there are many material features to be observed on any cuneiform tablet, palaeographic and diplomatic analysis goes beyond this first observation step and relies on a sound methodology in order to categorise those features readily observable and how to collect, record and measure them before analysing and interpreting them. Proceeding from the overview of cuneiform palaeographic and diplomatic features outlined in Chapter 1, the present chapter contends that not all features, however readily observable, can be systematically recorded, measured and exploited. Focussing on the two study corpora selected for this research, this chapter considers the characteristics of Ur III and Old Assyrian cuneiform and outlines the methodology specifically developed to analyse both corpora in the light of identity and individuality in cuneiform. The following paragraphs present a methodology developed for, and applied to, the study of writing practices in the Ur III and Old Assyrian periods by means of an innovative approach to palaeographic and diplomatic variation. One aspect of this approach is that it could theoretically be adapted to any cuneiform corpus. In order to outline the methodology developed for this research on identity and individuality, this chapter first considers the specificities of Ur III and Old Assyrian cuneiform, how they may address the research topic and how they may shape and impact data collection and sampling. It then proceeds to devise the methodological framework of this research and considers the diplomatic and palaeographic features observed on two sample groups, one for each corpus.

## 2.1 Research corpora, collections and samples

Approaching identity and individuality in cuneiform in terms of material features rests on interpreting those available features and what they could mean to understand writing practices at group and individual level.

Cuneiform records form the largest documentation available for ancient times, covering almost all genres from receipts to hymns and contracts to letters. Within that breadth, this research concentrates on two corpora whose characteristics and traits offer an a priori contrasting insight into writing practices around 2,000 BCE. The Ur III and Old Assyrian corpora are amongst the two largest available for study, with about 120,000 and 23,000 published documents respectively.[160] Ur III and Old Assyrian cuneiform have otherwise little in common and are thought to represent two almost opposed writing contexts. On the one hand, the formal and institutional Ur III bureaucracy; on the other, the informal and entrepreneurial Old Assyrian trade. The wealth of documents each corpus offers and the context each presumably represents both constitute an exceptional material for the study of writing practices at group and individual level. Considering the many palaeographic and diplomatic features available overviewed in Chapter 1, the following paragraphs present the characteristics of each corpus and how they may shape data sampling and collection protocols applied in this research.

### 2.1.1 Ur III

Ruling over Mesopotamia and beyond at the end of the 3rd millennium BCE, the Third Dynasty of Ur (2110-2003 BCE) is traditionally perceived as a centralised bureaucratic system relying on large-scale administrative structures.[161] With more than 120,000 texts preserved, often dated, the scale of the Ur III corpus offers unparalleled possibilities for the study of writing practices in the 21st century BCE.

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[160] Molina, 'The Corpus of Neo-Sumerian Tablets: An Overview', in Johnson et al., eds., (2008), pp. 19-53; Michel, *Old Assyrian Bibliography*, (2003).

[161] Steinkeller, 'The Administrative and Economic Organization of the Ur III State: The Core and the Periphery', in Gibson et al., eds., (1991), pp. 15-33; Garfinkle, 'Was the Ur III State Bureaucratic? Patrimonialism and Bureaucracy in the Ur III Period', in Johnson et al., eds., (2008), pp. 55-61; Johnson et al., eds., *The Growth of an Early State in Mesopotamia: Studies in Ur III Administration*, (2008); Sallaberger et al., *Mesopotamien: Akkade-Zeit und Ur III-Zeit*, (1999), pt. 2; Civil, 'Ur III Bureaucracy: Quantitative Aspects', in Biggs et al., eds., (1991), pp. 35-44.

Previous research on Ur III has focussed on understanding administrative and economic structures and how they may relate to state organisation.[162] The administrative texts constituting the bulk of the Ur III corpus have served individual studies on various aspects of craft production and work administration, covering labour hierarchies, services and trade organisation, animal husbandry, or administration and bookkeeping.[163] Ur III scholarship has also focussed on power structures, especially the dynamics between central and provincial government.[164] This research benefits from such studies as they provide a background to investigate writing practices as well as a starting point to sample the vast Ur III corpus. However, there remain gaps in scholarship which, coupled with the large volume of available material, constrain and shape the sampling of Ur III tablets for the study of writing practices.

Unlike Old Assyrian studies, there has been little focus on Ur III prosopography and onomastics, thus limiting the possibilities of investigating scribal hands by sampling tablets based on names or personal networks, although there is a handful of monographs dedicated to the topic, supplemented by articles, scattered comments in other studies or name indices in text publications.[165] There is no comprehensive typology of Ur III texts, which may reasonably be justified by the amount of material to categorise as much as the variation between sites and collections. Most individual studies therefore tend to adopt categorisations adapted to their specific topics and dossiers while general resources favour the categorisation per text type.[166] The focus of the existing scholarship on the administrative structures of Ur III and the power dynamics of the state through

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[162] Garfinkle et al., eds., *From the 21st Century B.C. to the 21st Century A.D.*, (2013); Johnson et al., eds., *The Growth of an Early State in Mesopotamia: Studies in Ur III Administration*, (2008); Michalowski, ed., *On the Third Dynasty of Ur*, (2008).

[163] For an overview of Ur III scholarship, see 'State of Research', *CDLI Wiki* (2008), (http://cdli.ox.ac.uk/wiki/doku.php?id=ur_iii_state_of_research - accessed 18/06/2018), and for a detailed list of published texts, see Sigrist et al., *The Comprehensive Catalogue of Published Ur III Tablets*, (1991); Sallaberger et al., *Mesopotamien: Akkade-Zeit und Ur III-Zeit*, (1999), pp. 351-363; Garcia-Ventura, 'Ur III Studies: Bibliography 1997-2014', *Studia Orientalia Electronica* 3 (2015), pp. 22-47.

[164] Garfinkle, 'The Third Dynasty of Ur and the Limits of State Power in Early Mesopotamia', in Garfinkle et al., eds., (2013), pp. 153-167; Michalowski, 'Networks of Authority and Power in Ur III Times', in Garfinkle et al., eds., (2013), pp. 169-205; Steinkeller, 'The Administrative and Economic Organization of the Ur III State: The Core and the Periphery', in Gibson et al., eds., (1991), pp. 15-33.

[165] One recent study, for instance, addresses power hierarchies based on personal names: Yanli et al., 'The Names of the Leaders and Diplomats of Marhaši and Related Men in the Ur III Dynasty', *CDLJ* 2017:1 (2017). On onomastics, see, for example, Huber, *Die Personennamen in den Keilschrifturkunden : aus der Zeit der Könige von Ur und Nisin*, (1907); Limet, *L'Anthroponymie sumérienne dans les documents de la 3e dynastie d'Ur*, (1968); Di Vito, *Studies in Third Millennium Sumerian and Akkadian Personal Names: The Designation and Conception of the Personal God*, (1993). On prosopography, see, for example, Dahl, *The Ruling Family of Ur III Umma*, (2007); Tsouparopoulou, *The Ur III Seals Impressed on Documents from Puzriš-Dagan (Drehem)*, (2015).

[166] Categorisation per subject matter includes, for example: Snell, 'The Lager Texts: Transliteration, Translation, and Notes', *ASJ* 11 (1989), pp. 155-224; mixed categorisation per subject matter and transaction type includes, for instance: Notizia, *Testi amministrativi Neo-Sumerici da Girsu nel British Museum (BM 98119-BM 98240)*, (2006); general categorisation per transaction or document type includes, for example: Sallaberger et al., *Mesopotamien: Akkade-Zeit und Ur III-Zeit*, (1999), pp. 211-227 and the online Database of Neo-Sumerian Texts (BDTNS).

mainly individual studies along with the lack of a general prosopography and multiple text typologies shape the way this research may navigate the vast Ur III corpus and sample it. Individual studies reconstructing dossiers and archives are therefore a much reliable resource to scale down the corpus into manageable units. In fact, the case studies presented in Chapter 4 relating to identity in Ur III cuneiform were selected from dossiers reconstructed after previous studies, covering altogether different typologies between subject-matters and document types.

The tablets produced during the Ur III Period have been extensively studied for the content they carry but seldom for their materiality. Mentions of their palaeographic and diplomatic features are too often restricted to footnotes and the only sign list dedicated to Ur III dates back to 1935.[167] Although this gap in scholarship may justify the undertaking of the present research, the lack of dedicated palaeographic or diplomatic studies of Ur III cuneiform does not provide it with a backdrop against which its results may be assessed or contextualised.

As mentioned in the Introduction, cuneiform palaeography and diplomatics have only recently developed as specialised disciplines and this might have played some part in the shortcomings of Ur III scholarship on the topic. It might also be that the nature of the Ur III corpus and how it is perceived have not encouraged research down the palaeographic or diplomatic avenues. The Ur III corpus is of a mostly administrative nature and texts tend to be dated following the regnal calendar. The chronology of the kings of Ur is well enough documented to reconstruct the chronology of the period, even though some aspects remain unclear.[168] Ur III texts span a relatively short period compared to other cuneiform corpora. Preserved dated texts are, however, unevenly distributed over time with very few texts dated to Ur-Namma and three times less texts dated to Ibbi-Suen than to Šu-Suen.[169] That being so, the available material spans a little less than the 100 years the rule of the kings of Ur lasted. It may therefore be the case that palaeography, primarily being a dating method in cuneiform studies, might have appeared irrelevant for a corpus of mostly dated texts, covering a short time span and

[167] A concise sign list for the Neo-Sumerian Period was recently published in D'Agostino et al.'s new teaching handbook of Sumerian (D'Agostino et al., *La lingua dei Sumeri*, (2019), pp. 299-319).
[168] The chronology of the Ur III Period was recently re-assessed in Sallaberger et al., *Associated Regional Chronologies for the Ancient Near East and the Eastern Mediterranean. 3: History and Philology*, (2015).
[169] On recently published new Ur-Namma texts, see Hallo et al., 'New Texts from the Reign of Ur-Namma', in Michalowski, ed., (2008), pp. 53-62.

from a period with a well-documented chronology. Although palaeography may not have been used as a dating method to establish the palaeographic sequence of the Ur III Period, it has punctually been applied to the corpus, especially with regard to orthography and the relation between sign form and sign use.[170] Such studies make careful observations on sign forms. They are not, however, fully-fledged palaeographic studies applied to the Ur III corpus as a whole.

However large and historically well-documented, the Ur III corpus is also limited by the distribution of the source material across few sites and by the lack of archaeological context.[171]

Most collections preserving Ur III tablets were formed from unprovenanced material in the late 19th and early 20th century.[172] When they were formally excavated – namely at Ur in the 1920s – the available archaeological documentation did not record detailed information about their find context.[173] This research is mainly based on the collections hosted in the British Museum, whose distribution mirrors the characteristics enunciated above. The Ur III tablets there are mostly administrative texts, spanning reigns from Šulgi to Ibbi-Suen and representing four main sites (three southern: Tello, ancient Girsu; Jokha, ancient Umma; Tell Muqayyar, ancient Ur; one northern: Drehem, ancient Puzriš Dagan).

The mass of available material may potentially be an asset for the study of Ur III cuneiform; it may also make it hardly manageable. The gap in Ur III palaeography and diplomatics deprives the research of comparative material and is addressed in the following sections and the next chapter by creating a benchmark sample. This benchmark aims at developing a methodology to approach cuneiform materiality and

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[170] Steinkeller, 'Studies in Third Millennium Palaeography, 1: Signs TIL and BAD', *ZA* 71 (1981), pp. 19-28; Steinkeller, 'Studies in Third Millennium Paleography 2. Signs ŠEN and ALAL', *OrAnt* 20 (1981), pp. 243-249; Steinkeller, 'Studies in Third Millennium Paleography 2. Signs ŠEN and ALAL: Addendum', *OrAnt* 23 (1981), pp. 39-41; Watson, ed., *Catalogue of cuneiform tablets in Birmingham City Museum. Vol.1, Neo-Sumerian texts from Drehem*, (1986), pp. 79-85; Steinkeller, 'Studies in Third Millennium Paleography 3. Sign DARA4', *Studi Epigrafici e Linguistici sul Vicino Oriente Antico (SEL)* 6 (1989), pp. 3-7; Yoshikawa, 'A Note on Stylus', *ASJ* 12 (1990), pp. 356-357; Steinkeller, 'Studies in Third Millennium Paleography, 4: Sign KIŠ', *ZA* 94 (2004), pp. 175-185; Veldhuis, 'Orthography and Politics: adda, "carcass" and kur$_9$, "to enter"', in Michalowski, ed., (2008), pp. 223-229.

[171] According to Molina, 27 sites have been identified as the source of Ur III texts (Molina, 'Archives and Bookkeeping in Southern Mesopotamia during the Ur III period', *Comptabilités* 8 (2016), p. 8).

[172] Molina, 'The Corpus of Neo-Sumerian Tablets: An Overview', in Johnson et al., eds., (2008), pp. 19-53; Verderame, 'Rassam's Activities at Tello (1879) and the Earliest Acquisition of Neo-Sumerian Tablets in the British Museum', in Michalowski, ed., (2008), pp. 231-244.

[173] Current excavations are yielding more material with context, not studied in this research, which will potentially shed new light on historical collections.

at outlining aspects of Ur III writing practices. Since the overarching methodology developed for this research applies to both research corpora, with adaptations to the characteristics of either Ur III or Old Assyrian cuneiform, the resulting sampling protocols and benchmarks will be jointly presented hereinafter.

### 2.1.2 Old Assyrian

Like Ur III, the Old Assyrian corpus is also one of the largest available for study. Dating to the 19th and 18th centuries BCE, the 23,000 Old Assyrian texts published to this day span a relatively short period of approximately 50 years, according to dated texts and prosopography.[174] Unlike Ur III, however, the Old Assyrian Period has often been portrayed as a time of private entrepreneurship on a backdrop of long-distance trade between Anatolia and Assyria. Given the almost exclusive business nature of the documentation, in the form of letters and debt notes, legal documents and private contracts, and the scarcity of school texts, the Old Assyrian corpus is thought to have been produced by non-professional writers, whether settled in Assur and Kaneš or travelling between trading posts in Anatolia.[175] The extent of the available material and its presumed non-professional writing context therefore provide this research with a corpus potentially rich in variations to be analysed. The Old Assyrian corpus also offers a contrasting example to the Ur III texts considered in this research.

Until official excavations began on the site of Kültepe in 1948, the Old Assyrian corpus had mostly been known from a collection of ca. 5,000 unprovenanced documents, mainly acquired from the Istanbul art markets and dispersed throughout American and European museums, as well as from some ca. 1,000 tablets informally excavated at Kültepe in the 1920s. Before then, the presumed Anatolian origins of the tablets inspired two archaeological endeavours on the site of Kültepe – a French team led by Chantre in 1893-1894 and a German team led by Grothe and Winckler in 1906-1907 – neither of which yielded the much hoped-for Old Assyrian material. The identification of Kültepe with the ancient city of Kaneš and as the provenance of the then known museum tablets would only be confirmed in 1924 by Landsberger, whose work would be almost

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[174] Veenhof et al., *Mesopotamia: The Old Assyrian Period*, (2008), p. 32; Barjamovic et al., *Ups and Downs at Kanesh*, (2012), pp. 55-58.

[175] Larsen, *Ancient Kanesh: A Merchant Colony in Bronze Age Anatolia*, (2015), pp. 55-57. Less than 100 Old Assyrian texts are not business documents, including less than 20 school texts (Michel, *Old Assyrian Bibliography*, (2003), pp. 133-141).

immediately followed by a campaign on site in 1925 led by Hrozný.[176] Official excavations began at Kültepe in 1948 under the direction of Özgüç and have since then yielded much more Old Assyrian texts and objects, and most importantly provided context to these findings.[177] The vast majority of the currently published texts comes from Kültepe, alongside another few hundreds texts from across Anatolia and Mesopotamia, such as Boğazköy (ancient Hattuša), Alişar Hüyük, Acemhöyük, Qalat Sherqat (ancient Assur), Yorgan Tepe (ancient Nuzi/Gasur), Tell Abu Habba (ancient Sippar), Tell Asmar (ancient Ešnunna) and Tell Leilan (ancient Šubat-Enlil).[178] It is estimated that about a quarter of the Kültepe texts have been published thus far.[179]

The Old Assyrian corpus almost exclusively consists of the business documentation produced by merchants. Amongst the many thousand letters, debt notes, legal documents, private contracts, and personal memoranda, fewer than a hundred documents do not belong to business archives.[180] As such, Old Assyrian texts are by nature directly attached to individuals, much more so than Ur III texts. This is especially true of letters from and to named individuals written in the first person. As such, Old Assyrian research has focussed on individuals and how they relate to and interact with each other, whether tackling archival dossier reconstruction, social network analysis or scribal hand identification.[181] Old Assyrian texts are also more rarely directly dated, even if an official dating system based on eponymy was used in the Old Assyrian Period. While not explicitly dated, most texts being attached to individuals can be located in the chronology through prosopography and the reconstruction of traders' archives. In the Old Assyrian Period, the organisation of the cities of Assur and Kaneš attests to the interrelationship between institutional and non-institutional levels of administration and traders could hold official and unofficial positions concurrently, such

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[176] Landsberger, 'Über die Völker Vorderasiens im dritten Jahrtausend', *ZA* 35 (1924), pp. 213-244.

[177] See, for example, Atici et al., eds., *Current Research at Kültepe-Kanesh*, (2014); Kulakoğlu et al., eds., *Anatolia's Prologue*, (2010); Kulakoğlu et al., eds., *Integrative Approaches to the Archaeology and History of Kültepe-Kaneš. Proceedings of the 3rd Kültepe International Meeting, Kültepe, 4-7 August 2017. KIM 3 (Kültepe International Meetings 3)*, (2020).

[178] Michel, *Old Assyrian Bibliography*, (2003), pp. 119-132.

[179] Tablets excavated at Kültepe since 1948 are published in the two series AKT and TPAK.

[180] They are historical texts (royal inscriptions, treaties), incantations, school texts, and a handful of inscribed objects (vessels and weapons) (Michel, *Old Assyrian Bibliography*, (2003), pp. 133-141; Veenhof, 'Archives of Old Assyrian Traders', in Brosius, ed., (2003), pp. 78-123).

[181] See, for example, Veenhof, *The Archive of Kuliya, son of Ali-abum (Kt. 92/k 188-263)*, (1990); Michel, *Innaya dans les tablettes Paléo-Assyriennes. 1: Analyse*, (1991); Michel, *Innaya dans les tablettes Paléo-Assyriennes. 2: Edition des Textes*, (1991); Larsen, *The Aššur-nada Archive*, (2002); Anderson, *The Old Assyrian Social Network*, (PhD Dissertation, 2017); Beyer, *The Identification of Scribal Hands on the Basis of an Old Assyrian Archive*, (PhD Dissertation, 2019); Michel, *Women of Assur and Kanesh*, (2020).

as being members of the local trading offices, and year eponyms.[182] The distinction between 'public'/institutional and 'private'/non-institutional may not be systematically drawn when applied to cuneiform texts, and activities undertaken by individuals may overlap the two concepts. The nature of the Old Assyrian trade and the organisation of the Assyrian colony in Kaneš and trading posts throughout Anatolia has, as such, also been a main focus of research.[183]

The nature of the corpus and the relatively limited text genres represented, consisting mainly of letters, alongside legal and administrative documents, may also be echoed in the limited signary in use on Old Assyrian texts. Inscribed in the cuneiform script and written in a dialect of Akkadian, Old Assyrian uses between 150 to 200 signs, and a set of Sumerian logograms to write frequent words associated with trading activities – raw materials (e.g. KÙ.BABBAR *kaspum* 'silver'), weights and measures, animals (e.g. ANŠE, *imerum* 'donkey') – and personal names.[184] The same sign can also express multiple syllabic values, e.g. NIM for [*nim*], [*num*], and [*nam*], or GA for [*ga*], [*ka*], and [*qa*]. The limited number of cuneiform signs and the restricted use of logograms are traditionally considered to reflect the practical needs of merchants to communicate along trading routes and has also been interpreted as a sign of widespread literacy in the Old Assyrian society.[185]

The Ur III and Old Assyrian corpora differ in many respects. Ur III is traditionally viewed as the paragon of uniformity, whereas the Old Assyrian corpus is associated with informality. They each assumingly represent opposed writing contexts: formal or informal, professional or amateur, central administration or private enterprise. They also each represent two key periods in the development of the cuneiform script. The Ur III Period sees the transition between the 3rd and the 2nd millennium BCE tradition, expressed through a progressive palaeographic shift between archaising forms to more

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[182] Garelli, ed., 'Marchands et tamkaru assyriens en Cappadoce', *Iraq* 39 (1977), pp. 99-107; Dercksen, 'Interdependency of Institutions and Private Entrepreneurs', in Bongenaar, ed., (2000), pp. 135-152.

[183] Larsen, *Old Assyrian Caravan Procedures*, (1967); Veenhof, *Aspects of Old Assyrian Trade and its Terminology*, (1972); Larsen, *The Old Assyrian City-State and its Colonies*, (1976); Barjamovic, *A Historical Geography of Anatolia in the Old Assyrian Colony Period*, (2011); Stratford, *A Year of Vengeance*, (2017); Palmisano, *The Geography of Trade*, (2018).

[184] 138 signs listed in Smith, ed., *CCT 1*, (1921), plates A-B; 193 signs listed in Kouwenberg, *Introduction to Old Assyrian*, (2019), pp. 29-39.

[185] Larsen, *The Old Assyrian City-State and its Colonies*, (1976), p. 305; Schousboe et al., eds., *Literacy and Society*, (1989); Michel, 'Écrire et compter chez les marchands assyriens du début du IIe millénaire av. J.-C.', in Tarhan et al., eds., (2008), p. 354; Veldhuis, 'Levels of Literacy', in Radner et al., eds., (2011), p. 86; Barjamovic, 'Contextualizing Tradition. Magic, Literacy and Domestic Life in Old Assyrian Kanesh', in Delnero et al., eds., (2015), pp. 60-61.

and more cursive ones. The Old Assyrian Period marks a unique episode of mass cuneiform outside its Mesopotamian hinterland and a particular use of writing in both conception and spread. As such, they represent a unique opportunity to investigate writing practices in broad terms.

### 2.1.3 Sampling and data collection protocols

The vast amount of available Ur III and Old Assyrian material is as much a hindrance as it is an asset and one of the challenges of this research has been to maintain manageable datasets that can be analysed and interpreted. The following paragraphs present the sampling and data collection protocols developed for this research and the resulting benchmark sets gathered for each corpus.

Since this research is interested in the materiality of writing, data sampling and collection is guided by the overarching principle that both palaeographic and diplomatic aspects should be represented in each study group. This has the benefit of enabling a holistic approach to the study of writing practices by analysing signs and tablets together. Since there are many signs on a single tablet, such approach also creates an imbalance between diplomatic and palaeographic sets without, however, impacting the analysis since the two aspects are first assessed autonomously before their respective results can be confronted. The effects of such imbalance are contained by the guiding principle governing tablet selection according to which tablets not representing both palaeographic and diplomatic aspects are rejected. Finally, tablets are selected against their condition status so as to maximise the data yield.

The palaeographic data yield is further dependent on the syllabary used in each corpus. Some signs can be more frequently attested than others, either restricted to specific genres or more broadly applied to the entire corpus. As such, the sign TA rendering the Sumerian ablative suffix is frequently attested on Ur III receipts, while $TI_2$ is specifically found in Old Assyrian texts to render [*ti*] or [*di*]. As a result, each study sample displays its own set of signs. Some signs are exclusively found in one sample, such as $TI_2$ in Old Assyrian or LUM in Ur III, while others are shared between the two samples, albeit in varying proportions.

Sign instances are grouped according to the primary sign name as allocated in MesZL. For data collection purposes, no distinction is drawn between sign values or usages so that, for example, syllabic [*an*] and determinative [$^{d}$] are both considered for their

graphic rendering of the sign AN. This principle applies to all value types, whether syllabic, logographic or numeric. For example, the values [tur], [dumu] and [banda$_3$] are all grouped under TUR, just as [*maš*] and [½] are grouped under MAŠ. Finally, signs are also considered when used in compound forms, e.g. AN in AM$_3$ (A.AN) or ŠA in PUZUR$_4$ (PU$_3$.ŠA). In such cases, the focus is set on the elementary sign and not on the entire compound sign.

The following sections will present the diplomatic and palaeographic variation observed on two benchmark samples. The two study samples collected for this study represent a portion only of the available material. In blunt figures, the Ur III sample represents less than 1% of the available material and the Old Assyrian sample reaches 5%.[186] Yet, they gather into a large dataset of 150 sampled tablets and 3,612 sampled sign instances altogether, where each object can yield up to 30 datapoints and each sign instance up to 10 datapoints. The fact that the samples only represent a small portion of each corpus means that the results they yield only suggest trends rather than gathering into a comprehensive analysis of Ur III and Old Assyrian cuneiform. The samples were, however, gathered to reflect the nature and characteristics of each corpus and to ensure their representativity. The trends revealed by the benchmark samples gathered for this study therefore constitute the backdrop for the case studies in the next chapters against which to assess and contrast their results in the absence of such resource in the existing scholarship.

The Ur III benchmark reflects the nature of the corpus and considers the possibilities it offers and the limitations it presents. The sampled tablets illustrate the administrative production of the four main sites represented in the British Museum collections studied for this project: Drehem, Girsu, Umma and Ur. The sample consists of 104 objects – 101 tablets and 3 envelopes –, 90 of which are explicitly dated, from 2060 to 2012 BCE (Šulgi 33 to Ibbi-Suen 15) [Figure 36; Appendix 2.a].[187] Tablets were also selected to encompass variation in terms of provenance and date, as well as document type and

[186] 104 Ur III texts = 0.08% of the whole Ur III corpus of ca. 120,000, and 0.4% of the Ur III collection of the British Museum. 46 Old Assyrian texts = 0.19% of the whole Old Assyrian corpus of ca. 23,000 and 5% of the Old Assyrian collection in the British Museum.

[187] Administrative tablets dated to Ur-Namma are virtually not represented in the collections of the British Museum and the Musée du Louvre (a search in the Database of Neo-Sumerian Texts (BDTNS) respectively yielded 2 and 9 results at as of January 2019). See also Hallo et al., 'New Texts from the Reign of Ur-Namma', in Michalowski, ed., (2008), pp. 53-62.

subject matter. Altogether, the 104 objects in the benchmark sample yielded 1,813 sign instances.

| | Drehem | Girsu | Umma | Ur | |
|---|---|---|---|---|---|
| **Šulgi** | 6 | 7 | 7 | 5 | **25** |
| **Amar-Suen** | 8 | 5 | 8 | 3 | **24** |
| **Šu-Suen** | 4 | 6 | 6 | 4 | **20** |
| **Ibbi-Suen** | 5 | 6 | 3 | 7 | **21** |
| **undated** | 2 | 5 | 3 | 4 | **14** |
| | **25** | **29** | **27** | **23** | |

Figure 36: Distribution of sampled data per ruler and per site: Ur III benchmark sample

As mentioned earlier, the Old Assyrian corpus mainly consists of mostly undated business letters, although an estimated dating can often be deduced from the content of the inscription.[188] The study sample gathered for this study was selected to reflect the epistolary nature of the corpus while also including dated texts in order to investigate patterns of variation over time. It consists of 46 objects – 45 tablets and one envelope – of which 12 are explicitly dated between 1925 and 1841 BCE (REL 48 to REL 132) [Appendix 3.a]. The sample illustrates a variety of text genres, divided into three categories following Veenhof's typology: letters (9), administrative (19), legal (18) [Figure 37].[189] Overall, the 46 objects sampled for this benchmark yielded 1,799 sign instances.

| | Letter | Administrative | Legal | |
|---|---|---|---|---|
| **dated** | - | 2 | 10 | **12** |
| **undated** | 9 | 17 | 8 | **34** |
| | **9** | **19** | **18** | |

Figure 37: Distribution of sampled data per dating and per genre: Old Assyrian benchmark sample

Through diplomatics and palaeography, the methodology further outlined below approaches material features of cuneiform tablets as interrelated, whether at broad level, e.g. text layout as regards script density, or at focussed level, e.g. sign variation with

[188] When not explicitly dated, other means are available to date documents, albeit more or less accurately, e.g. onomastics and prosopography. See for instance Anderson's application of social network analysis to Old Assyrian prosopography: Bamman et al., 'Inferring Social Rank in an Old Assyrian Trade Network', *Digital Humanities* (2013); Anderson, *The Old Assyrian Social Network*, (PhD Dissertation, 2017).

[189] On administrative Old Assyrian texts, see Ulshöfer, *Die Altassyrischen Privaturkunden*, (1995).

respect to sign formation. This new approach contends that writing practices may be analysed based on the patterns revealed by material features.

## 2.2 Diplomatic criteria and variation

Of the many diplomatic features and their variation observable on cuneiform objects as described in Chapter 1, not all can be considered in measurable terms and subsequently exploited. The following section assesses diplomatic criteria and variation against observations made on the two benchmark samples of Ur III and Old Assyrian cuneiform gathered for this study [Appendix 2.a (Ur III); Appendix 3.a (Old Assyrian)].

### 2.2.1 Non-measurable features

This research relies mostly on naked-eye observation and does not include scientific methods of analysis. Material features of clay may well be observable, they are not measurable without scientific equipment and therefore not exploitable in the context of this research. While clay texture and fabrics were recorded, the data thus gathered merely consist of notes by the observer to the observer and was therefore not exploited. Information on inclusions, when visible on the surface of tablets or in breaks, were still collected and may form the basis of further research. Developing a classification system of clay types adapted to cuneiform tablets is a research project per se and such an endeavour is not within the scope of this study.

While modern firing campaigns tend to be documented with details about firing temperature and its effect on clay colour, earlier campaigns rarely did document the process and changes of colour cannot be conveyed by black and white photographs either. During a firing campaign led at the British Museum in the 1950s, setting the kiln to 750° C reportedly caused little change in colour whereas in the 1970s, conservators at Penn Museum recorded colour variations after firing tablets at 825° C.[190] The kiln used by Woolley at Ur in the 1920s, fuelled by petrol and built on the site, would most certainly not have enabled a consistent temperature, shedding further uncertainty on the colour displayed nowadays on tablets excavated then [Figure 38].[191]

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[190] Organ, 'The Conservation of Cuneiform Tablets', *The British Museum Quarterly* 23 (1961), p. 53; Guinan et al., 'Nippur Rebaked', *Expedition* 18 (1976), p. 46).

[191] On tablets from Nimrud excavated by Rassam, see Reade, 'Unfired Clay, Models, and "Sculptors' Models" in the British Museum', *AfO* 48/49 (2001), p. 148.

Figure 38: Tablet kiln on site at Ur in the 1920s

Most cuneiform tablets would not have been intentionally baked in Antiquity, apart from some exceptional documents.[192] Tablets that were not accidentally baked during a fire outbreak, for instance, would have therefore most likely been unearthed raw and only sun-dried. Most tablets nowadays would have been baked, either in the field, when entering museum collections, or during conservation campaigns.[193] Both Ur III and Old Assyrian collections kept at the British Museum and the Louvre originate from early informal excavations at the end of the 19th century and in the early 20th century, and there is little to no documentation at all about the context in which they were unearthed. Budge, a curator at the British Museum in the late 19th century, mentions the many attempts at conserving unbaked tablets arriving at the museum by different means, including firing.[194] He also recounts his visit to the site of Abu Habba (Sippar) in 1888 and 1891: "*I saw the remains of great numbers of large jars, which resembled the* zîr*, or*

[192] Veenhof, 'Cuneiform Archives. An Introduction', in Veenhof, ed., (1986), p. 1; Charpin, 'Corrections, ratures, annulations : la pratiques des scribes mésopotamiens', in Bady et al., eds., (1989), p. 60; Taylor et al., 'The Making and Re-Making of Clay Tablets', *Scienze dell'Antichità* (2011), p. 300.

[193] Delougaz, *I. Plano-Convex Bricks and the Methods of Their Employment; II. The Treatment of Clay Tablets in the Field*, (1933); Crawford, 'Processing clay tablets in the field', in Bateman (1966), pp. 1-17.

[194] Budge, *The Rise and Progress of Assyriology*, (1925), pp. 147-157.

*waterpot; and the natives told me that when they opened them, they found them full of soft unbaked inscribed tablets*".[195] Excavation reports from the 19th and 20th century unsystematically mention whether tablets were unearthed baked or sun-dried, and, when they do, the information may not be too reliable. As such, tablets from Uruk excavated in the 1850s were described as "*unbaked*" by Loftus but "*baked*" by Rawlinson.[196] In Reade's words: "*So there is often no clear answer to the seemingly elementary question as to whether or not a tablet is made of unfired clay, fired clay, or something in between the two*".[197] With regard to Ur III tablets, excavation records are usually neither explicit nor consistent on the firing condition of cuneiform documents upon discovery. Tablets from Tello are anecdotally recorded as unfired or fired, while those tablets found in Nippur are all recorded as baked.[198] In the case of Old Assyrian tablets, it may be the case that some tablets were indeed baked in Antiquity. As such, the archives of Šalim-Aššur were discovered at Kültepe in a layer showing evidence of a fire outbreak but also seemingly prepared for firing by their primary user: "*Next to the hearth [in room no. 8] were found unbaked tablets evidently left to dry or prepared to be fired*".[199] Be that as it may, the two collections under study in this research come from early excavations and their context of discovery is not documented. There are, however, a few conservation records mentioning that tablets would have been fired by conservation specialists at the British Museum between the 1950s and the 1990s.

Beyond firing, tablets uncovered during early excavations could also have received various treatments, rarely documented, which may have affected their colour. One such account recalls the immersion in various substances of tablets excavated at Susa by Morgan in the 1900s, with mentions of shale oil and blubber being used: "*J'ai employé la paraffine, le blanc de baleine, le silicate de potasse; fréquemment les tablettes sont imprégnées de salpêtre, substance essentiellement hygrométrique qui, sous les influences atmosphériques, effritent la matière qui le contient par une succession incessante de cristallisation et de dissolution. Le seul moyen que je connaisse jusqu'ici de préserver les documents de première importance est de les conserver dans l'huile de*

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[195] Budge, *The Rise and Progress of Assyriology*, (1925), p. 133.
[196] Reade, 'The Manufacture, Evaluation and Conservation of Clay Tablets Inscribed in Cuneiform: Traditional Problems and Solutions', *Iraq* 79 (2017), p. 176.
[197] *Ibid.*, p. 174.
[198] Cros, ed., *Nouvelles fouilles de Tello*, (1910); Hilprecht, *The Babylonian Expedition of the University of Pennsylvania. Series A: Cuneiform Texts*, (1910), 1, pp. 93-111.
[199] Larsen, *The Archive of the Salim-Assur Family. Volume 1: The first two generations*, (2010), pp. 3-5 esp. p. 3.

*schiste, comme il est d'usage de le faire pour certains échantillons minéralogiques très hygrométriques.*"[200]

The two corpora used in the present research come from early discoveries at the end of the 19th and the beginning of the 20th century and are mostly unprovenanced. As such, the nature of the soil they came from and any treatment they would have received upon discovery being undocumented, the factors that have affected the colour they nowadays display are more than uncertain. Whether affected by soil composition, clay types or firing conditions, clay colour may not always be a reliable feature. This is strikingly illustrated by tablets reconstructed from different fragments which may vary greatly in colour shades [Figure 39].


Figure 39: Tablet reconstructed from various fragments of different colours (U 8810b + U 5628)

While shades of clay could have been systematically recorded using Munsell charts, for example, the data thus collected would have relied on feeble foundations for exploitability. Therefore, while clay colour is an observable feature of cuneiform tablets, such feature was not retained for analysis in this research.

This research on identity in cuneiform writing investigates the relationship between scribal practices with time and place, and with groups and individuals. It does so by appraising writing practices encompassing both text-carrier and written signs. In order

[200] de Morgan, 'Note sur les procédés techniques en usage chez les scribes babyloniens', *Recueil de Travaux Relatifs à la Philologie et à l'Archéologie Égyptiennes et Assyriennes* 27 (1905), p. 236 note 2.

to do so, the selection process used in this study privileges complete tablets as they have the best potential at yielding a balanced dataset between the many features to be analysed, from shape to sign variants. Traces of manufacturing techniques are not readily observable on complete tablets and best visible in breaks. Although complete tablets compose the bulk of this research dataset, a small proportion presents small breaks showing traces of manufacture. The modest data thus collected was subsequently not exploited and may eventually serve further research on tablet making techniques.

### 2.2.2 Measurable features

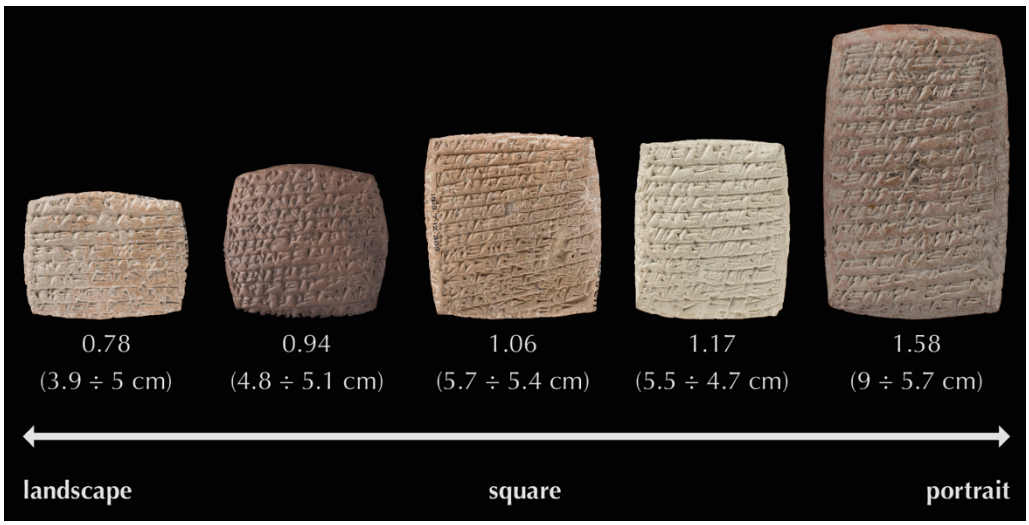


Figure 40: Tablet formats expressed by ratio

The great variety of shapes across cuneiform documents not only is observable, it is also measurable. Preliminary to interpreting the relation between format and provenance is considering how to measure or categorise tablet shapes. Tablets from the two main corpora studied in this research are either square or rectangular.[201] Depending on tablet proportions, variations may be strikingly obvious or more tenuous. The difference between square and rectangular is more accurately gauged by computing a ratio figure calculated as (*height ÷ width)* [Figure 40].[202] In this system, a ratio figure of 1 represents a square tablet, a ratio figure lesser than 1 indicates a rectangular tablet in landscape format and a ratio figure greater than 1 represents a rectangular portrait tablet. Given that cuneiform tablets are not pure geometrical forms and that measurements may be

[201] There is a greater variety of shapes across cuneiform documents over time and place, such as round tablets, although rectangular tablets are the most common throughout (Taylor, 'Tablets as Artefacts, Scribes as Artisans', in Radner et al., eds., (2011), pp. 9-10 figures 1.2 a and 1.2 b).

[202] The dimensions of the tablet are taken in reference to the orientation of the text: the height is measured across the text; the width is measured along the text.

± 1 mm, the ratio figures thus computed are in turn weighted so that: a ratio equal to or lesser than 0.98 represents landscape tablets; a ratio between 0.99 and 1.02 represents square tablets; a ratio equal to or greater than 1.03 represents portrait tablets.[203]

The external characteristics of a tablet, readily available, give the observer a first impression. The main question posed is how to systematically and objectively measure and categorise this first impression, in other words, what makes a tablet look stout or slim? In this study's corpora, two profile types can be observed on the main faces – obverse and reverse – either showing a convex or a flat profile; the small faces – upper, lower, left, right – also split into two profile types, rounded or flat; finally, corners display three profiles, being pinched, squared or rounded [Figure 41].

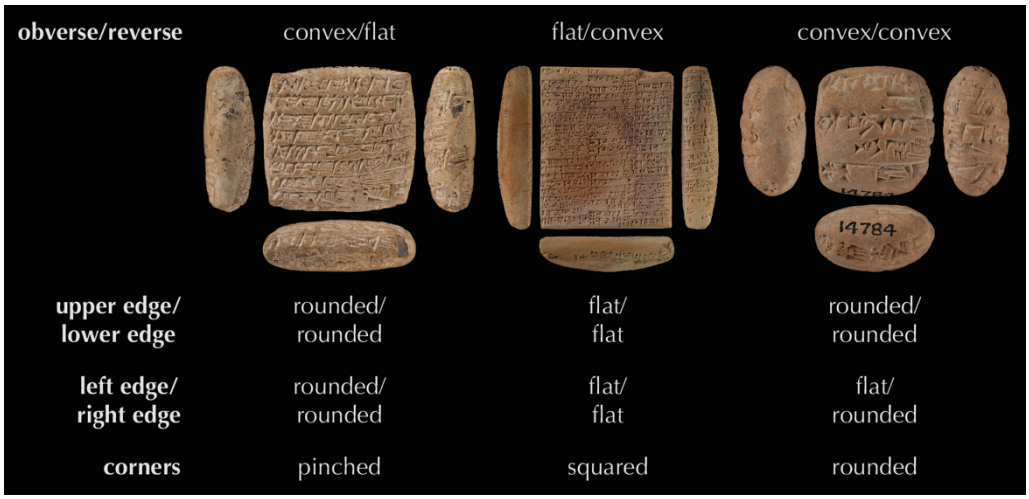


Figure 41: Tablet morphological types per profile

While shape is numerically measured by computing a ratio figure, the assessment of profiles relies on categorical values. Which category a profile belongs to is assessed by handling the tablet: lying on a flat surface, tablets with a convex profile typically swing while those with a flat profile remain stable. Handling also reveals how corners were shaped: fingertips characteristically lock into position on pinched corners whereas they cannot grip on rounded corners. In this study, profiles are analysed in pairs alongside corners: obverse and reverse; upper and lower edges; left and right edges.

When combined, the profiles displayed by the two main surfaces of a tablet, obverse and reverse, categorises tablet silhouettes into four morphological types. Each morphological type considers both profiles and is expressed as 'Obverse profile/Reverse profile', e.g. 'convex/flat'. Each inscribed surface of a tablet can be assessed in terms of

[203] This is the same principle as the optical correction in architecture or graphic design.

the profile it displays. As such, the profiles of the left and right edges of a tablet are combined to render four morphological types, distinguishing flat edges from rounded edges. The same applies to the upper and lower edges. In the following analysis, these morphological types are assessed against text layout in order to investigate the relationship between tablet shape and text layout. Finally, tablet shape can further be broken down by considering corner profiles. The two samples considered in this study reveal three different profiles. Whether the corners are pinched or rounded significantly impact the overall silhouette of a tablet and the analysis will assess further whether the shaping of corners may be related to broad trends, such as text genre, or to individuals.

The script density represents the average number of lines of text per measured unit (e.g. per cm) and calculated by dividing the total line count by the height of the inscribed surface (*line count ÷ height*) [Figure 42]. The script density is considered for the two main inscribed surfaces of a tablet, the obverse and the reverse, albeit not for the edges. Three values are computed per tablet: obverse script density; reverse script density; overall script density, i.e. the average value between obverse and reverse:

- Obverse Script Density (obv.SD = obv.LineCount ÷ H)
- Reverse Script Density (rev.SD = rev.LineCount ÷ H)
- Overall Script Density (overall.SD = (average (obv.SD ÷ rev.SD)))

Figure 42: Fully inscribed tablet

Overall script density: 2.09
Obverse: 2.00 (5.5 cm ÷ 11 lines) ÷ reverse: 2.18 (5.5 cm ÷ 12 lines)
(BM 113556)

Because the calculation of script density values depends on the layout of the text on the writing surfaces, the reverse value, and subsequently the overall density, cannot be computed when a tablet is only partially inscribed. Only one density value, the obverse, can therefore be computed for such tablets. Although the analysis relies mainly on

overall script density values, the lack of it does not prevent the analysis since the obverse script density value can be used as an alternative. In the case of envelopes, however, the inscription does not usually unfold in a continuous sequence of lines of text and the script density cannot therefore be computed altogether. Beside script density, script size could be computed using the same data (*height ÷ line count*). It would, however, only duplicate information already rendered by script density computation about the physical substance of an inscription and is therefore not used in the proceedings.

## 2.3 Palaeographic criteria and variation

How does a sign instance differ from another? In theory, there could be as many variants as there are sign instances, all differing in one respect or another, whether in minute details or in strong contrast. Patterns of variation are identifiable and qualifiable by applying the principles of categorisation outlined in Chapter 1. It follows that palaeographic variants can be defined as categories drawn from the graphic variation observed, assessed against and filtered through a set of variable features.

The following study of Ur III and Old Assyrian samples reveals two key aspects of variant categorisation. First, signs can display recurring variation across as well as within tablets. Second, different signs that are structurally close can display similar patterns of variation.

### 2.3.1 Sign-based variants

Palaeographic variations are more commonly assessed on a sign by sign basis, where all variants of a sign in a given study group are defined, compared and interpreted.[204]

Within the two benchmark samples considered in this study, recurring and consistent patterns of variation could be observed and resulting variants be identified. The signs selected for this study were extracted from each corpus as those varying the most. One outcome of the sign-based palaeographic assessment herein is the distinction between corpus-specific and cross-corpus variants.

[204] See, for instance, recent palaeographic studies in Devecchi, ed., *Palaeography and Scribal Practices in Syro-Palestine and Anatolia in the Late Bronze Age*, (2012); Devecchi et al., eds., *Current Research in Cuneiform Palaeography*, (2015).

### *Ur III variants*

This section presents the variants identified for six signs selected from the Ur III sample: LUM, IM, TI, TUR, BA and AN.

LUM, composed of a sequence of three stacks of wedges, is represented by 21 instances distributed over 19 tablets. The observed variations affect wedge count, with the stacks ranging from 4 to 7 wedges, and wedge type, whether horizontal or diagonal. The variable feature offering the most contrast between instances of LUM is the latter, from which two variants can be extracted: an aligned variant (v1), composed of a sequence of three stacks of horizontal wedges; and a diagonal variant (v2), made of a leading cluster of diagonal wedges followed by a sequence of two stacks of horizontal wedges [Figure 43].[205] The major variable feature considered here is therefore the wedge type, horizontal vs. diagonal, while the wedge count remains a minor variable.

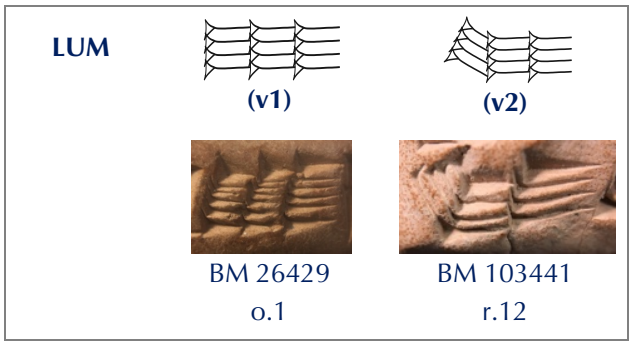


Figure 43: Two Ur III variants of LUM

IM is attested on 11 tablets and represented by 13 instances, from which three variants emerge and are defined by wedge placement, wedge count and wedge type, all of which variable features only affect the leading cluster of wedges [Figure 44].

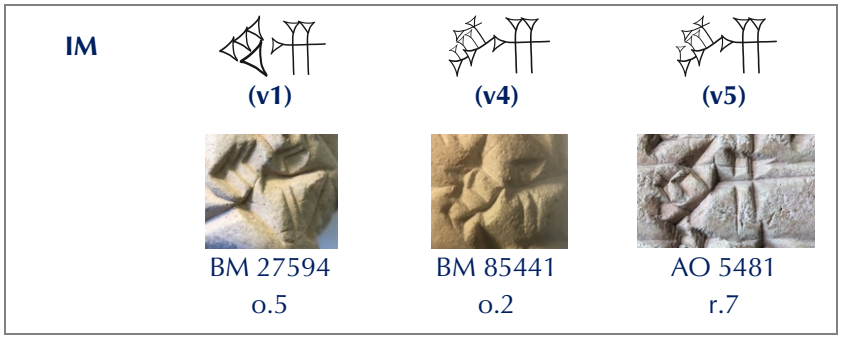


Figure 44: Three Ur III variants of IM

[205] The aligned variant of LUM (v1), composed of a leading stack of horizontal wedges, is also included in the structure-based palaeographic assessment [§2.3.2].

One variant (v1) is composed of a leading cluster of *winkelhaken*, arranged like a HI 𒄭 sign. Two other variants (v4 and v5) show a row of *winkelhaken* standing between two parallel diagonal wedges, the lowest of which is a broken diagonal, with the difference that one variant has a vertical wedge leading the *winkelhaken* row (v5). The major variable features distinguishing between variants are therefore wedge placement and wedge type.

TI displays two variant forms distributed across 24 tablets and represented by 26 instances [Figure 45]. Although the two variants of TI might not look strikingly different, they contrast in their makeup, both in terms of wedge count and consequently of wedge order.

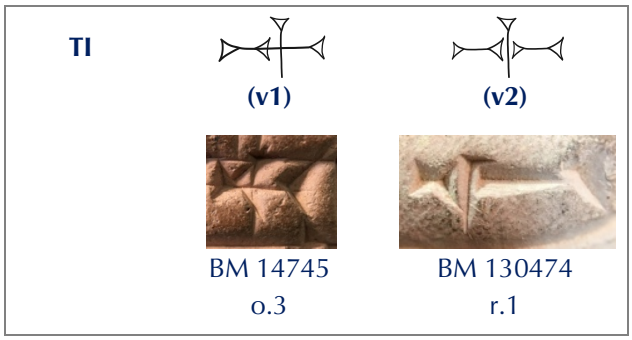


Figure 45: Two Ur III variants of TI

One variant (v1) is composed of 4 wedges: a horizontal ending with a *winkelhaken*, cut in its middle by a vertical wedge and a deferred *winkelhaken*. The second variant (v2) is composed of 5 wedges instead, in a sequence horizontal-*winkelhaken*-vertical-horizontal-*winkelhaken*. The sign instances sampled for the study also vary in body width, itself dependent on the length of the horizontal wedges.[206] The two variants of TI are therefore defined by their respective wedge count.

The 31 instances of TUR selected over 22 tablets reveal three variant forms of the sign, inferred from the type and placement of their respective constituent wedges [Figure 46]. Two variants (v1 and v2) are composed of a leading cluster of horizontal wedges and two diverging diagonal ones followed by two stacked horizontals. Although similar, both variants differ in that one (v2) starts with a vertical wedge which is positively absent from the other variant (v1). The third variant (v4) assembles horizontal wedges only, in

[206] The distinction between elongated and narrow body widths does not affect the structure of the sign. The elongation seems rather to be a choice in relation with text layout, especially when TI is used in the šu ba-ti formula, itself justified on a single line of text.

a sequence of two stacks, resembling a I sign.[207] The major variable features defining variants of TUR are thus wedge type and wedge placement.

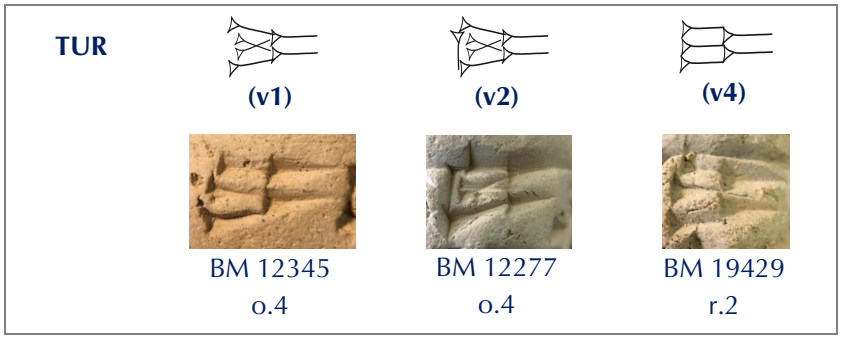


Figure 46: Three Ur III variants of TUR

BA is attested on 38 tablets and represented by 63 instances whose two variants are defined by wedge type [Figure 47].

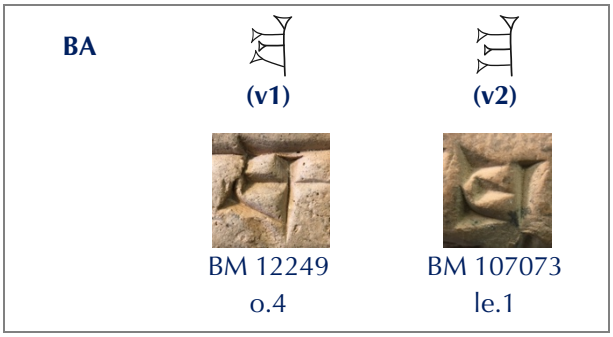


Figure 47: Two Ur III variants of BA

Both variants are similarly composed and only differentiated by the type of the lowest wedge in the leading cluster: a diagonal wedge (v1) or a horizontal wedge (v2). Variations of body width, resulting from the elongation of the middle horizontal wedge which can then stick out to the right, can also be observed, especially in the (v1) form. Wedge order also varies, whether impressing the central horizontal or the vertical last.[208]

The AN sign is amongst the most commonly used signs, whether it be standalone, compounded or ligatured.[209]

As a standalone sign, AN is represented by 119 instances over 60 tablets, and the variations between these sign instances reveal five variant forms, defined by wedge placement and wedge count [Figure 48]. Two variants are composed of four wedges (v1

[207] The stacked variant of TUR (v4), composed of a leading stack of horizontal wedges, is also included in the structure-based palaeographic assessment [Figure 66].

[208] Taylor, 'Wedge Order in Cuneiform: A Preliminary Survey', in Devecchi et al., eds., (2015), p. 21.

[209] The sign AN, used as a determinative in the sequence $^{d}$EN, is only set apart from the standalone AN when ligatured with the sign EN.

and v2). Whereas the star-like variant (v1) is composed of four complete wedges, (v2) is instead made of three complete ones while the middle horizontal wedge only consists of a wedge head with a tail positively absent. The remaining variants are made of three wedges and differ in how these are arranged and what type these are: a broken horizontal cut by a vertical wedge (v3); a horizontal, a diagonal and a vertical wedge (v4); two diverging diagonal wedges cut by a vertical (v5), like a $SILA_3$  sign.

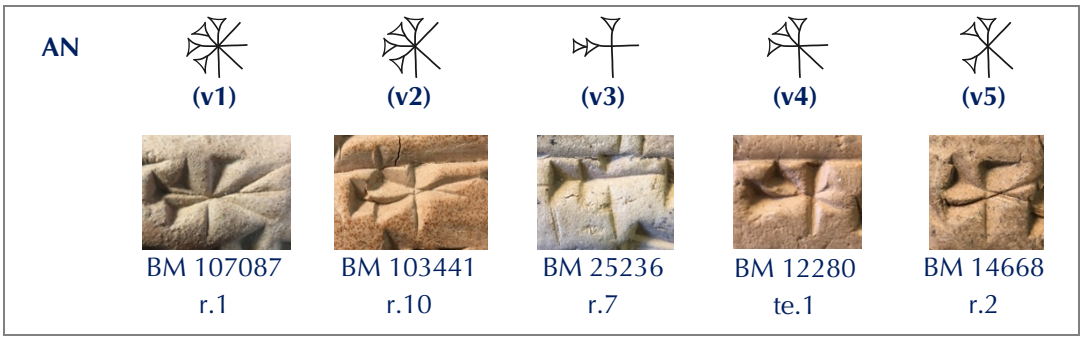


Figure 48: Five Ur III variants of AN

As used in the ligature $^{d}$EN, three of the above described variants could be observed amongst the 21 sign instances distributed across 21 tablets [Figure 49]. In quantifiable terms, it is interesting to note that there is a clear divide between the two most attested variants given the space constraint attached to ligaturing AN and EN: the sizeable star-like variant (v1) and the abbreviated variant (v4).

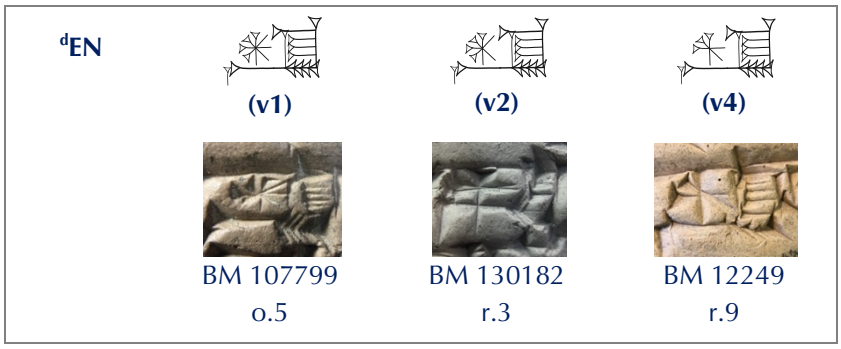


Figure 49: Three Ur III variants of AN in $^{d}$EN

The palaeographic assessment of six selected signs within the Ur III sample shows that variants can be defined according to their distinctive variable features. Although this principle applies to every sign, which is the major variable feature appears to be specific to each sign [Figure 50].

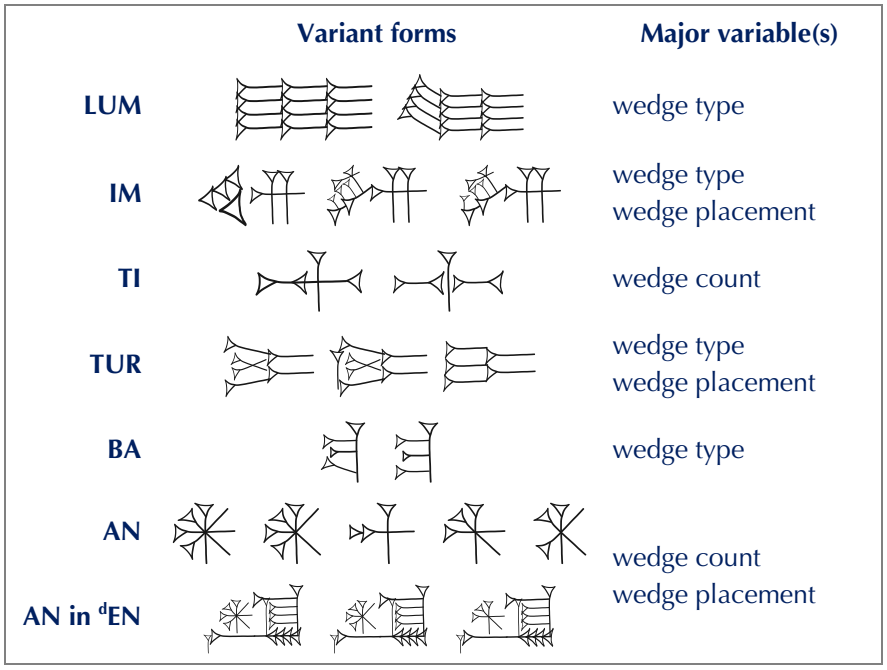


Figure 50: Ur III variants of LUM, IM, TI, TUR, BA and AN

## *Old Assyrian variants*

The same principle applies to identifying variants in the Old Assyrian sample. Some of the signs selected for the assessment of Ur III variants also display recurring and consistent patterns of variations in the Old Assyrian Period, i.e. IM, TI, TUR, BA and AN; while three signs, SUR, UŠ and $TI_2$, are specific to the Old Assyrian corpus.

IM is represented by 58 instances distributed across 28 tablets. Four variants can be identified, defined by wedge type and wedge placement, of which two were also found in the Ur III assessment (v1 and v5) [Figure 51]. The two remaining variant forms (v2 and v3) are both composed of a leading cluster of *winkelhaken* standing on a diagonal wedge. They differ in that one (v3) starts with a vertical wedge.

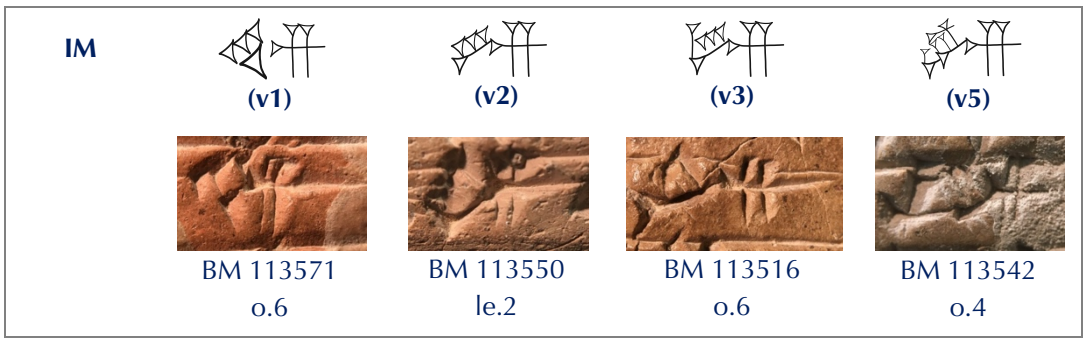


Figure 51: Four Old Assyrian variants of IM

The Old Assyrian syllabary traditionally favours the sign $TI_2$ over TI to render the values [*ti*] and [*di*].[210] It follows that TI is seldom attested in the study sample, with five instances distributed over three tablets. It is even more interesting then to find two variant forms of TI amongst such a reduced sample, and the same two variants that could also be observed in the Ur III sample [Figure 52].

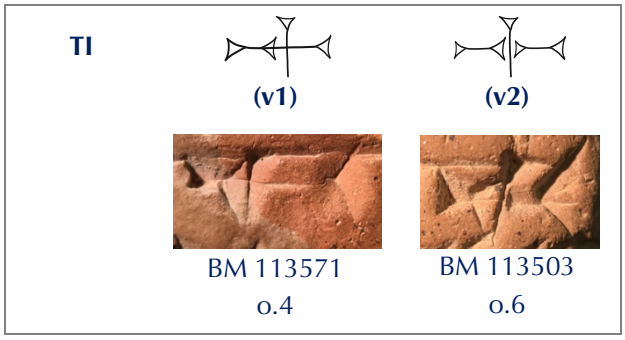


Figure 52: Two Old Assyrian variants of TI

As a corollary to the rare use of TI, $TI_2$ is represented by 98 instances distributed over 34 tablets. The variations across these sign instances reveal three variant forms, defined by wedge placement and count [Figure 53]. One variant (v1) is composed of a cluster of *winkelhaken* arranged like a HI sign.[211] In the second variant form (v2), the lower *winkelhaken* is deferred to the right, while it takes centre place in the HI-like variant. The wedge count does not vary and both variant forms are consistently composed of four wedges. The third variant (v3) distinctively displays multiplied *winkelhaken* in the upper row.

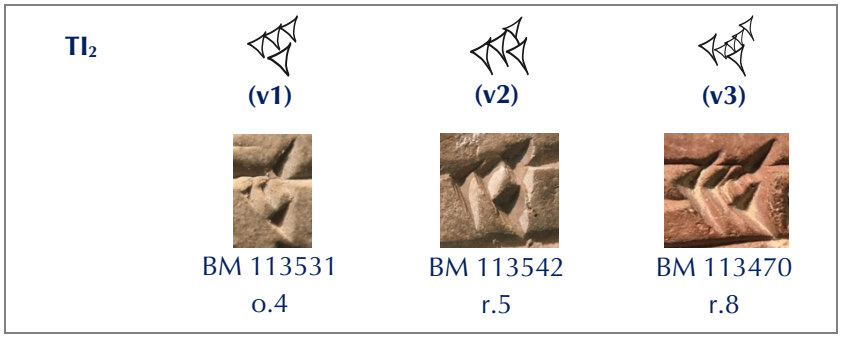


Figure 53: Three Old Assyrian variants of $TI_2$

TUR is attested on 16 tablets and represented by 30 instances. The variations observed across instances affect wedge type and wedge placement, revealing and defining three variant forms of the sign [Figure 54]. The stacked variant of TUR (v4) was already

[210] Kryszat, 'The Use of Writing among the Anatolians', in Dercksen, ed., (2008), pp. 231-238; Kryszat, 'Old Assyrian Writing and the Secret of the Kültepe Eponym List A', in Kulakoğlu et al., eds., (2015), pp. 111-115.
[211] Incidentally, HI and $TI_2$ are not differentiated in Labat (number 396), whereas MesZL distinguishes between HI (number 631) and $TI_2$ (number 633).

observed in the Ur III sample.[212] One variant (v5) is similarly composed of a sequence of stacked horizontal wedges, with the difference that the stacks are preceded by a leading vertical. The remaining variant (v3) also starts with a leading vertical wedge but it is followed by a cluster of diagonals and a stack of horizontal wedges.

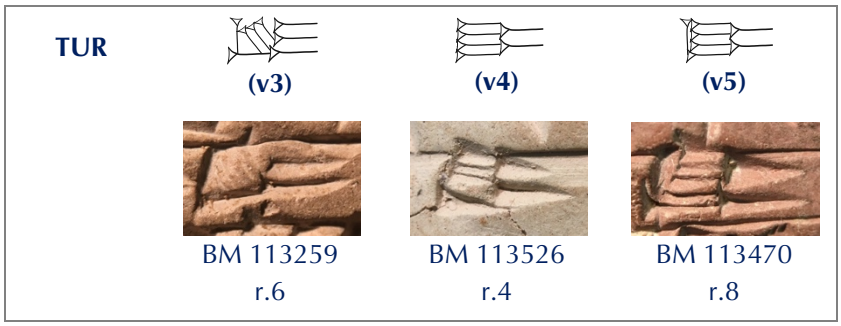


Figure 54: Three Old Assyrian variants of TUR

AN is exclusively used as a standalone sign in the Old Assyrian sample, represented by 33 instances over 20 tablets. The variations across sign instances pertain to wedge count and wedge placement, revealing three variant forms, all of which could also be observed in the Ur III sample [Figure 55].

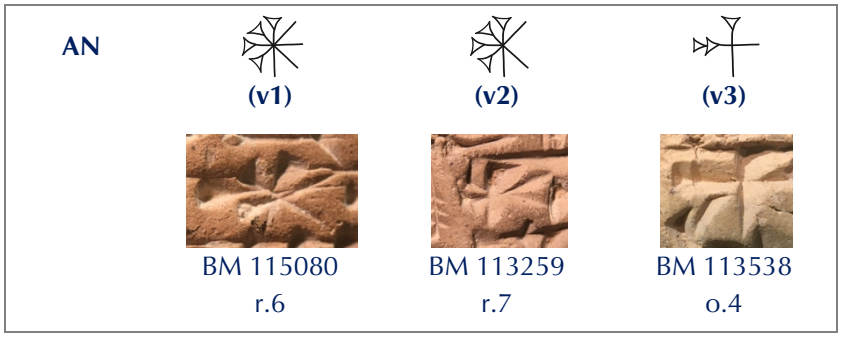


Figure 55: Three Old Assyrian variants of AN

The sign SUR is attested on 14 tablets and represented by 24 instances, all of which are invariably composed of five wedges. All instances also have in common to start with a leading horizontal wedge. Three variant forms can nevertheless be identified across the sample, distinguished only by their respective types of wedge [Figure 56]. One variant (v1) is composed of a cluster of diverging diagonal wedges. The two remaining variants display a sequence of three vertical wedges, either standing on a diagonal wedge (v3) or on another vertical wedge (v2).

[212] The stacked variant of TUR (v4), composed of a leading stack of horizontal wedges, is also included in the structure-based palaeographic assessment.

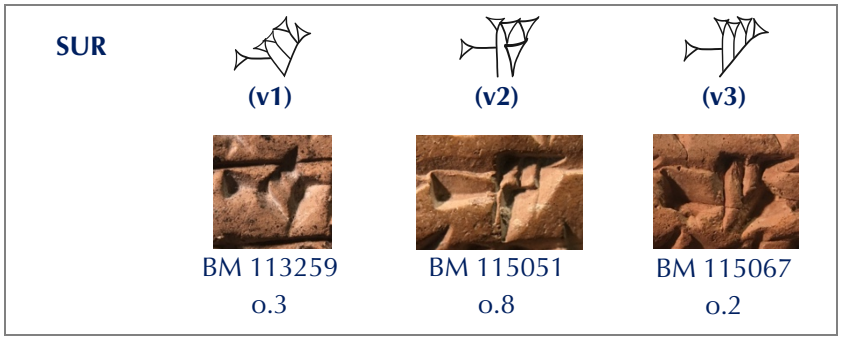


Figure 56: Three Old Assyrian variants of SUR

The variations of BA, observed over 21 tablets and 37 sign instances, reveal the two same variants that were also found in the Ur III sample [Figure 57].

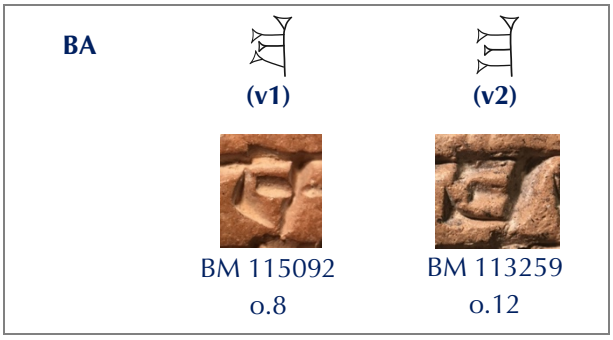


Figure 57: Two Old Assyrian variants of BA

UŠ is not amongst the most common signs, with nine instances found on nine tablets. Although little attested throughout, two variants emerge from these nine instances [Figure 58]. Both variant forms are similarly composed of two horizontal wedges abutting a final vertical wedge, enclosing two inner smaller verticals. The defining feature distinguishing between the two forms is the placement of the inner *winkelhaken*, at the tip of the lower horizontal wedge (v1) or below the upper horizontal (v2).

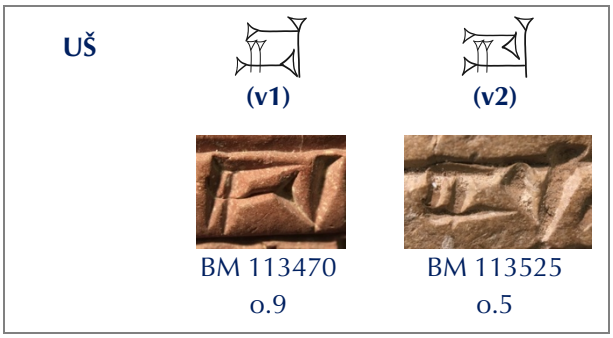


Figure 58: Two Old Assyrian variants of UŠ

Following the same principle enunciated for Ur III variants, the palaeographic assessment of eight selected signs within the Old Assyrian sample reveals variant forms across signs, each defined by its major variable feature, whether it be wedge count, wedge placement or wedge type [Figure 59]. The assessment also revealed that variants can emerge regardless of the size of the sample, as is the case with the signs TI and UŠ.

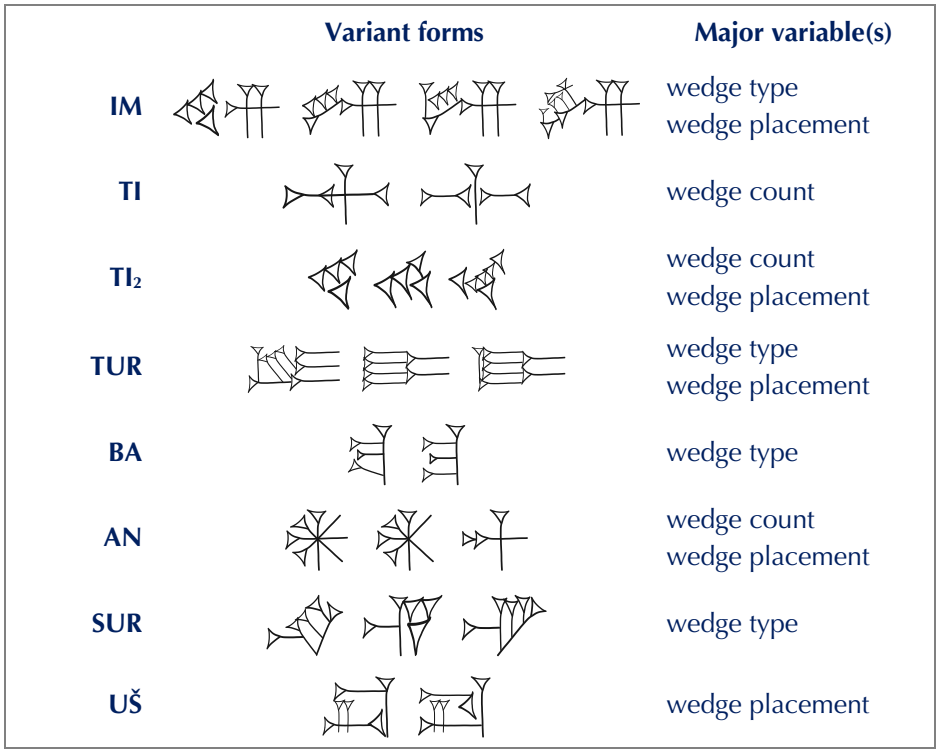


Figure 59: Old Assyrian variants of IM, TI, $TI_2$, TUR, BA, AN, SUR and UŠ

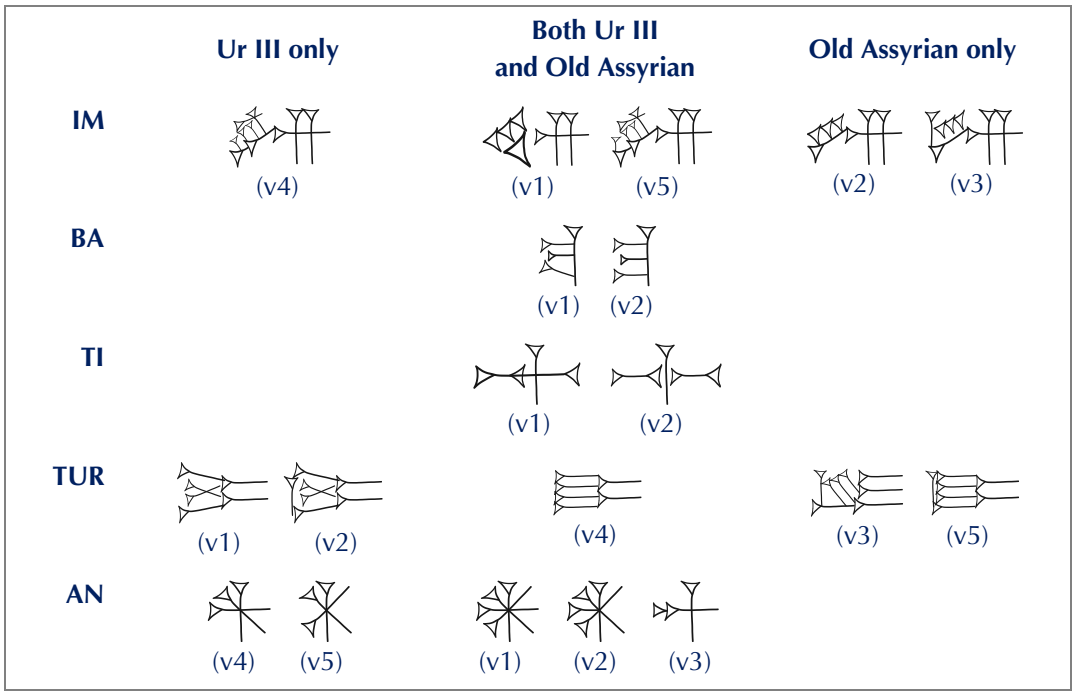


Figure 60: Ur III and Old Assyrian variants of IM, BA, TI, TUR and AN

Of the eight signs selected within the Old Assyrian sample, five are shared with the Ur III sample, i.e. IM, TI, TUR, BA and AN [Figure 60]. Two patterns emerge from the distribution of variants between the two samples. On the one hand, signs with a limited set of variant forms display the same variations in the Ur III and Old Assyrian groups. This is the case for BA and TI, both of which respective variants are shared. On the other hand, signs with a more extended set of variant forms show distinct behaviours of distribution. There are no exclusively Old Assyrian variants of AN, with three out of five variants also observed in the Ur III sample. Meanwhile, IM and TUR reveal exclusive variant forms per corpus.

The assessment of palaeographic variations observed in both Ur III and Old Assyrian study samples above demonstrates that variants are definable and qualifiable against their major variable features. Three variable features could be found throughout the examples provided above: wedge count, wedge placement and wedge type. The variations observed across sign instances of a given sign could either be related to a single variable feature or to a combination of two. How much a variable feature may affect the outline of a sign instance provides the contrast required to distinguish recurring and consistent forms and to define and qualify variants. For example, wedge count variation between instances of LUM in the Ur III sample proved to have less impact than wedge type on the overall outline.

Such approach to palaeographic variants is especially relevant and effective in the context of this study in that it adapts the means of investigation to the nature of the material and the questions posed. By looking at two of the largest cuneiform corpora, one aim of this study is to provide a backdrop and a reference point against which a more in-depth analysis of writing practices, identity and individuality can be assessed. The focus of this study is therefore to identify trends and characteristic traits over and across the two study samples by considering major variations, variables and variants. The more minute variations that may be observed are more relevant in the contained setting of the case studies dedicated to individual handwriting presented in the following chapters [§4.2; §5.2].

### 2.3.2 Structure-based variants

Although the sign-based approach to palaeographic variants remains the most widely used in cuneiform palaeography, recent studies have demonstrated the potential of evaluating graphic variations per sign categorisation and grouping.[213] Paoletti's study of archaic lexical texts from Ebla, for instance, relies on analysing graphically close signs, while Stratford investigates variations across wedge clusters within signs in Old Assyrian letters.[214] Studying cuneiform texts from Ugarit, Ernst-Pradal also developed a method based on groups of similar signs, such as I and TUR.[215] As demonstrated below, recurring and consistent patterns of variation are found in both benchmark samples gathered for Ur III and Old Assyrian cuneiform between signs sharing a similar structure – e.g. BI and GA – or containing a similar element – e.g. ŠU and DA. This forms the foundations of a structural approach to palaeographic variants that considers groups of signs gathered per structure. Following the same guiding principles as the sign-based approach, variants within each group are determined per outline identified according to major variable features. In addition, the same set of variable features (wedge count, wedge placement and wedge type) also applies to structural variants.

This approach also provides the palaeographer with a way to work around the variability of their study material and the limitations of the sign-based approach. The approach adapts the collection of data to the available data, therefore not being limited by the potential scarcity of one sign. It also enhances data collection regardless of tablet format. Small tablets can only carry a limited set a sign instances, of which only a further limited set of collectable instances can be extracted. As such, cuneiform palaeography has traditionally favoured medium to large tablets and their potential to each yield many instances of a given sign. Given the constraints attached to selecting material for palaeographic assessment in terms of representativity, availability, condition status, chronology and provenance, as outlined at the beginning of this chapter, it appeared relevant and necessary to find a way to include smaller tablets in this study. This holds true for both the Ur III and Old Assyrian corpora. On that account, the structure-based

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[213] See also Daniels, 'Cuneiform Calligraphy', in Mattila, ed., (1995), p. 87.

[214] Paoletti, 'The Lexical Texts from Ebla: Palaeography, Sign Identification and Scribes in the Early Dynastic Period', in Devecchi et al., eds., (2015), pp. 49-70; Stratford, 'Old Assyrian Literacy: Formulating a Method for Graphic Analysis and Some Initial Results', in Kulakoğlu et al., eds., (2015), pp. 117-128.

[215] Ernst-Pradal, 'Paléographie des textes hourrites syllabiques de Ras Shamra/Ougarit (suite). Les vocabulaires à colonne hourrite', in Devecchi et al., eds., (2015), pp. 103-128; Ernst-Pradal et al., 'Les écritures mises au jour sur le site d'Ougarit (Syrie) et leur déchiffrement: 1930-2010', in Bordreuil et al., eds., (2013), pp. 219-233; Ernst-Pradal, 'Les signes I, IA et TUR dans les textes juridiques d'Ougarit', in Devecchi, ed., (2012), pp. 65-78.

approach to palaeographic variation is used in this research in combination with a sign-based approach in order to encompass the variety of formats and sign usages encountered across the material analysed. The structure-based approach to palaeographic variations in this study and further case studies thus focusses on five groups of signs, selected for their potential to systematically assess palaeographic variation and to supplement the sign-based approach [Figure 61].

| | | | | |
|---|---|---|---|---|
| **KAŠ-based** structural similarity | e.g. | GIR$_2$ | LI | GU$_2$ |
| | | TA | AM | NE |
| | | BI | GU$_4$ | GA |
| | | GAR$_3$ | ŠA | TE |
| | | HAR | AMAR | UL |
| **Box-framed** structural similarity | e.g. | SAR | MA | ESIR$_2$ |
| | | KU | TUG$_2$ | ŠE$_3$ |
| | | LU | SIG$_2$ | |
| **Diamond-framed** structural similarity | e.g. | KI | ŠA$_3$ | DI |
| | | NA | | |
| **Horizontal-stack** elementary similarity | e.g. | I | LUGAL | NE |
| | | LUH | E | GAR$_3$ |
| | | AŠ$_2$ | GAL | A$_2$ |
| | | DA | ŠA | ŠU |
| **ŠE-cluster** elementary similarity | e.g. | LI | ZI | GI |
| | | IN | GAB | GI$_4$ |
| | | SAR | ŠE | UZ |

Figure 61: Five selected structural groups of palaeographic variations

### *Ur III variants*

In the Ur III sample, the five groups introduced above could be observed and their variants defined.

The two variants of the KAŠ-based group are defined by the type of wedge impressed after the horizontals, either two diverging diagonal wedges (v1) or two *winkelhaken* (v2) [Figure 62].[216] Distributed over 98 tablets and represented by 313 sign instances, the

[216] This group was named 'Archaising/Cursive group' in a previous article presenting the structural approach to palaeographic variation and has since been renamed to the more descriptive label 'KAŠ-based group' (Touillon-Ricci, 'Current Research in Cuneiform Palaeography 2', in Devecchi et al., eds., (2019), pp. 13-39).

two variants are found throughout the sample on signs as graphically close as GA and BI or as different as NE and AMAR.

| KAŠ-based | GA | BI | ŠA | TA |
|---|---|---|---|---|
| 'diagonal'  (v1) |  BM 107087 o.3 |  BM 106952 o.7 |  BM 130425 r.6 |  BM 107054 o.5 |
| *'winkelhaken'*  (v2) |  BM 12619 r.11 |  BM 130425 r.2 |  BM 112255 r.8 |  BM 107048 r.5 |

Figure 62: Two Ur III variants of KAŠ-based signs

| Box-framed | LU | MA | $SIG_2$ |
|---|---|---|---|
| 'interlocked'  (v1) |  BM 12608 o.3 |  BM 130124 r.2 | - |
| 'adjoining'  (v2) |  BM 107093 o.2 |  BM 108004 o.1 |  BM 130494 o.1 |
| 'overlaid'  (v3) |  BM 106965 o.1 |  BM 107090 o.5 |  BM 117179 r.1 |

Figure 63: Three Ur III variants of Box-framed signs

Signs composed of a box frame, such as $SIG_2$ or LU, are represented across the sample by 123 instances distributed over 55 tablets. Although the box frame is invariably composed of four wedges, their placement and interaction define three variant forms [Figure 63]. How the upper horizontal and the leftmost vertical wedge interact is key to

distinguishing between them, whether the heads are interlocked (v1), adjoining (v2) or overlaid (v3).

Signs gathered in the Diamond-framed group descend from an archaic diamond form, except for NA. They are represented across the sample by 137 instances distributed over 67 tablets.[217] Variants of the Diamond-framed signs are determined according to their outline, either an upright diamond (v3), a tilted diamond (v4) or a regular diamond (v5) [Figure 64]. This holds true for $ŠA_3$, KI and DI, and to a certain extent for NA.

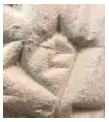
| **Diamond-framed** | **KI** | **DI** | **$ŠA_3$** |
|---|---|---|---|
| 'upright'  (v3) |  AO 5536 o.5 |  BM 130470 r.3 |  AO 5481 r.13 |
| 'tilted'  (v4) |  AO 5599 o.2 |  BM 130137 o.1 |  BM 12249 r.8 |
| 'regular'  (v5) |  BM 12481 A o.2 |  BM 130195 o.2 |  BM 27667 o.4 |

Figure 64: Three Ur III variants of Diamond-framed signs

Although NA displays the same variants as KI, $ŠA_3$ and DI, it also displays a variant of its own (v2) [Figure 65]. This variant is based on a diamond frame only comprising three wedges, as opposed to four wedges for the diamond variants previously presented. One tablet presents a sub-variant of the open diamond frame (BM 12619) characterised by three diagonal wedges, a peculiarity to be further analysed in the next chapter [§4.1.3].

[217] The full Diamond-framed group is represented by 67 tablets and 137 sign instances; excluding NA, the Diamond-frame group is represented by 60 tablets and 105 sign instances.

| NA | | |
|---|---|---|
| |  |  |
| |  |  |
| | BM 130474<br>o.4 | BM 12619<br>o.9 |

Figure 65: Two Ur III variants of NA characterised by an open diamond frame

Signs starting with a stack of horizontal wedges share a pattern of variation affecting the profile of the stack and how wedges align. Across the 224 instances collected over 83 tablets, four variants emerge [Figure 66]. Although the wedge count varies between sign instances, the major variable feature defining these four variants is the wedge placement. Found across sign instances, the profiles of the horizontal stack can be aligned (v1), with all wedges of equal length, clamped (v2), with the upper and lower wedges protruding, inset (v3), with only the lower wedge protruding, or stepped (v4), with each wedge in the stack longer than the one above it.

| Horizontal-stack | ŠU | DA | LUGAL |
|---|---|---|---|
| 'aligned'<br>  <br>(v1) |  <br>BM 115812<br>o.5 |  <br>BM 130426<br>r.6 |  <br>BM 134634<br>o.3 |
| 'clamped'<br>  <br>(v2) | - |  <br>BM 106962<br>o.2 | - |
| 'inset'<br>  <br>(v3) |  <br>BM 107090<br>r.3 |  <br>BM 103442<br>o.4 |  <br>BM 120143<br>o.7 |
| 'stepped'<br>  <br>(v4) |  <br>AO 5599<br>o.1 |  <br>AO 5481<br>o.5 |  <br>BM 12326<br>r.2 |

Figure 66: Four Ur III variants of Horizontal-stack signs

| ŠE-cluster | ŠE | UZ | SAR |
|---|---|---|---|
| '3 rows *winkelhaken*'  (v1) | - | - |  BM 106979 r.5 |
| '2 equal rows *winkelhaken*'  (v2) |  BM 107064 o.1 |  BM 110216 o.3 | - |
| '2 unequal rows *winkelhaken*'  (v3) |  BM 107069 o.1 |  BM 130124 o.8 | - |
| 'diverging diagonal'  (v4) |  BM 106962 o.8 |  BM 103442 r.1 | - |

Figure 67: Four Ur III variants of ŠE-cluster signs

Amongst the signs composed of a ŠE cluster, such as $GI_4$ or NAGA, four variants could be observed across 166 instances and 76 tablets [Figure 67]. The four variants are defined by a combination of variable features. One variant (v4) is composed of diverging diagonals, while the three remaining variants use *winkelhaken* instead. Two variants are arranged over two rows of *winkelhaken* (v2 and v3). They differ, however, in that one (v2) displays two equal rows, while the second one (v3) arranges wedges over two unequal rows. The remaining variant (v1) is composed of three rows of *winkelhaken*.[218] The wedge count can vary between instances of a same variant form. This is the case, for example, of variant (v2) ranging between 8 (4/4) and 14 (7/7) *winkelhaken*. Two variant forms (v3 and v4) have in common, however, to invariably display a lower row of two wedges, no more, no less. Variant forms of signs composed of a ŠE cluster are therefore defined by a combination of three variable features: wedge placement, wedge

[218] There could theoretically be a fifth variant with two equal rows of diverging diagonals since such a variant is included in Schneider's list of Ur III cuneiform (Schneider 1935): for ZI (number 125) and GAB (number 146), for instance. This variant form is, however, not attested in this study sample.

type and wedge count. Wedge count is in this context understood as relative rather than absolute, reflecting quantities rather than exact numbers.

### *Old Assyrian variants*

Similar structural groups can be gathered in the Old Assyrian sample, with some signs shared with Ur III and others exclusive to this sample. Signs composed of a diamond frame do not, however, present similar patterns of recurring and consistent variation. The use of DI and $ŠA_3$ is very limited in Old Assyrian as opposed to Ur III, whereas KI and NA remain two frequent signs. In the Old Assyrian sample, the variation observed on KI an NA follow distinct patterns, therefore not aggregating into a structural group per se as was the case in the Ur III sample.

Although there are only five signs composed of a Box-like frame, the three same variants than in Ur III are found across the 112 instances and 36 tablets in the sample [Figure 68].

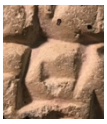
| **Box-framed** | **MA** | **KU** | **LU** |
|---|---|---|---|
| 'interlocked'  (v1) |  BM 115126 o.7 | - |  BM 115126 r.3 |
| 'adjoining'  (v2) |  BM 113416 o.1 |  BM 113531 o.3 |  BM 113558 o.9 |
| 'overlaid'  (v3) |  BM 113556 o.5 |  BM 113556 r.10 |  BM 115067 o.9 |

Figure 68: Three Old Assyrian variants of Box-framed signs

KAŠ-based signs are found across the sample over 44 tablets and are represented by 377 instances. The same two variants that were found in the Ur III sample can be observed across Old Assyrian instances [Figure 69].

| KAŠ-based | GA | UL | BI | TA |
|---|---|---|---|---|
| 'diagonal' (v1) |  BM 115067 o.6 |  BM 115126 o.8 |  BM 113556 o.11 |  BM 113304 r.10 |
| *'winkelhaken'* (v2) |  BM 113472 r.6 |  BM 115067 r.4 |  BM 113520 r.7 |  BM 115067 o.7 |

Figure 69: Two Old Assyrian variants of KAŠ-based signs

Signs starting with a stack of horizontal wedges are found over 44 tablets and represented by 350 sign instances, across which four variant forms can be identified [Figure 70]. These four variants are the same as in the Ur III sample.

| Horizontal-stack | $GAR_3$ | DA | ŠA |
|---|---|---|---|
| 'aligned' (v1) |  BM 113530 o.3 |  BM 113454 o.1 |  BM 115086 te.2 |
| 'clamped' (v2) | - |  BM 113503 o.2 |  BM 113530 o.5 |
| 'inset' (v3) |  BM 113565 r.8 |  BM 113454 r.9 |  BM 113458 r.4 |
| 'stepped' (v4) |  BM 113516 o.4 |  BM 113538 o.10 |  BM 115126 o.2 |

Figure 70: Four Old Assyrian variants of Horizontal-stack signs

The four variants that were identified in the Ur III sample amongst signs composed of a ŠE cluster could also be found across the 142 instances and 37 tablets extracted from the Old Assyrian material [Figure 71]. The 'diverging diagonal' variant (v4) was only observed on instances of GI.

| ŠE-cluster | ZI | IN | SAR |
|---|---|---|---|
| '3 rows *winkelhaken*'  (v1) | - | - |  BM 115080 r.11 |
| '2 equal rows *winkelhaken*'  (v2) |  BM 115080 r.6 |  BM 113556 o.4 |  BM 113470 o.4 |
| '2 unequal rows *winkelhaken*'  (v3) |  BM 113530 o.4 |  BM 113472 o.5 |  BM 113516 o.3 |

Figure 71: Three Old Assyrian variants of ŠE-cluster signs

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In the structural approach to palaeographic variants, similar patterns of variation can be observed across signs sharing similar characteristics. It can be the case that signs descend from a common line, as is the case with the Diamond-framed signs, originating from an archaic diamond shape. It can also be the case that signs are used as constituent element in compound signs, one example of which is the element ŠE in DABIN ($ŠE_3$.ŠE). On the other hand, signs can also have no common origin nor element. TA and AMAR, for example, have little in common other than being both composed of two horizontal wedges and displaying the same two variants (horizontals terminated by diagonal wedges or by *winkelhaken* instead). Like in the sign-based approach developed above, variant forms in the structure-based approach are defined and qualified within groups according to the major variable features they display [Figure 72]. That signs are

structurally similar, however, does not automatically form structural groups. Signs composing structural groups must present a significant array of palaeographic variation which should, in addition, be definable and qualifiable in measurable terms. The signs $E_2$, $GIN_2$, KID and $U_2$, for example, may share a structural similarity in that they are composed of a grid-like element of crossing vertical and horizontal wedges. The patterns of variation observed on such signs, mainly with respect to wedge count, affects each sign independently rather than being shared. In this case, the array of variation is too narrow and constrained to individual signs without involving group dynamics. In the structural approach to palaeographic variation, one sign can belong to more than one group according to its structure. The sign LI  , for instance, belongs to the ŠE-cluster group since it is formed with a leading cluster of *winkelhaken*, and to the KAŠ-based group since it displays a ŠA element.

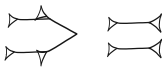
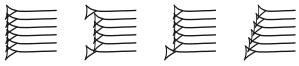
| | Variant forms | Major variable(s) |
|---|---|---|
| **KAŠ-based** |  | wedge type |
| **Box-framed** |  | wedge placement |
| **Diamond-framed** |  | wedge type<br>wedge placement |
| **Horizontal-stack** |  | wedge placement |
| **ŠE-cluster** |  | wedge count<br>wedge placement<br>(wedge type) |

Figure 72: Ur III and Old Assyrian structural groups of palaeographic variants

Structural groups are not exactly similar between the Ur III and Old Assyrian samples, with signs specific to one sample or the other. It is nevertheless interesting to find such a degree of similarity in the patterns of variation observable in both Ur III and Old Assyrian study samples. In terms of qualification, the focus of the above section has been to identify variants between groups of signs sharing a similar makeup. The distribution of variants between signs within these structural groups is further developed and their homogeneity assessed in the next chapter. The two benchmark samples presented in this chapter outline the nature and the extent of palaeographic and diplomatic variation in both Ur III and Old Assyrian cuneiform. On the one hand, this benchmark study enables the assessment of material features in terms of measurability

and exploitability; on the other, it provides a backdrop for the case studies presented in the next three chapters to address the questions of identity and individuality in Ur III and Old Assyrian cuneiform.

# CHAPTER 3

# OUTLINE OF WRITING PRACTICES IN UR III AND OLD ASSYRIAN CUNEIFORM

This chapter explores patterns of palaeographic and diplomatic variations in Ur III and Old Assyrian cuneiform following the methodology outlined in Chapter 2. This chapter includes a benchmark dataset for each corpus, designed to provide an initial overview of the palaeographic and diplomatic trends of the Ur III and Old Assyrian periods, against which further studies can be contextualised. Each study sample is analysed through a threefold process in order to identify whether variation in writing practices may relate to wider trends of time and place or be attached to specific text genres or be contained per manuscript.

## 3.1 Ur III

This section on Ur III cuneiform assesses the distribution of palaeographic and diplomatic variations through three case studies. Since the administrative documents from the Ur III Period are mostly dated, the first case study will look at patterns of variation over time, followed by a case study dedicated to patterns across sites. Patterns of variation will finally be assessed between tablets to further investigate how writing practices may be affected by context or scribal choices.

### 3.1.1 Patterns over time

The nature of the Ur III corpus – mostly administrative and often dated texts – allow for an assessment of palaeographic and diplomatic variation over time. The 90 dated tablets gathered in the Ur III benchmark sample reveal shifting patterns over the period they

cover – from Šulgi 33 to Ibbi-Suen 15 (2060 to 2012 BCE) –, albeit restricted to specific features rather than generalised [Appendix 2.a].

A sign-based approach to palaeographic variation does not suggest time-related patterns on signs such as TI and BA [Figure 73 and Figure 74].

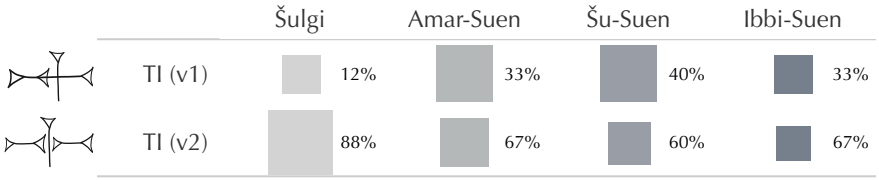



Figure 73: Variants of TI over time

% of Sign Instances (size) broken down by Ruler vs. TI Variants (colour). Sample size (in count of sign instances): 22. Sample size (in count of tablets): 22.

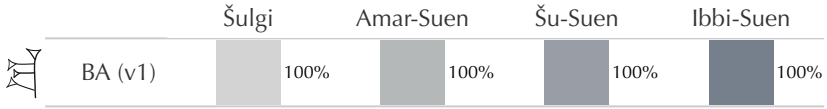



Figure 74: Variants of BA over time

% of Sign Instances (size) broken down by Ruler (colour) vs. BA Variants. Sample size (in count of sign instances): 57. Sample size (in count of tablets): 35.

Similarly, the sign AN, whether as a standalone sign or used in the ligature $^{d}$EN, displays consistent distribution patterns [Figure 75 and Figure 76].

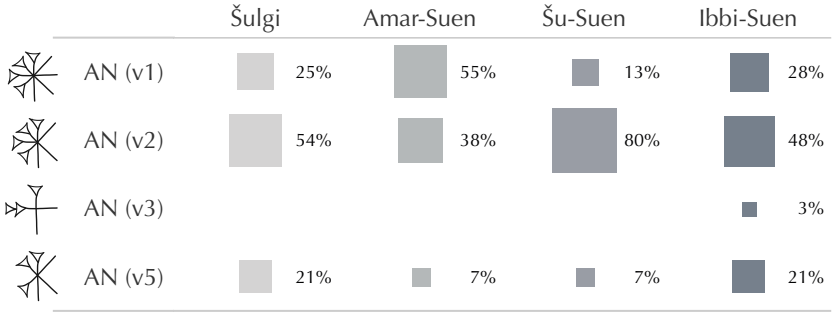



Figure 75: Variants of AN over time

% of Sign Instances (size) broken down by Ruler (colour) vs. AN Variants. Sample size (in count of sign instances): 97. Sample size (in count of tablets): 63.

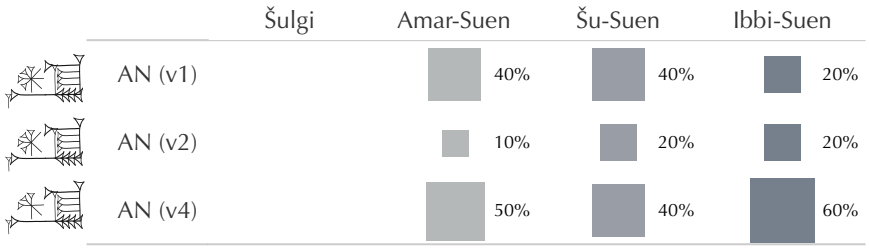



Figure 76: Variants of AN in $^{d}$EN over time

% of Sign Instances (size) broken down by Ruler (colour) vs. AN Variants. Sample size (in count of sign instances): 20. Sample size (in count of tablets): 20.

While a sign-based palaeographic approach does not reveal significant time-related patterns, the analysis of structural groups of signs suggests an evolution of the script. In the sample, the *winkelhaken* (v2) variant of signs in the KAŠ-based group, such as TA, BI or GA, for instance, is attested already in the earliest tablets, dated to the reign of Šulgi, although to a lesser extent than the diagonal (v1) variant [Figure 77].

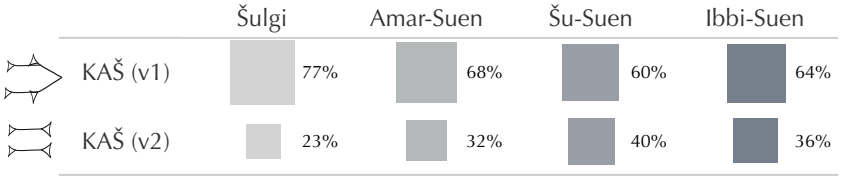



Figure 77: Distribution of KAŠ-based variants over time

% of Sign Instances (size) broken down by Ruler (colour) vs. KAŠ-based Variants. Sample size (in count of sign instances): 264. Sample size (in count of tablets): 85.

During Šulgi's reign, the diagonal (v1) variant is more often used exclusively, and tablets displaying a combination of both variants are uncommon [Figure 78]. When used in combination, the location of each variant type within the inscription suggests that the *winkelhaken* (v2) form might have been employed by the scribe in response to a lack of space on the writing surface. In the dataset, the *winkelhaken* (v2) form is thus found at the end of lines, as well as towards the end of the inscription on the reverse of the tablet, especially its lower half. From the reign of Amar-Suen onwards, however, the combined use of both diagonal (v1) and *winkelhaken* (v2) variants becomes more frequent and consistent, although the *winkelhaken* (v2) form remains secondary.

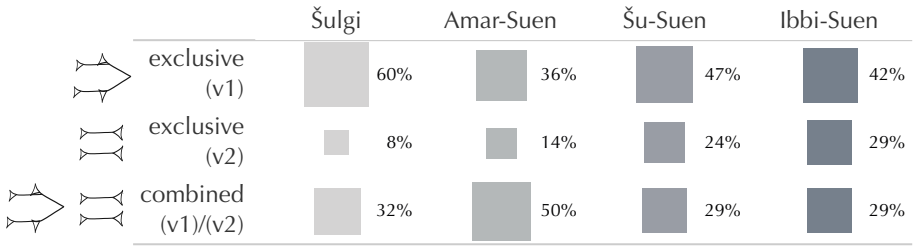



Figure 78: Distribution of KAŠ-based variants over time (usage per tablet)

% of Tablets (size) broken down by Ruler (colour) vs. KAŠ-based Variants. Sample size (in count of sign instances): 264. Sample size (in count of tablets): 85.

The exclusive use of either variant type displays an inverse shifting pattern: while the number of tablets displaying only *winkelhaken* (v2) forms increases over time, the number of tablets displaying only diagonal (v1) variants decreases over time. Although decreasing, the use of the diagonal (v1) form remains prevalent throughout. This inverse pattern of exclusive use is observable both when considering all signs within the KAŠ-based group and within the group at sign level. This pattern is observable across sites, except for Ur. The *winkelhaken* (v2) form is never attested on its own on tablets from Ur within the sample, whereas tablets from Drehem, Girsu and Umma reflect the general trend observed at group and sign levels.

The *winkelhaken* (v2) form is more compact than the diagonal (v1) one; it is also quicker and simpler for the scribe to write. The shift from diagonal (v1) to *winkelhaken* (v2) forms over the Ur III Period might therefore originate from their respective makings.

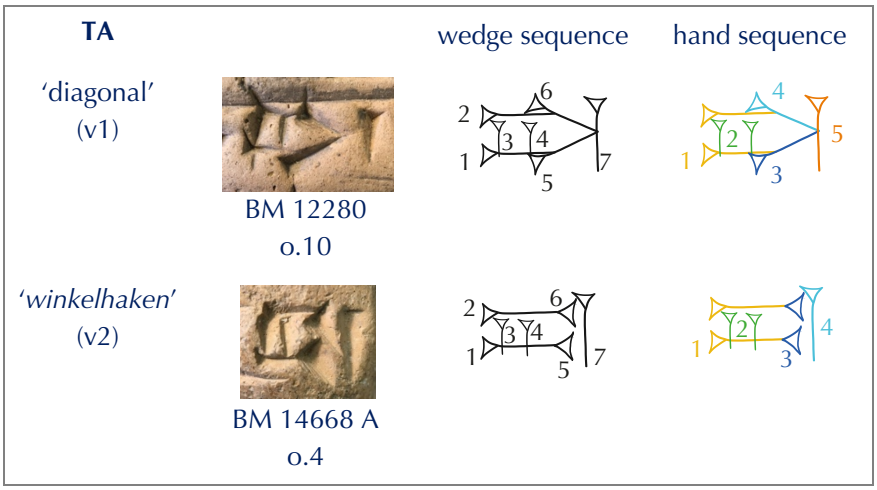



Figure 79: Writing sequence of wedges and hand movements in KAŠ-based variants of TA

The making of a variant is in this case deduced from the specific wedge types used in each variant – diagonals for the (v2) form; *winkelhaken* for the (v1) form – since the impression of these different types of wedge results from different hand and wrist

movements [Figure 79]. The *winkelhaken* (v2) variant of the sign TA, for instance, requires the hand to adopt 4 positions in total, against 5 for the diagonal (v1) form. This is explained by the *winkelhaken* (v2) type being formed with two identical wedges, the *winkelhaken*, whose impression flows from one hand position, whereas the diverging diagonals of the (v2) variant impose a wrist rotation to the writing hand, thus adding an extra move. Interestingly, the wedge type that characterises each variant seems not to affect the writing sequence, which remains identical in both diagonal (v1) and *winkelhaken* (v2) forms. Both variants of the sign TA display the same writing sequence of wedges: the horizontals are impressed first from bottom to top followed by the verticals from left to right; the diagonals come next in the (v1) form, replaced by *winkelhaken* in the (v2) form; the rightmost vertical comes last.

Similarly, signs belonging to the Diamond-framed group also display a shifting pattern towards an increasing use of shorter-handed forms over the Ur III Period. As such, the upright diamond (v3) variant becomes more frequent on later tablets within the sample [Figure 80].

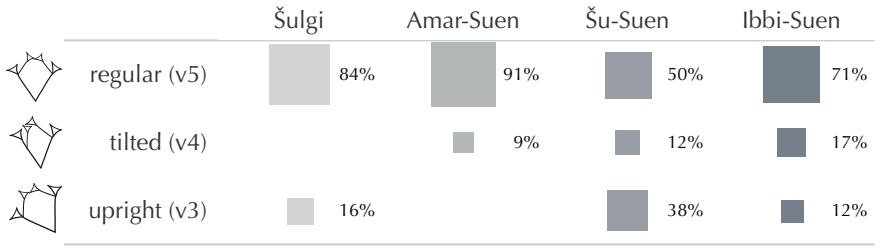



Figure 80: Distribution of Diamond-framed variants over time

% of Sign Instances (size) broken down by Ruler (colour) vs. Diamond-framed Variants. Sample size (in count of sign instances): 84. Sample size (in count of tablets): 52.

Like the *winkelhaken* (v2) variants of the KAŠ-based group, the upright diamond (v3) is quicker and simpler to write, as suggested by its making. Unlike in the *winkelhaken* (v2) forms, however, variants in signs belonging to KAŠ-based group display writing sequences that are distinct and variant-specific. In the case of the regular diamond (v5) form of KI, for instance, prevalent on earlier tablets, the writing sequence of wedges follows a clockwise movement outlining the diamond frame from the lower left diagonal to the lower right and ending with the impression of the internal horizontals.[219] By following this sequence, the writing hand has to adopt 5 different positions. In the

[219] The shift from a clockwise to a parallel flow in the writing sequence of KI is observable to a larger scale in Taylor's diachronic survey of wedge order (Taylor, 'Wedge Order in Cuneiform: A Preliminary Survey', in Devecchi et al., eds., (2015), pp. 10-12 and 17-18).

upright diamond (v3) form of KI, the mirroring sequences of writing, both of wedges and of hand, is determined by the wedge type. The diagonals are impressed first, followed by the verticals and finally by the horizontals. The upright diamond (v3) variant of KI thus requires the writing hand to adopt 3 different positions [Figure 81]. In both cases, regular (v5) and upright (v3) diamond, there is a direct correlation between the structure of a variant and its making since the number of hand moves is reduced by the change in wedge type.

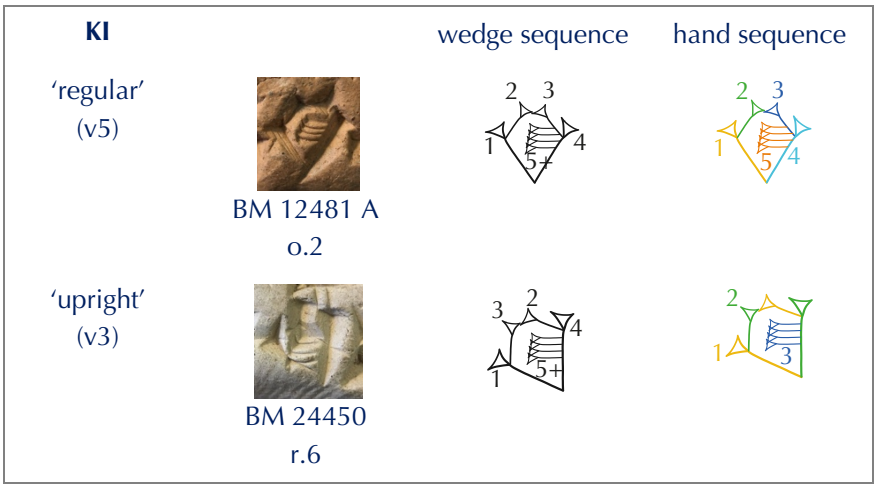



Figure 81: Writing sequence of wedges and hand movements in Diamond-framed variants of KI

The *winkelhaken* (v2) variant of the KAŠ-based group and the upright (v3) variant of the Diamond-framed group share a fundamental trait in terms of writing process. Both variants are impressed on clay with as few hand and wrist movements as possible, as reflected in the sequence of impression of their respective constituent wedges. They are therefore quicker to write than their respective diagonal (v1) and regular diamond (v5) counterparts. In its modern sense, *short-hand* is used to describe a rapid handwriting, generally quickened by ways of symbols or abbreviations. On that account, and although the latter devices do not apply here, both variants are referred to in this study as 'short-hand' since their making enables a rapid flow of writing by means of reducing hand and wrist movements.

While diplomatic features show no time-related patterns, whether shape and profile, format, or text layout and script density, palaeographic features suggest shifting patterns over time. Considering the making of sign forms, the shift in variants appears to be more than just formal but most importantly pertains to how signs are inscribed.

### 3.1.2 Patterns across place

The distribution of variants across the four sites represented in the Ur III benchmark sample – Drehem, Girsu, Umma, Ur – suggests trends relating to places [Appendix 2.a]. Apart from LUM, for which both variants are found in every location, the variants of IM, TI and AN display different distribution patterns across sites.

Tablets identified as being from Umma exclusively use the variant (v4) of IM, while the (v5) variant ifs found in both Ur and Drehem [Figure 82]. Only tablets from Girsu use a combination of variants of IM, (v1) and (v4). The variant form (v1) is also used in Girsu alone and not found on tablets from other provenances.

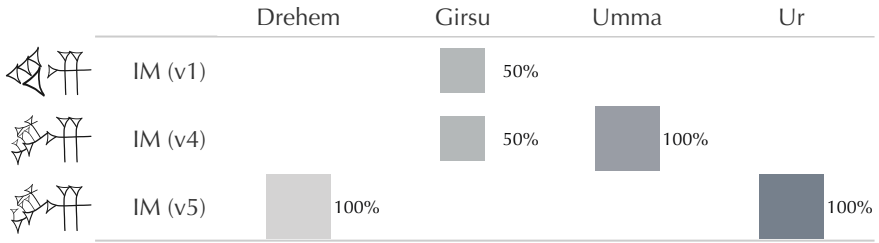



Figure 82: Variants of IM across sites

% of Sign Instances (size) broken down by Site (colour) vs. IM Variants. Sample size (in count of sign instances): 13. Sample size (in count of tablets): 11.

While variants of IM are locally distributed across sites, forms of TI are more evenly spread out between Drehem, Umma and Girsu [Figure 83]. Tablets from Ur, however, only ever use the (v2) variant, composed of five wedges.

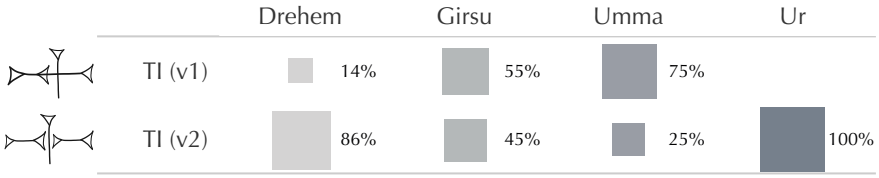



Figure 83: Variants of TI across sites

% of Sign Instances (size) broken down by Site (colour) vs. TI Variants. Sample size (in count of sign instances): 26. Sample size (in count of tablets): 24.

Ur stands out again when observing the distribution of variants of AN, although to a lesser extent [Figure 84]. Although the variant forms (v1) and (v2) are found across the four sites, tablets from Ur do not display any other variants of the sign, while the abbreviated form (v5) is found in Girsu, Drehem and Umma. More importantly, (v5) is as commonly used in Girsu as the variant (v1), while it is only seldom attested in Drehem

and Umma. Tablets from Girsu are also remarkable by their use of two variant forms that cannot be observed anywhere else in the sample, (v3) and (v4).

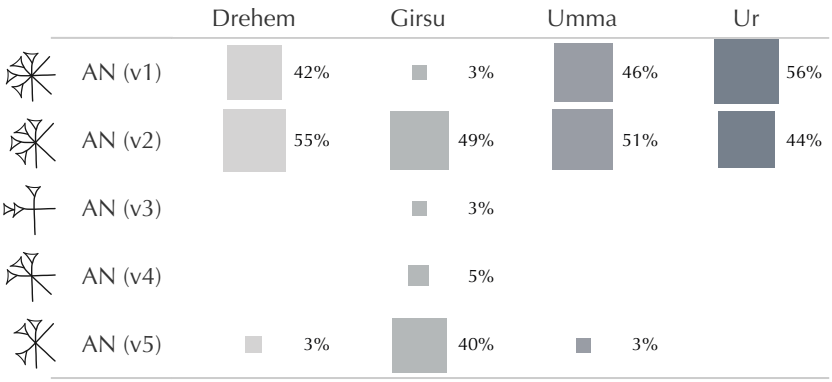



Figure 84: Variants of AN across sites

% of Sign Instances (size) broken down by Site (colour) vs. AN Variants. Sample size (in count of sign instances): 119. Sample size (in count of tablets): 76.

Yet, the variant form (v4), while only attested in Girsu when considering the sign AN, is used in Drehem, Umma and Ur for the ligature $^{d}$EN [Figure 85]. Tablets from Girsu, which displayed the widest array of variations for the sign AN, conversely only use the variant (v4) in the ligature $^{d}$EN.

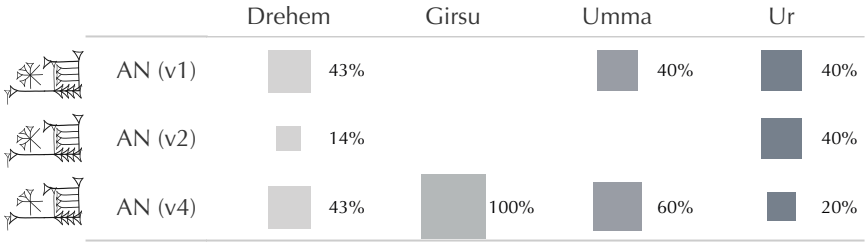



Figure 85: Variants of AN in $^{d}$EN across sites

% of Sign Instances (size) broken down by Site (colour) vs. AN Variants. Sample size (in count of sign instances): 21. Sample size (in count of tablets): 21.

When considering palaeographic variations across structural groups of signs, the data from the sample does not suggest any site-related patterns for signs belonging to the Box-framed, Horizontal-stack and ŠE-cluster groups. There are, however, patterns of distribution across sites for signs in the KAŠ-based and in the Diamond-framed groups. While the KAŠ-based group of signs revealed time-related patterns, as demonstrated above, tablets from Ur never use the *winkelhaken* (v2) variant alone, regardless of chronology [Figure 86 and Figure 87]. In Ur, *winkelhaken* (v2) variants are only ever found in combination with diagonal (v1) ones.

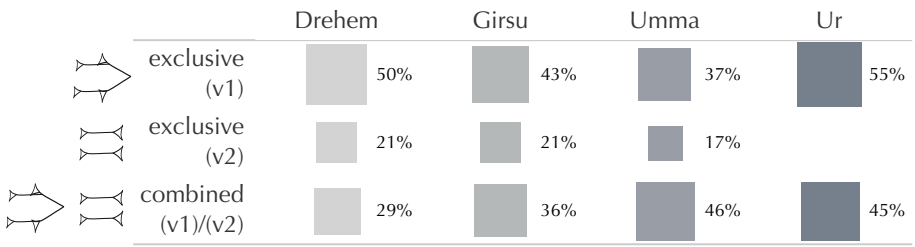



Figure 86: Distribution of KAŠ-based variants across sites (usage per tablet)

% of Tablets (size) broken down by Site (colour) vs. KAŠ-based Variants. Sample size (in count of sign instances): 313. Sample size (in count of tablets): 98.

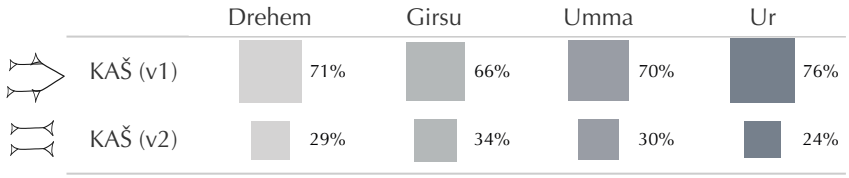



Figure 87: Distribution of KAŠ-based variants across sites

% of Sign Instances (size) broken down by Site (colour) vs. KAŠ-based Variants. Sample size (in count of sign instances): 313. Sample size (in count of tablets): 98.

As regards signs belonging to the Diamond-framed group, tablets from Ur also differ from other sites in that they equally use the three variant forms of the diamond, upright (v3), tilted (v4) and regular (v5) [Figure 88]. Although tablets from Drehem and Girsu also use all three variants, their distribution within the sample reveals different patterns, with Girsu favouring the regular diamond (v5) above all other forms. Notably, the tilted variant (v4) is not attested on tablets from Umma.

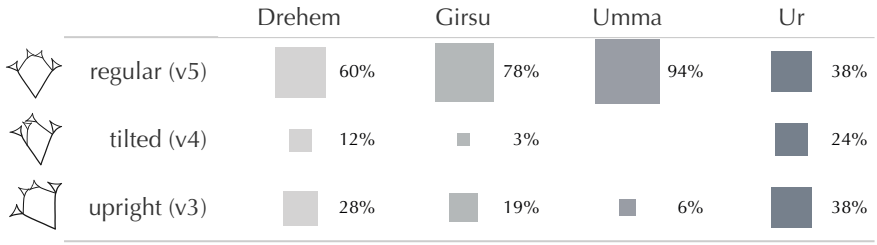



Figure 88: Distribution of Diamond-framed variants across sites

% of Sign Instances (size) broken down by Site (colour) vs. Diamond-framed Variants. Sample size (in count of sign instances): 105. Sample size (in count of tablets): 64.

Overall, diplomatic variations do not highlight any major site-related patterns. A few features, however, suggest trends according to the provenance of the tablets.

The distribution of morphological types is evenly spread out across sites [Figure 89]. All four groups favour the convex/convex type, with higher proportions overall in Drehem and Girsu. The flat/convex type is also found across sites, but is more frequent in Umma and Ur.

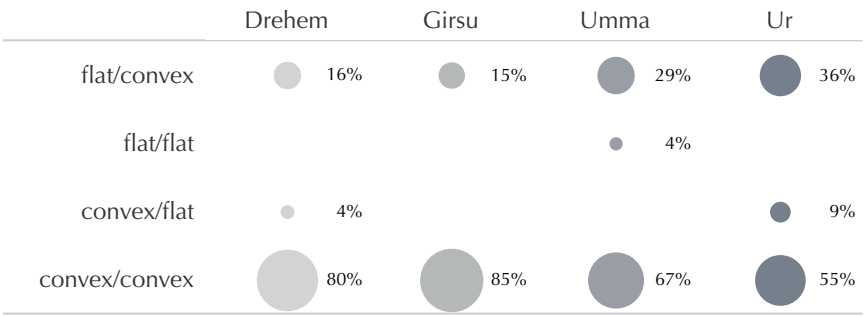



Figure 89: Distribution of tablet profiles across sites

% of Tablets (size) broken down by Site (colour) vs. Profile: Obverse/Reverse. Sample size (in count of tablets): 103.

In terms of ratio and format, all sites show a tendency for small rectangular tablets [Figure 90]. While tablets from Umma also tend towards this, the only four square tablets in the sample are all provenanced from Umma (BM 113020, BM 107873, BM 107799, BM 107570).

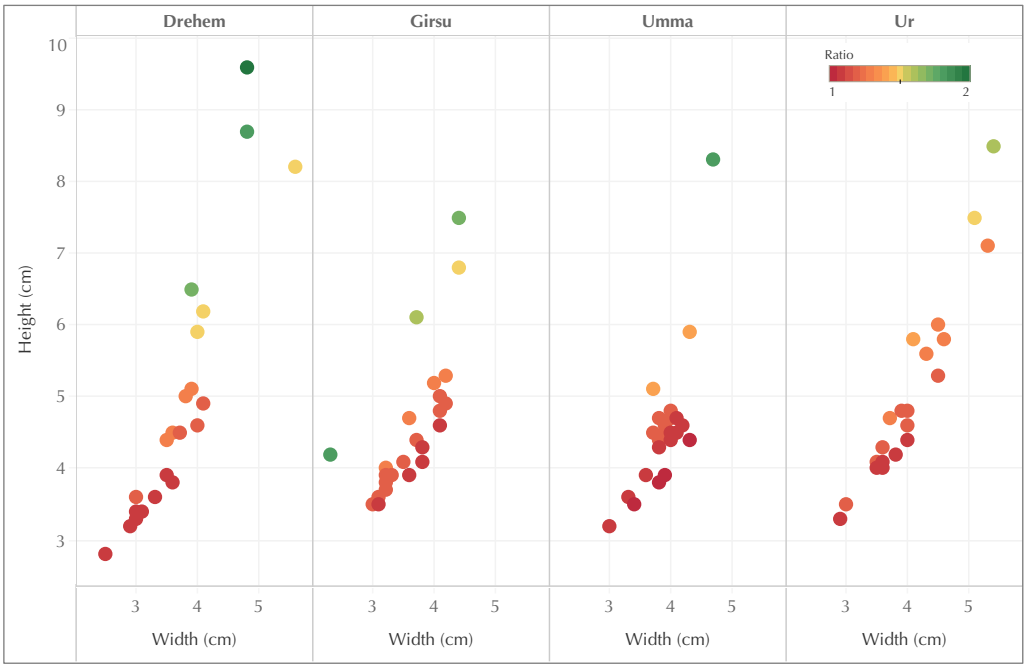



Figure 90: Distribution of tablet formats across sites

Tablet Width (x-axis) vs. Tablet Height (y-axis) broken down by Site. Colour shows details about Ratio. Sample size (in count of tablets): 101.

Finally, when considering script density, tablets from Drehem seem to stand out. They show a slightly higher overall script density than tablets from other sites. The contrast between sites is not strong, however. In addition, patterns of variation for script density seem to be distributed between tablets rather than relating to sites.

Whether palaeographic or diplomatic, patterns of variation reveal site-related trends. Two sites especially stand out as showing the most marked local traditions, Ur and Girsu. The next chapter will take a closer look at these two sites [§4.1.2].

### 3.1.3 Patterns between tablets

Palaeographic and diplomatic features have so far revealed both time- and place-related patterns. The following paragraphs investigate whether material features may also relate to the immediate context of writing rather than wider trends. For example, are sign variants affected by instance location on a tablet or by sign value? To what extent can text layout suggest aspects of text planning? In this section, palaeographic and diplomatic variations are assessed between the tablets gathered in the Ur III benchmark sample [Appendix 2.a].

The distribution of variants of LUM, IM and TI between tablets respectively reveals an exclusive use of either variant.

In the case of LUM, each tablet tends to bear only one instance of the sign. While the fact that there is a unique instance of LUM per tablet leaves no opportunity for variation, that tablets display either variant might reveal a scribal choice or coexisting scribal traditions [Figure 91]. When more than one instance appears, on BM 26429, they are written with the same variant [Figure 92]. Furthermore, the two variants of LUM were also found over time and across place regardless of dates and sites.


Figure 91: Variants of LUM between tablets

% of Tablets (size) broken down by LUM Variants vs. Usage (colour). Sample size (in count of sign instances): 21. Sample size (in count of tablets): 19.

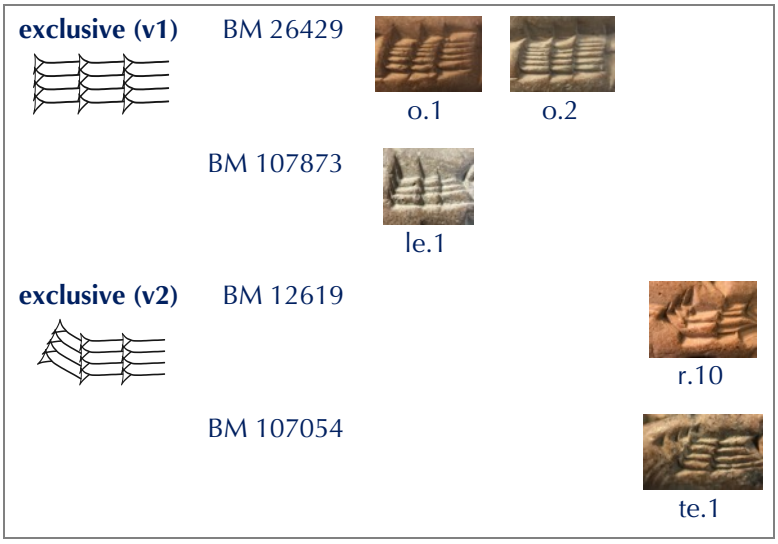



Figure 92: Variants of LUM between tablets (extract)

The distribution of variants of TI and IM previously suggested site-related patterns. Within this sample, however, the distribution of variants of TI and IM is similar to LUM, with variants used exclusively per tablet but also represented by unique instances of each sign [Figure 93 and Figure 94].

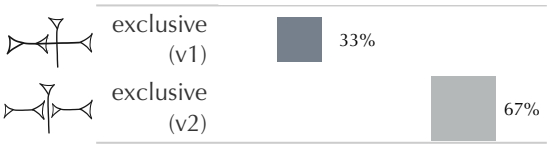



Figure 93: Variants of TI between tablets

% of Tablets (size) broken down by TI Variants vs. Usage (colour). Sample size (in count of sign instances): 26. Sample size (in count of tablets): 24.

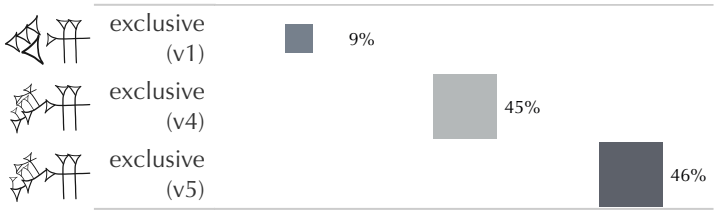



Figure 94: Variants of IM between tablets

% of Tablets (size) broken down by IM Variants vs. Usage (colour). Sample size (in count of sign instances): 13. Sample size (in count of tablets): 11.

When more than one instance of TI is observed, as on BM 14745, they are all written with the same variant [Figure 95]. This also applies to multiple instances of IM found, for example, on AO 5481 and BM 85441 [Figure 96].

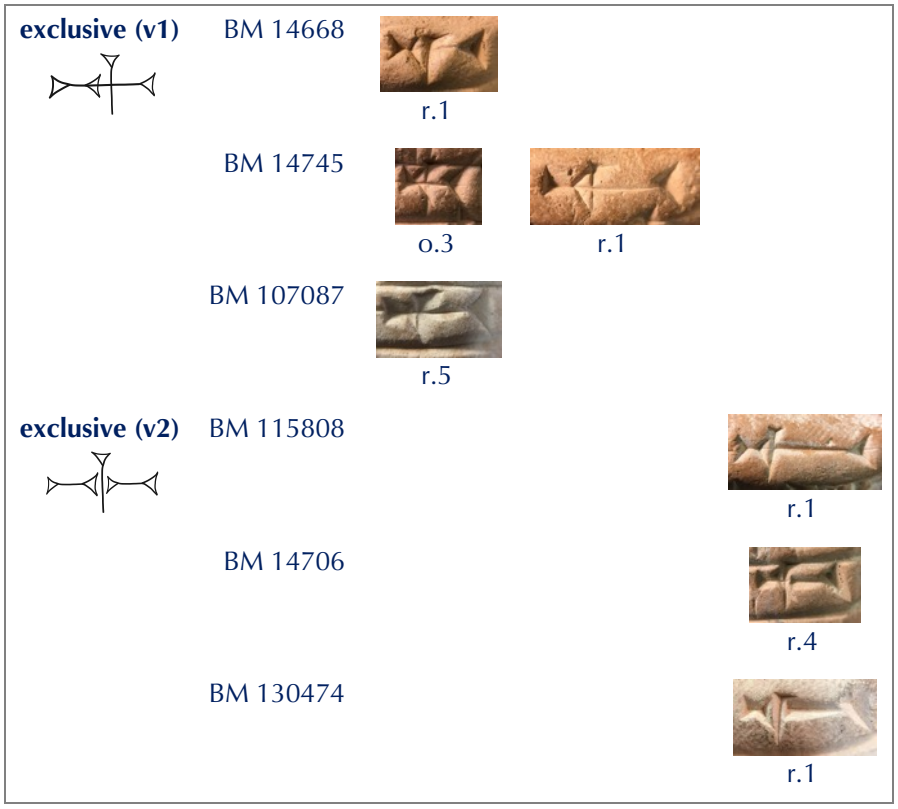



Figure 95: Variants of TI between tablets (extract)

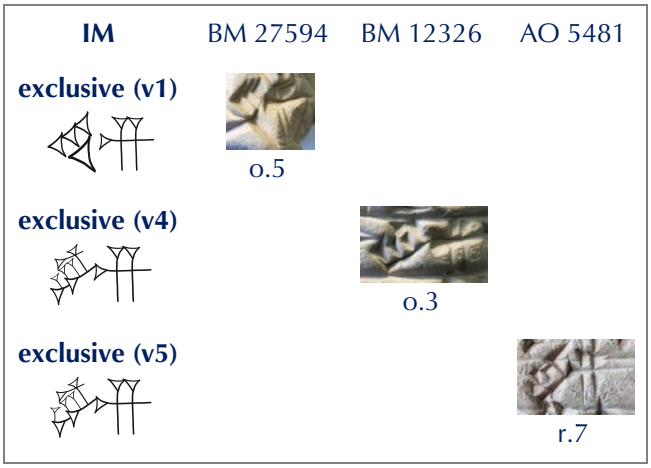



Figure 96: Variants of IM between tablets (extract)

How many variants of LUM, of TI or of IM would have been known to any Ur III scribe is unknown. Should they each have known both variants, the distributions of forms of LUM, TI or IM observed in the sample would reveal what choices they made while writing. Should they each have known one variant, the sample would reveal coexisting practices. Tablets bearing both instances of TI and LUM, however, do not reveal any consistent pattern of use between variants [Figure 97].

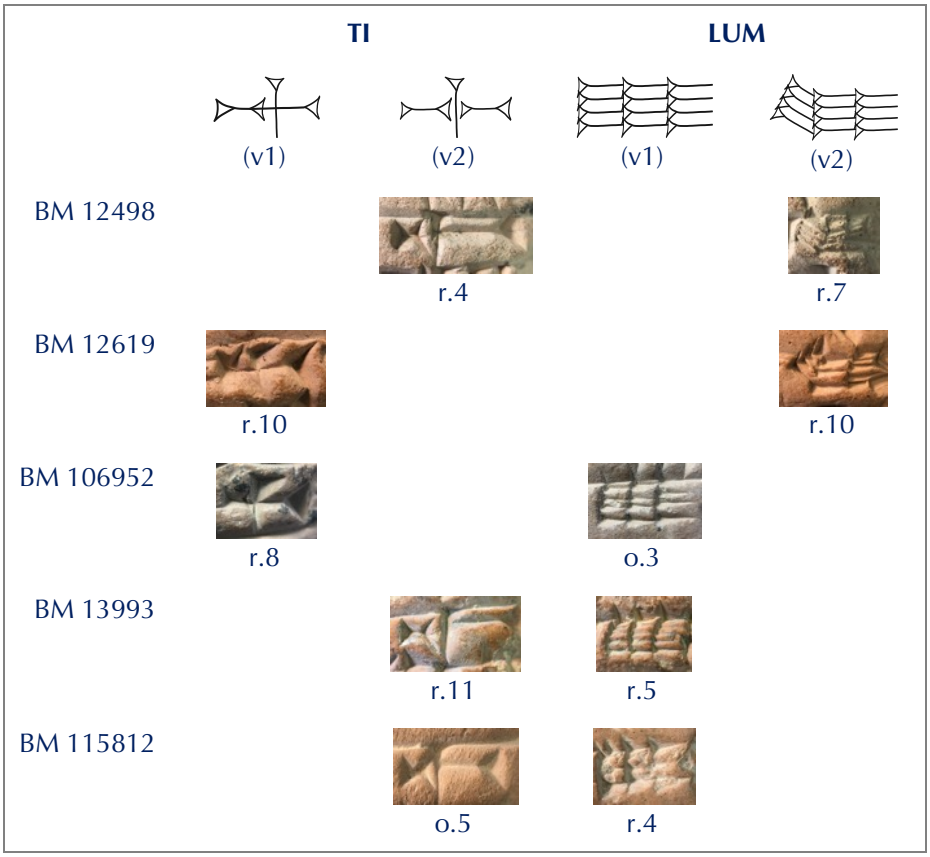



Figure 97: Variants of TI and LUM between tablets (extract)

The same pattern could also have applied to TUR, were it not for tablets bearing multiple instances of the sign [Figure 98 and Figure 99]. While BM 106864 and BM 130423, for example, each display two variants to render the logogram [dumu], they both use the same variant (v1) on the obverse and the other variant (v2) on the reverse. Conversely, instances of TUR on BM 12280 always use the same variant, whether they are on the obverse or the reverse and whether they render the logograms [dumu] or [banda$_3$].

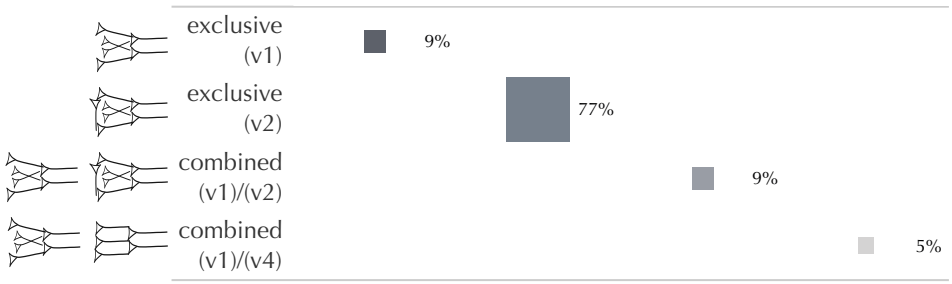



Figure 98: Variants of TUR between tablets

% of Tablets (size) broken down by TUR Variants vs. Usage (colour). Sample size (in count of sign instances): 21. Sample size (in count of tablets): 19.

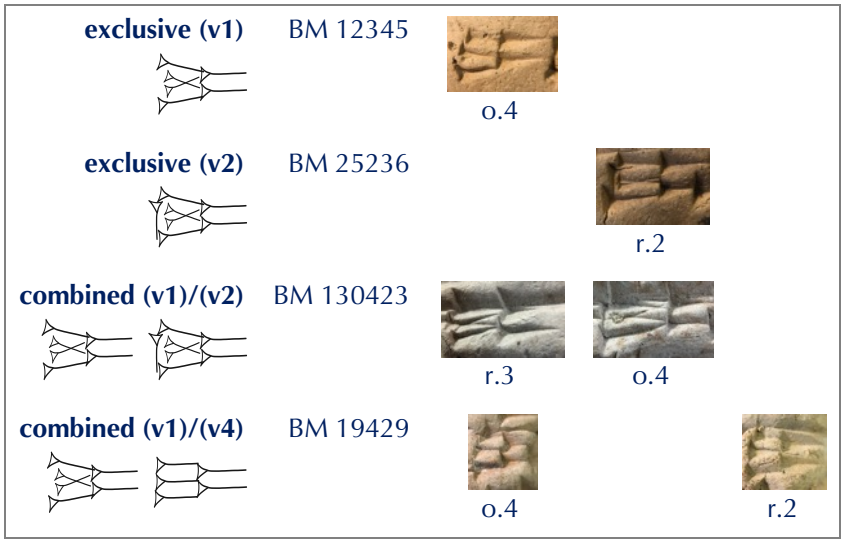



Figure 99: Variants of TUR between tablets (extract)

The variants of AN reveal patterns of combinations when multiple variants are used on a same tablet [Figure 100 to Figure 102]. The two resembling forms (v1) and (v2) are found in combined use on AO 5481 or BM 130426, without it being seemingly related to the location of the sign instance on the tablet, whether obverse or reverse. Forms (v4) and (v5), described in the previous chapter as the abbreviated versions of AN, can also be found in combined use. Notably, while variants (v4) or (v5) can also be combined with variant (v2), on BM 19429 for example, they are never used along with form (v1).

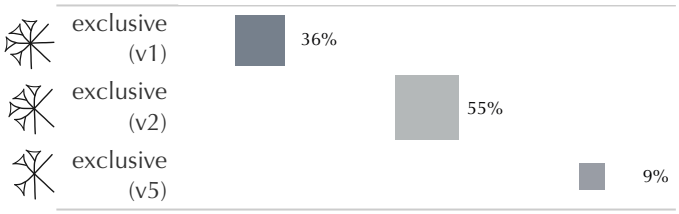



Figure 100: Variants of AN between tablets: exclusive

% of Tablets (size) broken down by AN Variants vs. Usage (colour). Sample size (in count of sign instances): 69. Sample size (in count of tablets): 42.

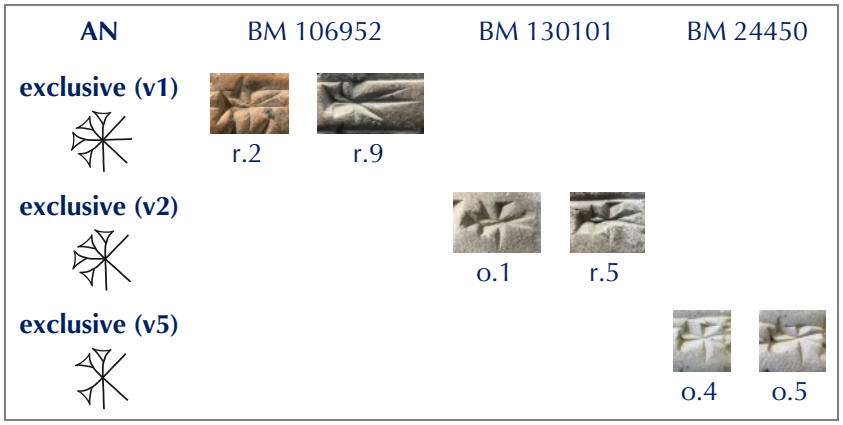



Figure 101: Variants of AN between tablets: exclusive (extract)

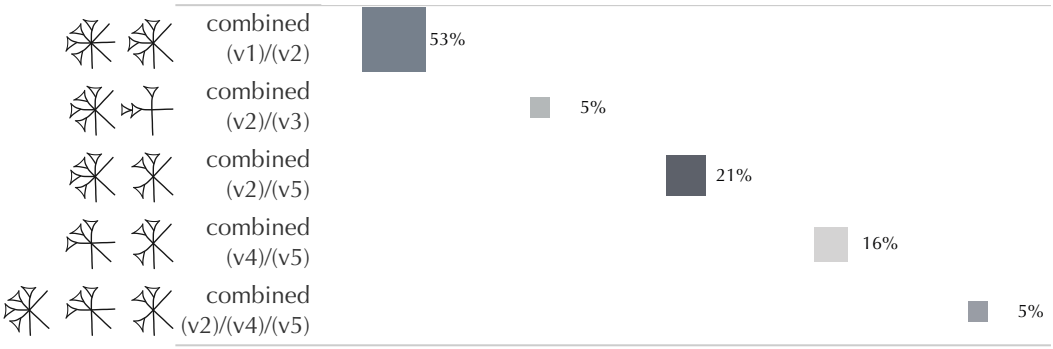



Figure 102: Variants of AN between tablets: combined

% of Tablets (size) broken down by AN Variants vs. Usage (colour). Sample size (in count of sign instances): 56. Sample size (in count of tablets): 35.

AN in the ligature $^{d}$EN is only ever used once per tablet, with variant (v4) overall favoured [Figure 103 and Figure 104]. The use of an abbreviated form (v4) most certainly responds to the space constraints imposed by the ligature of AN with EN, although it may also be a stylistic choice.

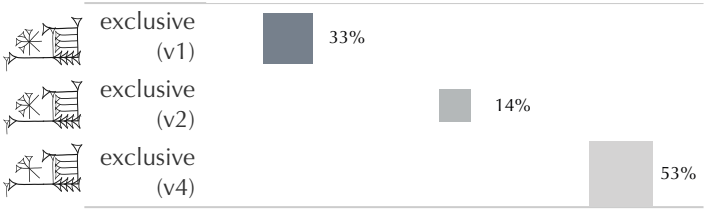



Figure 103: Variants of AN in $^{d}$EN between tablets

% of Tablets (size) broken down by AN Variants vs. Usage (colour). Sample size (in count of sign instances): 21. Sample size (in count of tablets): 21.

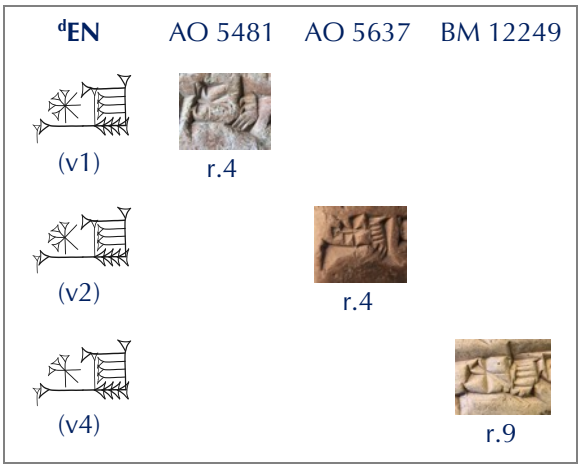



Figure 104: Variants of AN in $^{d}$EN between tablets (extract)

The patterns of combination of variants observed for AN as a standalone sign are not replicated when considering AN in the ligature $^{d}$EN. BM 103442 and BM 106979, for

example, both use the variant (v1) for the standalone sign while also using the abbreviated (v4) in the ligature [Figure 105].

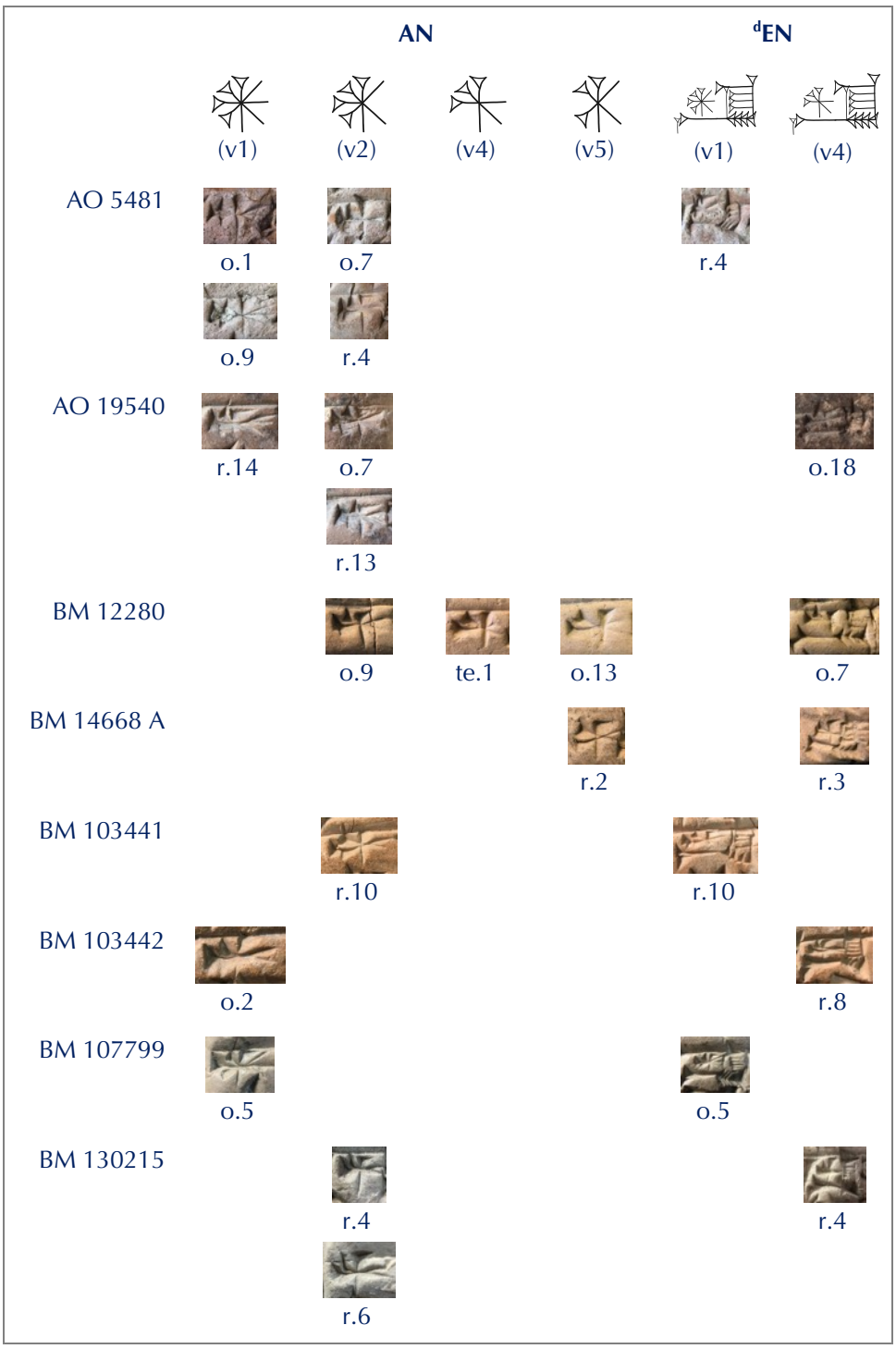



Figure 105: Variants of AN (as a standalone sign and in the ligature dEN) between tablets (extract)

Other clusters of palaeographic variations displayed across the sample seem not to be correlated to time. The trend towards a smoother writing process expressed in the development of short-hand forms is not matched by a consistent pattern of reduction in

wedge count. No such decreasing pattern in wedge count was found over time, although it could have been assumed to accompany an apparent streamlining process in writing expressed in the alternation of long- and short-hand forms. Variations in wedge count are, however, found per tablet. In the Horizontal-stack group, changing patterns in wedge count appear to be internal to each tablet, rather than across sites or over time. Signs such as LUGAL or E on these tablets diachronically display a high wedge count, between 5 and 7 horizontals on average. This feature is observable throughout signs belonging to the Horizontal-stack group, and most importantly also recurs across all other signs.

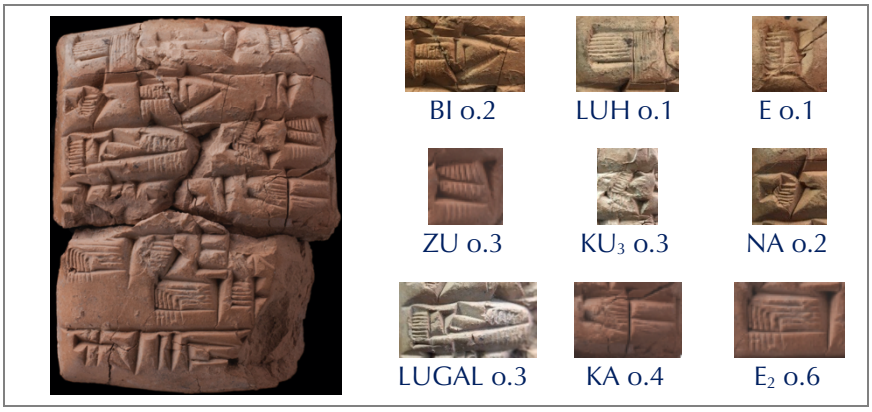



Figure 106: Distribution of relative wedge count across signs per manuscript (BM 134634)

On BM 134634, for instance, $KU_3$ and ZU show a high count of wedges. Found within horizontal stacks as well as sequences of verticals, this feature seems to occur regardless of the position of the wedge cluster in the sign, whether leading, trailing or internal [Figure 106]. Whether or not this feature can be related to individual scribes will be addressed in Chapter 4 [§4.2].

A similar pattern is visible in the ŠE-cluster structural group, in signs such as ZI, GI or GAB, where the wedge count varies regardless of time or sites. In this case, however, variant forms are not homogeneous within the structural group but rather appear to be more sign-specific than in other groups [Figure 107]. Such sign-specific patterns also apply when considering the position of the ŠE cluster within the sign, either leading or trailing. The 3-row variant is as such exclusively found in instances of IN and SAR; a pattern consistent over time. Similarly, ZI and GAB always use the 2 equal rows variant, regardless of chronology. The sign ŠE, on the other hand, displays significant variants, apart from the 3-row form. Overall, the 2-row variants – both equal and unequal – consistently prevail throughout. Interestingly, the diverging diagonals variant of ŠE

begins to fall out of use over the period covered by the sample. As opposed to the other variants, this form cannot be impressed without switching the position of the writing hand, suggesting that the correlation between the structure and the execution of a sign previously observed in the KAŠ-based and Diamond-framed groups also explains the pattern of ŠE and its variants.

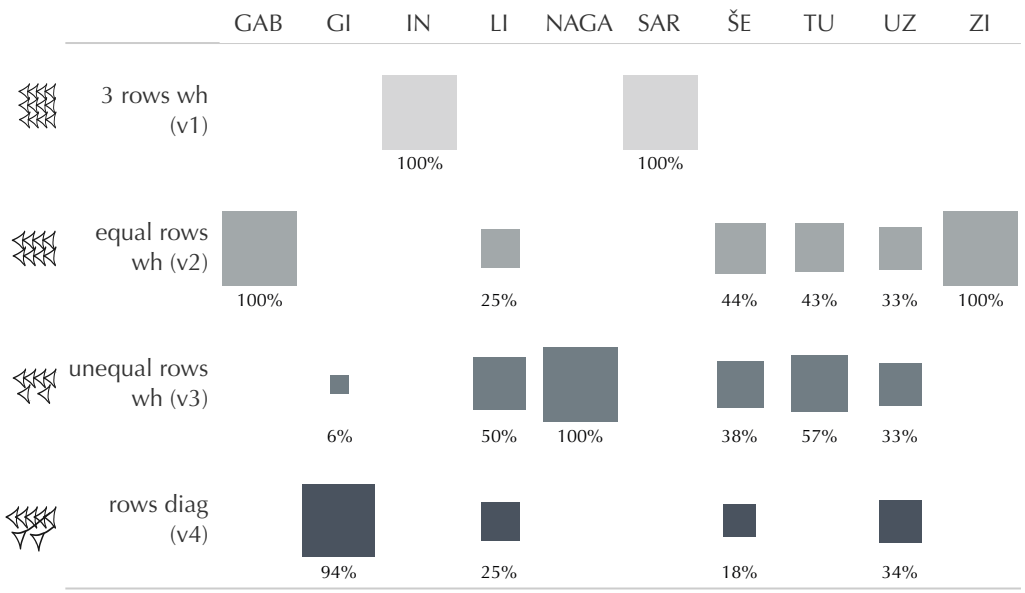



Figure 107: Distribution of ŠE-cluster variants between signs

% of Sign Instances (size) broken down by ŠE-cluster Variants (colour) vs. Sign Name. Sample size (in count of sign instances): 164. Sample size (in count of tablets): 75.

Considering diplomatic features, patterns of variation between tablets suggest dynamic combination, such as format and script density, that may reveal aspects of text planning.

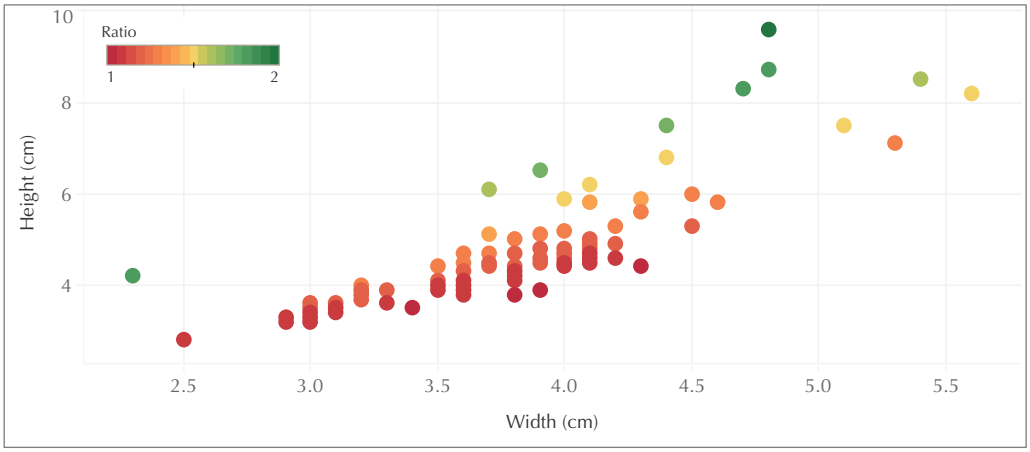
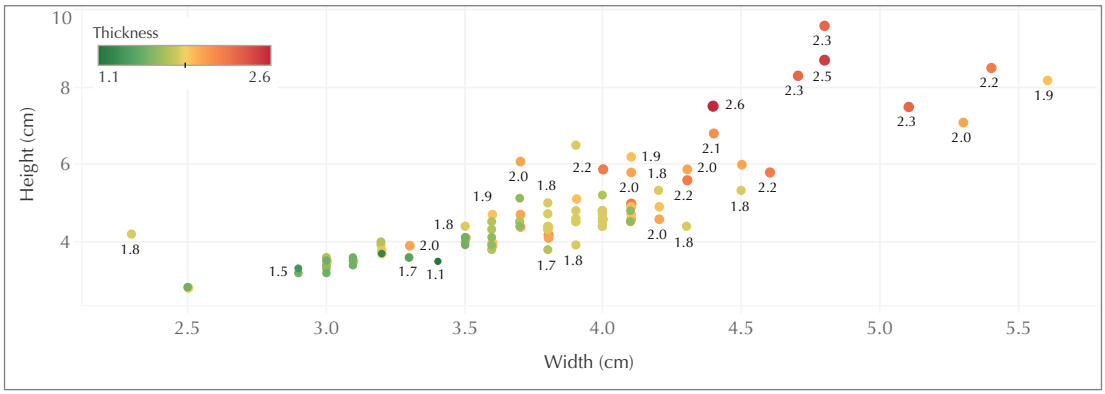



Figure 108: Distribution of tablet formats between tablets

Tablet Width (x-axis) vs. Tablet Height (y-axis). Colour shows details about Ratio. Sample size (in count of tablets): 101.

Figure 108 shows tablet proportions across the sample expressed in ratio. The highest ratios are obtained from tablets that are much higher than they are wide (rectangular portrait), whereas the lowest ratios represent tablets whose height and width are similar (square). Portrait-oriented is the most represented format across the sample, evenly spread across subject matters, dates and sites. The distribution of these formats across the tablets in the sample, seemingly unrelated to the content of the text, would indicate that the proportions of a tablet are primarily dependent on its execution. This in return suggests that the writing surface is planned in advance, according to the length of the inscription to be carried. The expansion in height is not matched by an expansion in width, so that lines still represent meaningful units of text.

Furthermore, there is a general trend for tablet thickness to increase with tablet dimensions [Figure 109].




| *(cm)* | **AO 5481** | **AO 19540** | **BM 12249** | **BM 12345** | **BM 12277** | **BM 107873** | **BM 115808** |
|---|---|---|---|---|---|---|---|
| Thickness | 1.9 | 2.3 | 2.6 | 1.9 | 2 | 1.1 | 1.4 |
| Height | 8.2 | 9.6 | 7.5 | 3.8 | 3.9 | 3.5 | 3.6 |
| Width | 5.6 | 4.8 | 4.4 | 3.2 | 3.3 | 3.4 | 3.3 |

Figure 109: Tablet thickness compared to tablet dimensions

Tablet Width (x-axis) vs. Tablet Height (y-axis). Colour and size show details about Thickness. Sample size (in count of tablets): 101.

However, this pattern is not systematic, nor is it absolute. The thinnest tablet, BM 107873, is 1.1 cm thick and measures H.3.5 x W.3.4 cm. Tablets in the same dimension range show thicknesses varying between 1.7 and 2 cm. While BM 107873 is the thinnest tablet of the sample, it is not the smallest. BM 117279, while being the smallest with dimensions of H.2.8 x W.2.5 cm, is 1.9 cm thick. AO 5481 is also 1.9 cm thick, but one of the largest tablets, measuring H.8.2 x W.5.6 cm.

Advance planning is also evident in the layout of the inscription over the writing surface as well as the density of the script, which suggests a direct connection between planning ahead and impressing the clay. Tablets across the sample are mostly only inscribed on their faces, obverse and reverse, with the edges left blank. A third of the tablets depart from this rule. Those are inscribed also on their upper edge, although not on their lower. The upper edge is the 4th available surface to write in the sequence of laying out the inscription, after the obverse, lower edge and reverse, and just before the left edge when required. Interestingly, the script density on both faces is consistently different on these tablets inscribed on their upper edge, with the script being denser on the reverse than on the obverse. The co-occurrence of an inscribed upper edge and a discrepant script density holds true regardless of date or provenance, suggesting that it is directly related to space planning on the writing surface.

## 3.2 Old Assyrian Period

The benchmark sample of Old Assyrian tablets gathered for this study and introduced in Chapter 2 is assessed in this chapter through three case studies in order to determine the extent of palaeographic and diplomatic variations within Old Assyrian cuneiform. Patterns of variation are first assessed between tablets to determine how they are distributed in the sample. Further, tablets are grouped according to text genres. Finally, a third case study looks at variations over time on a selection of dated Old Assyrian tablets.

### 3.2.1 Patterns between tablets

The distribution of variants of TUR shows three variants across tablets within the Old Assyrian benchmark sample, with (v5) prevailing overall [Figure 110 and Figure 111; Appendix 3.a]. Whichever variants are used, they never coexist on a single tablet.

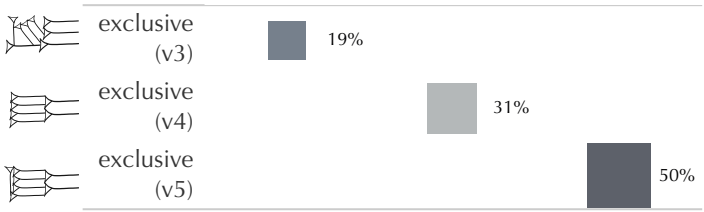



Figure 110: Variants of TUR between tablets

% of Tablets (size) broken down by TUR Variants vs. Usage (colour). Sample size (in count of sign instances): 30. Sample size (in count of tablets): 16.

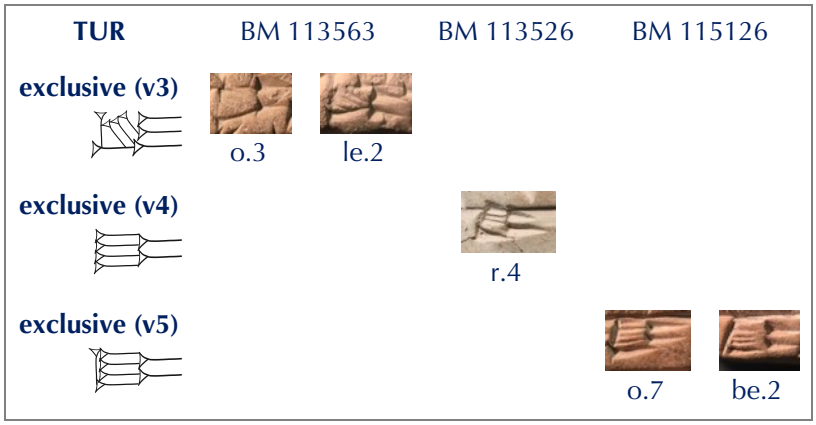



Figure 111: Variants of TUR between tablets (extract)

On those tablets that use the (v4) variant composed of horizontal wedges, the distinction between TUR and I is ensured by the number of wedges of the leading stack: I is consistently written with three horizontal wedges; while TUR always display between four and six wedges [Figure 112].

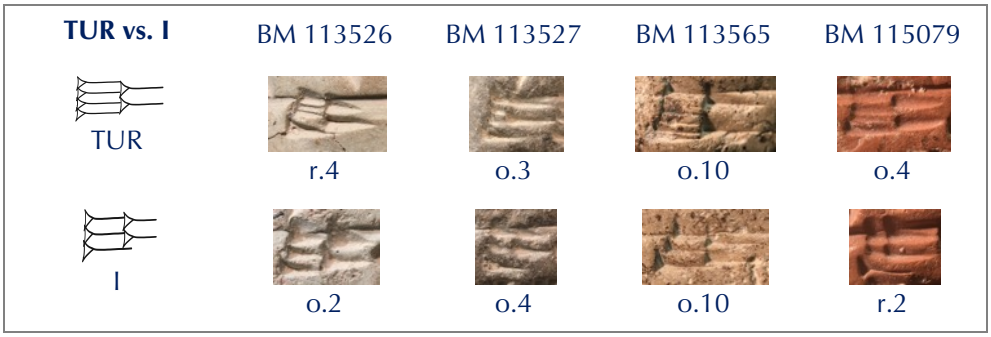



Figure 112: Distinction between TUR (v4) and I

The same pattern of exclusive use can also be observed on variants of SUR, with no tablet displaying coexisting variants [Figure 113 and Figure 114].

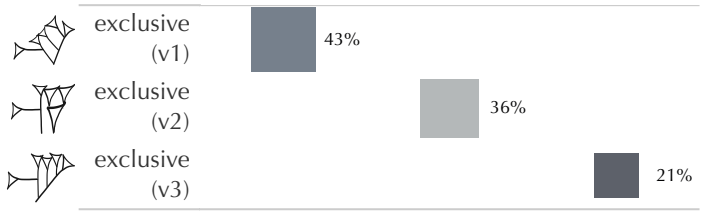



Figure 113: Variants of SUR between tablets

% of Tablets (size) broken down by SUR Variants vs. Usage (colour). Sample size (in count of sign instances): 24. Sample size (in count of tablets): 14.

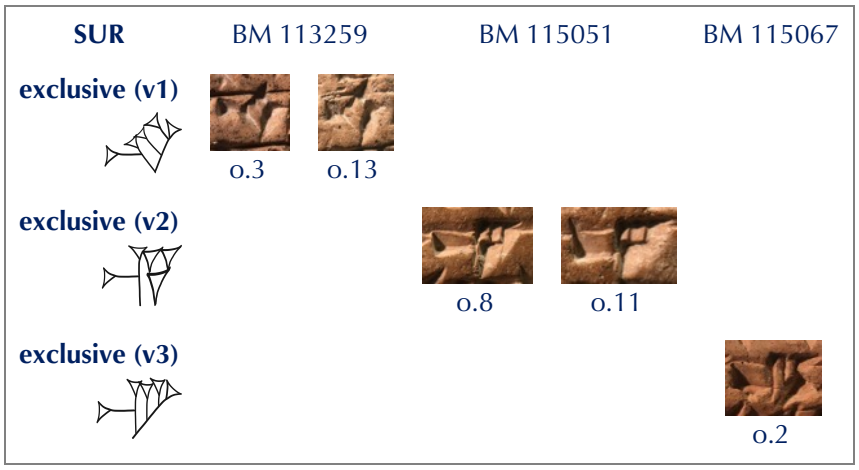



Figure 114: Variants of SUR between tablets (extract)

The variations of IM suggest a similar trend tending towards an exclusive use of variants, although to a lesser extent. The variant (v1) of IM prevails throughout the sample [Figure 115].

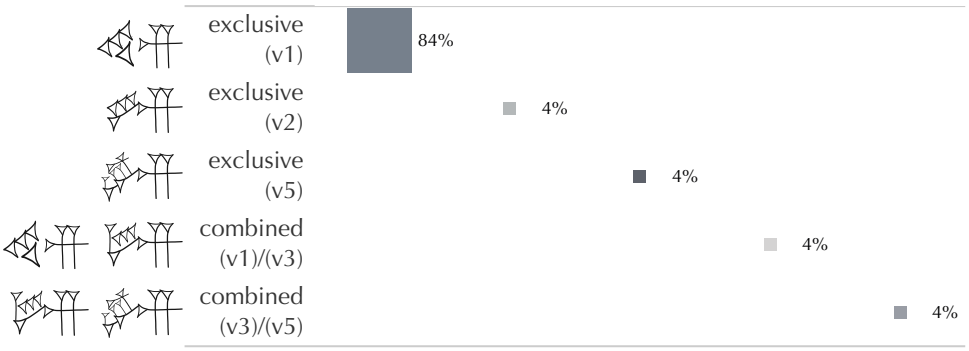



Figure 115: Variants of IM between tablets

% of Tablets (size) broken down by IM Variants vs. Usage (colour). Sample size (in count of sign instances): 58. Sample size (in count of tablets): 30.

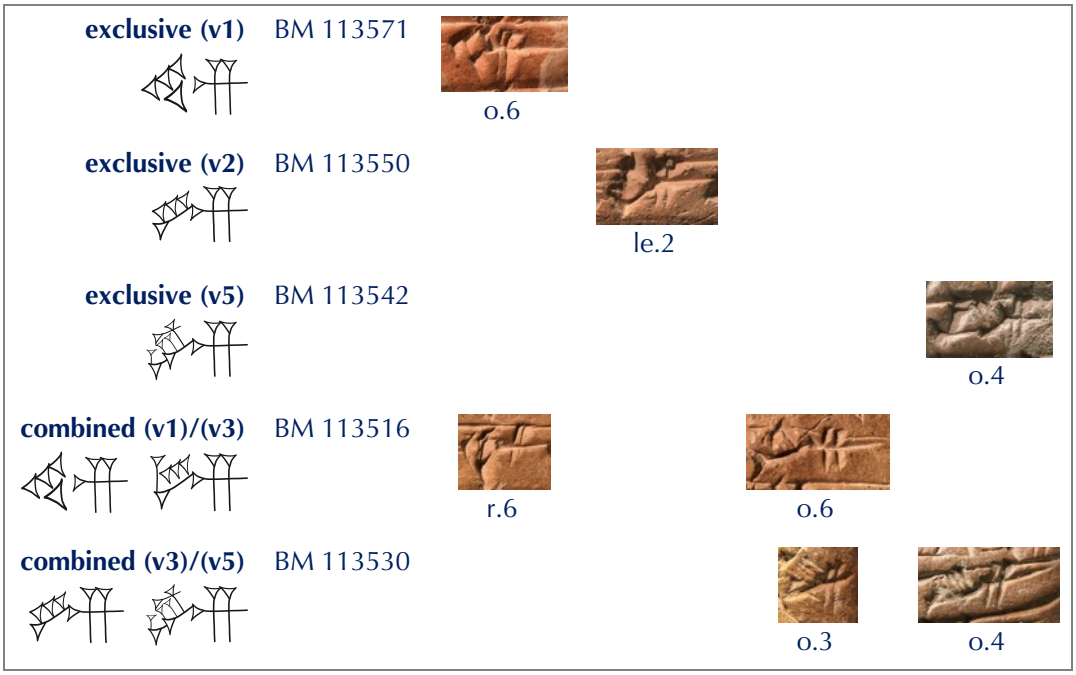



Figure 116: Variants of IM between tablets (extract)

Both BM 113542 and BM 113550 each displays a unique instance of IM, respectively using the variant forms (v5) and (v2), thus not enabling variation [Figure 116]. In addition, BM 113550 provides the only occurrence of the variant (v2). BM 113530 also overlooks the (v1) form and more remarkably stands out by using two different variants, alongside with BM 113516, the only two tablets for which the exclusive distribution of variants does not apply. BM 113516 displays two distinct variants, (v1) and (v3), both used to render the syllable [*im*]. While the value of IM in this instance does not explain the use of a different variant, the location of the form (v3), neither on the edge nor at the end of the inscription, does not provide any more elements about the reason behind coexisting variants on BM 113516. On BM 113530, however, the location of sign instances suggests otherwise, with the shorter (v3) placed on the edge where space is more constrained than on the body of the tablet.

As is the case for IM, the distribution of variants of $TI_2$ tends towards an exclusive use of forms per tablet, although not systematically [Figure 117]. BM 113470, a loan text dated to 1862 (REL 111), stands out from the sample. Although it uses one variant exclusively, it is the only tablet to display the variant form (v3). While most tablets favour either the variant forms (v1) or (v2), three tablets display a combined use of both variants. This combination might be explained by the location of sign instances of the tablet. On BM 113554, which overall privileges the use of the variant (v2), the form (v1) is only found on the left edge of the tablet. Similarly, on BM 115080, the same (v1) is

exclusively found on the lower edge of the tablet, while instances on the body use the variant (v2).

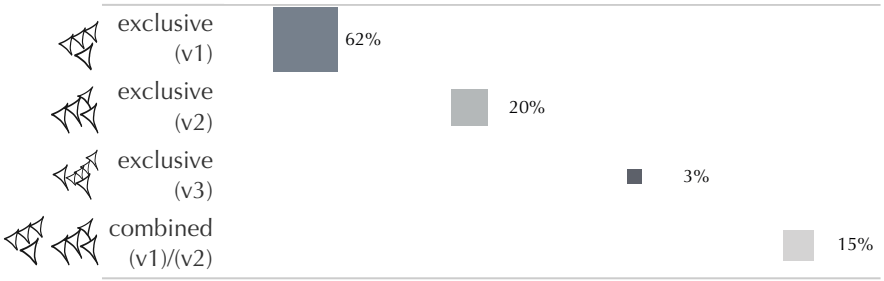



Figure 117: Variants of $TI_2$ between tablets

% of Tablets (size) broken down by $TI_2$ Variants vs. Usage (colour). Sample size (in count of sign instances): 98. Sample size (in count of tablets): 39.

Although both the variant form (v1) of IM and variants (v1) and (v2) of $TI_2$ are related to the cluster of wedges HI, no mirroring patterns or similarity could be observed in the variations of the HI-element on signs between tablets. While tablets displaying the variant (v1) of IM also use the (v1) form of $TI_2$, they do so alongside other variants of $TI_2$. The typical wedge placement observable on instances of IM on BM 115126 is not replicated on variants of $TI_2$. Also, on BM 113554, IM forms are written with four wedges, whereas the variants of $TI_2$, whether (v1) or (v2), use five wedges instead.

The patterns of distribution of variants of BA do not reveal a form favoured over the other [Figure 118]. Both are used almost equally within the sample, forming two distinct groups: tablets using the variant (v1) and tablets using the (v2) form.

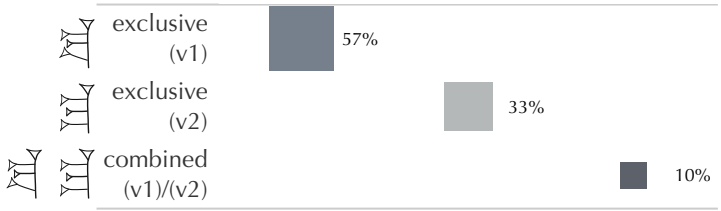



Figure 118: Variants of BA between tablets

% of Tablets (size) broken down by BA Variants vs. Usage (colour). Sample size (in count of sign instances): 37. Sample size (in count of tablets): 23.

Two tablets, however, combine both forms, the use of which might be related to the location of the instance. The form (v2) is found on BM 113556 just before a line break on r.4, while on BM 113571 it is used on the upper edge of the tablet. Although the location of a sign instance seems to affect the choice of variants when multiple forms coexist, the exclusive use of a variant is not influenced by instance location, so that, on

BM 113259, the instance of BA positioned on the edge of o.22 is written similarly to all others on the tablet.

The patterns observed on forms of AN across the sample reveal an overall prevailing variant form (v1), used across most tablets [Figure 119].

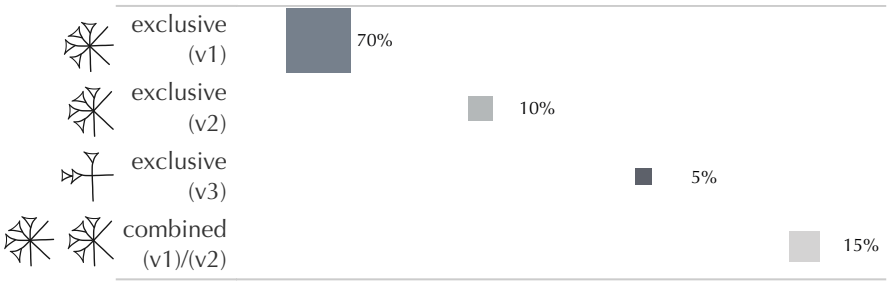



Figure 119: Variants of AN between tablets

% of Tablets (size) broken down by AN Variants vs. Usage (colour). Sample size (in count of sign instances): 33. Sample size (in count of tablets): 23.

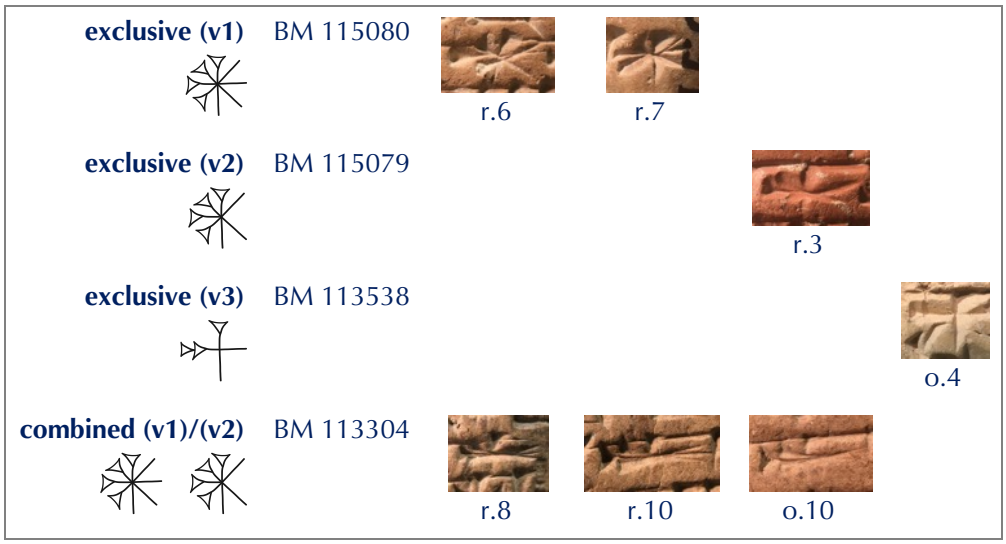



Figure 120: Variants of AN between tablets (extract)

BM 113538 stands out from the sample as the only tablet displaying the peculiar variant (v3), used as a divine determinative and written over an erasure [Figure 120]. As was the case for signs mentioned previously, the distribution of variants tends towards an exclusive use per manuscript. And while three tablets display coexisting variants, the use of multiple forms of AN does not seem to be related to either the location of the instance or the value of the sign.[220] As such, all instances of AN on BM 113259 are used as a divine determinative in the personal name $^{d}$Enlil-bani, regardless of variants. The

[220] On variant and sign value, see also Taylor: "*BM 13312, which shows a distinction between SAL in the NIN of the god Ninurta's name and SAL elsewhere. The former retains the archaic form, while all other instances use the modern, cursive form. Similarly, BM 17452 env. o4 uses the older, three wedge form of NU in a personal name.*" (Taylor, 'Wedge Order in Cuneiform: A Preliminary Survey', in Devecchi et al., eds., (2015), p. 16 note 9).

same pattern can also be observed on BM 113575. Similarly, multiple variants are used on BM 113304, all rendering the syllable [*an*].

Considering palaeographic variations amongst structural groups of signs reveals similar patterns of distribution.
The variations observable on signs composed of a leading stack of horizontal wedges, such as ŠA or I, highlight an overall combination of forms between signs and within manuscripts [Figure 121].

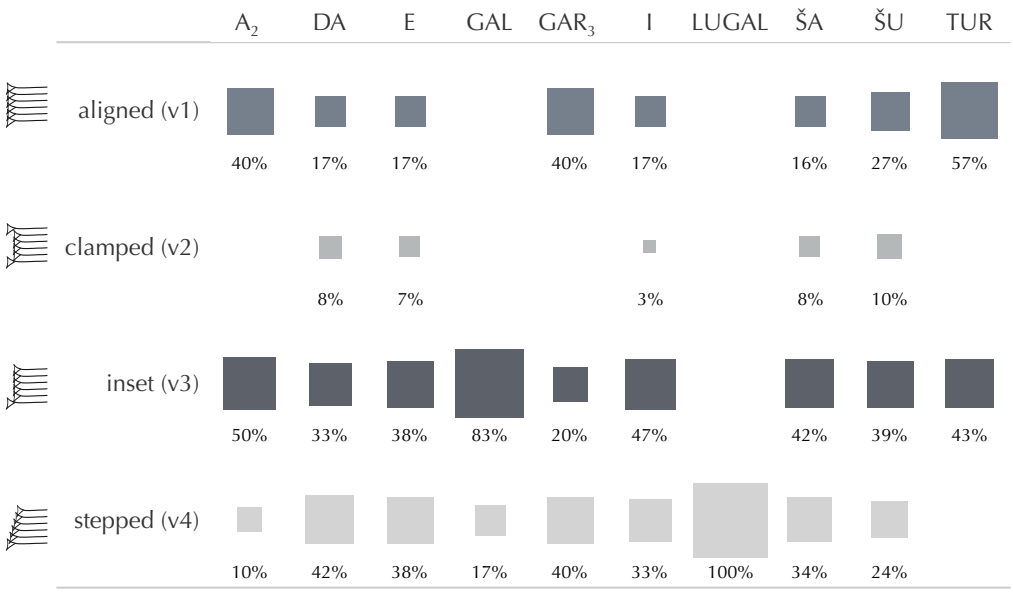



Figure 121: Distribution of Horizontal-stack variants between signs

% of Sign Instances (size) broken down by Horizontal-stack Variants (colour) vs. Sign Name. Sample size (in count of sign instances): 349. Sample size (in count of tablets): 43.

Such pattern seems to occur regardless of instance location on the tablet or of sign value and is found at group level as well as at sign level. On BM 113259, for example, three variants coexist on instances of ŠA and ŠU, both written with either the aligned (v1), inset (v3) or stepped (v4) form. Overall, those three variants are evenly distributed across the sample. Four tablets, however, do use variant forms exclusively. Instances of I, ŠU and TUR are all written with the aligned (v1) variant, while $A_2$, I, ŠU exclusively use the inset variant (v3) on BM 113542.

Amongst the KAŠ-based group, the *winkelhaken* (v2) variant of signs such as BI or GA, for instance, is used exclusively on most tablets within the sample [Figure 122].

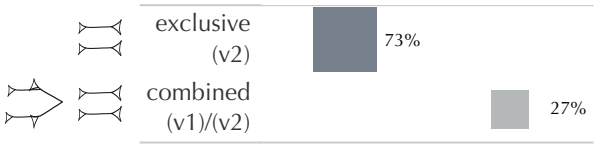



Figure 122: Distribution of KAŠ-based variants between tablets

% of Tablets (size) broken down by KAŠ-based Variants vs. Usage (colour). Sample size (in count of sign instances): 378. Sample size (in count of tablets): 44.

The diagonal (v1) variant, meanwhile, is never used alone on any single tablet within the sample. Even on the 12 tablets combining diagonal (v1) and *winkelhaken* (v2) forms, the latter prevails in much higher proportions throughout. This applies regardless of instance count so that the *winkelhaken* (v2) variant of the frequently used sign ŠA represents 88% of the total 118 instances collected, while the *winkelhaken* (v2) form of the rarer sign UL represents 78% of the nine instances collected. Amongst the 10 signs included in the KAŠ-based structural group, AM and $GAR_3$ never display the diagonal (v1) form. On such tablets with AM or $GAR_3$, *winkelhaken* (v2) forms coexist with diagonal (v1) ones [Figure 123].

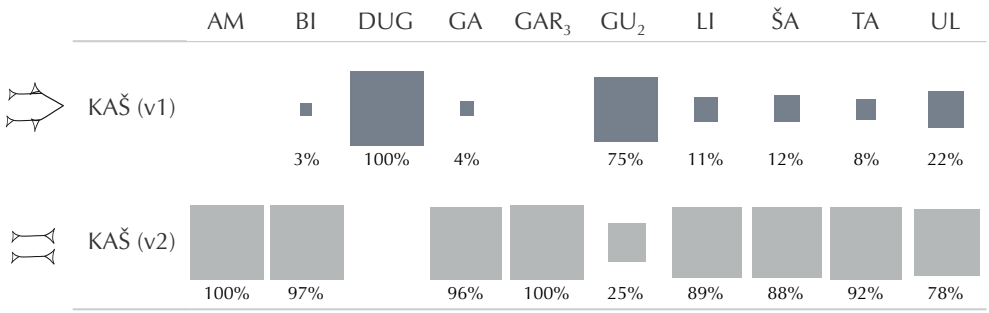



Figure 123: Distribution of KAŠ-based variants between signs

% of Sign Instances (size) broken down by KAŠ-based Variants (colour) vs. Sign Name. Sample size (in count of sign instances): 378. Sample size (in count of tablets): 44.

The few instances collected on the edges of the tablets hinders any potential pattern related to instance location. Interestingly, on BM 115067, *winkelhaken* (v2) forms are found on the body of the tablet, and the unique diagonal (v1) variant is used on the edge of o.6, although space constraint on the edge could have affected the choice of variants, as seen in the Ur III Period for instance.

The patterns of distribution of KAŠ-based variants in the light of sign value and usage reveal coexisting patterns, attached to individual tablets rather than being a widespread practice observable across the sample. Considering variations per manuscript suggests patterns linking the choice of variant to the value of the sign. On the three instances of UL found on BM 115126, the two diagonal (v1) forms are used to write the same sequence *e-pu-ul-šu*. BM 115115 and BM 113566, on the other hand, seem to use the

diagonal (v1) variant for logograms, respectively DUG and $GU_2$, whereas all other signs on both tablets are written with *winkelhaken* (v2) forms. There is unfortunately no example in the sample of the same sign used to render both logograms and syllables on a same tablet. Also, the spelling of the sequence *li-mu-um* differs between BM 113550, favouring the diagonal (v1) form of LI, and BM 113496, using the *winkelhaken* (v2) variant. BM 113556 offers an interesting illustration of the many patterns of variant distribution at play on one single tablet. All diagonal (v1) forms of LI are found on the body of the tablet, including the two instances in sequence on r.8. The only *winkelhaken* (v2) variant of LI is used on the left edge. Meanwhile, ŠA and TA are written in the *winkelhaken* (v2) form regardless of their location on the tablet. Also, the two close sequences *ra-bi-iṣ-ni* (o.11) and *ra-bi-ṣi*$_2$*-ni* (r.2) use different variants of BI, with the diagonal (v1) form on the obverse and the *winkelhaken* (v2) one on the reverse. Noticeably, the diagonal (v1) form of BI is found on o.11, a line where the text is justified, with all four signs evenly distributed to fill the writing space. In this context, the use of the wider diagonal (v1) form serves the purpose of filling the line more efficiently than the narrower *winkelhaken* (v2) variant would have.

The palaeographic variations on signs composed of a ŠE-cluster reveal a heterogeneous distribution between signs [Figure 124].

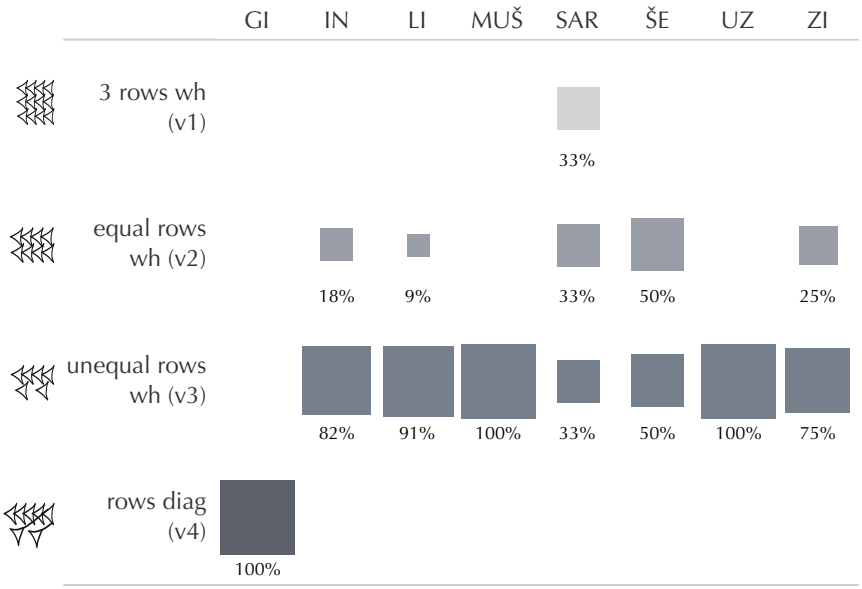



Figure 124: Distribution of ŠE-cluster variants between signs

% of Sign Instances (size) broken down by ŠE-cluster Variants (colour) vs. Sign Name. Sample size (in count of sign instances): 142. Sample size (in count of tablets): 37.

The variant form (v1) is only ever found on sign SAR, although instances of SAR overall display two other forms, (v2) and (v3). The diverging diagonals variant (v4) is exclusively

used to write instance of GI. The most frequently attested variant in the sample, the (v3) form, is most often used exclusively across different signs per manuscript [Figure 125].

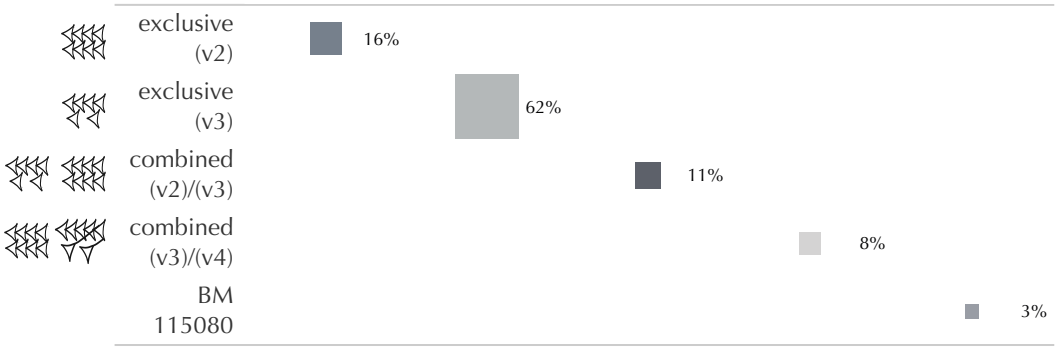



Figure 125: Distribution of ŠE-cluster variants between tablets

% of Tablets (size) broken down by ŠE-cluster Variants vs. Usage (colour). Sample size (in count of sign instances): 142. Sample size (in count of tablets): 37.

The exclusive use of a specific variant form per tablet is, for example, visible on BM 113259, where instances of IN, LI, ŠE and ZI are written with the (v3) form. This also applies to BM 113556, which uses the variant form (v2) across instances of IN, LI and ZI. One tablet in the sample, BM 115080, displays the four variants of the ŠE-cluster, each of which is used for a different sign: SAR uses the (v1) form; ZI is written with the variant (v2); the (v3) form is found on LI; and the (v4) one on GI.

The above palaeographic assessment suggests a generalised trend in usage towards variant exclusivity per tablet. When variants are combined, however, patterns of distribution appear related to the location of the sign instance on the tablet as well as with sign value. The multiple patterns at play within single manuscripts seem to respond to internal dynamics per tablet. Whether this may correspond to a less controlled writing hand or to a greater control of variation will be investigated further in Chapter 5 and discussed in the Conclusion. Diplomatic features also reveal patterns of variations per tablet rather than relating to wider trends.

The sample of Old Assyrian tablets gathered for this study displays a wide array of tablet types, both in terms of shape and format. The analysis of diplomatic features and their interaction in the making of a cuneiform tablet reveals a multiplicity of patterns and of combinations distributed across the sample.

Three formats are unequally represented across tablets.[221] Square tablets form a minority, while most are rectangular, with the inscription either landscape-oriented, 19 tablets, or portrait-oriented, 20 tablets. Noticeably, landscape tablets are concentrated amongst the smallest dimensions, while larger tablets tend to be portrait-oriented [Figure 126].

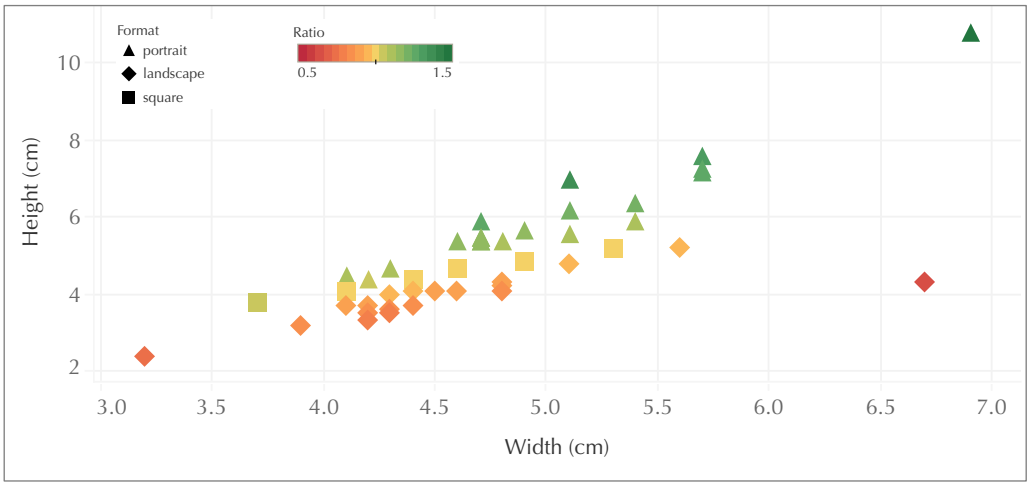


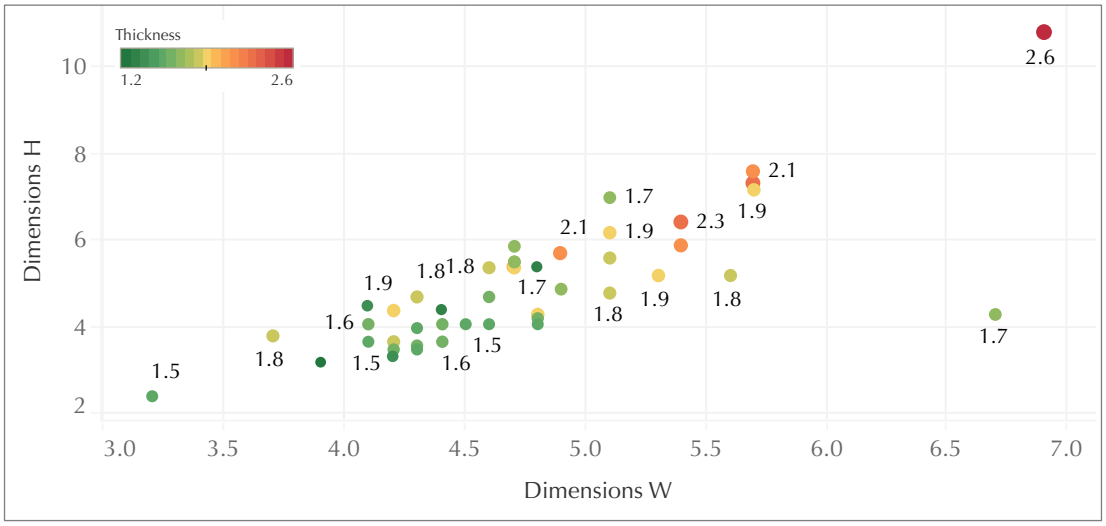

Figure 126: Distribution of tablet formats between tablets

Tablet Width (x-axis) vs. Tablet Height (y-axis). Colour shows details about Ratio. Shape shows details about Format. Sample size (in count of tablets): 45.

A similar pattern, according to which taller tablets do not get wider, was also observed on tablets from the Ur III Period, suggesting that it is intrinsic to the physical making of a cuneiform tablet rather related to a specific tradition.

Another pattern observable in both Old Assyrian and Ur III samples is the apparent autonomy of tablet thickness against height and width. There is no systematic pattern between thickness and size on Old Assyrian tablets within the sample, although there is a tendency for larger tablets to be thicker [Figure 127]. While the thickest tablet, BM 113259, is indeed also the largest one (H.10.8 x W.6.9 x D.2.6 cm), the thinnest tablet, BM 115079 (H.3.2 x W.3.9 x D.1.2 cm), is not the smallest. And while BM 113458 (H.5.4 x W.4.8 cm) and BM 113416 (H.5.4 x W.4.7 cm) have similar dimensions, the former is 1.3 cm thick and the latter is 1.9 cm.

[221] As detailed in Chapter 2, formats are identified by a computed ratio figure between the height and the width of a tablet, as follows: <0.98 = landscape; 0.99<>1.02 = square; >1.03 = portrait.




| *cm* | **BM 113259** | **BM 113416** | **BM 113458** | **BM 113575** | **BM 115079** | **BM 115176** |
|---|---|---|---|---|---|---|
| Thickness | 2.6 | 1.9 | 1.3 | 1.3 | 1.2 | 1.5 |
| Height | 10.8 | 5.4 | 5.4 | 4.4 | 3.2 | 2.4 |
| Width | 6.9 | 4.7 | 4.8 | 4.4 | 3.9 | 3.2 |

Figure 127: Tablet thickness compared to tablet dimensions

Tablet Width (x-axis) vs. Tablet Height (y-axis). Colour and size show details about Thickness. Sample size (in count of tablets): 45.

Considering tablet profiles, the four morphological types are attested in the sample, with a prevalent tendency for convex obverses observable throughout [Figure 128].

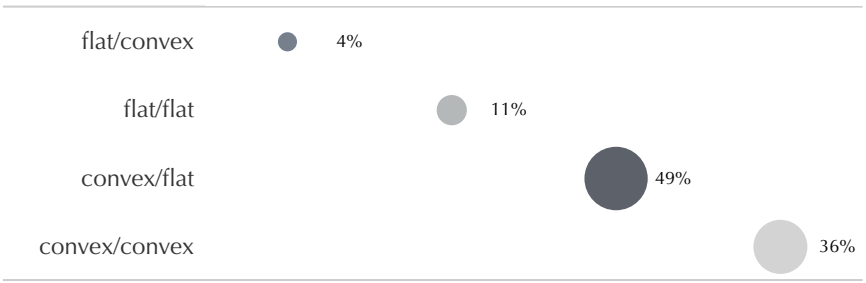



Figure 128: Distribution of tablet profiles (obverse/reverse) between tablets

% of Tablets (size) broken down by Profile: Obverse/Reverse (colour). Sample size (in count of tablets): 45.

The morphology of the small edges in relation to obverse and reverse profiles reveals multiple and non-systematic patterns. The similarity between BM 115079 and BM 115126, for instance, is limited to both tablets displaying a flat obverse and a convex reverse, since BM 115079 is a landscape rectangular tablet with rounded edges and pinched corners, and BM 115126 is a square tablet with flat edges and squared corners.

There seems to be, however, some patterns of symmetry in the shaping of the small edges between the upper and lower edges as well as between the left and right ones, although such patterns do not consistently apply across tablets in the sample [Figure 129 and Figure 130].

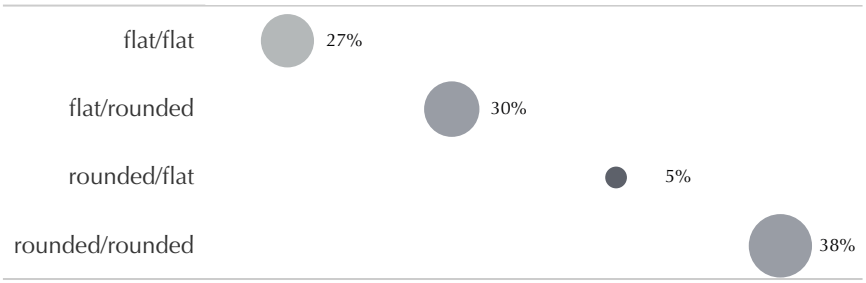



Figure 129: Distribution of tablet profiles (upper edge/lower edge) between tablets

% of Tablets (size) broken down by Profile: Upper/Lower Edge (colour). Sample size (in count of tablets): 44.

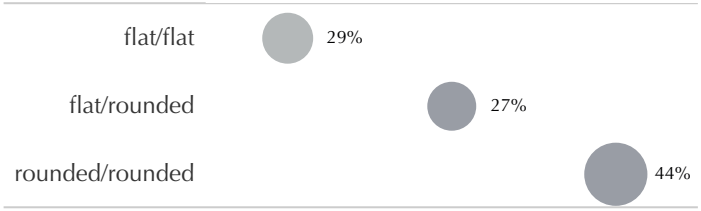



Figure 130: Distribution of tablet profiles (left edge/right) edge between tablets

% of Tablets (size) broken down by Profile: Left/Right Edge (colour). Sample size (in count of tablets): 45.

The lower edge of tablets is overall more frequently rounded than flat. The only 12 tablets shaped with a flat lower edge also display a flat upper edge. Across the sample, most tablets display matching profiles, suggesting a tendency to symmetry between upper and lower edges (12 flat/flat, 17 rounded/rounded). The right edge is more frequently rounded. It is only ever flat shaped when the left edge is too. The opposite is not true, however, so that tablets with a flat left edge do not necessarily have a flat right edge. In quantitative terms, amongst the 25 tablets with a flat left edge, 13 have a symmetrically flat right edge and 12 display a rounded profile.

Old Assyrian tablets typically have their inscription unfolding over the available writing surface, including the small edges, except the right edge. As such, the laying out of the inscription can affect the shaping of the small edges of a tablet. As observed above, the lower edge can have varying profiles, with an overall preference for a rounded surface. Yet, all tablets bar one in the sample are inscribed on their lower edge, suggesting that the shaping of this edge is not related to the layout of the inscription. Similarly, there is

an even distribution of profiles visible on tablets with an inscribed upper edge between rounded and flat. The shaping of the left edge, conversely, is more closely related to the laying out of the inscription. Overall, left edge profiles are equally distributed in the sample between flat and rounded. When inscribed, however, left edges are mostly flattened. Even though there are instances of rounded left edges bearing an inscription, these are never inscribed with more than three lines, while tablets with an inscribed and flat edge can display up to five lines of text.

As mentioned above, the inscription unfolds in a continuous flow on Old Assyrian tablets, starting from the obverse, running along the lower edge, the reverse and the upper edge, and finishing on the left edge. Depending on the length of the text, this sequence can be shortened, but never altered. On BM 113525 and BM 115176, for instance, the writing sequence covers the obverse and finishes on the lower edge, while the reverse is left uninscribed. The laying out of the text over the writing surface available on the tablet is consistent and systematic throughout. There are, however, variations in how the text of the left edge is oriented, whether from top to bottom or the other way around, without it being seemingly related to other diplomatic features.

The horizontal laying out of the text also seems to unfold in a continuous flow, with units of text broken over as many lines as necessary. Words, however, are usually not truncated between the end of one line and the beginning of the following. Rather, should space become limited, words can be truncated over two lines on the right edge and the last sign written just below, a typical feature of Old Assyrian tablets [Figure 131].


Figure 131: Sign alignment on the right edge

In terms of alignment, the text is most commonly aligned to the left, where the inscription begins, and not aligned on the right, either overstepping on the edge or

leaving blank space depending on the signs to be inscribed. In some cases, the text is justified, with signs evenly spread out along the full width of the writing line, and more rarely can it also be indented. The justification of the text, however, never applies to the whole text but is rather restricted to a few lines. BM 113556, for example, displays a justified line of text on o.11, while the text is aligned to the left on r.11, leaving a blank space behind the last sign of the line [Figure 132].

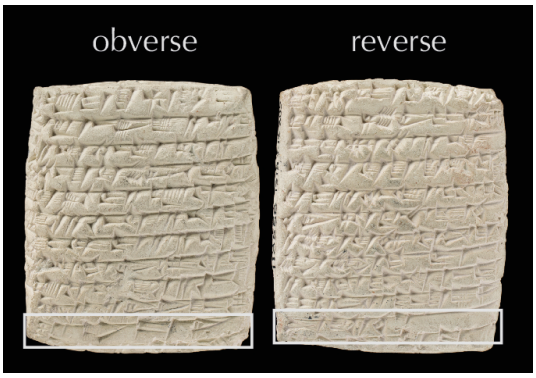



Figure 132: Co-occurrence of text alignments (justified and left-aligned)
(BM 113556)

Assessing the alignment of the text on Old Assyrian inscriptions can prove challenging since it is all too often impossible to identify, for example, whether a line ending by the right margin without space between signs attests to a careful laying out of the text along the writing space or is pure happenstance.

In one case, however, text alignment can clearly be identified and moreover also possibly related to a purposeful laying out of the text. BM 113531 is the only tablet in the sample with indented text, and one of the rare ones in the Old Assyrian corpus overall [Figure 133].

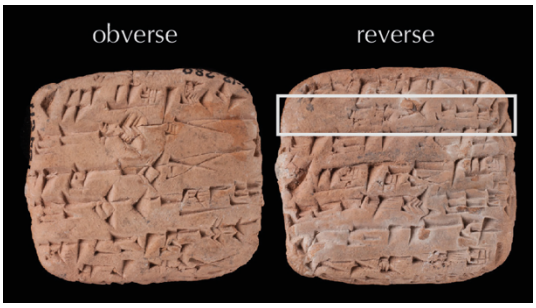



Figure 133: Indented text
(BM 113531)

In addition to displaying an indentation, the first sentence of the reverse, introducing the interest attached to the loan recorded on the tablet, is written over two lines that are not separated by a ruling, a feature not seen on any other tablet in the sample. That such an exceptional feature is used to introduce the loan interest would have likely highlighted

the clause in an obvious, graphic, way. Other loan tablets in the sample do not use that same device, suggesting that this text layout may not relate to a widespread practice in similar circumstances.

Considering diplomatic features across tablets reveals patterns of interrelation or, on the contrary, of autonomy. Tablet profiles suggest patterns of symmetry between the left and right edge, as well as interrelation between the left edge profile and whether it is inscribed or not, in turn suggesting some form of planning by the scribe. Other interrelated patterns appear between dimensions and formats, as well as how the inscription unfolds on the surface of the tablet. Conversely, other diplomatic features reveal autonomous patterns of variation. As such, tablet dimensions (height and width) appear unrelated to tablet thickness, while the profiles of both upper and lower edges seem independent from text layout.

### 3.2.2 Patterns across text types

Following the typology of Old Assyrian texts presented in the previous chapter, the following paragraphs will assess palaeographic and diplomatic features against the three text types represented in the benchmark sample – administrative tablets, correspondence, legal tablets – to investigate to what extent, if any, may patterns of variations be related to genre [Appendix 3.a].

Palaeographic variations between tablets revealed patterns of variant exclusivity per manuscript. Considering groups of tablets according to text types, whether administrative, legal or correspondence, the distribution of palaeographic variants suggests some degree of form exclusivity, yet to a lesser extent and not widespread amongst the signs under scrutiny in this study.

The exclusive use of variants of both TUR and SUR, observed on tablets across the sample, is somewhat mirrored across text types. No obvious trend emerges relating unequivocally variant forms to text types [Figure 134 and Figure 135]. Noticeably, however, the variant (v3) of TUR is never used on legal texts, while the (v3) form of SUR never appears on administrative texts, which, moreover, favour the variant form (v1).

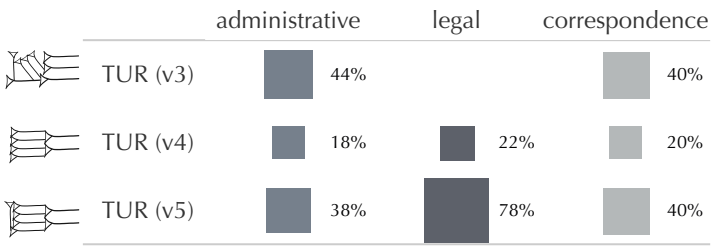



Figure 134: Variants of TUR between text types

% of Sign Instances (size) broken down by Text Type (colour) vs. TUR Variants. Sample size (in count of sign instances): 30. Sample size (in count of tablets): 16.

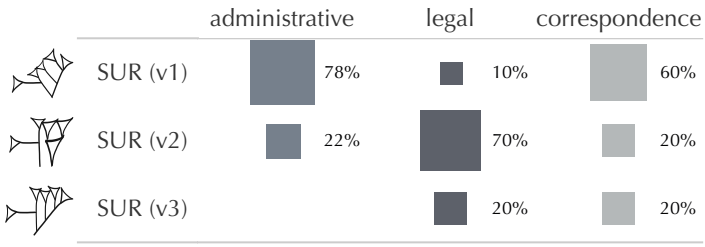



Figure 135: Variants of SUR between text types

% of Sign Instances (size) broken down by Text Type (colour) vs. SUR Variants. Sample size (in count of sign instances): 24. Sample size (in count of tablets): 14.

The distribution of variants of IM between tablets previously revealed a consistent and predominant use of the variant (v1) throughout. A super-imposed pattern, visible when considering text types, confirms the predominance of the (v1) form of IM between tablets, while revealing that the three other forms are seldom used in legal texts and never used in letters [Figure 136].

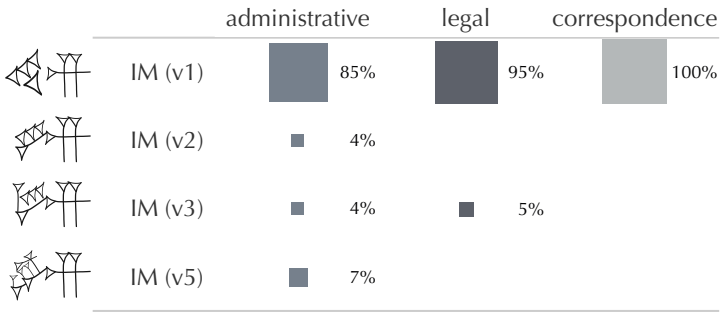



Figure 136: Variants of IM between text types

% of Sign Instances (size) broken down by Text Type (colour) vs. IM Variants. Sample size (in count of sign instances): 58. Sample size (in count of tablets): 30.

Although the lesser proportion of letters in the sample might have hindered a fuller depiction of the distribution of IM variants, the clear pattern emerging between legal and administrative texts can be supported by the equal number of tablets of each genre.

Considering palaeographic variations within structural groups of signs does not suggest clearly identifiable patterns between text types.

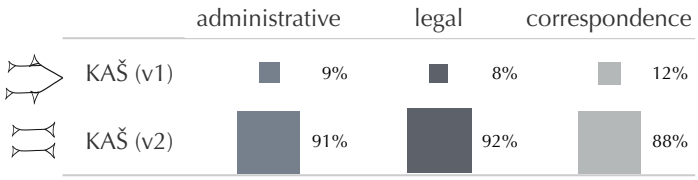



Figure 137: Distribution of KAŠ-based variants between text types

% of Sign Instances (size) broken down by Text Type (colour) vs. KAŠ-based Variants. Sample size (in count of sign instances): 378. Sample size (in count of tablets): 44.

Signs belonging to the KAŠ-based group, for instance, show the same proportional distribution of variants between genres that could also be observed between tablets [Figure 137]. Letters exclusively using the *winkelhaken* (v2) variant are 3.5 times as many as letters displaying a combination of both diagonal (v1) and *winkelhaken* (v2) forms, and so too are the legal texts. There is an equal ratio for both letters and legal texts. Administrative texts, on the other hand, show a greater proportion of tablets using a combination of variants. Overall, however, no specific pattern of variation can be related to any of the text types in the sample.

The same applies to signs belonging to the Horizontal-stack group [Figure 138]. The even distribution of variants across signs and tablets visible throughout the sample is replicated when considering manuscript according to their respective genre.

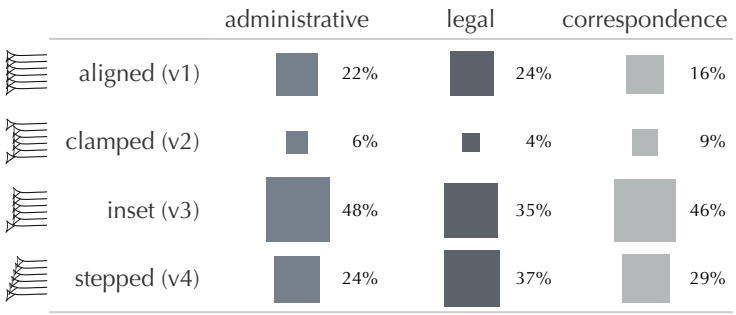



Figure 138: Distribution of Horizontal-stack variants between text types

% of Sign Instances (size) broken down by Text Type (colour) vs. Horizontal-stack Variants. Sample size (in count of sign instances): 350. Sample size (in count of tablets): 43.

Patterns of palaeographic variation between text types do not reveal outstanding genre-related trends. As such, IM represents an exception to the latter claim by revealing clear distribution patterns between text types.

While palaeographic variants revealed no outstanding patterns that could be related to text types, the distribution of diplomatic variations suggests some more direct interplays between the making of a tablet and its content. The four morphological types are represented in both letters and administrative texts [Figure 139].

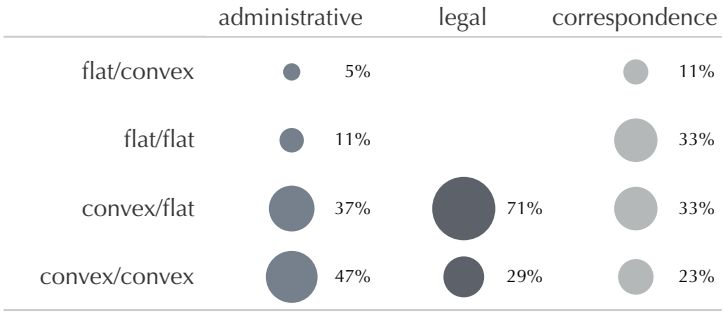



Figure 139: Distribution of tablet profiles (obverse/reverse) between text types

% of Tablets (size) broken down by Text Type (colour) vs. Profile: Obverse/Reverse. Sample size (in count of tablets): 45.

Although tablets with a flat obverse are not widely represented in the sample, none of them are legal texts. Furthermore, legal texts show the highest degree of uniformity of shape, although not systematic, since half of them display the same convex obverse and flat reverse profile. These nine legal texts also represent half of all the tablets in the sample with that profile, whereas the variety of shapes visible in both administrative texts and letters suggests no genre-related pattern.

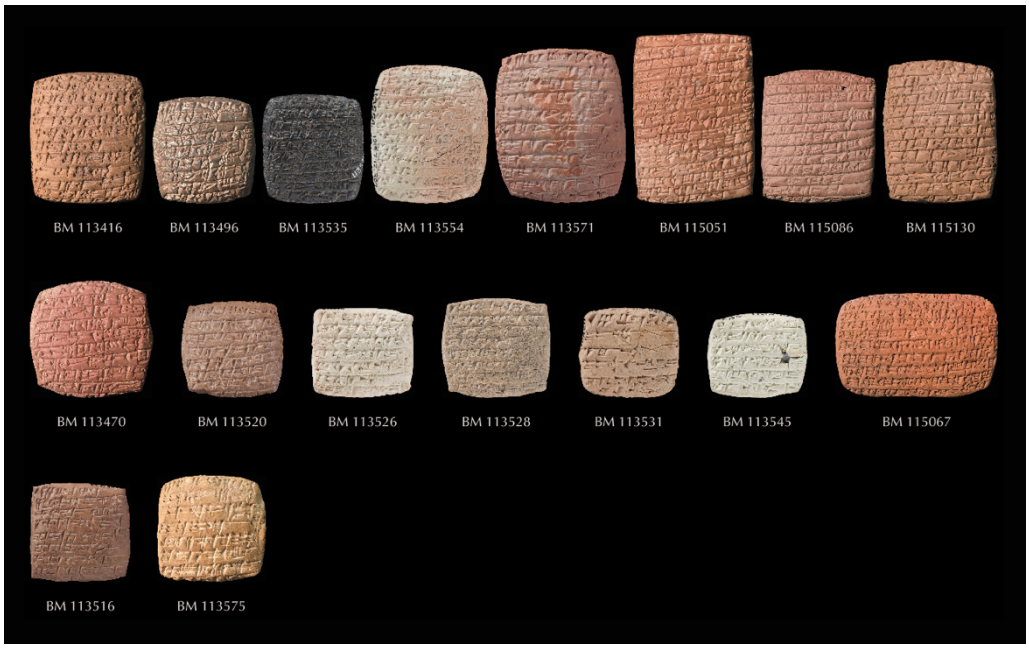



Figure 140: Legal texts arranged per format

From top to bottom row: portrait, landscape, square

The tendency across legal texts, disregarding flat-profiled obverse and favouring an overall convex obverse/flat reverse profile, is not correlated with a similar trend in format. Amongst the nine similarly shaped tablets, four are portrait-oriented and five are landscape-oriented. This matches the proportions found across all legal texts, with eight portrait rectangles and seven landscape, alongside two square tablets [Figure 140].

While tablet profiles appear distinctive for legal texts, such distinction does not extend to formats. Both administrative texts and letters, meanwhile, show distinct patterns, with letters typically more often portrait-oriented than any other format.

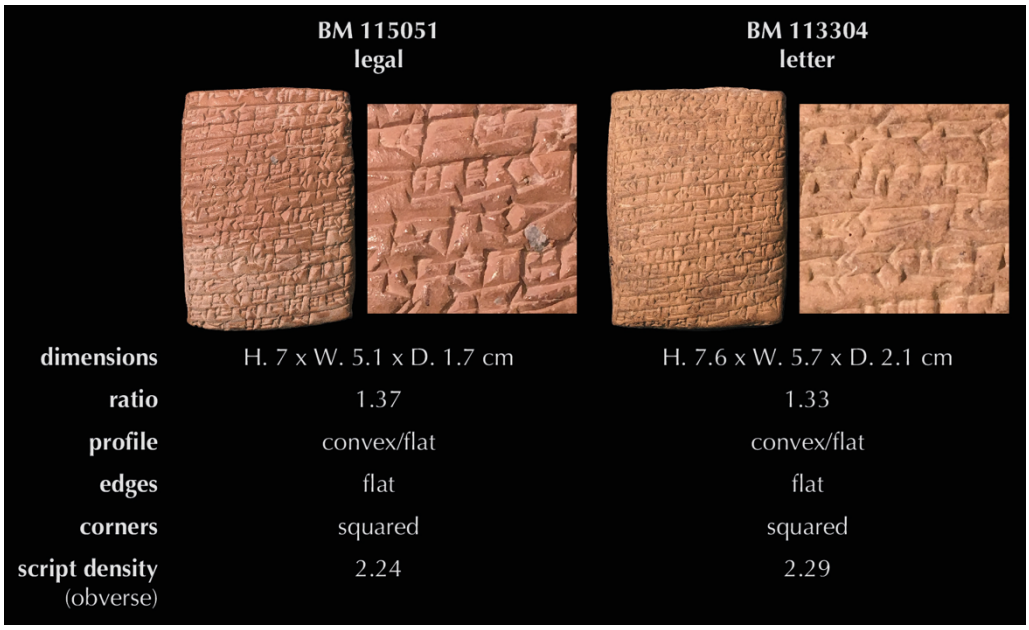

Figure 141: Administrative texts arranged per format

From top to bottom row: portrait, landscape, square

Administrative texts, conversely, show the greatest proportion of the landscape format [Figure 141]. They also display the widest array of sizes, from a small landscape note recording a money gift (BM 115176: H.2.4 x W.3.2 cm, ratio 0.75) to a large portrait account (BM 113259: H.10.8 x W.6.9 cm, ratio 1.56). No pattern of tablet size seems attached to any specific text type, suggesting that dimensions are directly related to the length of the inscription to be carried rather than any other factor. Administrative texts

also distinguish themselves through their low script density, ranging from 1.5 to 2.2 lines per 1 cm high with a median figure at 2, whereas letters have a median script density at 2.3 lines (1.9<>2.3).

While the array of diplomatic variations appears more directly related to text type than palaeographic variations, no distribution pattern is systematically or unequivocally related to genre. It is challenging, however, to analyse the many interrelations of diplomatic characteristics and how they interact on each manuscript, although it is the combination of many features that creates the 'visual identity' of a tablet, sometimes also referred to as 'equilibrium'.[222]



| | BM 115051 legal | BM 113304 letter |
|---|---|---|
| **dimensions** | H. 7 x W. 5.1 x D. 1.7 cm | H. 7.6 x W. 5.7 x D. 2.1 cm |
| **ratio** | 1.37 | 1.33 |
| **profile** | convex/flat | convex/flat |
| **edges** | flat | flat |
| **corners** | squared | squared |
| **script density** (obverse) | 2.24 | 2.29 |

Figure 142: Combination of diplomatic features against text types

BM 115051 and BM 113304 look alike in terms of format, dimensions and general *equilibrium* [Figure 142]. They also compare very closely when considering diplomatic features individually. Yet, BM 115051 is a legal text and BM 113304 is a letter, both undated. Essentially, the patterns of distribution of diplomatic variations between text genres can reveal wider trends pertaining to Old Assyrian writing practices while also not capturing finer-grained specificities.

[222] Parkes, *Their Hands Before Our Eyes*, (2008), p. 151; Cammarosano, '3D-Joins und Schriftmetrologie. A Quantitative Approach to Cuneiform Palaeography', in Devecchi et al., eds., (2015), p. 156.

### 3.2.3 Patterns over time

As mentioned in the previous chapter, most of the Old Assyrian corpus is composed of letters which are rarely dated. Based on eponymy, the Old Assyrian dating system named each year after a member of the community appointed as eponym in Assur. Recording the names of some 255 officials, the list of year eponyms, known as the Kültepe Eponym List (KEL), has been reconstructed from various tablets excavated in Kültepe.[223] In this chapter, dates are given according to the Revised Eponym List (REL) as published in 2012.[224]

Although explicitly dated letters are known, the Old Assyrian corpus is mostly undated. Over the 46 documents gathered in the sample for this chapter, 12 tablets are explicitly dated and span some 84 years (REL 48 to REL 132 = 1925 to 1841 BCE) [Appendix 3.a]. While the proportion of dated tablets in the sample tries to reflect the overall proportion in the overall corpus, it also provides a limited dataset to investigate palaeographic and diplomatic variations over time.

No clearly time-related pattern can be extracted from the available data, although the 12 dated tablets of the sample give us a glimpse at the distribution of variants over time. The variant (v5) of TUR, for instance, is found over time from the earliest tablet (BM 113571, REL 48 = 1925 BCE) to the latest one (BM 113554, REL 132 = 1841 BCE) [Figure 143]. The two other variant forms, (v3) and (v4), are concentrated around the 1860s BCE.

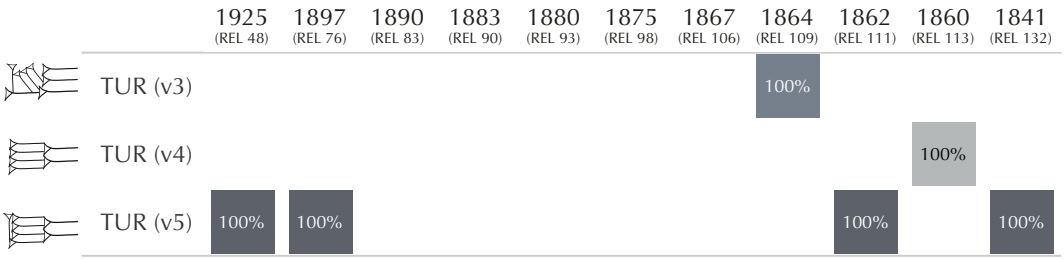



Figure 143: Variants of TUR over time

% of Sign Instances (size) broken down by Date vs. TUR Variants (colour). Sample size (in count of sign instances): 13. Sample size (in count of tablets): 6. Dates BCE.

[223] Veenhof, *The Old Assyrian List of Year Eponyms from Karum Kanish and its Chronological Implications*, (2003); Veenhof, 'The Old Assyrian List of Year Eponyms. Corrections, Additions and Chronology', *NABU* 2007:3 (2007), pp. 58-62.

[224] Barjamovic et al., *Ups and Downs at Kanesh*, (2012).

A similar pattern can be observed on variants of AN, whose (v1) form is attested throughout whereas the variant (v2) is found on tablets dated to the 1860s [Figure 144].

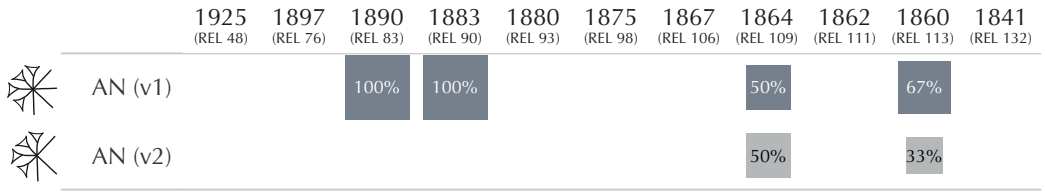



Figure 144: Variants of AN over time

% of Sign Instances (size) broken down by Date vs. AN Variants (colour). Sample size (in count of sign instances): 11. Sample size (in count of tablets): 7. Dates BCE.

There might also be a slight chronological trend shown in the distribution of variants of SUR [Figure 145]. Occurrences of the (v1) form are attested from 1897 to 1864 BCE (REL 76 to REL 109), while the only dated instance of the (v3) variant appears rather late in 1860 (REL 113). The (v2) form of SUR also appears in the 1860s and is maintained throughout the decade.

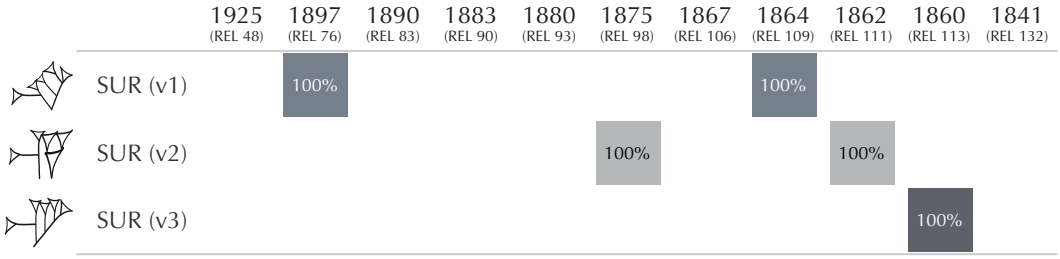



Figure 145: Variants of SUR over time

% of Sign Instances (size) broken down by Date vs. SUR Variants (colour). Sample size (in count of sign instances): 9. Sample size (in count of tablets): 5. Dates BCE.

While the distribution of dated variants of SUR might suggest a shift between the form (v1) and (v2) over time, the limited data in the sample cannot fully support the identification of a chronological trend.

The available data for the remaining prognostic signs, IM, BA and $TI_2$, does not suffice to even see variations over time emerging.

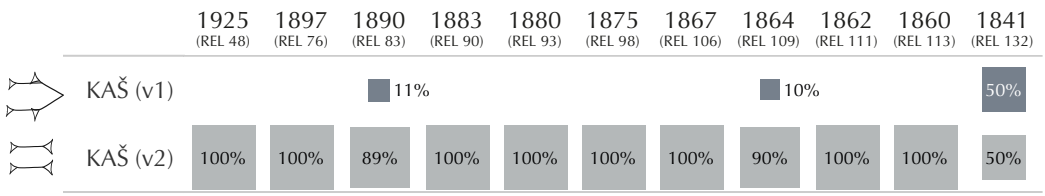



Figure 146: KAŠ-based variants over time

% of Sign Instances (size) broken down by Date vs. KAŠ-based Variants (colour). Sample size (in count of sign instances): 108. Sample size (in count of tablets): 15. Dates BCE.

Amongst structural groups of signs, it is worth remarking on the distribution of diagonal (v1) and *winkelhaken* (v2) variants of signs such as TA, BI or GA [Figure 146].

Mirroring the general distribution across all tablets in the sample, the *winkelhaken* (v2) variant is also more attested on dated tablets. Although less evenly distributed than its *winkelhaken* (v2) counterpart, the diagonal (v1) variant is present on three tablets dated to 1890 (REL 83), 1864 (REL 109) and 1841 BCE (REL 132). It is nonetheless interesting to find the diagonal (v1) variant up until the latest dated tablet. Because diagonal (v1) variants are never found in more than one instance per tablet and only on three of them, it is difficult to assess the chronological trend attached to its use. If anything, the distribution of KAŠ-based variants on dated tablets reveals that both forms are part of the Old Assyrian writing set.

The limited dataset available to approach chronologic variations in the sample hinders any clear representation of how writing might have evolved over the Old Assyrian Period. This is even more true for diplomatic variations, by nature lesser in quantity than palaeographic ones. While approximately 350 sign instances could be collected and analysed on dated tablets, the diplomatic analysis could only rely on the data attached to the 12 dated tablets in terms of shapes, formats and text layouts. No time-related pattern could therefore be extracted from dated tablets.

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The two benchmark samples presented in this chapter reveal patterns of variation in writing practices attached to either Ur III or Old Assyrian cuneiform. While both samples were selected to be representative of their respective corpus, their scale enables a first-level analysis to suggest trends and to outline the main aspects of Ur III and Old Assyrian writing practices.

The palaeographic and diplomatic analysis of the Ur III benchmark sample followed a threefold process. Over the time span covered by the sample – Šulgi 33 to Ibbi-Suen 15 (2060 to 2012 BCE) – variations revealed shifting patterns associated with specific features rather than generalised [§3.1.1]. Signs such as TI, BA, AN and $^{d}$EN, showed consistent distribution patterns, whereas signs belonging to the KAŠ-based and

Diamond-framed structural groups suggested an evolution of the script towards simpler forms. The analysis of the writing sequence of wedges and of hand movements of these simpler forms also revealed an increasing use of shorter-handed variants over the Ur III Period [Figure 79 and Figure 81]. The analysis of writing practices across the four sites represented in the sample – Drehem, Girsu, Umma, Ur – suggested local trends [§3.1.2]. As such, variants of IM, TI, AN and $^{d}$EN, as well as of signs belonging to the KAŠ-based and Diamond-framed structural groups, displayed specific distribution patterns per site. The diplomatic analysis tenuously mirrored such palaeographic trends, albeit revealing less contrast between sites. Tablets from Drehem, for instance, appeared more densely written, while the only square tablets from the sample, as well as flat-profiled tablets, were all provenanced from Umma [Figure 89 and Figure 90]. Amongst the four sites represented, the mostly marked local traditions were found on tablets from Ur and tablets from Girsu. Beyond chronology and geography, writing practices were assessed across tablets in the sample [§3.1.3]. Distribution patterns of palaeographic variants distinguished manuscripts per usage between those tablets consistently using exclusive forms of LUM, IM, TI and $^{d}$EN, and those displaying intra-manuscript variations attached to TUR and AN. Wedge count was also found to be distributed per tablet, and applied consistently within manuscripts across signs rather than attached to specific signs or sign forms [Figure 106]. The diplomatic analysis suggested dynamic patterns between features related to aspects of text planning. As such, tablet formats and ratios appeared evenly distributed and unrelated to content. Parallel patterns could also be observed between text layout and script density, so that a higher script density on the reverse than on the obverse of a tablet was consistently matched with the lower edge being inscribed.

The Old Assyrian benchmark sample was analysed through three angles. The analysis first considered writing practices between manuscripts [§3.2.1]. The distribution patterns of variants of TUR and SUR revealed a generalised usage trend towards exclusivity per tablet, whereas forms of IM, $TI_2$, BA and AN, as well as of signs belonging to the KAŠ-based and ŠE-cluster structural groups could be observed in either exclusive or combined use across tablets. This combination of variants within single manuscript could be related to the location of sign instances, whether on the body or the edge of the tablet, and to sign value [Figure 123 and Figure 124]. The analysis of diplomatic features revealed patterns of interrelation, especially of profile symmetry between edges, as well as between edge profile and text layout, so that an inscribed left edge tended to be flattened whereas a blank edge would have a rounded profile. Conversely, other

diplomatic features followed autonomous patterns, with the lower and upper edge profile unrelated to text layout. The analysis of palaeographic and diplomatic variation between the three text types represented in the sample – administrative, correspondence, legal – revealed no outstanding patterns per genre [§3.2.2]. As such, no recurring patterns could be observed on variants of TUR, SUR and IM, as well as of signs belonging to the KAŠ-based and Horizontal-stack structural groups. Similarly, diplomatic features did not overall distinguished writing practices between genres, although a stronger contrast could be observed on tablet profiles, with legal texts showing less variation than administrative texts or letters [Figure 139]. Such contrast was not matched, however, in tablet formatting [Figure 140 and Figure 141]. Although the Old Assyrian benchmark sample only comprised 12 dated tablets, palaeographic variations were assessed over time and no clear pattern could be extracted from the available data [§3.2.3]. The limited dataset suggested, however, tenuous patterns with regard to variants of TUR, AN and SUR, as well as of signs belonging to the KAŠ-based structural group [Figure 143 to Figure 146].

Ur III did not appear as standardised as traditionally conceived, with more variation over time and across place which may relate to broader trends of script evolution or to specific political purposes, like the so-called reform of writing under Šulgi. Chapter 4 will look further at Ur III cuneiform, through six case studies investigating the extent to which palaeographic and diplomatic variation may relate to time, to place or to text genre, and how writing may also be related to individual practices. Although it showed a wide array of both palaeographic and diplomatic variations, Old Assyrian cuneiform appeared more standardised than usually conceived. Specifically, such variations did not appear obviously related to broader trends of time or text genre but rather contained per manuscript. Chapter 5 will therefore investigate further the nature of Old Assyrian cuneiform through four case studies looking at the dynamics of writing between generations and between genders, and assessing palaeographic and diplomatic variation in letters attached to individuals. Altogether, from this chapter to the last, both Ur III and Old Assyrian cuneiform are being viewed in wide-angle (benchmark), medium-shot (groups) and close-up (individuals) view in order to identify to what extent can individuality and identity be detected in cuneiform and to determine how the normative nature of writing as a conventional system and the variable nature of handwriting interact.

# CHAPTER 4

# IDENTITY AND INDIVIDUALITY IN UR III CUNEIFORM

The sample-based analysis of palaeographic and diplomatic variation in the previous chapter revealed overarching trends governing Ur III writing practices, especially highlighting local traditions and an evolution of the script over time. This chapter aims at refining this picture of writing practices in the Ur III Period by assessing them at sub-corpus, i.e. between groups, and at individual level. Three case studies will explore identity in cuneiform and investigate the extent to which palaeographic and diplomatic variation may relate to time, to place or to genres. Further, three case studies will explore individuality in cuneiform and investigate the extent to which writing may be related to individual hands.

## 4.1 Identity in Ur III cuneiform

The following three case studies assess palaeographic and diplomatic variation against three aspects revealed in the benchmark sample analysed in Chapter 3. Time-related patterns are investigated on dated tablets, place-related patterns are observed on tablets from the two sites of Ur and Girsu, and dossier-related patterns are analysed on three groups of tablets from Girsu.

### 4.1.1 Time-related patterns of variations?

The assessment of the benchmark sample in Chapter 3 suggested an evolution of the script over the Ur III Period pertaining to sign structure [§3.1.1]. It also revealed that this script evolution was not generalised, so that it does not affect wedge count, for example. On the other hand, diplomatic features did not suggest a parallel evolution.

This section draws in new data to refine the nature and the extent of the palaeographic evolution observed over the period. It also investigates further diplomatic features

against time-related patterns. The dataset is composed of administrative tablets dated from Šulgi 24 to Ibbi-Suen 21 (2069 to 2006 BCE) [Figure 147; Appendix 2.b].

| | **Šulgi** | **Amar-Suen** | **Šu-Suen** | **Ibbi-Suen** | |
|---|---|---|---|---|---|
| **Tablets** | 20 | 23 | 33 | 29 | **105** |
| **Sign instances** | 325 | 338 | 815 | 660 | **2,138** |

Figure 147: Distribution of sampled data per ruler

## *Palaeographic variations*

Figure 148 shows the distribution over time of variants of the KAŠ-based group. The number of tablets exclusively using the diagonal variant (v1) is steady over time, with equivalent figures under the respective reigns of Šulgi and Ibbi-Suen. Overall, these tablets represent half of the study sample, illustrating the prevalence of the diagonal variant (v1) throughout the Ur III Period. In comparison, tablets exclusively using the *winkelhaken* variant (v2) are four times less numerous. Their number is, however, far from being steady over time, with figures tripling between the reigns of Šulgi and Ibbi-Suen. On tablets using both variants, there is also a shift in proportion between the diagonal (v1) and *winkelhaken* (v2) variants.

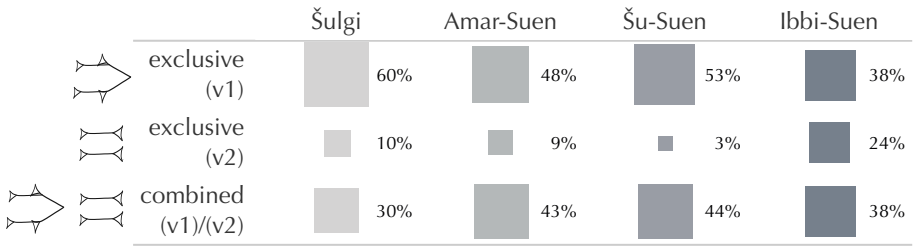


Figure 148: Distribution of variants of KAŠ-based signs over time

% of Tablets (size) broken down by Ruler (colour) vs. KAŠ-based Variants. Sample size (in count of sign instances): 347. Sample size (in count of tablets): 104.

New data, drawn in for this chapter, resonate with the patterns already observed in Chapter 3: the shifting trend between the two variants of signs such as TA, BI or GA, seeing the decrease of the diagonal form (v1), is matched by an increase of the *winkelhaken* form (v2) over time.

Similarly, the patterns previously observed in Chapter 3 on Diamond-framed signs, KI, DI and ŠA$_3$, also emerge from the analysis of new data. In the present sample, the use of the regular diamond variant (v5) decreases over time, in parallel to the emergence of the tilted (v4) and upright (v3) diamond variants, rather infrequent on earlier

tablets [Figure 149]. By the end of the period, the three variants of the Diamond-framed signs KI, DI and $ŠA_3$, are found in even proportions.

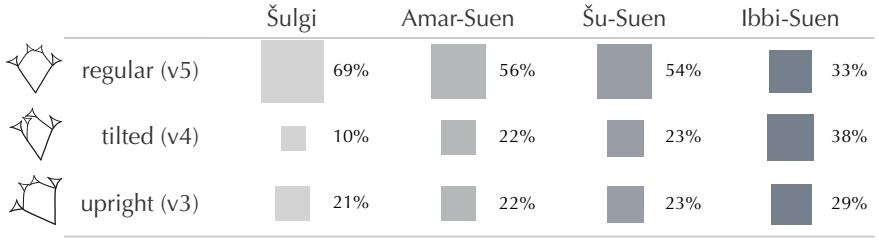


Figure 149: Distribution of variants of Diamond-framed signs over time

% of Sign Instances (size) broken down by Ruler (colour) vs. Diamond-framed Variants. Sample size (in count of sign instances): 134. Sample size (in count of tablets): 86.

As outlined in Chapter 3, the shifting trend observed on KAŠ-based signs and on Diamond-framed signs is formal but more importantly affects the structural formation of signs. That is to say that beyond looking different, emerging variants also differ in their makeup. Both the *winkelhaken* variant (v2) of the KAŠ-based signs and the upright variant (v3) of the Diamond-framed signs require fewer hand movements than their counterparts, respectively diagonal variant (v1) and regular diamond (v5). Such patterns, observed within two datasets in both previous and present chapters, attest of a direct correlation between the evolution of sign forms and their making.

Such threefold dynamics between chronology, structure and form, are also visible on variants of the sign $NIG_2$. The two variants observed in the study sample display inversed patterns of attestation [Figure 150 and Figure 151]: the (v1) variant, composed of vertical and diverging oblique wedges steadily decreases over the period, while the (v2) variant made of verticals and one oblique wedge steadily increases, so that proportions between the two forms are inverted between the reigns of Šulgi and that of Ibbi-Suen.

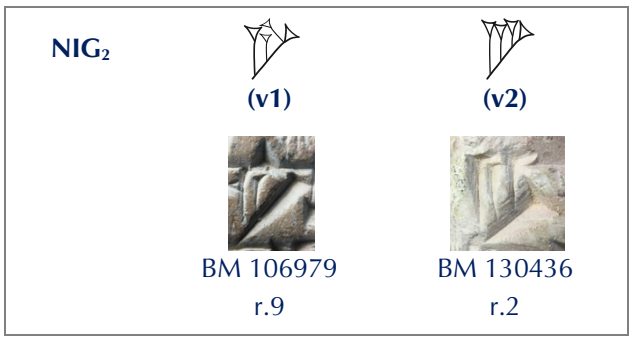


Figure 150: Two Ur III variants of $NIG_2$

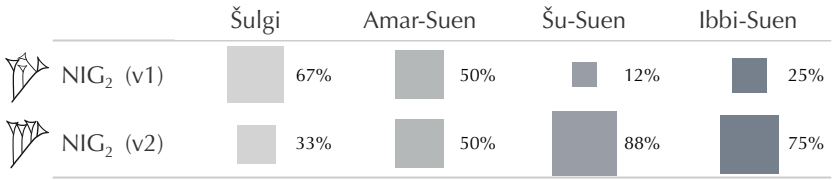


Figure 151: Distribution of variants of $NIG_2$ over time

% of Sign Instances (size) broken down by Ruler (colour) vs. $NIG_2$ Variants. Sample size (in count of sign instances): 19. Sample size (in count of tablets): 19.

Not only are the two variants formally different, but their respective formations are also specific. For the writing hand, the later variant (v2) involves one movement less than its earlier counterpart (v1). The writing sequence of wedges indeed reveals three positions involved to produce the (v1) form, against two positions for the (v2) variant [Figure 152].

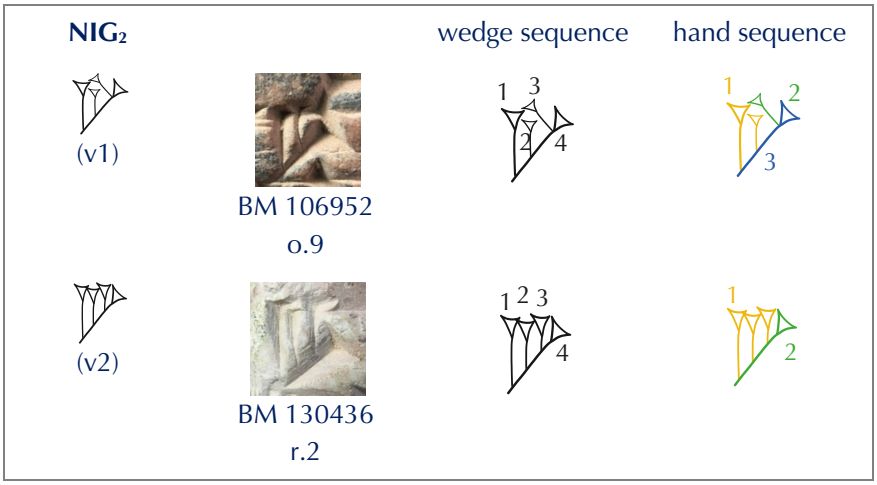


Figure 152: Writing sequence of wedges and hand movements in variants of $NIG_2$

Further, the observable patterns between chronology, form and structure is also visible in the evolution of the sign ŠE, assessed here as a standalone sign [Figure 153]. First, the sharp decrease of the diverging diagonals variant (v4) after the reign of Šulgi and its disappearance after that of Amar-Suen. Second, the appearance of the (v2) form of the sign, composed of two equal rows of *winkelhaken*, under the reign of Amar-Suen. Third, the increasing use of the (v3) variant of ŠE, composed of two unequal rows of *winkelhaken*.

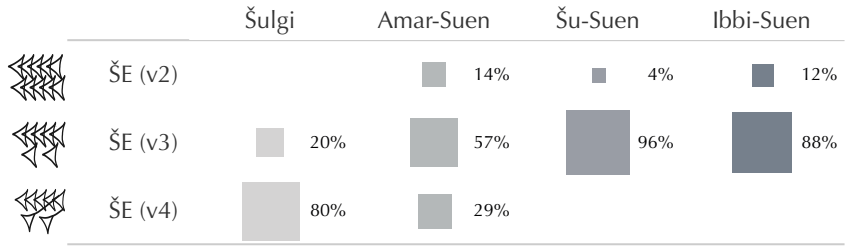


Figure 153: Distribution of variants of ŠE over time

% of Sign Instances (size) broken down by Ruler (colour) vs. ŠE Variants. Sample size (in count of sign instances): 78. Sample size (in count of tablets): 31.

Focussing on the first and third phenomena, the makeup of each variant, deduced from the writing sequence of its component wedges, reveals that the (v3) form requires less hand movements that its (v4) counterpart. Indeed, impressing the diverging diagonals in the (v4) form implies two different hand positions, while the *winkelhaken* variant (v3) can be impressed all at once from one single position of the hand over the writing surface. Such observations also apply to the (v2) form of ŠE, similarly composed of *winkelhaken*. Despite the differences in wedge type and wedge count between variants, the writing sequence of wedges is unaffected and remains the same between the three forms. The coexisting patterns of variations between the disappearance of the diverging diagonals variant (v4) after the reign of Amar-Suen on the one hand, and the increasing use of the two unequal rows of *winkelhaken* variant (v3) on the other hand, would therefore illustrate a similar shifting trend than that observed on KAŠ-based signs and Diamond-framed signs. In the case of variants of ŠE, however, the shift is mainly structural and only slightly formal. Both (v3) and (v4) variants look extremely similar, to the extent that stylus marks inside wedge impressions are often the only identifying feature between the two. It follows that while the two variants are formally similar, their respective makings would have influenced the abandonment of the more elaborate form to the benefit of the simpler one. In this case, the dynamics of palaeographic variations link chronology to structure.

A similar pattern linking structure and chronology, but excluding form, is also observable on variants of the sign TI. The distribution of variants of TI over time shows two parallel patterns of increase/decrease [Figure 154]. While the 5-wedge form (v2) decreases over time across tablets dated from Šulgi to Ibbi-Suen, the 4-wedge form (v1) becomes more and more frequently used to finally overtake its counterpart by the 2020s.

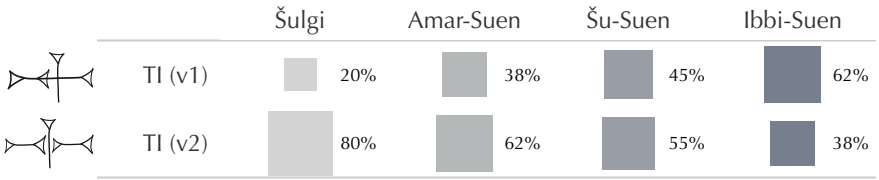


Figure 154: Distribution of variants of TI over time

% of Sign Instances (size) broken down by Ruler (colour) vs. TI Variants. Sample size (in count of sign instances): 46. Sample size (in count of tablets): 45.

The two variants of TI found on Ur III tablets, while looking similar, differ in their makeup: one variant is composed of four wedges (v1); the other is made of five wedges (v2). The positioning of the writing hand, deduced from the order the wedges were impressed, also differ for each variant [Figure 155]. On the 5-wedge variant (v2), the flow of writing follows the sequence of wedges from left to right: horizontal, *winkelhaken*, vertical, horizontal, *winkelhaken*; thus involving five hand positions. On the 4-wedge variant, two writing sequences can be observed. In the sequence (a), the sequence follows wedge types: horizontal, vertical, *winkelhaken*, thus reducing the movements of the writing hand to three positions only. In the sequence (b), the order of impression of the wedges, from left to right, implies four hand positions: horizontal, *winkelhaken*, vertical, *winkelhaken*.

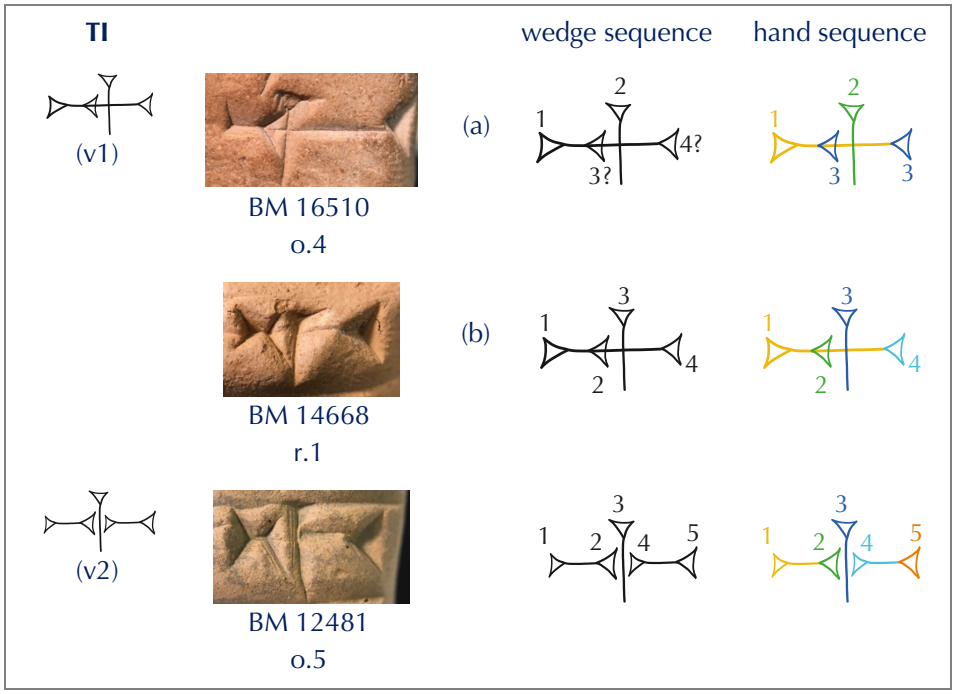


Figure 155: Writing sequence of wedges and hand movements in variants of TI

The distribution of variants of TI attests of a shifting palaeographic trend over time, directly related to the makeup of the emerging variant. This structural shift is not matched by a formal one, the two forms of TI looking closely similar.

Considering time-related variations, the different forms of the sign TUR also display shifting patterns, albeit less differently than for previously discussed signs.

The evolution of TUR over time seems to proceed in two potentially related phases [Figure 156]. First, the shift between the two similarly looking (v1) and (v2) variants emerges halfway through the period, under the reign of Šu-Suen. Second, the late and sudden appearance of a third variant, the abbreviated (v4).

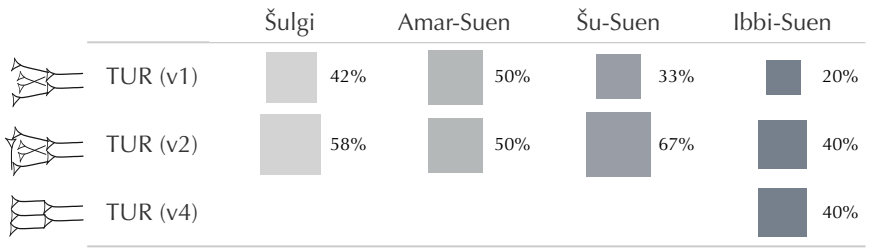


Figure 156: Distribution of variants of TUR over time

% of Sign Instances (size) broken down by Ruler (colour) vs. TUR Variants. Sample size (in count of sign instances): 42. Sample size (in count of tablets): 27.

While the distribution of variants over time does not reveal a shifting trend as clearly and unequivocally as for KAŠ-based signs and TI, for example, the patterns relating to the makeup of variants suggest similarities in the interplay between form, structure and chronology. The two forms of TUR are similarly composed of crossing diagonals and horizontals, the (v2) variant only differing from the (v1) in the presence of a leading vertical wedge. Both forms also share similar writing sequences of wedges and of hand [Figure 157]: vertical (for the (v2) form only), lower horizontal, lower diagonal cut through by an upper diagonal, upper horizontal, to end with the two rightmost horizontals. The movements of the writing hand deduced from this writing sequence are therefore: six positions for the (v2) form; five positions for the (v1) variant. In comparison, the horizontal form (v4) can be impressed all at once without changing hand position.

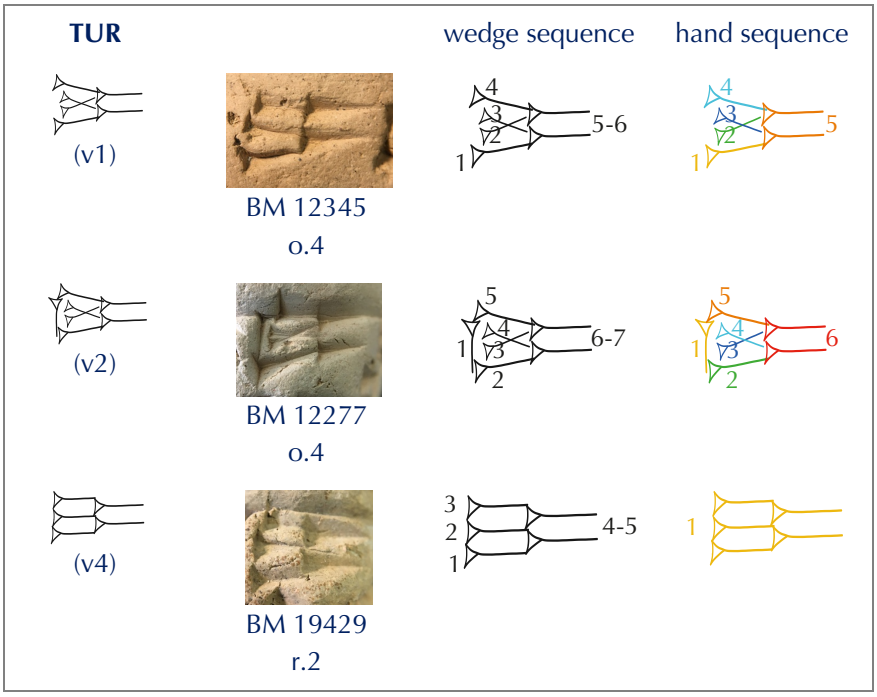


Figure 157: Writing sequence of wedges and hand movements in variants of TUR

Given the evidence presented above about a generalised structural palaeographic shift affecting KAŠ-based and Diamond-framed signs as well as signs such as TI and ŠE, the sudden appearance of the horizontal variant (v4) of TUR at the end of the period, on tablets dated to Ibbi-Suen, could be linked to the makeup of the form, impressed with as few as possible hand movements.

Conversely, the dynamics at play in the variations of the sign RU are not linked to the makeup of its variant forms. Two forms of RU can be observed in the study sample [Figure 158]: one variant is characterised by its diverging diagonal wedges (v1); the other by its crossing vertical and diagonal wedges (v2).

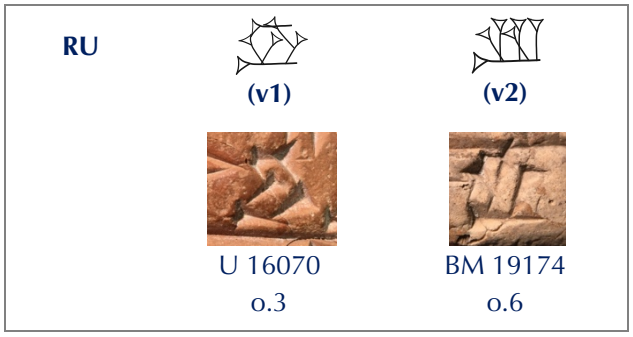


Figure 158: Two Ur III variants of RU

Insufficient data for the two last reigns of the period hinders a clear visualisation of the evolution of RU over time. Figure 159 therefore illustrates a limited dataset of sign instances.

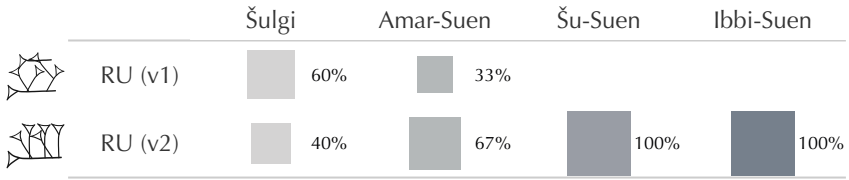


Figure 159: Partial distribution of variants of RU over time

% of Sign Instances (size) broken down by Ruler (colour) vs. RU Variants. Sample size (in count of sign instances): 11. Sample size (in count of tablets): 10.

The two forms of RU attested in the sample make for an interesting example of a formal distinction not being matched by a structural one. The writing sequence of wedges flows by wedge type on both forms: in the diverging form (v1), rightwards diagonals are impressed first followed by leftwards, to end with horizontals; in the crossing form (v2), diagonals are impressed first, followed by verticals and horizontals.[225] While formally distinct, the two forms are similar in structure and makeup, both following the same writing sequence of wedges by type and involving three hand positions [Figure 160].

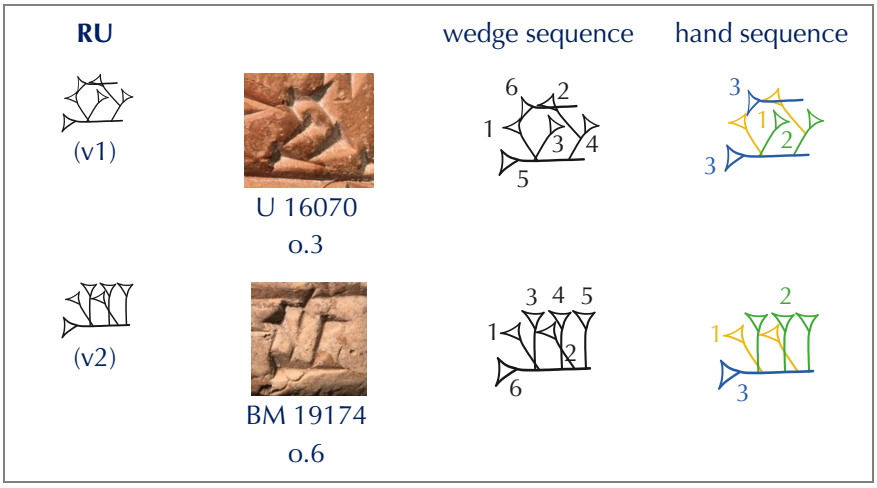


Figure 160: Writing sequence of wedges and hand movements in variants of RU

## *Diplomatic variations*

The analysis conducted in Chapter 3 on diplomatic variations showed no obvious correlation between the makeup of a tablet and chronology. The present study sample supports this, whether considering dimensions, tablet ratio and format or script density and text layout.

[225] On wedge order of RU in Ur III, see Taylor, 'Wedge Order in Cuneiform: A Preliminary Survey', in Devecchi et al., eds., (2015), pp. 7 and 15.

Tablet dimensions are intrinsically linked to the length of the text to be inscribed, and as such vary between tablets within the sample. While variations of tablet dimensions over time show no outstanding patterns, tablets also display equivalent formats and ratios [Figure 161].

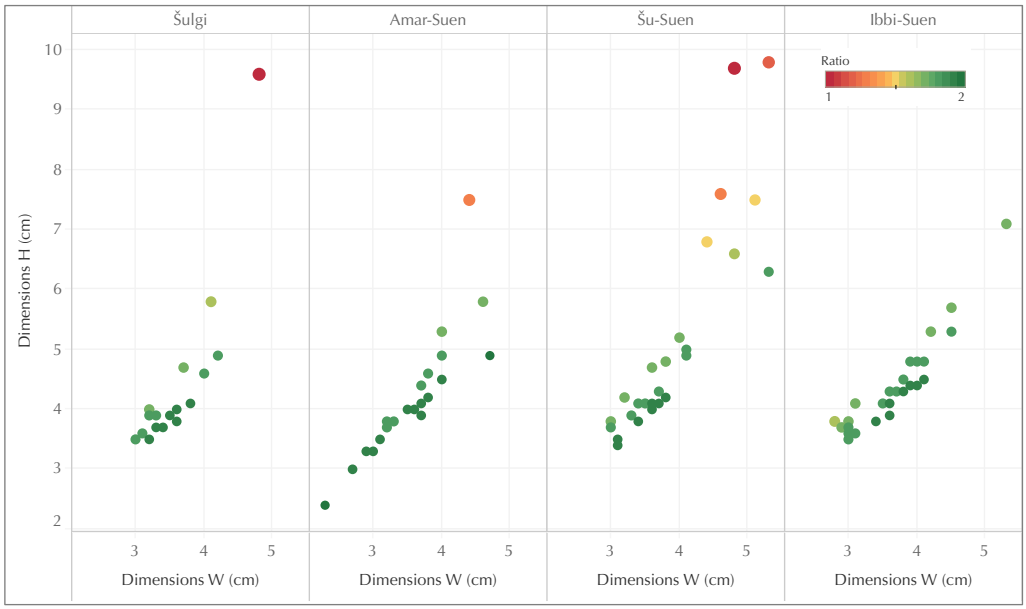


Figure 161: Distribution of tablet formats over time

Tablet Width (x-axis) vs. Tablet Height (y-axis) broken down by Ruler. Colour shows details about Ratio. Sample size (in count of tablets): 105.

The median tablet ratio values show an even progression line along regnal spans: Šulgi 1.2; Amar-Suen 1.1; Šu-Suen 1.2; Ibbi-Suen 1.2.[226] These values reveal a general trend favouring short rectangular portrait tablets.

In terms of tablet shape, expressed as the combination of obverse and reverse profiles, the distribution of the three represented types shows an even progression over time [Figure 162]. The two main types, convex/convex and flat/convex, are maintained in equivalent proportions throughout, while the third type, convex/flat, is little attested.

[226] As detailed in Chapter 2, formats are identified by a computed ratio figure between the height and the width of a tablet, as follows: <0.98 = landscape; 0.99<>1.02 = square; >1.03 = portrait.

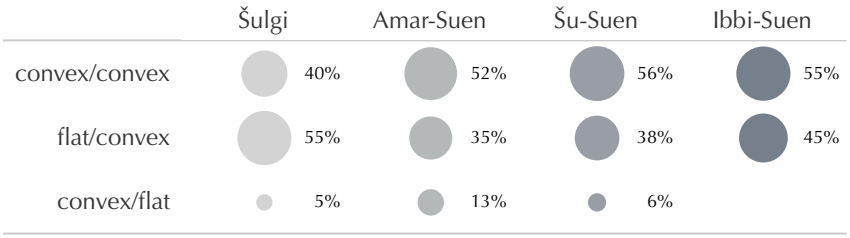


Figure 162: Distribution of tablet profiles (obverse/reverse) over time

% of Tablets (size) broken down by Ruler (colour) vs. Profile: Obverse/Reverse. Sample size (in count of tablets): 104.

Chapter 3 found a direct correlation between script density and text layout, regardless of chronology. New data, drawn in for the present chapter, supports such claim, with variations in script density values co-occurring with variations of text layout. As such, tablets with discrepant density values between obverse and reverse also tend to carry lines of text on their small edges. U 16525, for example, shows a density value of 1.39 lines of text per 1 cm high on its obverse, against a value of 1.94 on its obverse [Figure 163]. The layout of the text matches this, with five lines on the obverse, seven on the reverse, and an overflow of two lines on the upper edge of the tablet. Small edges are more commonly not inscribed, the text being reserved for the main obverse and reverse faces. The upper edge comes rather late in the sequence of unfolding the text on the tablet: obverse, lower edge, reverse, upper edge, left edge. Subsequently, that the lower edge, encountered earlier in the process of inscription, remains blank while the reverse is more densely inscribed and the upper edge carries two lines of text, appears hardly inconsequential.

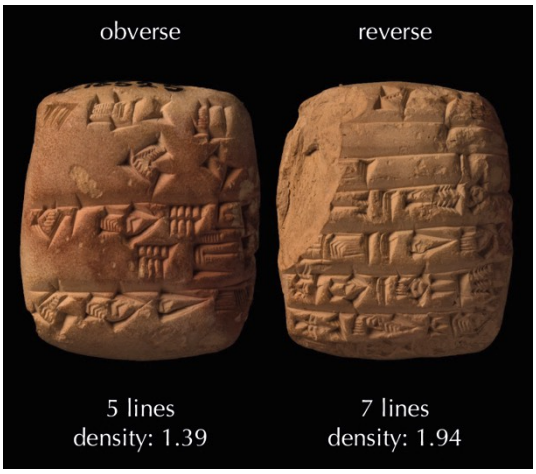


Figure 163: Script density and text layout

(U 16525)

Supplementing the evidence provided in Chapter 3, this suggests that the dynamics behind script density and text layout attest of the more intangible moment in the writing

process that is text planning, as if set into clay. Whether script density and text planning could also illustrate scribal choices or personal characteristics is addressed hereinbelow. While all tablets in the group are administrative documents, they belong to various sub-genres and relate to various subject matters, while also being provenanced from various sites. If the focus here is on time-related patterns, diplomatic variations according to genres and geographic provenances are investigated hereinafter.

The shifting palaeographic trend observed in Chapter 3 is supported by new data and evidence presented in this chapter, showing that the evolution of sign variants is linked to their composition. The interplay between chronology, composition and form reveals a stronger case in favour of a structural shift, with variants of signs such as ŠE or TI not formally distinct yet differing in composition. This threefold dynamic is neither even nor consistent between signs or groups of signs and reveals two distinct patterns: either balanced, characterised by a progressive shift, equally formal and structural; or imbalanced, characterised by a sudden shift, structural but not formal.
The absence of directly time-related patterns of diplomatic variation observed in Chapter 3 is supported by the data drawn in this chapter. Neither formats nor tablet profiles reveal characteristics that could be linked to regnal spans. Nevertheless, the sample reveals diplomatic variation, to be assessed against provenances and genres in the next sections of this chapter.

### 4.1.2 Place-related patterns of variations?

The assessment of a benchmark sample in Chapter 3 revealed a palaeographic contrast between sites, observable both on individual signs and on groups of signs [§3.1.2]. Diplomatic trends were also found, although lighter. Amongst the four sites analysed, Ur and Girsu presented the most outstanding patterns of variation and the most contrasted. This section investigates the local traditions of Ur and Girsu. It also looks at site-related patterns in relation to chronological patterns to determine the nature of palaeographic evolution previously observed, whether widespread or localised. The dataset is composed of administrative and legal tablets from Ur and Girsu [Figure 164; Appendix 2.b].

| | Ur | Girsu | |
|---|---|---|---|
| **Tablets** | 44 | 43 | **87** |
| **Sign instances** | 522 | 1,309 | **1,831** |

Figure 164: Distribution of sampled data per site

## *Palaeographic variations*

Three variants of the sign $KU_3$ are found in the study sample [Figure 165]: a bent variant (v1), composed of a frame of diverging oblique wedges filled in with rows of smaller wedges; a tilted variant (v2), similarly composed of a frame of diverging obliques, with a prominent basal wedge whose angle is close to horizontal; a horizontal variant (v3), formed of a basal horizontal on which sits a basal row of *winkelhaken* and on top of which a horizontal stack of wedges sits between two verticals.

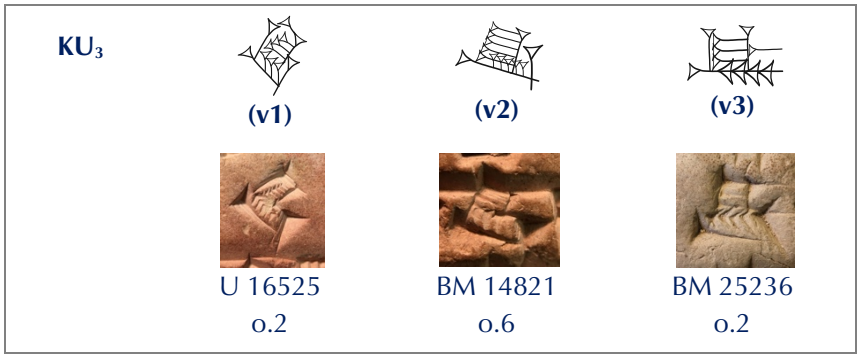


Figure 165: Three Ur III variants of $KU_3$

The patterns of use of these three variants between tablets from Girsu and tablets from Ur reveal geographic specificities [Figure 166]. While the three forms are attested on tablets from Ur, the tilted (v2) and horizontal (v3) forms are not as widely used as the prevailing bent variant (v1). Conversely, the bent variant is absent on tablets from Girsu, on which the horizontal form (v3) is favoured over the tilted (v2).

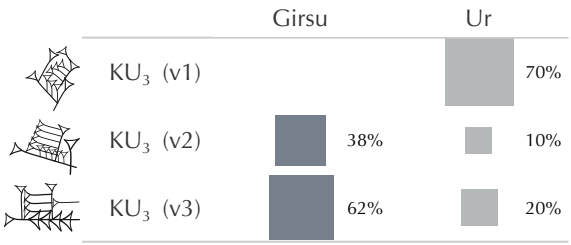


Figure 166: Distribution of variants of $KU_3$ between sites

% of Sign Instances (size) broken down by Site (colour) vs. $KU_3$ Variants. Sample size (in count of sign instances): 18. Sample size (in count of tablets): 14.

Although $KU_3$ is not largely represented in the study sample, thus forming a limited dataset, the contrasting distribution of variant forms between the two sites of Girsu and Ur is noteworthy.

The analysis conducted in Chapter 3 revealed discrepant patterns of use of the variants of AN between Girsu and Ur. On the four sites assessed then, Girsu showed the most variations with five forms attested, while Ur showed the least with only two variants represented. In the present sample, the distribution of variants of AN between sites reflects the distribution observed in Chapter 3, with greater variations in Girsu than in Ur [Figure 167].

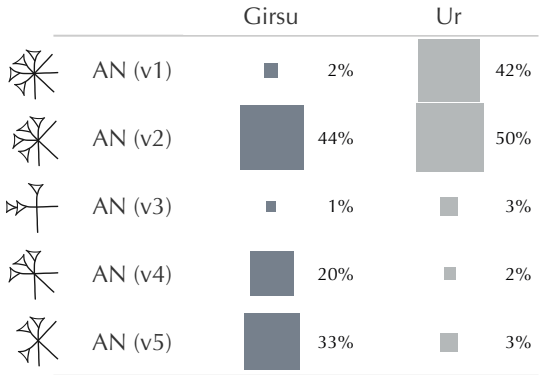


Figure 167: Distribution of variants of AN between sites

% of Sign Instances (size) broken down by Site (colour) vs. AN Variants. Sample size (in count of sign instances): 160. Sample size (in count of tablets): 95.

Tablets from Ur in the sample display two forms until then only known in Girsu. The two abbreviated forms (v3) and (v5) are, however, only attested with a unique instance each on tablets from Ur [Figure 168]. On BM 16510, the (v3) form is used on r.3 as a divine determinative, while the scribe had used the more classic (v1) variant earlier on that same tablet and in the same context. Similarly, on U 18833 the (v5) variant is used on r.5 while the instance of AN on o.2 uses the (v1) form.

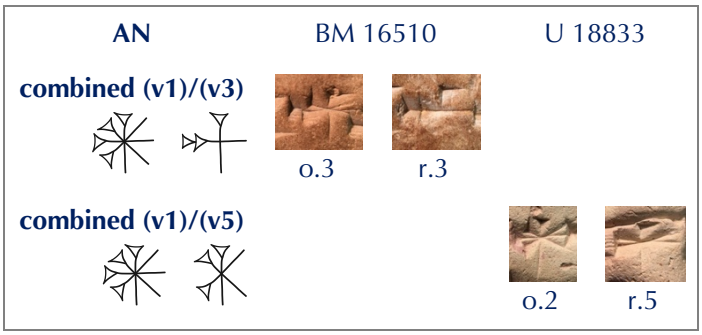


Figure 168: Combined use of variants of AN on tablets from Ur

More broadly, the main observed variants of AN differ between Ur and Girsu. Although both sites share a similar fondness for the (v2) form of the sign, tablets from Girsu also favour the abbreviated (v5) and (v4) variants, while tablets from Ur equally favours the elaborate (v1) form.

While the abbreviated forms of AN are not favoured on tablets from Ur, it is worth noting that they are not unknown. On U 18833, the (v5) form of AN is used in a constrained context: the last sign of the last-but-one line, in the lower right corner of the tablet, where space becomes limited. Conversely, on BM 16510 the (v3) variant of AN is conveniently located in the upper middle of the reverse. All aspects considered, the occurrence in Ur of abbreviated variants of AN, sign instance locations on the body of the tablets, and the fact that the abbreviated (v5) form is otherwise widely found on tablets from Girsu, could also suggest that the more elaborate (v1) and (v2) forms are knowingly used in Ur, or at least characteristic of Ur tablets.

The patterns of distribution of the variant forms of $KU_3$ and AN between Girsu and Ur reveal characteristic traits directly related to provenance. Such geographic patterns had already been observed in the previous Chapter 3 and are supported here by new data, suggesting the existence of two distinct traditions. These geographic trends cannot be related to chronology, for lack of data in the case of $KU_3$ and for lack of results in the case of AN. Nevertheless, given the evidence presented in both Chapter 3 and the above section on the palaeographic shift observable over time, considering geographic patterns of variations along with chronology might help understanding the nature and the extent of the evolution of the script during the Ur III Period. The following paragraphs investigate palaeographic variations across sites against trends over time.

Figure 169 shows the distribution of variants of the KAŠ-based group between sites. There is a clear preference for the diagonal variant (v1) on tablets from Ur. Not only is there a much larger proportion of tablets exclusively using the (v1) form, but tablets also exclusively using the *winkelhaken* form (v2) are seldom attested in Ur. Conversely, the proportions in Girsu are more evenly distributed between variant types, and overall, tablets combining both (v1) and (v2) forms are favoured.

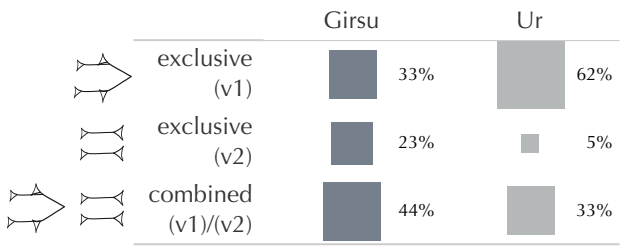


Figure 169: Distribution of KAŠ-based variants across sites (usage per tablet)

% of Tablets (size) broken down by Site (colour) vs. KAŠ-based Variants. Sample size (in count of sign instances): 295. Sample size (in count of tablets): 86.

The palaeographic analysis in Chapter 3 partially revealed the outline of a bifold dynamic between time and place, with Ur at odds with the general shifting trend in favour of the *winkelhaken* form (v2). Data presented in the present chapter supplements and supports this picture, at least when considering palaeographic variations of the KAŠ-based group of signs.

Conversely, evidence drawn in from the distribution of variants of the Diamond-framed group suggests otherwise. The two sites display patterns of their own, with a contrasted distribution of variants in Girsu and more evenly distributed proportions in Ur [Figure 170 and Figure 171]. Although the regular diamond (v5) is the main variant for both sites, the upright (v3) and tilted (v4) forms are seldom attested in Girsu while they are not rare in Ur.

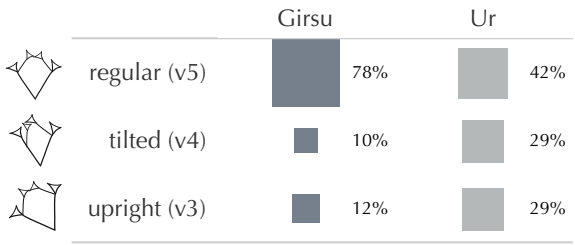


Figure 170: Distribution of variants of Diamond-framed signs between sites

% of Sign Instances (size) broken down by Site (colour) vs. Diamond-framed Variants. Sample size (in count of sign instances): 127. Sample size (in count of tablets): 76.

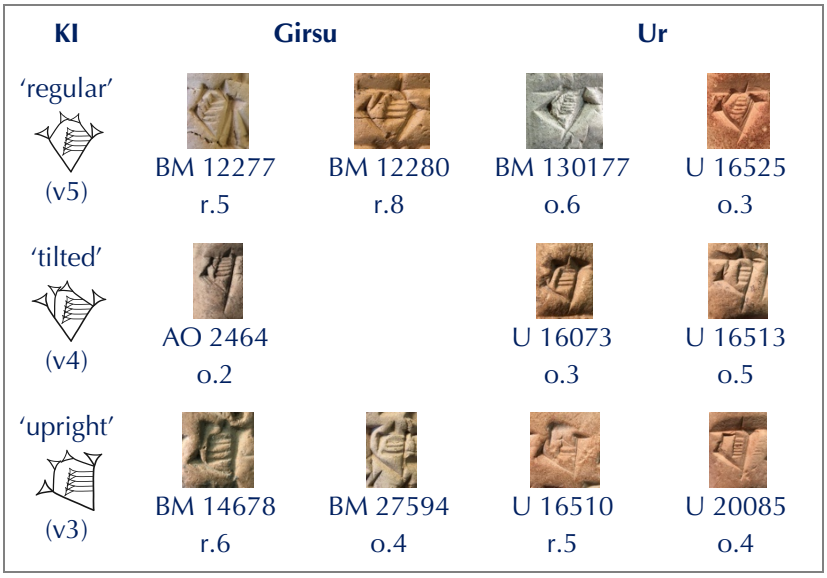


Figure 171: Variants of KI between sites

The contrasting patterns of Diamond-framed sign variants between Girsu and Ur mirrors that observed in Chapter 3. As opposed to the KAŠ-based group, the variations of the Diamond-framed group over time and across sites highlights a greater use of variants associated with the later years of the Ur III Period in Ur, while the earlier variants are favoured in Girsu.

The two KAŠ-based and Diamond-framed groups thus suggest opposed time/place dynamics of variations. The following paragraphs assess patterns between sites on signs that showed a clear correlation to chronology in the previous section of this chapter in order to refine the ambivalent image depicted by KAŠ-based and Diamond-framed variants.

The variations of the sign TI reveal clear and distinct patterns between Girsu and Ur [Figure 172]. The 5-wedge variant (v2) is largely favoured in Ur, while the distribution is more even between the two forms of TI on tablets from Girsu.

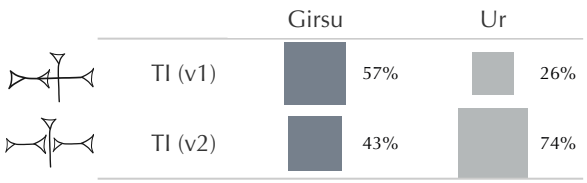


Figure 172: Distribution of variants of TI between sites

% of Sign Instances (size) broken down by Site (colour) vs. TI Variants. Sample size (in count of sign instances): 33. Sample size (in count of tablets): 30.

The 5-wedge form (v2) of TI was previously found to be more frequent on earlier tablets, with a decrease over time in favour of the 4-wedge variant (v1). The prevalence of the

earlier form of TI on tablets from Ur mirrors the image given by the distribution over time and sites of the KAŠ-based signs.

Clear geographic patterns are also revealed by the distribution of variants of the sign ŠE between sites [Figure 173]. Tablets from Girsu unequivocally use the 2 unequal rows variant (v3) and only very rarely the two other forms of the sign. In Ur, conversely, the (v3) form is attested while not favoured and largely overtaken by the 2 equal rows variant (v2).

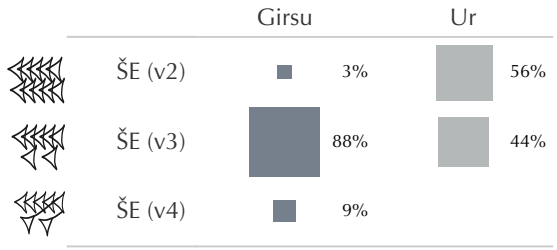


Figure 173: Distribution of variants of ŠE between sites

% of Sign Instances (size) broken down by Site (colour) vs. ŠE Variants. Sample size (in count of sign instances): 74. Sample size (in count of tablets): 30.

The distribution of variants of the sign ŠE in Girsu matches the two-sided dynamics between time and place observed on KAŠ-based signs, with forms associated with later tablets favoured in Girsu. Ur, on the other hand, reveals a vaguer image. While the prevailing (v2) form did not show a strong progression over time in the previous case study, it nevertheless emerged and somehow maintained itself between the reigns of Amar-Suen and Ibbi-Suen. Furthermore, the diverging diagonals variant (v4), overall prevailing under the reign of Šulgi, is not attested in the present study sample on tablets from Ur.

The two variants of $NIG_2$ are characteristically distributed between Girsu and Ur [Figure 174]. While both variants are found in equal proportions on tablets from Ur, tablets from Girsu largely use the (v2) form of $NIG_2$.

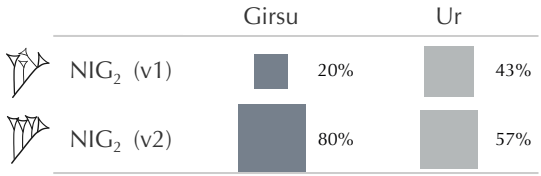


Figure 174: Distribution of variants of $NIG_2$ between sites

% of Sign Instances (size) broken down by Site (colour) vs. $NIG_2$ Variants. Sample size (in count of sign instances): 17. Sample size (in count of tablets): 16.

As mentioned earlier in this chapter, the patterns of variations of $NIG_2$ are closely related to chronology, with a structural shift paired to a formal one between the two variants of the sign. The prevalence of the (v2) form in Girsu, associated with later tablets, repeats the two-sided dynamics observed on KAŠ-based signs and variants of ŠE. However, as was the case with ŠE, while tablets from Girsu reveal a close link between time and place, such link appears much milder on tablets from Ur.

The distribution of variants of TUR between Girsu and Ur reveals a strong contrast between the two sites [Figure 175]. Tablets provenanced from Girsu show an even distribution between the two main forms (v1) and (v2), and rare instances of the abbreviated (v4) variant. In contrast, the (v2) form is the only main form on tablets from Ur, and the abbreviated (v4) is not attested at all.

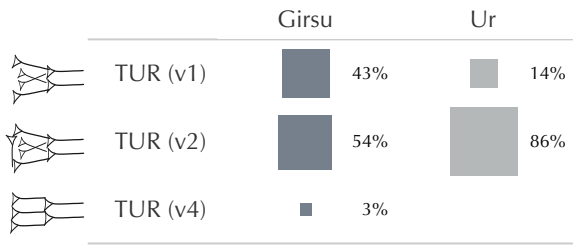


Figure 175: Distribution of variants of TUR between sites

% of Sign Instances (size) broken down by Site (colour) vs. TUR Variants. Sample size (in count of sign instances): 44. Sample size (in count of tablets): 27.

BM 19429 bears both (v1) and (v4) variants of TUR. In both cases, the instance is located at the end of a line (o.4 and r.2) and has the value [dumu] so that their respective locations on the tablet does not appear to have affected the choice of variant.
More broadly, the previous section showed a relatively late evolution of the sign TUR over time, while the distinction between provenances appears more contrasted.

### *Diplomatic variations*

While the diplomatic analysis in Chapter 3 revealed no outstanding geographic patterns, a few features suggested site-related trends, amongst which distinct preferences in terms of tablet profiles between Girsu and Ur.

Such local trends pertaining to tablet shape can also be observed in the present study sample. Tablets from Ur are most frequently shaped with a flat obverse while those from Girsu display a convex profile, while both sites share the same preference for convex

reverses. Overall, the main profile type in Ur is the flat/convex tablet, while Girsu favours the convex/convex more [Figure 176]. How the corners of the tablets are shaped also appears specific to provenances, with Girsu tablets more prone to show squared corners and Ur tablets most frequently shaped with pinched corners [Figure 177].

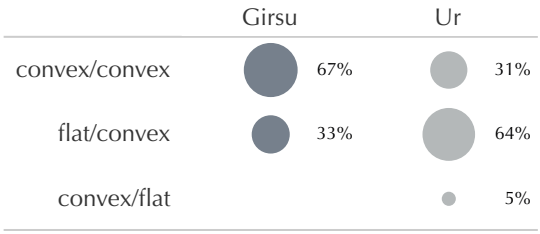


Figure 176: Distribution of tablet profiles (obverse/reverse) between sites

% of Tablets (size) broken down by Site (colour) vs. Profile: Obverse/Reverse. Sample size (in count of tablets): 86.

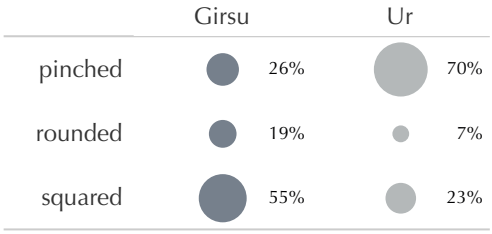


Figure 177: Distribution of tablet profiles (corners) between sites

% of Tablets (size) broken down by Site (colour) vs. Profile: Corners. Sample size (in count of tablets): 87.

Ur tablets also more frequently display flat small edges, whether upper and lower edges or left and right edges, while Girsu tablets also tend to show flat upper and lower edges [Figure 178]. On Girsu tablets, conversely, the symmetry does not apply between the left and right edges, with a favoured flat/rounded combination [Figure 179]. Whether tablet small edges are inscribed or not does not seem to affect edge profiles.

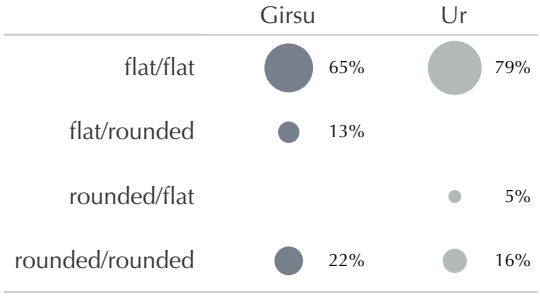


Figure 178: Distribution of tablet profiles (upper edge/lower edge) between sites

% of Tablets (size) broken down by Site (colour) vs. Profile: Upper/Lower Edge. Sample size (in count of tablets): 84.

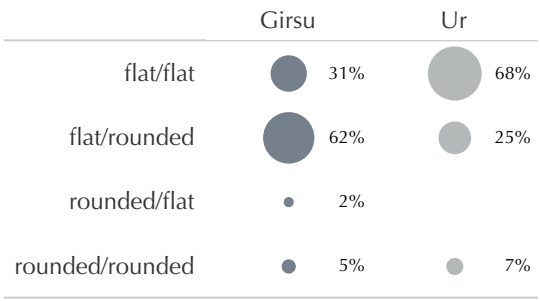


Figure 179: Distribution of tablet profiles (left edge/right edge) between sites

% of Tablets (size) broken down by Site (colour) vs. Profile: Left/Right Edge. Sample size (in count of tablets): 86.

The assessment of profile types in the previous section revealed no outstanding time-related patterns. Variations in shape, considering the profiles of each of the six faces of a tablet, appear directly related to provenance, thus supporting the local trends already observed in Chapter 3. Representing tablet profiles by sub-types (obverse/reverse, corners, upper edge/lower edge, left edge/right edge) therefore suggests specific tablet shapes that are different between Ur and Girsu. The contrast between tablets from Ur and from Girsu suggest site-related trends pertaining to shape. Still, there are also variations within both groups. These variations in shape are less contrasted than they are between the two groups and might relate to genres. Moreover, tablets from Girsu show greater variations than their Ur counterparts. Diplomatic variations between genres are investigated hereinafter with a focus on tablets from Girsu.

Variations of script density revealed no outstanding patterns that could be related to time or place, rather suggesting a tablet-by-tablet pattern linked to text layout. The previously observed relation between script density and text layout, according to which the density of the script is affected by the layout of the text on the tablet, also applies to the tablets in the present study sample. Yet, the variation of script density between the two groups of tablets suggests site-specific trends. Tablets from Ur show a median figure at 1.6 lines of text per 1 cm height, while tablets from Girsu generally show a denser script, with a median figure at 1.9 lines of text. Variations of script density within groups supports this. The less densely written tablet from Girsu is still denser than the less densely written tablet from Ur. Whereas the difference between those two tablets is only minor, that between the more densely inscribed tablets in the two groups is greater. The denser script in Ur rises to 2.1 lines of text per 1 cm height, against 2.8 lines on the more

densely written tablet from Girsu. That is to say that Girsu tablets are generally and particularly more densely written than their Ur counterparts.

Diplomatic features between tablets from Ur and from Girsu reveal site-specific variations, possibly related to two distinct traditions. While tablet profiles did not appear related to chronology, tablets from Ur and Girsu respectively show specific patterns.
The two sites show contrasted patterns of palaeographic variation, both at group level and at sign level, suggesting two distinct traditions. The dynamics of variations across sites and over time show no obvious nor consistent pattern. Yet, on signs or group with a strong link to chronology, usage in Girsu more often adopts forms observed in late Ur III while Ur forms more often match earlier trends. Most importantly, however, this is not systematic and is limited to a few features, so that the palaeographic evolution observed over the period appears localised rather than widespread. Overall, Girsu shows greater palaeographic variation, to be investigated further in this chapter through three case studies focussing on tablets from Girsu.

### 4.1.3 Dossier-related patterns of variations?

As revealed in both Chapter 3 and this chapter, there is greater palaeographic variation in Girsu than in Ur, expressed namely through variants exclusively found in Girsu (e.g. AN). This section investigates further the nature of the palaeographic variation observed on tablets from Girsu by looking at three dossiers of administrative texts to assess whether text genre could be an influencing factor. The dataset confronts a group of metal issuing receipts, referred to as the 'Blacksmiths tablets', a group of letter-orders, referred to as 'Letters', and a group of trial reports, referred to as 'Di til-la tablets' [Figure 180; Appendix 2.b].[227]

| | **Blacksmiths** | **Letters** | **Di til-la** | |
|---|---|---|---|---|
| **Tablets** | 22 | 20 | 9 | **51** |
| **Sign instances** | 392 | 376 | 435 | **1,203** |

Figure 180: Distribution of sampled data per dossier

The Blacksmiths tablets record the transfer of metal objects between the administration, represented by a named administrator (dub.sar), and the metalworkers, represented by

[227] On reconstructed Girsu dossiers, see Mander, 'Interrelazioni tra archivi minori a Girsu nel periodo di Ur III', in Waetzoldt et al., eds., (2004), pp. 121-128.

a named blacksmith (simug).[228] The Letters, or 'letter-orders', also relate to the administration, sent internally by one or more named individual to communicate orders to subordinates.[229] Finally, the Di til-la tablets are tribunal verdicts, recording the outcome of legal disputes presented in court. They represent the highest level of local administration, that of the governor ($ensi_2$), since the dispense of justice was a royal prerogative assumed locally by the king's representative.[230] While all provenanced from Girsu, the nature of the three selected dossiers therefore illustrates various contexts of production with regard to the form and function of the documents, whether relating to the administration of local craftsmanship, to internal bureaucratic communication, or to the dispense of justice.[231] Moreover, two dossiers are genre-specific, the Letters and the Di til-la, while the third dossier relating to blacksmithing activities is subject-specific. Tablets in the Blacksmiths dossier are, however, of the same nature, mainly issuing receipts.

### *Palaeographic variations*

In Chapter 3, Girsu tablets showed greater palaeographic variations than other geographic corpora. For example, this was especially appreciable on variants of the sign AN, with up to five variants identified on tablets from Girsu.

In the present study sample, the distribution of variants of AN suggests distinctive patterns of use between dossiers [Figure 181]. The Letters show the most unequivocal illustration of palaeographic uniformity, with the (v2) variant of the sign outshining the rare abbreviated (v5) form. The Blacksmiths tablets show the most different variants, albeit only two of them, the (v2) and (v5) forms, are frequently attested.

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[228] Previous studies of the corpus have focussed on the history of metalwork and on the organisation of craftsmanship and its administration in the Ur III Period, see Limet, *Le travail du métal au pays de Sumer*, (1960); Jones, 'Review of : Le Travail du métal au pays de Sumer au temps de la IIIe dynastie d'Ur by Henri Limet', *JCS* 15 (1961), pp. 114-116; Lafont, 'Les forgerons sumériens de la ville de Girsu', *Anatolia Antiqua* 1 (1991), pp. 119-130; Neumann, 'Staatliche Verwaltung und Privates Handwerk in der Ur III-Zeit: Die Auftragstätigkeit der Schmiede von Girsu', in Bongenaar, ed., (2000), pp. 119-133.

[229] See Sollberger, *The Business and Administrative Correspondence under the Kings of Ur*, (1966); Michalowski et al., eds., *Letters from Early Mesopotamia*, (1993); Molina, 'Neo-Sumerian Letter-Orders in the British Museum I', *AuOr* 17-18 (1999-2000), pp. 215-228.

[230] See Sigrist, 'Some di-til-la Tablets in the British Museum', in Zevit et al., eds., (1995), pp. 609-618; Sollberger, 'Some Legal Documents of the Third Dynasty of Ur', in Eichler et al., eds., (1976), pp. 435-450.

[231] On the function of cuneiform documents in the administrative apparatus of the Ur III Period, see Steinkeller, 'Archival Practices at Babylonia in the Third Millennium', in Brosius, ed., (2003), pp. 37-58; Steinkeller, 'The Function of Written Documentation in the Administrative Praxis of Early Babylonia', in Hudson et al., eds., (2004), pp. 65-88, and more recently Widell, 'Administrative and Archival Procedures in Early Babylonia. With an Addendum on the Implications on Sealing Practices', in Günther et al., eds., (2021), pp. 289-315.

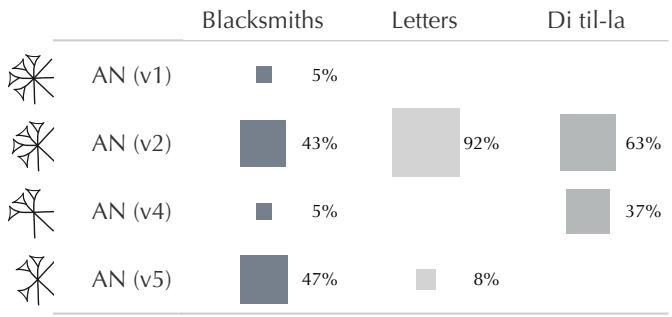


Figure 181: Distribution of variants of AN between dossiers

% of Sign Instances (size) broken down by Dossier (colour) vs. AN Variants. Sample size (in count of sign instances): 61. Sample size (in count of tablets): 31.

The two genre-specific dossiers (Letters and Di til-la) show less variations than the subject-specific Blacksmiths dossier. The latter also shows two distinct groups of tablets, equally using either the (v2) or the (v5) form.

This distribution pattern is not observable on variations of the sign $NIG_2$, which nevertheless reveals distinctive traits between dossiers [Figure 182]. All three dossiers show a marked preference for one variant form of $NIG_2$: the (v2) variant prevails on the Blacksmiths tablets, while the (v1) form is preferred on the Letters. Noticeably, the Di til-la tablets show the absolute exclusivity of the (v2) variant.

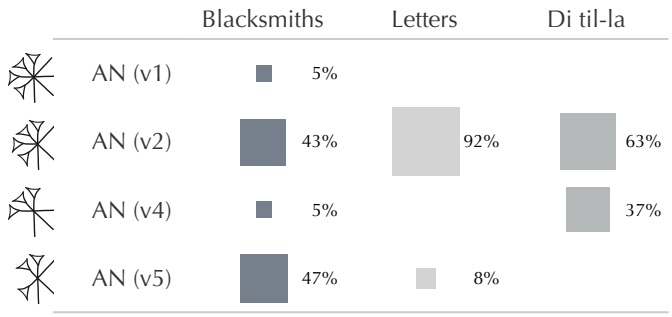


Figure 182: Distribution of variants of $NIG_2$ between dossiers

% of Sign Instances (size) broken down by Dossier (colour) vs. $NIG_2$ Variants. Sample size (in count of sign instances): 18. Sample size (in count of tablets): 17.

Unlike what could be observed on variants of the sign AN, the distribution of variants of the sign $NIG_2$ does not mirror the nature of each dossier, either genre-specific or subject-specific. It should still be noted that expression of palaeographic uniformity is a feature of the Di til-la tablets, and that such strong contrast was previously observed with variants of AN on the other genre-specific dossier, the Letters.

In the previous section of this chapter, directly time-related patterns of use emerged from the variations of the sign $NIG_2$. Here, the distribution of variants of $NIG_2$ between dossiers and over time is not observable, for lack of dated tablets. There are,

nevertheless, visible traits that can be linked to previously observed time-related patterns, according to which the (v1) form of $NIG_2$ prevailed on tablets from the earlier Ur III Period and the (v2) form on later tablets. In that regard, the Letters stand out as favouring the earlier form of $NIG_2$, while both the Blacksmiths and Di til-la tablets tend towards the later form.

The sign TI, as well as KAŠ-based signs and Diamond-framed signs, also revealed time-related patterns of variations earlier in this chapter. The following paragraphs look at the distribution of variants of TI, KAŠ-based signs and Diamond-framed signs between dossiers. In addition, the correlation between dossier-related patterns and time-related patterns is tested on sub-groups of tablets. While the Letters are all undated, there are substantial sub-samples of tablets dated to Šu-Suen that can be gathered for the Blacksmiths and the Di til-la tablets.

The distribution of the variant forms of TI between dossiers shows an overall prevalence of the 4-wedge form (v1) [Figure 183]. As also observed on the signs AN and $NIG_2$, the two genre-specific dossiers – Letters and Di til-la – display more contrasted distributions than the subject-specific Blacksmiths tablets, although this trend is here less marked.

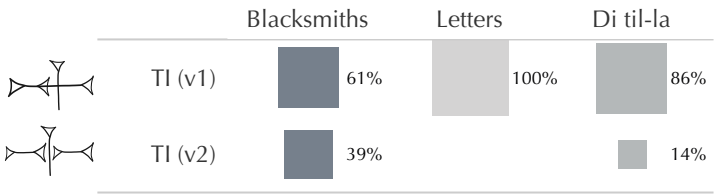


Figure 183: Distribution of variants of TI between dossiers

% of Sign Instances (size) broken down by Dossier (colour) vs. TI Variants. Sample size (in count of sign instances): 30. Sample size (in count of tablets): 26.

Variants of TI between the Blacksmiths and the Di til-la tablets dated to Šu-Suen show similar patterns of distribution between two variants, with the 4-wedge form (v1) three times more frequent than the (v2) variant in both dossiers [Figure 184].

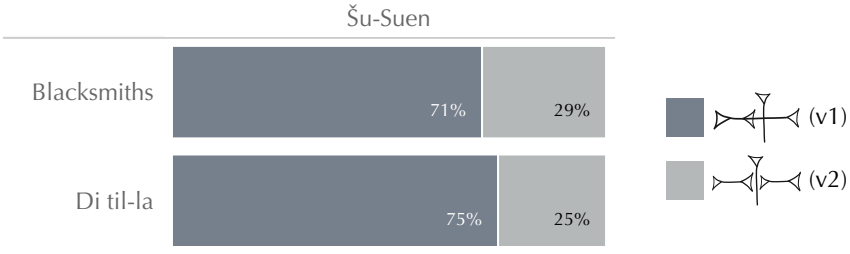


Figure 184: Distribution of variants of TI between dossiers on tablets dated to Šu-Suen

% of Sign Instances (size) broken down by Dossier vs. TI Variants (colour). Sample size (in count of sign instances): 11. Sample size (in count of tablets): 11.

Palaeographic variations of KAŠ-based signs were also amongst the noticeable differences between tablets from Ur and tablets from Girsu, as well as showing clear time-related patterns. Conversely, the distribution of variants of KAŠ-based signs between dossiers is less contrasted [Figure 185]. There are, however, differences. Overall, the Di til-la tablets tend to combine the diagonal variant (v1) and the *winkelhaken* variant (v2) more frequently than the two other dossiers, while the Letters favour the diagonal variant (v1) more. On tablets with both variants, the Di til-la tablets also show a higher proportion of the (v2) form over the (v1) variant.

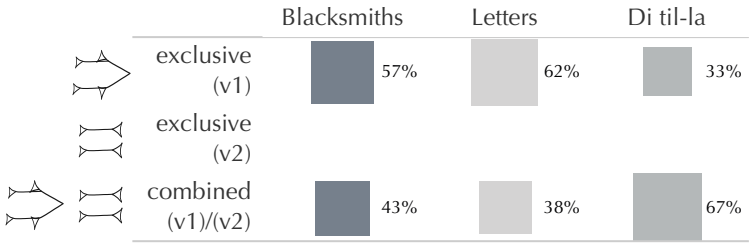


Figure 185: Distribution of variants of KAŠ-based signs between dossiers

% of Tablets (size) broken down by Dossier (colour) vs. KAŠ-based Variants. Sample size (in count of sign instances): 156. Sample size (in count of tablets): 46.

Most noticeably, however, the *winkelhaken* variant (v2) is not attested in exclusive use on any tablet in the study sample and always used in combination with the diagonal variant (v1). Timewise, a palaeographic shift could be observed on dated tablets previously assessed, that saw the *winkelhaken* variant (v2) being increasingly used over time while the diagonal form (v1) showed an inverted pattern and a decrease in use.

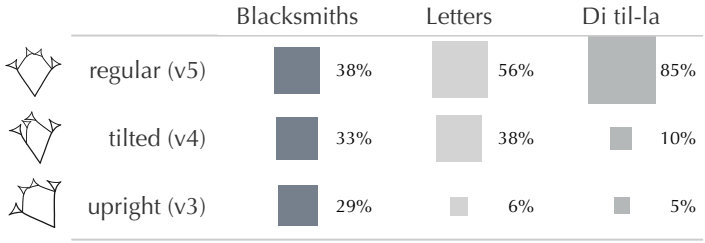


Figure 186: Distribution of variants of Diamond-framed signs between dossiers

% of Sign Instances (size) broken down by Dossier (colour) vs. Diamond-framed Variants. Sample size (in count of sign instances): 78. Sample size (in count of tablets): 40.

The dissimilarity between groups in distribution patterns of KAŠ-based variants is not replicated on Diamond-framed signs KI, DI and ŠA$_3$. The two genre-specific dossiers – Letters and Di til-la – show some similarity of practice in that they both favour the

regular diamond (v5) form, while the subject-specific Blacksmiths tablets show greater variations between the attested three variants [Figure 186].

Previous assessments of Diamond-framed sign variants revealed directly time- and site-related patterns: decrease of the regular diamond form (v5) over the Ur III Period reaching a status quo situation under the reign of Ibbi-Suen, with all three variants used in equivalent proportions; largely prevalent use of the (v5) variant in Girsu. Focussing on groups of tablets dated to Šu-Suen suggests distinctive patterns on the Blacksmiths and Di til-la tablets [Figure 187].

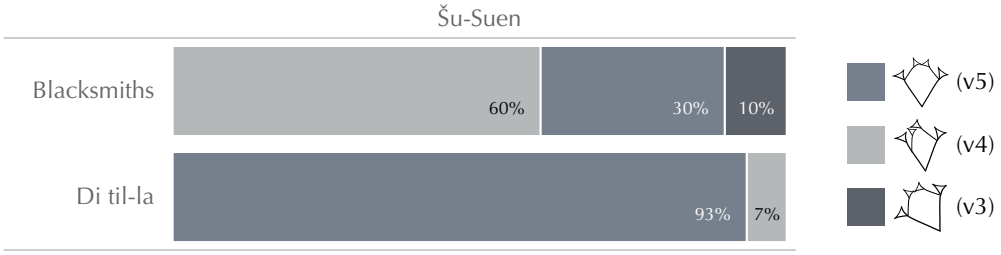


Figure 187: Distribution of variants of Diamond-framed signs between dossiers on tablets dated to Šu-Suen

% of Sign Instances (size) broken down by Dossier vs. Diamond-framed Variants (colour). Sample size (in count of sign instances): 25. Sample size (in count of tablets): 13.

Di til-la tablets dated to Šu-Suen are largely using the (v5) form, a practice previously associated with earlier tablets, while the Blacksmiths tablets show a mixed used of variants with a prevalence of the tilted diamond (v4), previously not strongly associated with any regnal span.

In addition to the variations observed on Diamond-framed signs, the three dossiers under study here also revealed interesting patterns of use on variants of the sign NA.

While resembling Diamond-framed signs, the sign NA is a peculiar case that does not completely belong to this structural group. KI, $ŠA_3$ and DI share a common graphic history, all deriving from archaic diamond forms composed of two lower diverging oblique wedges joined at their tails and of two upper oblique wedges converging at their heads [Figure 188]. Although also in the shape of a diamond, the archaic outline of NA is impressed with two diagonal wedges meeting at their heads to the left and meeting at their tails to the right.

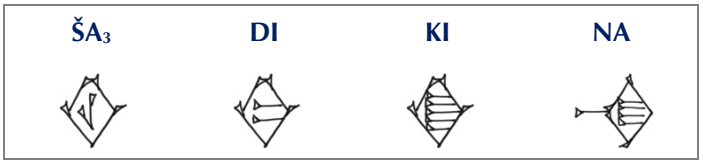


Figure 188: Archaic forms of $ŠA_3$, DI, KI and NA

In the Ur III Period, written forms of NA have already opened by omitting the upper left wedge, a phenomenon not observed on ŠA$_3$, KI or DI. Variants of NA in its enclosed 4-wedge frame are nevertheless also attested. Moreover, the framing wedges on such variants are no different from that of ŠA$_3$, KI and DI.

In the present study sample, both variant types of NA are attested: the 3-wedge open frame (v2), and the enclosed forms (v4) and (v5) as also known for Diamond-framed signs. The distribution of these three variants between dossiers reveals various and distinctive patterns of use [Figure 189]. First, the open frame (v2) form is positively absent from the Di til-la tablets. Second, the regular diamond frame (v5) form prevails on the Letters and Di til-la tablets, although to a lesser extent on the former. Third, the Blacksmiths tablets differ from the two other dossiers on both points: not only is the open frame (v2) form attested, it also largely prevails.

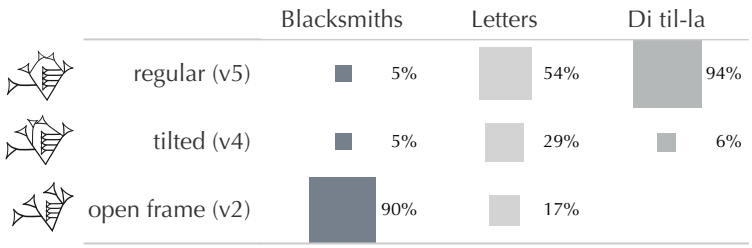


Figure 189: Distribution of variants of NA between dossiers

% of Sign Instances (size) broken down by Dossier (colour) vs. NA Variants. Sample size (in count of sign instances): 71. Sample size (in count of tablets): 41.

The patterns of use between the two genre-specific dossiers differ and seem to suggest that NA fully belongs to the Diamond-framed group as far as the Di til-la tablets are concerned, while it retains its outlier nature (partly Diamond-framed sign, partly standalone sign) as far as the Letters are concerned. On this last point, it should be noted that NA is written with its specific open (v2) form on two of the Letters only. Conversely, the open form (v2) is largely favoured on the Blacksmiths tablets, on which the enclosed (v4) and (v5) forms are seldom. Moreover, a few tablets from the Blacksmiths and the Letters dossiers display a peculiar form of NA [Figure 190]. Characterised by three oblique wedges crossing its frame, this variant of NA was not found in other study samples.


Figure 190: A peculiar variant of NA

This peculiar (vX) form is only attested on six tablets between the two dossiers, and no link to either usage, sign value or instance location on the tablet could be found. While the Letters are undated, the Blacksmiths tablets bearing such peculiar (vX) form are dated to Amar-Suen 1 and 3 (2044 and 2042 BCE) and Šu-Suen 2 (2034 BCE).

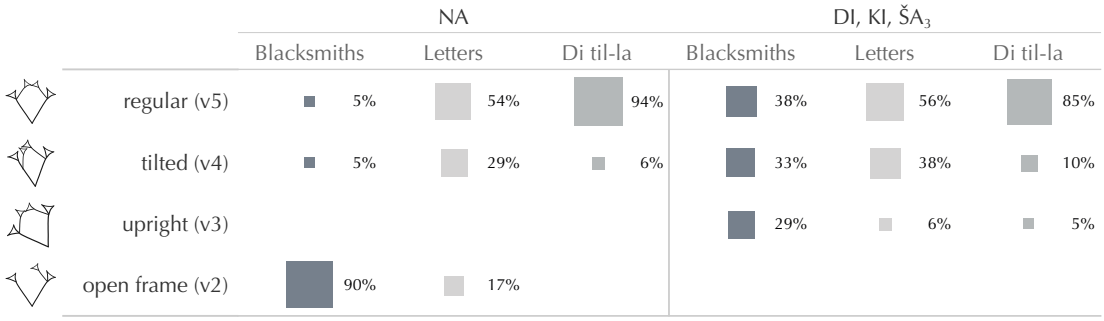


Figure 191: Distribution between dossiers of variants of NA and of Diamond-framed signs DI, KI, ŠA$_3$

% of Sign Instances (size) broken down by Sign Name (left: NA vs. right: DI, KI, ŠA$_3$) and by Dossier (colour) vs. Diamond-framed Variants. Sample size (in count of sign instances): 149. Sample size (in count of tablets): 43.

Considering the distribution of variants of Diamond-framed signs on the one hand, and of the sign NA on the other hand, the already observed divide between the genre-specific dossiers and the subject-specific Blacksmiths tablets is again clearly visible [Figure 191].

### *Diplomatic variations*

Diplomatic variations between groups reveal multiple dossier-related patterns, especially regarding shaping and formatting.

In terms of tablet profiles, the four morphological types are represented across the three dossiers under study [Figure 192]. There are, however, trends attached to the Letters and Di til-la tablets, both favouring the flat/convex profile, while the Blacksmiths tablets show greater variation overall. Although the convex/convex profile is represented in the Letters and Di til-la tablets, it only prevails on Blacksmiths tablets.

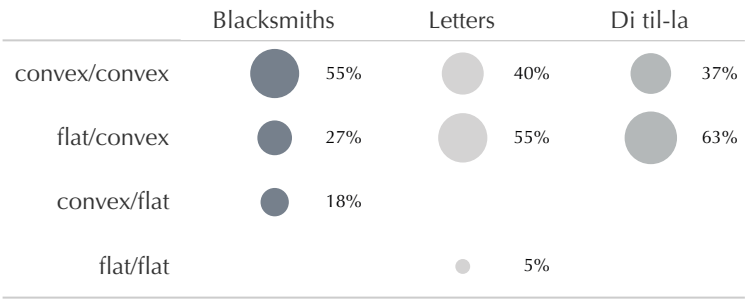


Figure 192: Distribution of tablet profiles (obverse/reverse) between dossiers

% of Tablets (size) broken down by Dossier (colour) vs. Profile: Obverse/Reverse. Sample size (in count of tablets): 50.

The distinction between Blacksmiths tablets on one side and both the Letters and Di til-la tablets on the other is not replicated when considering corner profiles, with each dossier displaying distinct patterns [Figure 193]. Blacksmiths tablets favour pinched corners, while Letters more often display squared ones. Overall, Di til-la tablets show the greater variation between the three corner profiles, although rounded corners prevail.

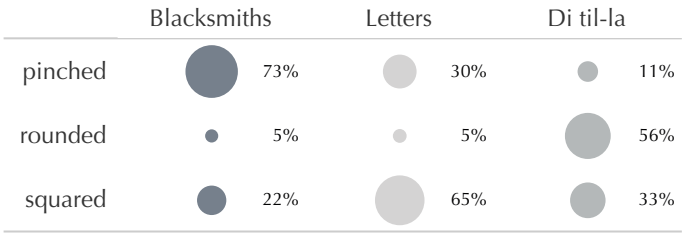


Figure 193: Distribution of tablet profiles (corners) between dossiers

% of Tablets (size) broken down by Dossier (colour) vs. Profile: Corners. Sample size (in count of tablets): 51.

Small edges profiles suggest dossier-related trends as well as shared practices across. Left and right edges profile types show distinct patterns between dossiers, with Di til-la tablets remarkably distinctive [Figure 194]. While the Letters and Blacksmiths tablets show greater variation, with the two types flat/flat and flat/rounded fairly represented, the Di til-la tablets are consistently shaped with both rounded left and right edges.

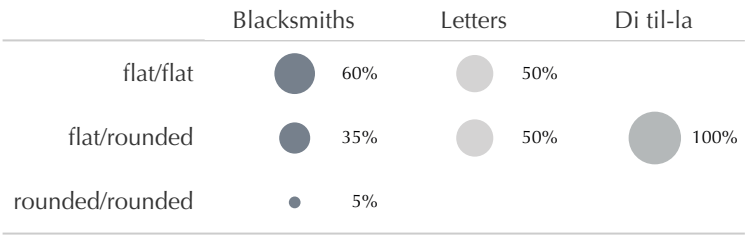


Figure 194: Distribution of tablet profiles (left edge/right edge) between dossiers

% of Tablets (size) broken down by Dossier (colour) vs. Profile: Left/Right Edge. Sample size (in count of tablets): 48.

Across all three dossiers, there seems to be no related patterns between edge profile and text layout, with the left edge showing a flattened profile whether inscribed or not. This holds true across the sample except for one Blacksmiths tablet, BM 14772, with a rounded left edge.

Conversely, upper and lower edges profiles suggest shared practices across all dossiers with the flat/flat type prevailing throughout [Figure 195]. As it was the case for the left and right edges, there also seems to be no related patterns between upper/lower edge profiles and text layout as tablets with flattened edges in the sample bear between none to three lines of text.

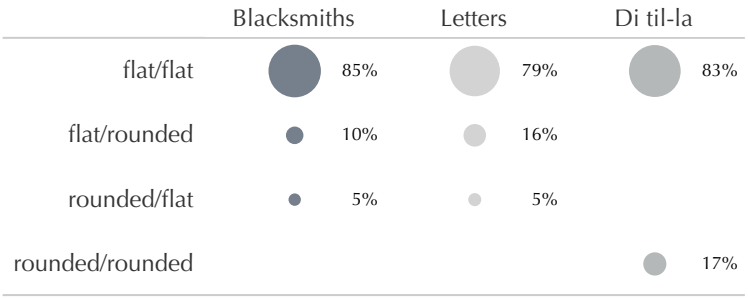


Figure 195: Distribution of tablet profiles (upper edge/lower edge) between dossiers

% of Tablets (size) broken down by Dossier (colour) vs. Profile: Upper/Lower Edge. Sample size (in count of tablets): 46.

Dimensions depend on the length of the text to be inscribed, and as such vary accordingly. It follows that Di til-la tablets are overall larger than the Letters or Blacksmiths tablets. However, considering proportions and formats between dossiers reveals patterns of variation, this time tablet-related rather than dossier-related [Figure 196].

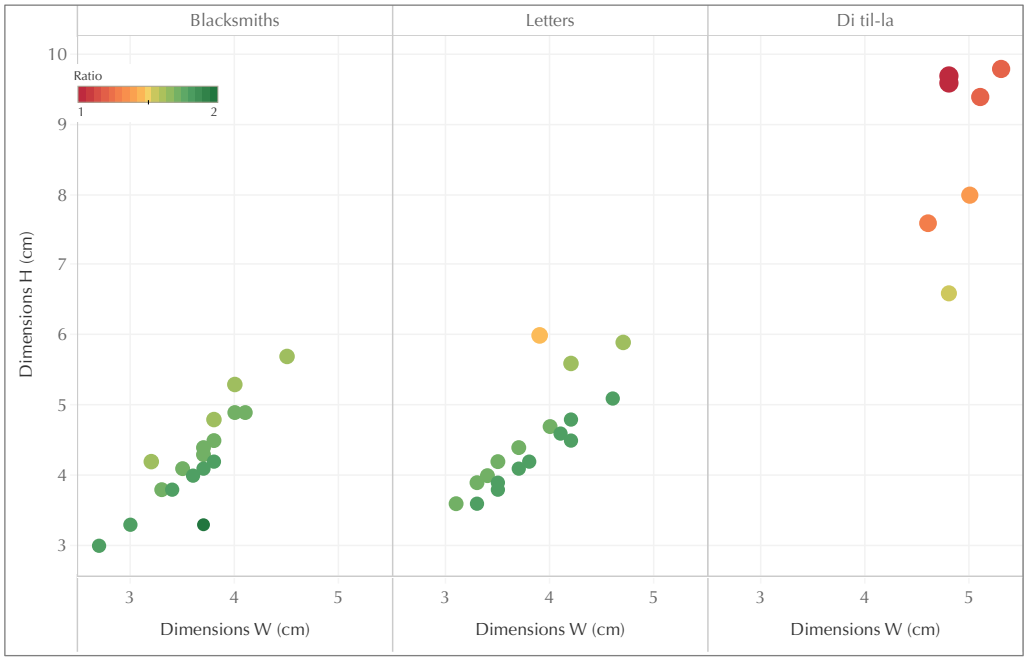


Figure 196: Distribution of tablet formats between dossiers

Tablet Width (x-axis) vs. Tablet Height (y-axis) broken down by Dossier. Colour shows details about Ratio. Sample size (in count of tablets): 49.

Small tablets have close width and height dimensions and corresponding square or short rectangle formats, while large tablets are taller than they are wide and show a corresponding slim rectangle format. The expansion in height is not matched by an expansion in width on large tablets, so that lines still represent meaningful units of text. The proportions of a tablet are therefore primarily dependent on its execution, in return suggesting that the writing surface is planned in advance according to the length of the inscription to be carried.

In previous assessments, tablets from Girsu revealed greater palaeographic variation than any other site. For lack of dated tablets, patterns of variation between dossiers could not be systematically confronted to chronology. Considering variation between three dossiers of different nature, either genre-specific or subject-specific, reveals palaeographic trends per group. As such, the greater variation is found on Blacksmiths tablets, while legal Di til-la tablets more often show group uniformity. While palaeographic trends emerge from each dossier, specific patterns appear related to single tablets rather than being a case for group dynamics. This holds especially true for both Blacksmiths and Di til-la tablets, for which a further assessment will be carried out in the following section of this chapter to determine the dynamics behind similarity and dissimilarity patterns within each dossier. A similar dynamic emerges when considering

diplomatic features, with the Blacksmiths tablets presenting greater variation than the Letters or Di til-la tablets.

## 4.2 Individuality in Ur III cuneiform

Following on the previous section, the next paragraphs delve further into the Girsu corpus through three case studies aiming at identifying to what extent can individuality be detected in cuneiform by assessing for each case the dynamics at play between groups of tablets and what features appear the most revealing.

### 4.2.1 The Blacksmiths tablets from Girsu

This case study further investigates the Blacksmiths tablets, previously assessed as a group [§4.1.3]. The general dossier relating to the administration of blacksmithing activities in Girsu in the Ur III Period consists of tablets officially excavated at Tello in 1894 and 1895, as well as tablets informally excavated off-season and subsequently sold on neighbouring markets.[232] The tablets are nowadays kept in various museums, namely in Istanbul, Paris, London and Berlin.[233] The collection of Blacksmiths tablets kept at the British Museum consists of 41 published tablets and 19 unpublished tablets dated from Šulgi 29 to Ibbi-Suen 5 (2064 to 2022 BCE). The Blacksmiths tablets record transfers in (ba-la$_2$) and out (ba-zi-ir) of metal objects between the administration and the forge.[234] Based on mentions of personal names, previous studies of the dossier by Lafont and Neumann have identified that officials in charge of the 'Blacksmiths bureau' (dub.sar) tended to work with dedicated partners amongst the metalworkers (simug).[235] Drawing on an extended dataset of 40 tablets, this section investigates whether the greater palaeographic and diplomatic variations previously observed on the Blacksmiths tablets may express communities of practice or if it may relate to specific contexts or individuals [Appendix 2.b].[236]

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[232] For the peculiars of the excavations at Tello, see Parrot, *Tello: 20 campagnes de fouilles (1877-1933)*, (1948), pp. 20-21.
[233] Tablets are dispersed between Istanbul, Paris, London and Liverpool, Dublin, Berlin, Leiden, New York, Oxford (MS) and Cambridge (MA).
[234] On the formulaic vocabulary used in the Blacksmiths tablets, see Lafont, 'Les forgerons sumériens de la ville de Girsu', *Anatolia Antiqua* 1 (1991), pp. 120-121.
[235] *Ibid.*, pp. 122-123; Neumann, 'Staatliche Verwaltung und Privates Handwerk in der Ur III-Zeit: Die Auftragstätigkeit der Schmiede von Girsu', in Bongenaar, ed., (2000), pp. 120-124.
[236] This case study includes the best preserved tablets from the collection, representing 40 tablets and 592 sign instances.

## *Diplomatic variations*

The Blacksmiths tablets are consistently rectangular and portrait-oriented, with dimensions ranging from H.3 x W.2.7 cm (BM 100648) to H.5.7 x W.4.5 cm (AO 3556).

While consistently shaped and formatted, the overall profiles (obverse/reverse) throughout the group distinguish two main groups [Figure 197 and Figure 198]. The prevailing group display an overall convex tablet profile, both obverse and reverse, while the flat/convex profile is also widely used. Only five tablets do not show the prevailing preference for a convex reverse, with BM 14493 especially standing out from the group as the sole example of an overall flat tablet, both obverse and reverse.


Figure 197: Distribution of tablet profiles (obverse/reverse) between tablets

% of Tablets (size) broken down by Profile: Upper/Lower Edge (colour). Sample size (in count of tablets): 40.


Figure 198: Distribution of tablet profiles (obverse/reverse) between tablets (extract)

Corner profile types, conversely, show limited variation, with only eight tablets not shaped with pinched corners [Figure 199].

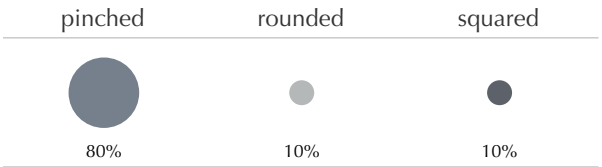



Figure 199: Distribution of tablet profiles (corners) between tablets

% of Tablets (size) broken down by Profile: Corners (colour). Sample size (in count of tablets): 40.

Script density values suggest a largely populated median cluster and three pairs of outliers. In addition to standing out as the only flat profiled tablet, BM 14493 is also amongst the tablets with the lowest script density, at 1.25 lines of text per 1 cm high. The median script density value for the group is set at 1.5 lines, with the main cluster of tablets ranging between 1.45 and 1.63 lines [Figure 200 and Figure 201].

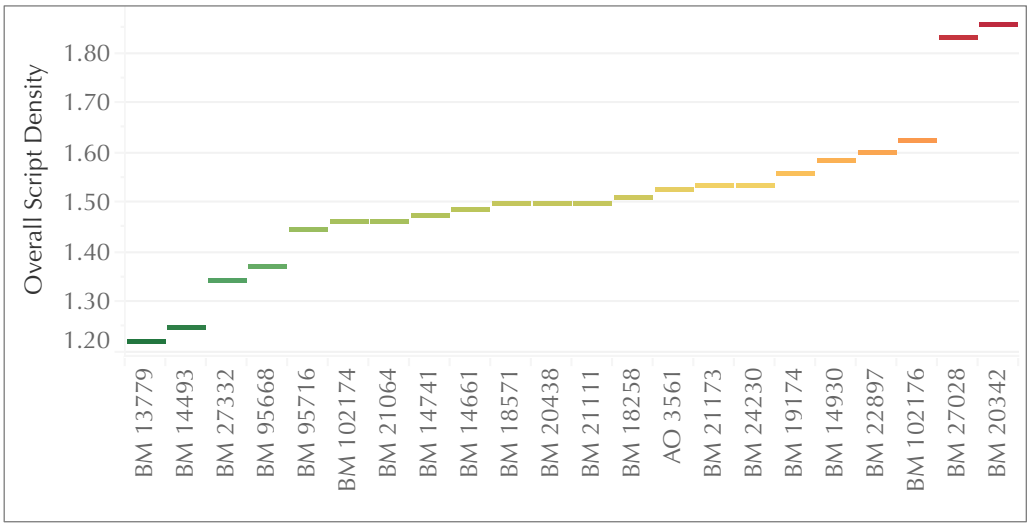



Figure 200: Distribution of script density across tablets

Tablets (x-axis) vs. Overall Script Density (y-axis). Colour shows details about Script Density. Partially inscribed tablets are excluded. Sample size (in count of tablets): 22.


Figure 201: Script density median cluster (extract)

Six tablets are not part of the main cluster and found at the extreme ends of the median density range [Figure 202]: BM 13779 and BM 14493 have the lowest density, respectively 1.22 and 1.25; BM 27332 and BM 95668 also show a low script density, respectively 1.35 and 1.25; meanwhile, BM 27028 and BM 20342 both stand out with the denser observed script, respectively 1.84 and 1.86 lines of text per 1 cm high.


Figure 202: Script density outliers

Variations in script density partly depend on the length of the text to be inscribed. The high script density on BM 27028 matches its 19-line inscription, the longest in the group, while the low density on BM 13779 and BM 14493 pairs with their 13-line text each, the shortest in the group. Such direct relation between script density and text length does not apply to BM 20342, the densest inscription in the group. BM 20342 bears a 16-line text and has a script density of 1.86, while BM 14661 and BM 18258 show within-average values, 1.49 and 1.51 respectively.

Conversely, there seems to be no direct correlation between script density and dimensions, as tablets with close density values are not necessarily close in size, and vice versa [Figure 203].

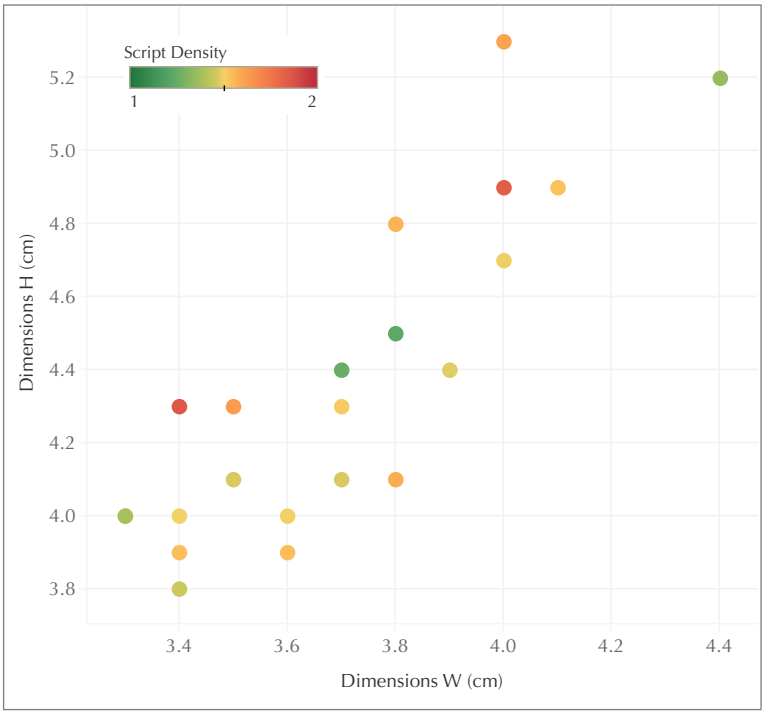



Figure 203: Script density (overall) and tablet dimensions

Tablet Width (x-axis) vs. Tablet Height (y-axis). Colour shows details about Script Density. Partially inscribed tablets are excluded. Sample size (in count of tablets): 22.

AO 3561 and BM 21173, for example, have similar overall script density values, respectively 1.53 and 1.54, yet do not have comparable dimensions, respectively H.4.9 and 3.9 cm. Furthermore, while BM 27028 is as high as AO 3561, its script is much denser, the second densest script in the group at 1.84 lines.

### *Palaeographic variations*

The distribution of palaeographic variants of TI distinguishes two groups: those tablets using the 4-wedge form (v1) [Figure 204] and those using the 5-wedge form (v2) [Figure 205].

| TI | BM 18258 | BM 18268 | BM 19958 | BM 21111 | BM 100648 |
|---|---|---|---|---|---|
|  (v1) |  r.2 |  r.2 |  r.2 |  r.5 |  r.3 |

Figure 204: Tablets using the 4-wedge variant form of TI (v1) (extract)

| TI | BM 14661 | BM 14741 | BM 27028 | BM 95716 | BM 102176 |
|---|---|---|---|---|---|
|  (v2) |  r.2 |  r.1 |  r.9 |  r.2 |  r.2 |

Figure 205: Tablets using the 5-wedge variant form of TI (v2) (extract)

The choice of variant does not appear related to the layout of the šu ba-ti formula in which it is used, nor does the horizontal expansion of the sign instance along the line. Formula lines using the 4-wedge variant of TI (v1) are equally distributed between two variant layouts of text justification: either the three sign instances are evenly spaced along the writing line (šu…ba…ti); either the ŠU and BA are clustered on the left with a large space separating them from the TI at the end of the line (šu ba……ti). The formula lines using the 5-wedge variant of TI (v2) also show an equal distribution between even and clustered text justification. Furthermore, the horizontal expansion of TI along the writing line is found on both variant forms and with both justification layouts. That neither variants of text justification nor variants of TI show contrasted patterns of distribution or of correlation therefore suggests that the rendering of the šu ba-ti formula was not limited to a unique standard form. Rather, the writing hand would have been able to select the best suited option between various combinations of features. In addition, the distribution of variants of ŠU in the formula does not reveal any distinctive pattern either.

BM 18571 stands out by its use of two different variants of TI. Only two tablets in the group, BM 18571 and BM 14930, bear multiple instances of TI, the sign being otherwise used once per tablet, in the šu ba-ti formula [Figure 206]. Both tablets use TI in the personal name lugal-ti-ra-aš$_2$. With these only two examples of multiple instances of TI per tablet, no patterns of use can reliably be visible. It is, however, noticeable that

BM 14930 uses the same variant in both personal name and formula, while BM 18571 writes the personal name with the 5-wedge form (v1) and the formula with the 4-wedge variant (v2).

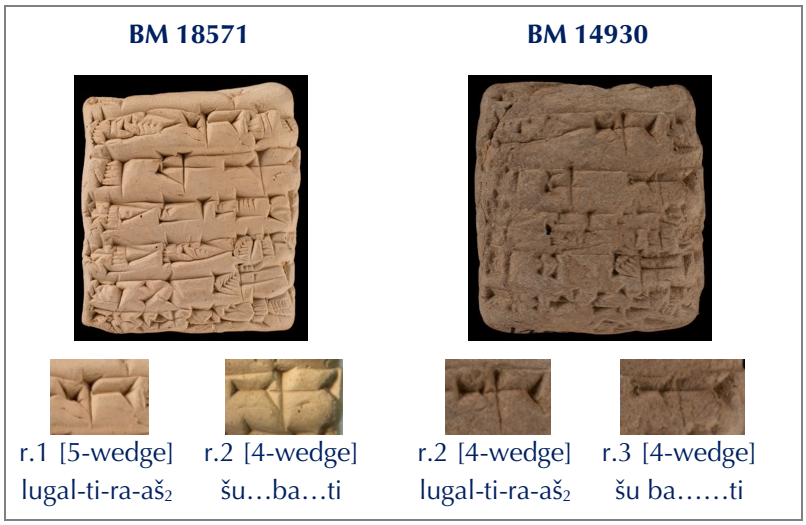



Figure 206: Intra-manuscript variation across forms of TI

The variant profiles of the horizontal stack of wedge on instances of ŠU are unevenly distributed within the group, with the stepped variant (v4) more widely used than any other. The use of variants of ŠU is overall consistent between instances within manuscripts, with only four tablets displaying intra-manuscript variations, between two and three different forms per tablet [Figure 207].

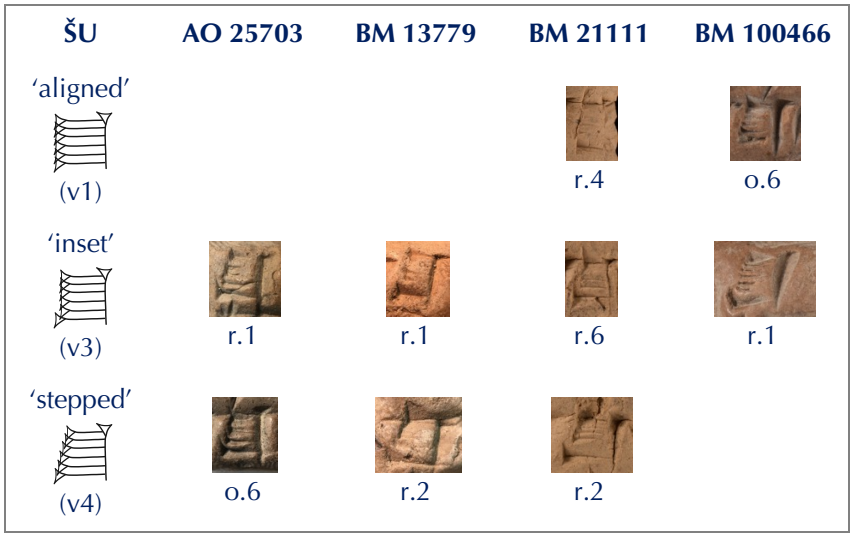



Figure 207: Intra-manuscript variation across forms of ŠU

There seems to be no correlation between variant forms and wedge count. In the most frequent variant, the stepped horizontal stack (v4), the number of horizontal wedges ranges from four to seven [Figure 208]. Also, on tablets with a combined use of different forms, the wedge count is consistent between variants, so that, for example, BM 21111

writes both the aligned variant (v1) and the stepped variant (v4) with six horizontal wedges and the inset variant (v3) with five.

| **ŠU** | BM 18268 | BM 19958 | BM 21064 | BM 27028 | BM 100648 | BM 102176 | BM 18571 |
|---|---|---|---|---|---|---|---|
|  (v4) |  r.2 |  r.2 |  r.2 |  r.9 |  r.3 |  r.2 |  r.2 |
| *count* | *4* | *4* | *5* | *5* | *6* | *6* | *7* |

Figure 208: Wedge count variation across the 'stepped' (v4) forms of ŠU

Moreover, the wedge count is also consistent on those tablets bearing instances of both ŠU and DA [Figure 209]. Both instances of ŠU and DA are written with four horizontal wedges on BM 18268, with seven on AO 27518, while AO 25703 writes ŠU with six and seven wedges and DA with seven wedges also.

| **ŠU vs. DA** | BM 18268 | BM 19958 | BM 21064 |
|---|---|---|---|
| ŠU |  r.2 *4* |  r.1 *6* |  o.4 *7* |
| DA |  o.1 *4* |  o.1 *7* |  o.2 *7* |

Figure 209: Wedge count variation between forms of ŠU and DA

The variant forms of DA mirror, to a certain extent, the variations observed on ŠU, with the stepped form (v4) more widely used throughout the group. DA differs from ŠU, however, in that it is also written with the clamped variant (v2), a form otherwise not attested on instances of ŠU. Similar to ŠU, there seems to be no direct correlation between the choice of variant and wedge count [Figure 210 and Figure 211]. The number of horizontal wedges forming the leading cluster of DA ranges from four to eight throughout, a range replicated when considering variant forms, so that the clamped variant (v2), for example, is found with five to eight horizontals.

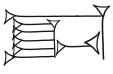
| **DA** | BM 12477 | BM 13779 | BM 14784 | BM 21111 | BM 100648 |
|---|---|---|---|---|---|
|  (v2) |  o.3 |  o.1 |  o.2 |  o.2 |  r.2 |
| *count* | *5* | *8* | *6* | *5* | *7* |

Figure 210: Wedge count variation across the 'clamped' (v2) forms of DA

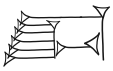
| **DA** | BM 14741 | BM 14933 | BM 21064 | BM 22897 | BM 24230 |
|---|---|---|---|---|---|
|  |  |  |  |  |  |
| (v4) | o.2 | r.6 | r.1 | r.1 | o.5 |
| *count* | *6* | *7* | *4* | *6* | *5* |

Figure 211: Wedge count variation across the 'stepped' (v4) forms of DA

Considering tablets bearing multiple instances of DA highlights a distinction between those tablets consistently using the same variant per manuscript from those displaying a mixed use of different variants per tablet. Beyond this distinction based on variant usage, considering wedge count and sign instance location on the tablet reveals dynamic patterns of variations. BM 12477 consistently uses the clamped variant (v2) of DA, also consistently written with five horizontal wedges. Conversely, while AO 2561 consistently uses the aligned form of DA (v1), the wedge count goes from simple to double with respectively four wedges on r.5 and eight wedges on o.1. A similar pattern is observable on BM 102176 where the inset forms of DA are written with eight wedges on o.2 and only five on be.1. The consistent form and wedge count on BM 12477 would thus be directly related to the favourable location, so to speak, of the instances on the first lines of the obverse of the tablet, where the hand can naturally position itself. Similarly, sign instances written on the bottom of the reverse (AO 2561) or on the small edges (BM 102176) of a tablet are shaped by the constraints of movement imposed on the writing hand in such unfavourable locations. Moreover, such dynamics are also visible on tablets displaying a mixed use of different variants. BM 95716 uses two variant forms of DA, the aligned variant (v1) and the stepped variant (v4). The two aligned forms are both written on r.1 and both with five horizontal wedges, and the stepped instance on o.1 displays six horizontals. The stepped form of DA on be.1, conversely, is reduced to the minimal count of four horizontal wedges.

Palaeographic variation of the ŠE-cluster in the ZI sign appears rather limited, with the 2-equal rows form (v2) largely prevailing throughout. BM 18268 is the only tablet with different coexisting variants. Although other tablets with multiple instances show variations in wedge count (e.g. BM 12477), they maintain the same variant throughout with an even distribution of *winkelhaken* over two rows (v2). On BM 18268, the occurrence of two different variants might be related to the location of the instances on the tablet: the unique ZI in the entire group to display two unequal rows of *winkelhaken*

(v3) is indeed found on the bottom edge of the tablet (be.1), while the more common variant is used on its reverse (r.5).

| **ZI** | BM 18258 | BM 102176 | BM 109378 | BM 22133 | BM 22897 | BM 14933 |
|---|---|---|---|---|---|---|
|  (v2) |  r.7 |  r.5 |  o.3 |  o.4 |  r.1 |  r.6 |
| *count* | *[4/4]* | *[4/4]* | *[4/4]* | *[5/4]* | *[5/4]* | *[5/4]* |

Figure 212: Wedge count variation across the (v2) forms of ZI (≤9)

Variations in wedge count distinguishes two main trends: economy and profusion [Figure 212 and Figure 213]. BM 102174 stands out as the only tablet displaying the minimal wedge count of two rows of three *winkelhaken*. At the other extreme, AO 3556 and BM 102146, abound with *winkelhaken*, distributed in two equal rows of six. Although the wedge count is higher on these two tablets than on the rest of the group, the visual rendering is similar between two rows of six *winkelhaken* and two rows of five, while the minimalist wedge count on BM 102174 strikingly differs.

| **ZI** | AO 3561 | BM 14741 | BM 95716 | AO 3556 | BM 102146 |
|---|---|---|---|---|---|
|  (v2) |  o.1 |  te.1 |  o.5 |  o.5 |  o.4 |
| *count* | *[5/5]* | *[5/5]* | *[6/5]* | *[6/6]* | *[6/6]* |

Figure 213: Wedge count variation across the (v2) forms of ZI (≥10)

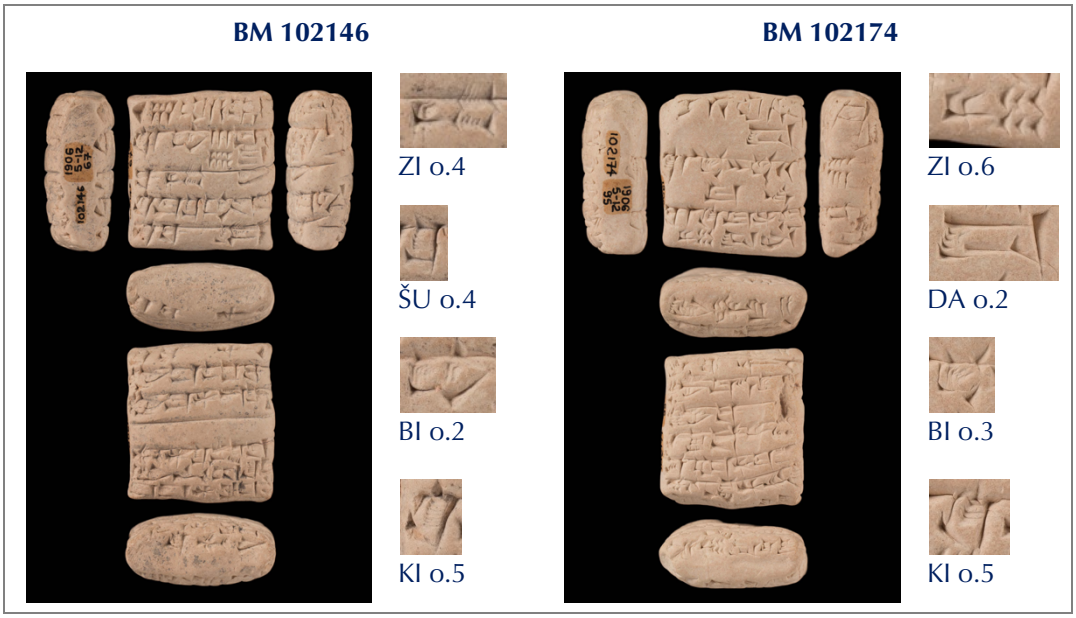



Figure 214: Wedge count variation across signs per manuscript

In addition, BM 102146 shows a tendency to multiply wedges on various other signs than ZI, while the overall writing style of BM 102174 seems to bend towards the opposite direction [Figure 214]: eight inner wedges in BI, 7-horizontal in ŠU, up to eight inner horizontals in KI on BM 102146; five inner wedges in BI, 4-horizontal in DA, four inner horizontals in KI on BM 102174.

Taken individually, each palaeographic and diplomatic feature assessed in the previous paragraphs has revealed groups and outliers. Furthermore, this dissertation demonstrated that a single manuscript may present palaeographic variation, thus suggesting that individual features may not be enough to secure a hand identification. The below gathers features in a bid to confront palaeographic and diplomatic practices and to determine the extent of similarity and dissimilarity between the Blacksmiths tablets. While the five tablets presented in Figure 215 all present similar palaeographic features, only two of them, BM 19958 and BM 22133, also display matching diplomatic features. Both tablets are receipts issued by Lugal-imrua. The same Lugal-imrua is named as the issuer on two matching tablets in another group of four [Figure 216]. Of those four, BM 22897 and BM 102176 match in both palaeography and diplomatics.


Figure 215: Set of palaeographically matching tablets (Group 1)


Figure 216: Set of palaeographically matching tablets (Group 2)

The two pairs may have features in common, like a consistent use of the diagonal (v1) variant of BI or the (v2) form of ZI, they differ in that both tablets from Group 1 (BM 19958 and BM 22133) use the 4-wedge form (v1) of TI while the other two from Group 2 (BM 22897 and BM 102176) use the other TI form with five wedges (v2). Both pairs also differ in shape, with tablets from Group 1 displaying a convex/flat profile whereas those from Group 2 are flat/convex. The name of Lugal-imrua is also associated with BM 18268, a tablet that revealed the most dissimilarities in the group, especially in profile (convex/convex) and its combined use of two variants of ZI (v2 and v3). That each pair of Group 1 and Group 2 presented above shows recurring and consistent patterns of both palaeographic and diplomatic variation suggests two hands.

Yet, not all tablets mentioning Lugal-imrua as the issuer show matching features. Whether named individual and writing hand could be different people remains an open question, especially as the mechanisms operating Ur III bureaucracy are still not clearly identified.[237] Whether scribal hands may be identified through similarity or dissimilarity, however, is within the scope of this research and is discussed at the end of this chapter and in the Conclusion.

### 4.2.2 The Shepherds tablets from Girsu

This case study assesses a new group of tablets from Girsu recording food deliveries, most often known in publications as 'testi dei pastori' and here referred to as the 'Shepherds tablets'.[238] Consisting of issuing receipts of goods destined to feed the herds before consumption, 25 new tablets kept at the British Museum have recently been published by Verderame and Pomponio, dated between Šu-Suen 8 and Ibbi-Suen 3 (2028 to 2024 BCE).[239] The dataset presented in this section consists of 13 tablets, selected from the group identified by Verderame and Pomponio for their state of preservation to assess whether palaeographic and diplomatic variation may express group identity or individual hands [Appendix 2.b].[240]

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[237] Steinkeller, 'Toward a Definition of Private Economic Activity in Third Millennium Babylonia', in Rollinger et al., eds., (2004), pp. 91-111.

[238] Durand et al., 'Remarques sur l'élevage intensif dans l'Iraq ancien', in Barrelet, ed., (1980), pp. 137-140; Maekawa, 'The Management of Fatted Sheep (udu-niga) in Ur III Girsu/Lagash', *ASJ* 5 (1983), pp. 81-111; Molina, *Testi amministrativi neosumerici del British Museum*, (2003), pp. 12-15.

[239] Pomponio et al., '25 nuove tavolette neo-sumeriche da Girsu appartenenti al cosiddetto dossier dei «pastori»', *SEL* 34-36 (2017-2019), pp. 211-235. I am grateful to Dr Lorenzo Verderame and Dr Francesco Pomponio for kindly giving me access to this dossier prior to publication and allowing me to study it for this project.

[240] Data collected on 13 tablets and 533 sign instances.

## *Diplomatic variations*

Diplomatic variation at dossier level distinguishes small groups of tablets per feature, albeit not for all features. Dimensions, for example, do not vary greatly, with heights ranging between 3.6 and 4.1 cm, and widths between 2.8 and 3.4 cm. There is no format variation either, with all tablets rectangular and portrait-oriented.

Tablets form, however, small morphological groups according to each profile type [Figure 217].

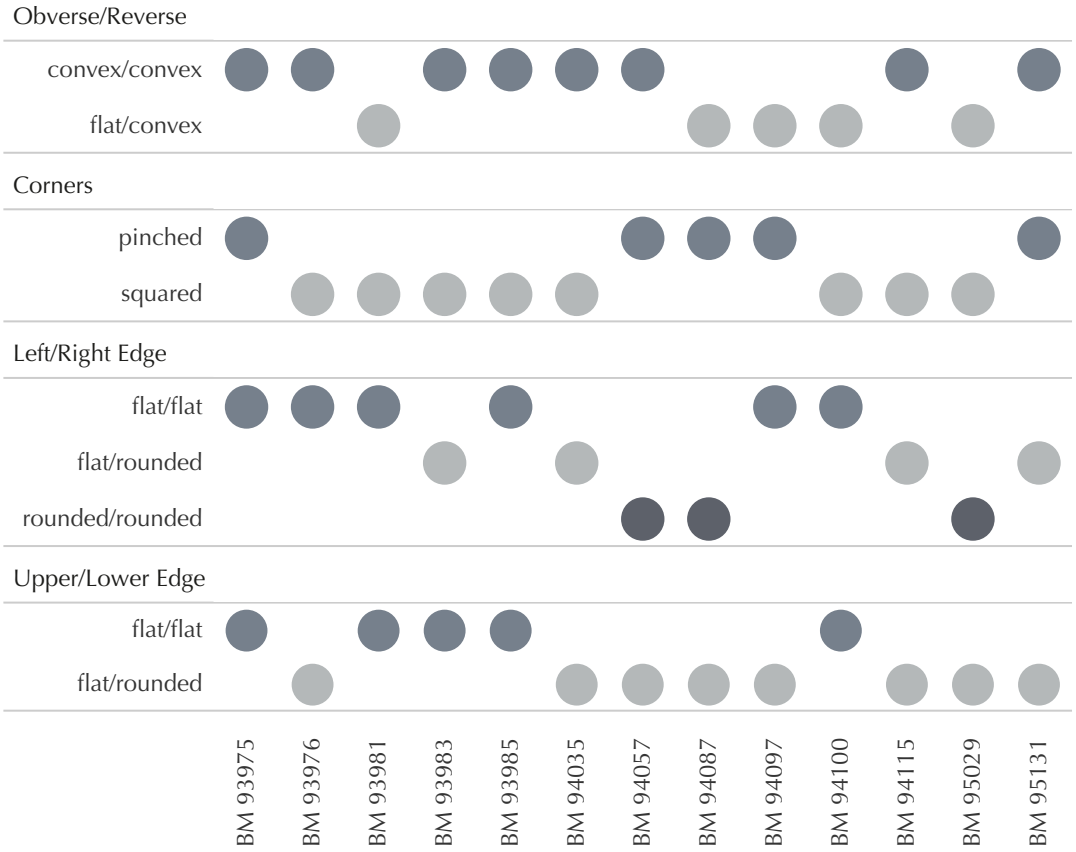


Figure 217: Distribution of tablet profiles (obverse/reverse, corners, left/right edge, lower/upper edge) between tablets

Tablets broken down by Profile Type (colour). Sample size (in count of tablets): 13.

Considering all four profile types, two pairs of tablets stand out by showing recurring combinations. BM 93981 and BM 94100 are similarly shaped with a flat obverse and convex reverse, and flat small edges (upper, lower, left and right). BM 94035 and BM 94115, on the other hand, display more convex and rounded surfaces. They are both shaped with convex obverse and reverse, flat upper and left edges, and rounded lower and right edges. Both pairs have squared corners. Although one pair of tablets displays symmetrically shaped small edges (flat/flat) and not the other pair (flat/rounded),

small edges seem to be shaped regardless of text layout since no matching pattern of small edge inscription could be observed between tablets.

Groups of tablets emerge from computing script density values, with a median value for the group at 2.36 lines of text per 1 cm high [Figure 218 and Figure 219]. As a comparison, the median value observed on the Blacksmiths tablets was 1.5 lines.

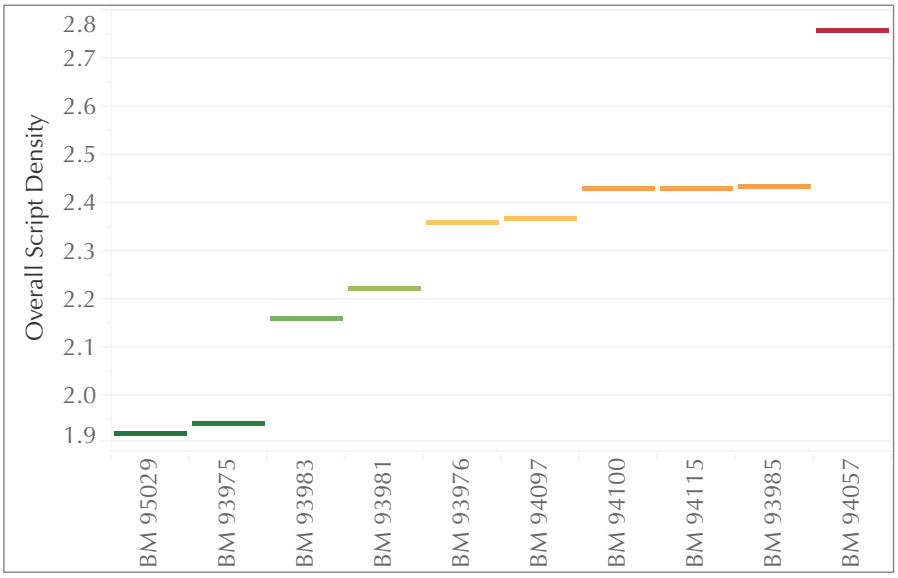


Figure 218: Distribution of script density (overall) across tablets

Tablets (x-axis) vs. Overall Script Density (y-axis). Colour shows details about Script Density. Partially inscribed tablets are excluded. Sample size (in count of tablets): 10.


Figure 219: Script density median cluster (extract)

Three tablets stand out from the group with extreme values [Figure 220]. On the one hand, BM 95029 and BM 93975 both have a low-density inscription, respectively 1.92 and 1.94 lines, while also bearing a 15-line text, the shortest in the group. On the other hand, BM 94057 is both the denser inscription, at 2.76, and the longest with its 24-line text. These three tablets, at the extreme ends of both arrays of script density and text length, thus suggest a direct relation between those two features.


Figure 220: Script density outliers

There is, however, no obvious correlation emerging between script density, text length and dimensions. While BM 95029 and BM 93975 both have a low-density and a short text, their respective dimensions differ. Furthermore, the taller tablet in the group, BM 93985 (H.4.1 x W.3.1 cm), while also having a long text of 22 lines, has a within-average script density value of 2.44 lines per 1 cm high.

## *Palaeographic variations*

The distribution of KAŠ-based variants segregates tablets in three groups according to usage, whether exclusively using the diagonal (v1) form or the *winkelhaken* (v2) form or combining both variants [Figure 221].

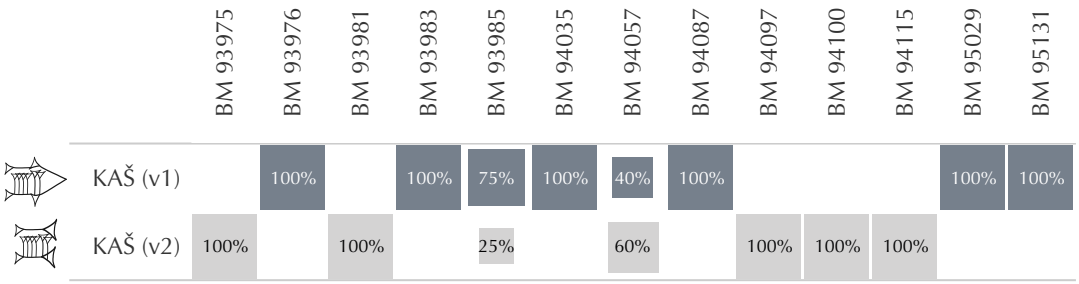


Figure 221: Distribution of KAŠ-based variants on instances of BI between tablets

% of Sign Instances (size) broken down by Tablet vs. KAŠ-based Variants (colour).

Only two tablets make use of both variants of BI: BM 93985 and BM 94057 [Figure 222 and Figure 223]. In the case of BM 93985, all instances of the sign are used in the same context: all are the second written sign of the line, all belong to the sequence še-bi. The only instance to use the (v2) variant is incidentally found on o.10, the last line of the obverse. All other instances are located on the body of the tablet where the writing hand can conveniently hover over to form signs. The choice of the variant (v2) which requires less hand movement than its (v1) counterpart, as observed previously, to write on the edge of the tablet therefore reveals the ability of the scribe to adapt its writing to the context in which it takes place.

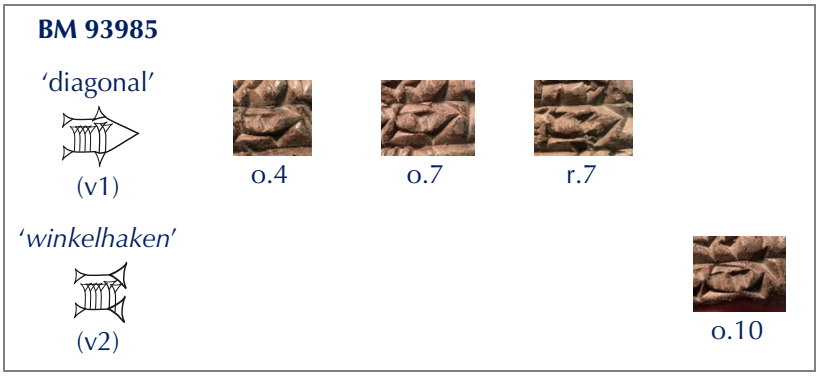


Figure 222: Two variants of BI on BM 93985

Such dynamics do not, however, apply to BM 94057. Although all instances of BI are used in the same context (second sign of the line, še-bi sequence), like it was on BM 93985, the choice of variants appears less unequivocally related to sign instance location on the tablet. While the easier (v2) variant is indeed used on the lower edge (be.1), it also appears on the non-constrained obverse and reverse of the tablet (o.8, r.8) alongside the (v1) variant. In the case of BM 94057, would the choice of either variant of BI thus be a question of personal preference of the scribe, whether conscious or not?

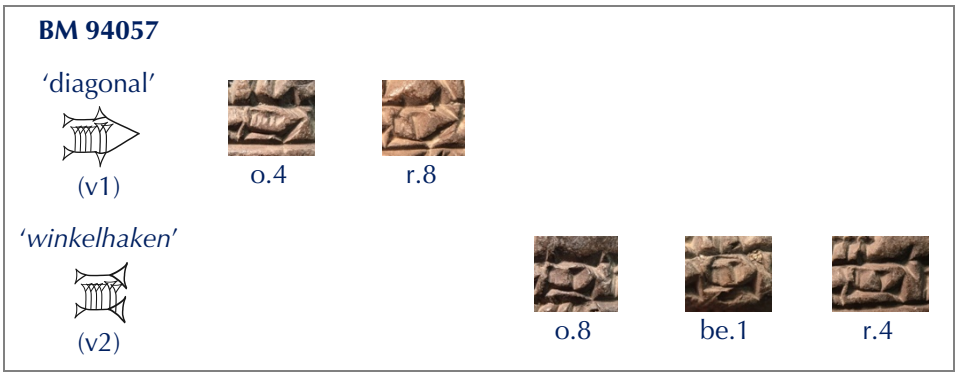


Figure 223: Two variants of BI on BM 94057

Interestingly, tablets exclusively using the (v1) variant to write instances of BI display a varied array of practice when it comes to writing other signs belonging to the KAŠ-based group [Figure 224].

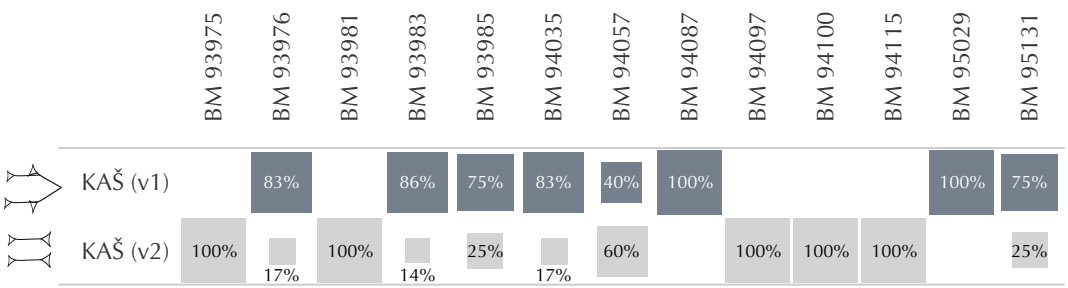


Figure 224: Distribution of KAŠ-based variants across signs between tablets

% of Sign Instances (size) broken down by Tablet vs. KAŠ-based Variants (colour). Sample size (in count of sign instances): 70. Sample size (in count of tablets): 13.

As such, BM 93976 writes AMAR (v2), BM 93983 writes NE (v2), BM 94035 writes $GU_4$ (v2), BM 95131 writes NE and GA (v2). All four tablets have in common to use the (v1) variant of BI in constrained locations while also writing other KAŠ-based signs using the (v2) variant.

Across the tablets in the study group, all instances of ŠE are written using the (v3) variant consisting of two unequal rows of *winkelhaken*. While there is no variation in form, further distinction between tablets can be made by looking at the number of *winkelhaken* impressed per sign instance. BM 93975 and BM 93983, for example, show little variations, with a wedge count between seven and eight. BM 94097 also displays a steady wedge count, though higher overall, between eight and nine *winkelhaken*. BM 93976 and BM 95131, meanwhile, stand out with greater variations. All instances of ŠE are used in the same context: first written sign on the line introducing the sequence še-bi. Instances are found on the body or the edges of the tablet, without any direct correlation with wedge count emerging. Thus, the only minor distinction between tablets that can be made based on wedge count pertains to intra-manuscript variations.

A major distinction emerges between tablets depending on the form of $LU_2$ which they use [Figure 225 and Figure 226]. Two forms can be observed in the study sample: the two are similar but differ in that one (v1) is characterised by a leading vertical wedge that the other (v2) does not have. It is also interesting to note that there are no intra-manuscript variations, with each tablet using the same form of $LU_2$ across all instances.

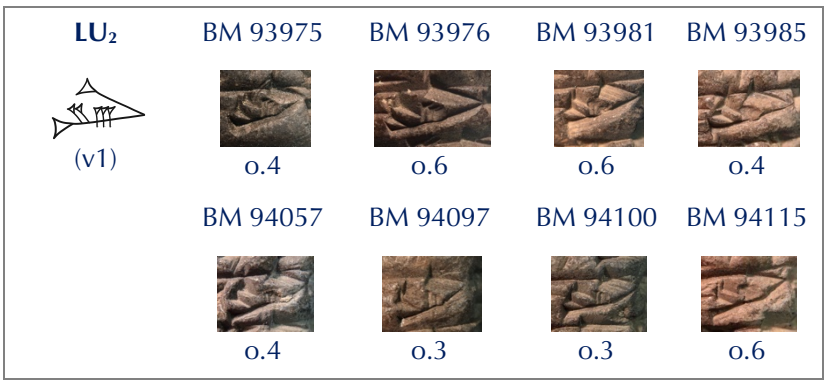


Figure 225: Variants of $LU_2$ (v1) across tablets

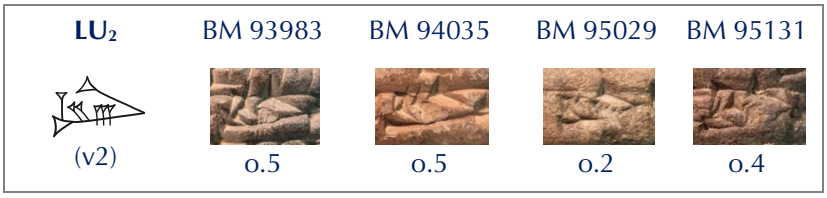


Figure 226: Variants of $LU_2$ (v2) across tablets

Considering that all tablets in the group bear the same type of text, there are recurring signs attested in many instances across the sample. Not all signs, however numerous, can be assessed against palaeographic criteria based on structural and/or formal variations. That is to say that although each sign instance is unique, the variations between all of them should be objectively measurable and therefore exploitable. The sign SILA$_3$, for example, while attested almost a hundred times in the sample, shows no such variations. Although there can be slightly longer or shorter wedges or small differences in wedge slant, such observations are too vague and subjective to be gathered into meaningful and exploitable datasets.

Conversely, less frequently used signs can still yield meaningful palaeographic data. In the present study group, the signs ITI and KAM, while attested in limited numbers, still reveal distinctions between groups of tablets.
ITI, for example, is attested in two variant forms distributed over 11 instances. Since ITI is only ever used once per tablet, in the month formula, intra-manuscript variations cannot be considered. The distribution of the two attested variants between tablets does, however, distinguish two groups [Figure 227 and Figure 228].

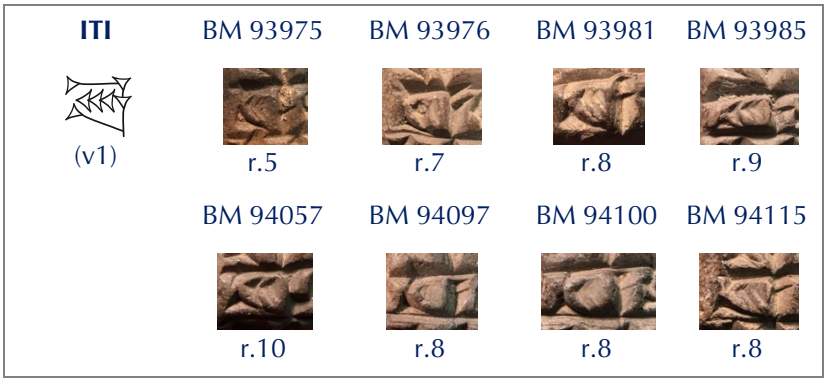


Figure 227: Variants of ITI (v1) across tablets

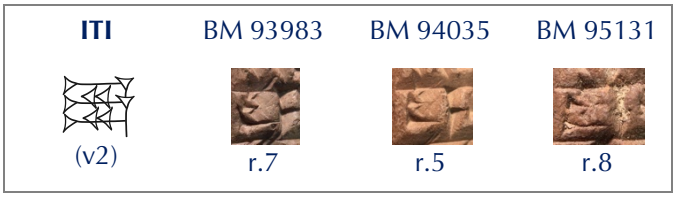


Figure 228: Variants of ITI (v2) across tablets

Likewise, the use of either of the two attested forms of KAM within the study sample distinguishes two groups of tablets [Figure 229 and Figure 230]. The larger group uses a form of KAM composed of a cluster of *winkelhaken* which a horizontal wedge crosses

out. The second group uses a variant of KAM consisting of oblique wedges arranged in a row and framed by diverging wedges.

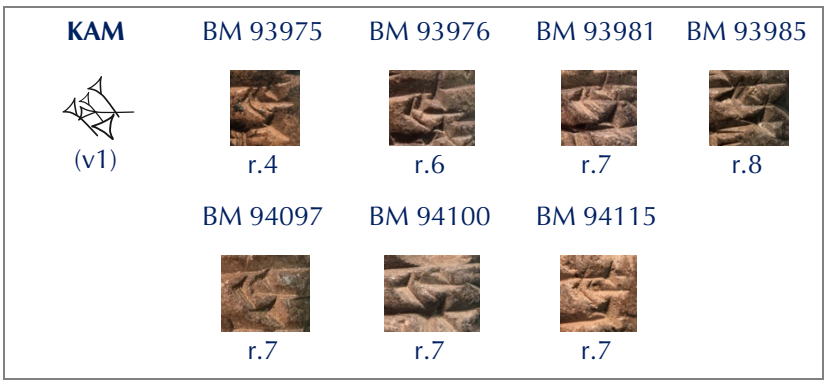


Figure 229: Variants of KAM (v1) across tablets

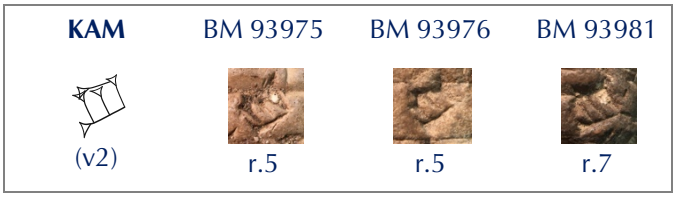


Figure 230: Variants of KAM (v2) across tablets

The few instances of E collected in the study sample show some variations in the alignment of the trailing vertical wedges. BM 93976 stands out as the only instance of E with aligned wedge heads, whereas all other tablets show offset vertical wedges [Figure 231]. Sign instance location does not appear to be a determining factor in the choice of variant. While it is true that the E on BM 93976 is located right at the end of the last line of the reverse, which might have affected the formal rendering of the sign, all other instances are found on the edge of the tablets, either the upper or the left one, where the hand is as inconveniently positioned as it is in the lower corner of the reverse.

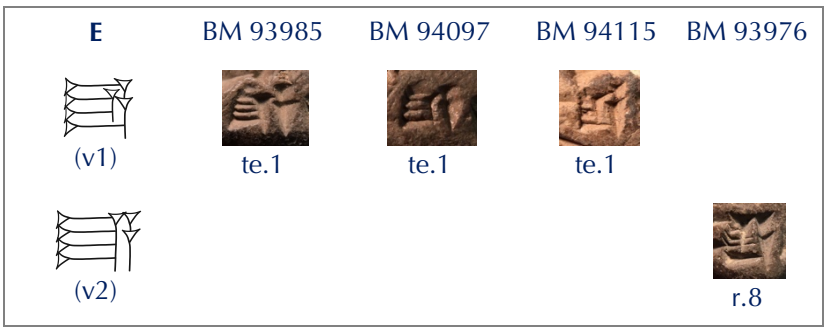


Figure 231: Two variants of E

Signs belonging to the Diamond-framed group do not yield sufficient data for analysis in terms of structural or formal variations. There are, however, hitherto unseen variations

of KI, with a clear graphic distinction between instances of KI used to render the syllable [ki] and those used to render the divine name $^{d}$Nanna (ŠEŠ.KI) [Figure 232].

| KI | BM 93975 | BM 93983 | BM 94035 | BM 94057 | BM 94097 | BM 94100 | BM 94115 |
|---|---|---|---|---|---|---|---|
|  (v3) | [ki]  r.6 | | | | | | |
|  (v4) | [$^{d}$Nanna]  r.1 | | [ki]  o.3 | | | | |
|  (v5) | | [ki]  o.3 | | | | | |
|  (vX) | | [$^{d}$Nanna]  r.1 | | [$^{d}$Nanna]  r.1 | [$^{d}$Nanna]  r.3 | [$^{d}$Nanna]  r.3 | [$^{d}$Nanna]  r.3 |

Figure 232: Distribution of variants of KI between values [ki] and [$^{d}$Nanna]

A group of tablets uses a variant of KI thus far unattested composed of a 3-wedge frame within which is impressed a middle oblique wedge. This variant (vX) is exclusively used to write the divine name $^{d}$Nanna. Patterns of variant usage between sign values are unfortunately hindered by the limited dataset available. It can still be noted that, of the only two tablets displaying both values of KI, BM 93975 is the only tablet not using the (vX) form for the divine name, rather choosing the tilted diamond (v4) variant.

The Shepherds tablets from Girsu show various patterns of palaeographic and diplomatic variation. Converging features observable on all 13 tablets of the sample single out a group of four tablets, characterised by a consistent use of variants of BI and AMAR, $LU_2$, ITI and KAM [Figure 233].


Figure 233: Set of palaeographically matching tablets vs. BM 95131

Furthermore, three of those four tablets also match in terms of diplomatic features (BM 93981, BM 94097, BM 94100).

A full palaeographic and diplomatic match between the three tablets mentioned above certainly suggests a single scribal hand and suits the writing context of the Shepherds tablets, covering a short time span between Šu-Suen 8 and Ibbi-Suen 3 (2028-2024 BCE) and mentioning the same individuals throughout. Unlike the Blacksmiths tablets, however, the selected Shepherds tablets do not mention issuing officials and only name the recipients of the goods being issued. Although there are only three fully matching tablets within the selected sample, it is even more revealing to look at differences between tablets. BM 95131 stands out as showing the most dissimilarities, characterised by a consistent use of the diagonal form of BI (v1) and the (v2) forms of $LU_2$, ITI and KAM. Furthermore, BM 95131 is dated to Šu-Suen, unlike the matching tablets dated to Ibbi-Suen. The contrast between BM 95131 and the three matching tablets – BM 93981, BM 94097, BM 94100 – reveals two distinct traditions linked to the ruler in place at the time of writing that can be traced throughout the sample. The (v2) forms of $LU_2$, KAM and ITI are only ever found on tablets dated to Šu-Suen whereas the (v1) variants of those same signs are exclusively inscribed on tablets dated to Ibbi-Suen. The fully matching features on BM 93981, BM 94097 and BM 94100 suggest a single scribal hand and a second distinct hand is suggested by the opposed features on BM 95131. In addition, the unequivocal distribution of variants of $LU_2$, KAM and ITI also suggests a correlation between the change of ruler and the change of scribe. Without establishing any causal link between the two, the analysis of palaeographic and diplomatic features on the Shepherds tablets highlights the handover between Šu-Suen and Ibbi-Suen as a pivotal moment. Whether pivotal to the Shepherds tablets only or more broadly to writing practices in the Ur III Period is discussed at the end of this chapter and further in the Conclusion.

### 4.2.3 The Di til-la tablets from Girsu

The assessment of trial reports, the Di til-la tablets from Girsu, in the previous section revealed limited palaeographic and diplomatic variation overall as opposed to letter-orders or issuing receipts [§4.1.3]. As previously mentioned, the Di til-la tablets relate to the highest level of local administration, the governor (ensi$_2$) being responsible for dispensing justice on behalf of the king of Ur. The Di til-la tablets are therefore highly

official and regulated documents, recording legal disputes and kept in the archives of the judicial courts. The texts of the Di til-la tablets are consistently formulated and mention the names of the various officials involved in the trials, such as the commissioner (maškim), the city governor (šagina) or the judges (dikud).[241] Focussing on these reports from Girsu, this section investigates the apparent uniformity of the Di til-la tablets to understand the dynamics of writing practices in a small set of tablets and to what extent they may relate to group practice or to individuals [Appendix 2.b].[242]

### *Diplomatic variations*

Di til-la tablets show no variation of format with all objects in the sample consistently rectangular and portrait-oriented while the distribution of tablet shapes shows relatively consistent patterns, especially with regard to small edges profiling.

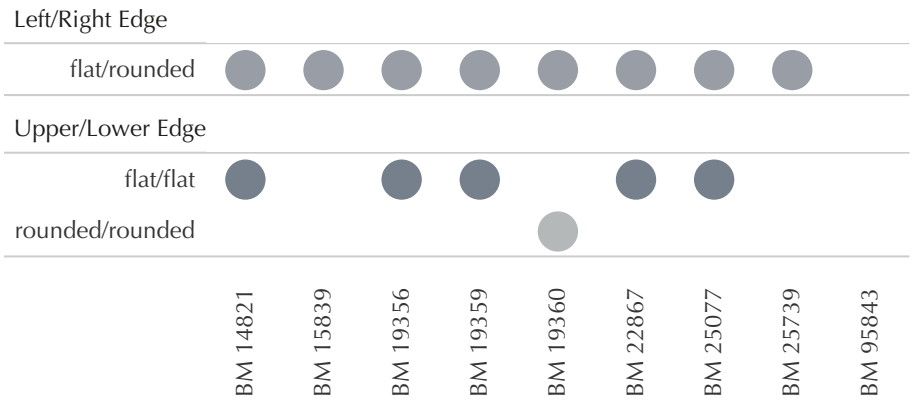


Figure 234: Distribution of tablet profiles (left/right edge, lower/upper edge) between tablets

Tablets broken down by Profile Type (colour). Sample size (in count of tablets): 9.

The available data indeed shows a consistent asymmetry between the left and right edges regardless of inscription, while the upper and lower edges tend to be symmetrically flat shaped [Figure 234]. There is greater variation in overall profiles. Although the reverse is always convex, two groups of tablets can be distinguished by either their convex or flat obverse [Figure 235].

[241] See Sigrist, 'Some di-til-la Tablets in the British Museum', in Zevit et al., eds., (1995), pp. 609-618.
[242] Data collected on 9 tablets and 435 sign instances.

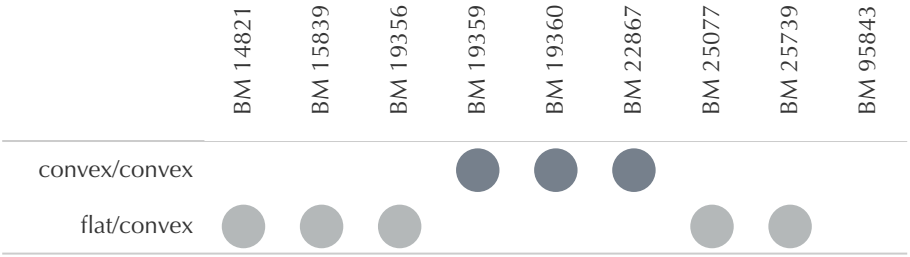


Figure 235: Distribution of tablet profiles (obverse/reverse) between tablets

Tablets broken down by Profile Type (colour). Sample size (in count of tablets): 9.

While size variation is not an absolute criterion, the dimensions vary significantly across tablets, between 6.6 and 9.8 cm in height.


Figure 236: Four Di til-la tablets > 9 cm in height

Of the four tablets in the upper range (> H.9 cm), BM 22867 is the only one with a large blank space on its reverse, posing questions of text layout and text planning [Figure 236]. In addition, the lowest and highest script density figures are found on two of those four tablets. Since the Di til-la tablets in the sample are not fully inscribed on their reverse, script density figures are here considered for the obverse inscription. While the median value across the group is at 1.58 lines of text per 1 cm high, BM 25077 stands out with a low-density value of 1.38 whereas BM 14821 shows the densest script at 1.77 lines [Figure 237].

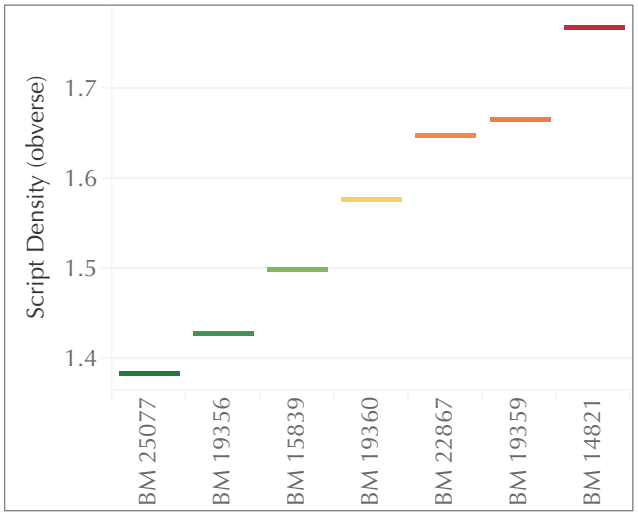


Figure 237: Distribution of script density (obverse) across tablets

Tablets (x-axis) vs. Obverse Script Density (y-axis). Colour shows details about Script Density. Partially inscribed tablets are excluded. Sample size (in count of tablets): 7.

BM 14821 is also the longest text at 17 lines on the obverse. BM 25077 and BM 19356, despite their low density, have an average text length of respectively 13 and 14 lines. Meanwhile, BM 15839, while having a within-average density value of 1.5 has a short text of 12 lines on the obverse. Conversely, BM 19359, has a densely written and short inscription (1.67 density value, in the upper quartile; 11 lines). This suggests that there is no direct relation between script density and text length, while it was the case for the Blacksmiths and the Shepherds tablets. There also seems to be no correlation between script density and dimensions. BM 22867 and BM 19359 share an obverse density of 1.65 and 1.67, yet they are respectively the second tallest and the shortest tablet in the group. Script density, text length and dimensions seem to interact on one tablet only: BM 14821 is amongst the tallest tablets (> H.9 cm), has the longest text and is also the densest script.

Diplomatic features suggest aspects of text planning and writing mode. While Di til-la tablets are partially inscribed on the reverse, the length of the blank space ranges from one line (e.g. BM 19356) to five (e.g. BM 22867). This pattern may suggest that tablets could have been shaped in advance without prior knowledge of the text to be inscribed. A similar suggestion was put forward regarding Old Babylonian tablets from the royal chancellery of Larsa, many of which are not fully inscribed.[243] This might be further

[243] Stol, ed., *Letters from Yale*, (1981), p. 126 note 197a (e.g. NBC 5287= CDLI: P292757, NBC 7348 = CDLI: P298928, NBC 7850 = P299307, NBC 8696 = CDLI: P300035, IM 11053,031 = CDLI: P222990). According to Charpin, this would indicate that texts were written without prior knowledge of their length (Charpin, *Lire et écrire à Babylone*, (2008), p. 110).

supported by counterexample, as found in BM 19359. The only fully inscribed tablet in the group, BM 19359 is also the shortest at H.6.6 cm and has a high script density at 1.67 lines.

### *Palaeographic variations*

The distribution of Diamond-framed variants shows limited variation, with a prevailing preference for the regular diamond (v5) form [Figure 238]. There is, however, a group of four tablets on which the prevailing (v5) variant is combined with other Diamond-framed forms, albeit in small proportions. Unlike for the Shepherds tablets, the Di til-la tablets show no graphic distinction between signs rendering syllables and theonyms, e.g. DI to write the values [di] and [$^{d}$Ištaran (KA.DI)], and KI to write the values [ki] and $^{d}$Nanna (ŠEŠ.KI)] [Figure 239].

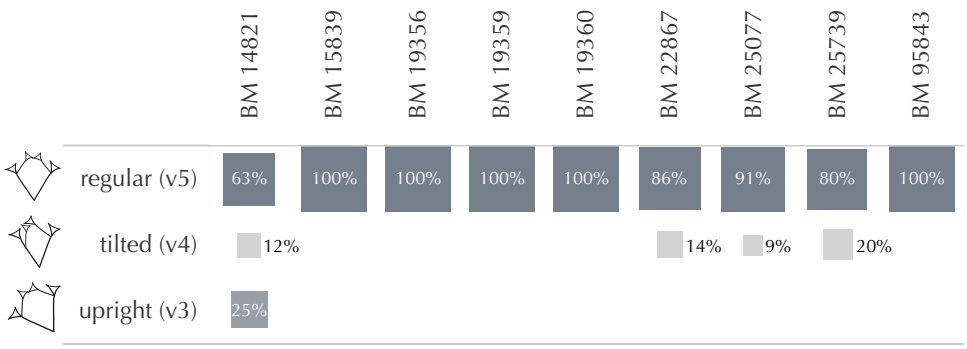


Figure 238: Distribution of Diamond-framed variants between tablets

% of Sign Instances (size) broken down by Tablet vs. Diamond-framed Variants (colour). Sample size (in count of sign instances): 41. Sample size (in count of tablets): 9.

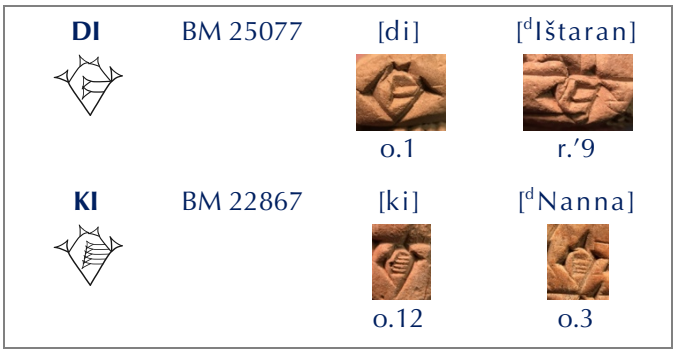


Figure 239: Variants of KI and DI between values

DI as [di] and [$^{d}$Ištaran]; KI as [ki] and [$^{d}$Nanna]

Patterns of variation are not observable at group level on signs composed of a ŠE cluster. There are, however, visible patterns on groups of signs GI and its gunû $GI_4$, IN and SAR.

The limited variation of GI and $GI_4$ distinguishes two patterns: either an exclusive use of the 2-unequal rows variant (v3) or of the diverging diagonals variant (v4) [Figure 240].

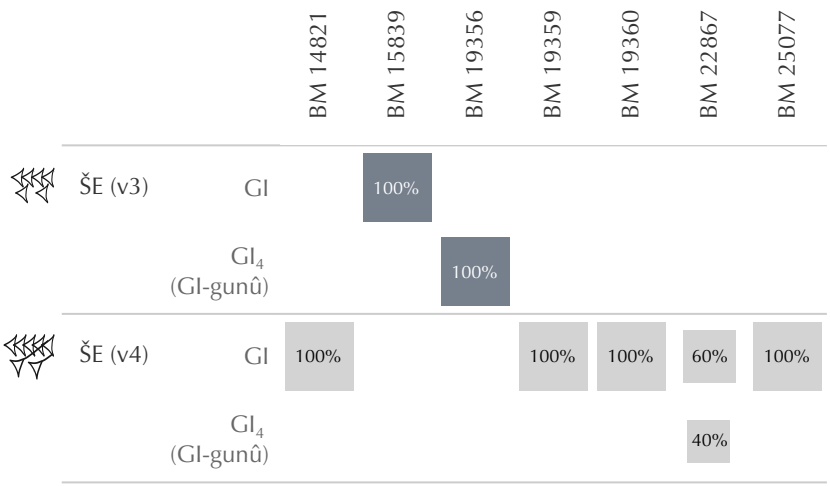


Figure 240: Distribution of ŠE-cluster variants between GI and $GI_4$

% of Sign Instances (size) broken down by Tablet vs. ŠE-cluster Variants (colour). Sample size (in count of sign instances): 13. Sample size (in count of tablets): 7.

GI shows greater variation in wedge count on the diverging diagonals variant (v4), between four and seven wedges on the top row while the lower row is invariably written with two wedges. Two tablets stand out at the extreme ends of wedge count variation: BM 14821 shows a minimalist wedge count whereas BM 22867 multiplies wedges. On BM 22867, this tendency to profusion can also be observed on instances of $GI_4$ and of IN, even though IN is written with a different variant, the 3-row form (v1) [Figure 241]. Likewise, a similar minimalism also applies to instances of IN on BM 14821, whereas it does not apply to instances of SAR [Figure 242].

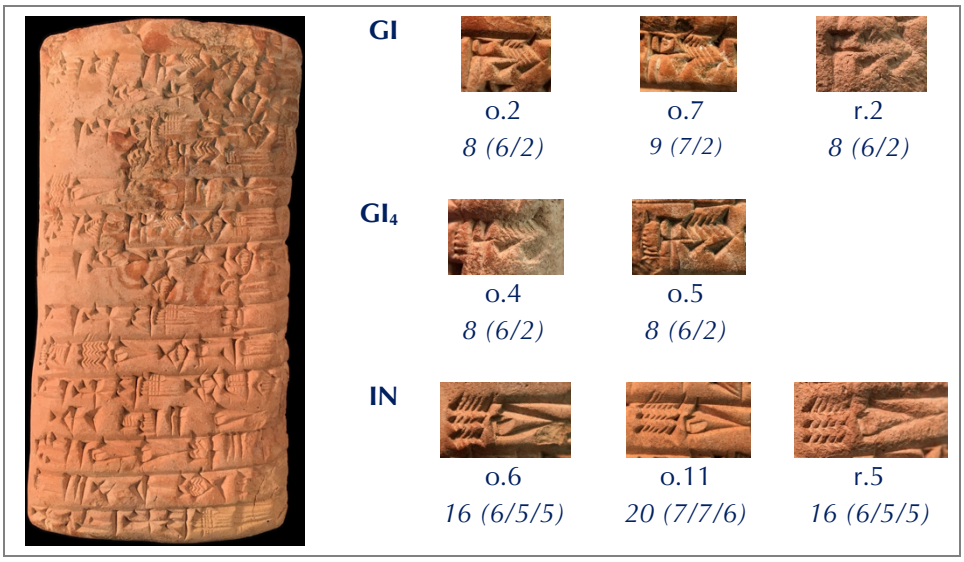


Figure 241: Wedge count variation between GI, $GI_4$ and IN on BM 22867

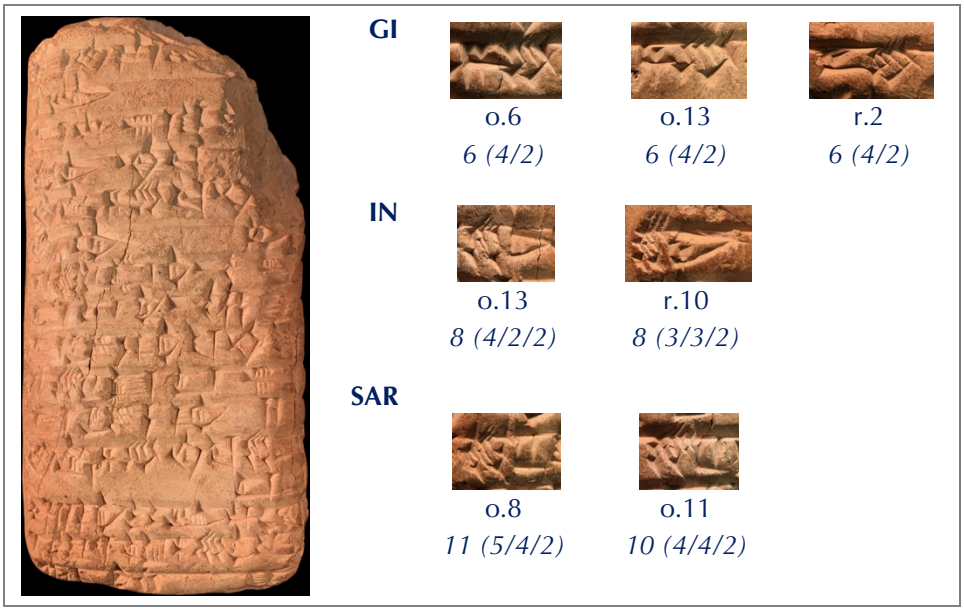


Figure 242: Wedge count variation between GI, IN and SAR on BM 14821

Beside wedge count, IN and SAR show limited variation with the 3-row variant (v1) used on every tablet in the sample [Figure 243]. BM 14821 stands out from the group as not only being the sole tablet using multiple variant forms, but also as using an otherwise unknown variant of IN [Figure 244].

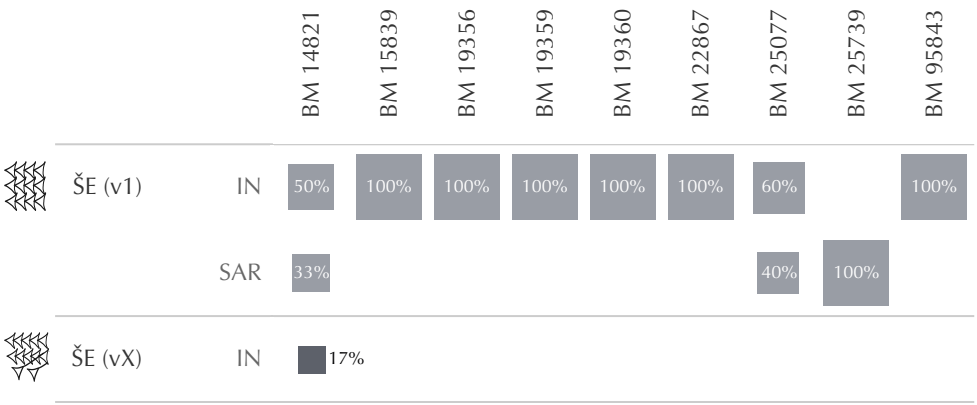


Figure 243: Distribution of ŠE-cluster variants between IN and SAR

% of Sign Instances (size) broken down by Tablet vs. ŠE-cluster Variants (colour). Sample size (in count of sign instances): 23. Sample size (in count of tablets): 9.

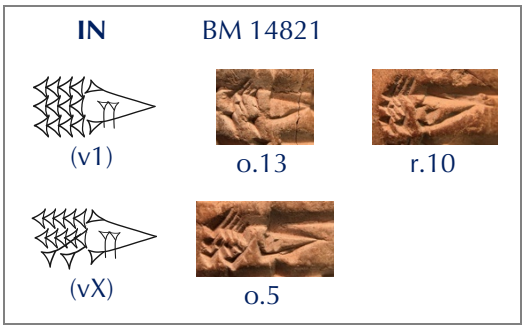


Figure 244: A peculiar form of IN on BM 14821

The distribution of variants of TUR suggests three patterns of exclusive or combined use [Figure 245]. Amongst the three tablets using both variants of TUR, BM 14821 and BM 25077 only use the (v2) form once each, while BM 19360 uses both variants in equal proportions.

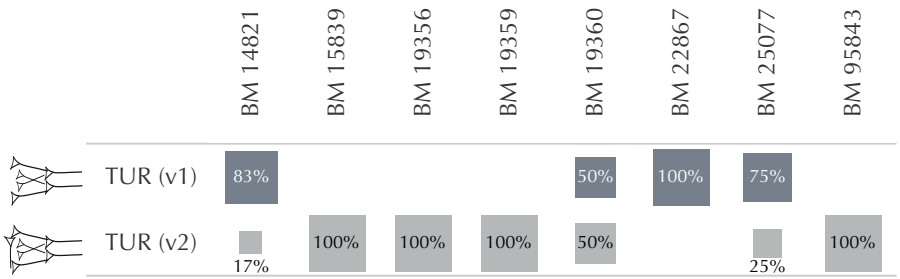


Figure 245: Distribution of variants of TUR between tablets

% of Sign Instances (size) broken down by Tablet vs. TUR Variants (colour). Sample size (in count of sign instances): 27. Sample size (in count of tablets): 8.

All instances of TUR on these tablets render the logogram [dumu], thus ruling out sign value as an influencing factor of form variation. Sign instance location also seems unlikely related to the choice of variants, with all instances of TUR evenly distributed over the writing surface on BM 19360 and equally representing both (v1) and (v2) forms. Nevertheless, it should be noted that the (v2) variant on BM 25077 is the only instance of TUR written at the beginning of a line, while on BM 14821 the (v2) form is used on the last-but-one sign of the reverse.

In a previous section of this chapter assessing palaeographic and diplomatic features between dossiers, the Di til-la tablets showed limited variation. Such statement also holds true when considering patterns of variation between tablets. Converging features observable on all nine tablets assessed, only two tablets match each other, and this is limited to palaeographic features [Figure 246].


Figure 246: Set of palaeographically matching tablets

Recurring and consistent patterns are indeed observable on both BM 22867 and BM 25077, characterised by a combined use of both tilted (v4) and regular (v5) variant

of Diamond-framed signs, of both diagonal (v1) and *winkelhaken* (v2) forms of KAŠ-based signs, or of the exclusive use of the 4-wedge form (v1) of TI. Although both tablets show recurring and consistent patterns, they also differ with regard to variants of TUR, with BM 22867 exclusively using the (v1) form while BM 25077 combines both (v1) and (v2) variants. Furthermore, both tablets show respectively different diplomatic features, with BM 22867 showing a convex/convex overall profile with squared corners whereas BM 25077 is flat/convex with rounded corners. Both tablets differ in script density and text layout although they are of similar dimensions and text length. These two tablets ultimately present an interesting contrast, closely matching in terms of palaeography while mismatching in terms of diplomatics. The diplomatic features of the Di til-la tablets especially resonates with the patterns observed on Old Babylonian chancellery tablets from Larsa mentioned earlier in this dissertation. On the Larsa tablets, the dissimilarities in text layout coupled with similarities of format and blank lines on the reverse were interpreted by Charpin as a sign that the scribe would have ignored the length of the text to be inscribed before committing to taking the stylus.[244] With little data, any conclusive statement would appear overstretched. It is tempting, however, to contemplate that the contrast between the palaeographic similarity of BM 22867 and BM 25077 and their diplomatic dissimilarity may suggest some scribal specialisation, with one hand responsible for writing on two tablets shaped by different hands.

## 4.3 On writing in the Ur III Period

Drawing on the analysis of a benchmark sample of Ur III tablets carried out in Chapter 3, this chapter assessed palaeographic and diplomatic variations through six case studies investigating the interrelation of writing practices against factors of chronology, geography and dossiers, as well as intra-manuscript variations per group of tablets.

The shifting palaeographic patterns towards shorter-handed forms observed in Chapter 3 was substantiated by new data [§4.1.1]. The analysis further demonstrated that such shift could be related to the interplay between sign form and sign composition by looking in parallel at the writing sequence of wedges and of hand movements on variants of $NIG_2$, TI, TUR and RU [Figure 151 to Figure 160]. With regard to diplomatic features, no time-related patterns could be observed, as was already the case in Chapter 3, although the

[244] Charpin, *Lire et écrire à Babylone*, (2008), pp. 109-110; Stol, ed., *Letters from Yale*, (1981), p. 126.

sampled tablets displayed light variation in shapes and formats. The outstanding contrast between Ur and Girsu revealed in Chapter 3 was analysed in focus in this chapter [§4.1.2]. The distribution of palaeographic variants of $KU_3$, AN, TI and ŠE between sites revealed characteristic local traditions, with tablets from Ur overall favouring more elaborate forms than tablets from Girsu [Figure 165 and Figure 167]. The diplomatic analysis revealed a stronger contrast between the two sites than was observed in Chapter 3, suggesting distinct traditions. As such, tablet shapes and formats were more consistent across tablets from Ur whereas tablets from Girsu showed greater variation. Considering this point, palaeographic and diplomatic variation were analysed on three dossiers from Girsu to investigate the nature of local writing practices – the issuing receipts of the Blacksmiths dossier, the letter-orders and the trial verdicts 'Di til-la' – [§4.1.3]. Although a large array of palaeographic variations could be observed between the three dossiers, the Blacksmiths tablets overall showed the greatest array whereas the Di til-la conversely proved more consistent. Such aspect was particularly visible on variants of AN and NA [Figure 181 and Figure 191]. Similar dynamics could also be observed on diplomatic features, such as tablet shapes and formats [Figure 196]. Although writing practices could appear related to dossiers, specific patterns were also revealed per manuscript within dossiers and further analysed in the second part of this chapter.

Considering palaeographic and diplomatic features per manuscript on an extended dataset of Blacksmiths tablets revealed two distinct groups of tablets displaying recurring and consistent patterns [§4.2.1]. While the two groups suggested distinct hands, the anonymous scribes could not be related to named individuals mentioned in the inscriptions [Figure 215 and Figure 216]. A second case study investigated patterns of palaeographic and diplomatic variation on a dossier of delivery receipts from Girsu [§4.2.2]. Beyond considering variation per feature, the analysis encompassed all characteristics to identify recurring patterns and diagnostic traits. As such, variants of $LU_2$ revealed no intra-manuscript variation, distinguishing groups of tablets according to the form used [Figure 225 and Figure 226]. A group of palaeographically and diplomatically matching tablets emerged from the analysis, which could also be related to chronology since all tablets dated to Ibbi-Suen 2 (2025 BCE) [Figure 233]. Furthermore, the analysis revealed a strong contrast between these tablets and earlier ones in the sample dated to Šu-Suen, suggesting a correlation between individual scribes in office and regnal spans. The Di til-la tablets from Girsu were further analysed to

investigate variation between tablets [§4.2.3]. The consistency that could be observed in a previous analysis could overall also be found across palaeographic features, such as signs belonging to the Diamond-framed structural group [Figure 238]. Specific, manuscript-related features, could, however, also be found. As such, one tablet displayed an otherwise unattested variant of IN [Figure 244]. Considering consistent and specific features altogether, the analysis found recurring patterns on two sets of tablets, albeit restricted to palaeographic features and not matching diplomatically [Figure 246].

The six case studies presented in this chapter investigated writing practices in relation to contexts and to individuals to understand the factors at play behind palaeographic and diplomatic variation. Across case studies, aspects of Ur III cuneiform appeared interrelated or on the contrary autonomous, suggesting parallel dynamics between communities and singularities of writing practices.

### 4.3.1 Communities of writing practices

Looking in parallel at patterns of variation over time and across sites reveals intertwining trends [Figure 247]. In general terms, the variants observed on later tablets also prevail on tablets from Girsu, regardless of date, while the opposite is true for tablets from Ur, more inclined to display variants observed on earlier tablets. Variants of KAŠ-based signs such as BI or GA, for instance, showed clear time-related distribution. The diagonal variant (v1) more often observed on earlier tablets is also the prevailing form on tablets from Ur, whereas the *winkelhaken* form (v2) that prevails in Girsu is also the variant that characterises later tablets. Furthermore, the 5-wedge form (v2) of TI is related to earlier tablets and prevails on tablets from Ur, while the later straight variant (v2) of $NIG_2$ is favoured in Girsu. The pattern according to which tablets from Ur favour variants associated with the early Ur III Period and tablets from Girsu conversely favour those associated with the later years is by no means systematic, however. As such, the earlier variant (v5) of Diamond-framed signs clearly prevails in Girsu, while the relatively new 2-equal row form (v2) of ŠE is favoured in Ur.

| | | Ur | Girsu |
|---|---|---|---|
| **KAŠ-based** | · diagonal form (v1) prevails on earlier tablets<br>· winkelhaken form (v2) takes over on later tablets | earlier form prevails | later form prevails |
| **Diamond-framed** | · regular diamond form (v5) prevails on earlier tablets<br>· all variants on later tablets, no prevailing form | later fashion prevails (all variants) | earlier form prevails |
| **ŠE sign** | · (v4) exclusive to earlier tablets<br>· (v2) exclusive to later tablets<br>· (v3) prevails on later tablets | later form prevails | later form prevails |
| **TI** | · 5-wedge form (v2) prevails on earlier tablets<br>· 4-wedge form (v1) prevails on later tablets | earlier form prevails | no prevailing form |
| **$NIG_2$** | · (v1) prevails on earlier tablets<br>· (v2) prevails on later tablets | no prevailing form | later form prevails |

Figure 247: Crosstab of palaeographic trends over time and across sites (Ur III)

Palaeographic variation over the Ur III Period shows a shifting pattern towards new forms. This shift is not only progressive, it is also not generalised. It should also be noted that this shift is visible in both Ur and Girsu, but that each site has its own pattern. Both Ur and Girsu stand between older and newer forms, although Girsu is more strongly inclined towards newer ones. Ur and Girsu were selected in the first instance for the palaeographic contrast they revealed in Chapter 3. The evidence gathered for this chapter supports this previous observation while it also refines it. The contrast between writing practices in Ur and in Girsu does not place the two traditions in opposition. Rather, this contrast emphasizes that both traditions follow the same evolution, albeit to a different pace. The palaeographic assessment of Ur III cuneiform therefore suggests an evolution of the script over the period whose impact on local traditions was neither even nor consistent.

Before delving further into interpreting how the evolution of Ur III cuneiform may fit into the broader historical context of the end of the 3rd millennium BCE, the nature of this evolution should also be highlighted. The study of palaeographic variation in Ur III cuneiform revealed that signs of matching structure and signs sharing alike wedge

clusters display similar patterns of variation. Over time, a shifting trend is observed in writing, witnessing an increasing use of shorter-handed forms such as the upright variant (v3) of Diamond-framed signs, the *winkelhaken* variant (v2) of KAŠ-based signs or the 4-wedge form (v1) of TI. Similar patterns can also be observed on individual signs, such as ŠE, $NIG_2$, TUR and RU. On those signs and groups of signs, the observable writing sequence of wedges and the deduced writing sequence of hand movements indeed revealed a parallel development towards variants requiring fewer hand and wrist movements, thus enabling a smoother flow of the hand on the writing surface. Furthermore, this observed structural shift is not systematically matched by a formal shift. While earlier and later forms of KAŠ-based signs are visually distinct, the overall outline of both early and late variants of TI is similar so that the palaeographic development of TI affects its making but not its form.

### 4.3.2 Singularities of writing practices

Other palaeographic and diplomatic features, however, tell another story, observable tablet by tablet and not relating to wider trends. They seem to be linked to the very moment a tablet was being inscribed and to the very hand inscribing it.

The similarity of variation patterns observed in signs composed of a leading horizontal stack of wedges, such as LUGAL or ŠU, does not appear to be related to time or place. That their wedge count, whether low or high, matches the wedge count of other signs on any given tablet indicates rather that the number of wedges has more to do with personal preference, a question of style perhaps. However, as much as wedge count might be a matter of choice, such choice also depends on factors external to the writing hand, so that constrained instances located on edges tend to display less wedges than those located on the body of the tablet. Palaeographic variants are also dependent on external factors, such as sign value or instance location on the tablet. In very rare cases, they are not. BM 14821 is a rare example in that it carries a variant of IN (vX) not observed otherwise. Furthermore, this unique variant is combined with other identified forms. On o.5, the ŠE-cluster is composed of three rows of wedges: two upper rows of *winkelhaken* and a lower row of diagonal wedges. All other instances of IN on BM 14821 use the 3-row form (v1). No influencing factors, such as sign instance location or sign value, could be identified to understand the unusual variant of IN used on o.5. This reveals a fundamental aspect of the dynamics at work in handwriting. At

the crossroads between the necessarily normative nature of writing and the inevitably variable nature of the writing hand, the individual is free to adapt its writing to the context and to choose from an array of options, whether variant or wedge count. This freedom, however, can only be expressed if the context permits it and not constrained by external factors.

Intra-manuscripts variations are not uncommon, and a single tablet may present more than one variant of a same sign, a possible choice of the scribe influenced by the context of writing, especially sign value or instance location. Variants of KI on letter-orders from Girsu are consistently distinct between instances rendering the value [ki] and those used to write the divine name of $^{d}$Nanna ($^{d}$ŠEŠ.KI). Conversely, there is no such distinction on the Di til-la tablets from Girsu, with the same variant of KI used to write both values, and the same variant of DI to render the value [di] or in the divine name $^{d}$Ištaran ($^{d}$KA.DI).

The trends expressed through diplomatic features are less broad than the ones observed through the lens of palaeography. Selected diplomatic features materialise the moment a tablet was inscribed and express the choices made by the tablet producer and writer rather than belonging to wider chronological or geographical trends. The patterns they display are affected by internal factors, so that the proportions of a tablet appear to be related to the length of the text, while the density of the script behaves in tandem with the execution of the inscription on the writing surface. Variations in formats and proportions relate to the making of the tablet and the text it is intended to carry, so that the writing surface is planned, and the text-carrier extended accordingly. The placement of the inscription on the tablet and the density of the script highlight cases when the writing surface became insufficient to accommodate the remaining text, forcing the scribe to find emergency solutions such as squeezing in as many lines as possible on the reverse of the tablet and writing on the usually blank upper edge. The analysis of script density demonstrates the visible effects of advance writing and space planning on the surface.

The analysis of Ur III cuneiform presented in Chapter 3 and this chapter pictures the writing practices of the period as less uniform than is traditionally depicted in Ur III scholarship. Variation, both palaeographic and diplomatic, appear influenced by many, often non-exclusive, factors. Time, place and purpose may affect writing practices so that, for example, the Di til-la tablets show less variation overall than issuing receipts (Blacksmiths tablets) or letter-orders.

The overall consistency of the Di til-la tablets may as well relate directly to their context of production since these trial verdicts belonged to the highest level of administration, that of the governor (ensi$_2$) dispensing justice on behalf of the king of Ur. Conversely, the Letters and the Blacksmiths tablets relate to the local administration of Girsu. Distinctions between varying writing practices against the purpose and function of cuneiform documents have been observed in the Old Akkadian corpus, which predates the Ur III Period. With regard to levels of administration and writing practices, Foster noted a distinction in "*appearance and content*" between "*records of purely intramural interest*" and "*inspectable*" records, the latter being meant to be examined by representatives of the king of Akkad.[245] Be that as it may, and although writing practices observed on the Di til-la tablets are distinguishable from those observed on the Blacksmiths tablets and the Letters, written variations are also found between Di til-la tablets. As such, wedge count appears consistent per manuscript across written forms but not per sign or group of signs. In the Old Akkadian corpus, this feature of wedge count has been used to categorise and define writing 'styles'. Sommerfeld thus distinguished three 'styles' ranked from the most minimalist use of wedges as "*eine einfache Gebrauchsschrift für Notizen*" to the most profuse count of wedges as "*eine aufwendige kalligraphische Schrift für besondere Anlässe*".[246] However, in the present study, the joint analysis of wedge count against sign variants revealed no parallel patterns of variation. Within the Blacksmiths tablets, for instance, the (v2) form of ZI is found to be written with 8 to 12 *winkelhaken* across manuscripts [Figure 212 and Figure 213]. Moreover, within the Di til-la tablets, the number of wedges impressed per sign ranges from 10 to 20 on the ŠE cluster of the sign IN between BM 14821 and

[245] Foster, 'Archives and Empire in Sargonic Mesopotamia', in Veenhof, ed., (1986), pp. 48-49. See also the recent study of Old Akkadian palaeography in Maiocchi, 'From Stylus to Sign: A Sketch of Old Akkadian Palaeography', in Devecchi et al., eds., (2015), pp. 71-88.
[246] Sommerfeld, *Die Texte der Akkade-Zeit. 1: Das Dijala-Gebiet: Tutub*, (1999), pp. 7-17 esp. p. 13.

BM 22867 respectively, two tablets which otherwise display the same array of palaeographic variation [Figure 241 and Figure 242].

It appears, therefore, that while singularities can be identified in writing, seldom cannot they be related to broader trends of time, place, purpose or context. Beside wedge count, whose consistency per tablet but not per sign or group of signs relates to personal preference, those external factors constrain and influence writing practices to the extent that idiosyncrasies are difficult to identify with any certainty. Reconsidering the ambivalence between the normative nature of writing as a conventional system and the variable nature of handwriting, the intra-manuscript variations observed in the case studies presented above demonstrated that in parallel to the many factors influencing writing practices, the scribal hand may choose, whether voluntarily or not, between the forms and options known to the scribe (see *Identity and Individuality in* cuneiform in Conclusion.[247] Writing practices in the Ur III Period present enough variation to reveal distinct traditions and enough uniformity to hinder individuality.

[247] Such intra-manuscript variations are frequently observed across corpora, e.g. on Old Akkadian tablets from Nippur (Tinney, 'A New Look at Naram-Sin and the "Great Rebellion"', *JCS* 47 (1995), p. 12).

# CHAPTER 5

# IDENTITY AND INDIVIDUALITY IN OLD ASSYRIAN CUNEIFORM

The sample-based analysis of palaeographic and diplomatic variation in Chapter 3 suggested variation patterns between tablets rather than related to wider trends of time or genre. This chapter aims at assessing the interplay between medium-wide trends at community level and fine-grained trends at individual level. Two case studies will explore identity in cuneiform and investigate the extent to which palaeographic and diplomatic variation may relate to time or to gender. Another two case studies will explore individuality in cuneiform and investigate the extent of palaeographic variation between family members.[248]

## 5.1 Identity in Old Assyrian cuneiform

The following two case studies further the initial assessment undertaken in Chapter 3 by considering palaeographic and diplomatic variation over time and between genders. Time-related patterns are investigated between two generations of Old Assyrian merchants and gender-related patterns are observed on letters authored by men and women.

### 5.1.1 Time-related patterns of variations?

The assessment of the benchmark sample in Chapter 3 yielded no significant information on variation over time due to the lack of available dated tablets in the Old Assyrian corpus [§3.2.3]. This section works around this limitation by drawing in new data collected on indirectly dated tablets to assess palaeographic and diplomatic

[248] Note to the reader: This chapter was being completed when the Covid-19 pandemic started and a nation-wide lockdown prevented access to the research corpus of this study. As a result, some hypotheses could not be entirely tested due to the lack of access to primary sources. This chapter was adapted to mitigate the impact of the pandemic. However, in cases where a hypothesis appeared integrally relevant to the development of the main argument of this research, the choice was made to present it in this dissertation with tentative conclusions.

variation between two generations of merchants, identified from prosopography and social network analysis [Figure 248; Appendix 3.b]. All 33 tablets in the dataset are business letters.

| | Generation 1 | Generation 2 | |
|---|---|---|---|
| **Tablets** | 20 | 13 | **33** |
| **Sign instances** | 1,467 | 765 | **2,232** |

Figure 248: Distribution of sampled data per generation

### *Time-related palaeographic variations*

The distribution of palaeographic variants across signs and groups of signs between the two generations of merchants distinguishes non-distinctive and distinctive patterns.

Both generations show a similar use of the variants of the two closely composed signs $TI_2$ and IM [Figure 249 and Figure 250].

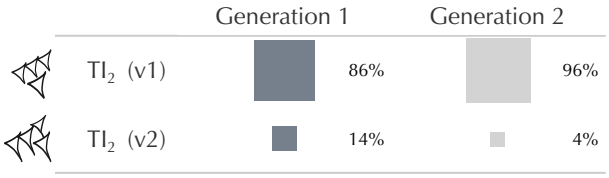


Figure 249: Distribution of variants of $TI_2$ between generations

% of Sign Instances (size) broken down by Generation (colour) vs. $TI_2$ Variants. Sample size (in count of sign instances): 90. Sample size (in count of tablets): 24.

The (v1) form of $TI_2$ largely prevails on both earlier and later tablets, although the (v2) variant is slightly more represented on earlier ones. This pattern can also be observed on variants of IM, with the similarly composed (v1) form prevailing throughout, although the dataset is smaller.

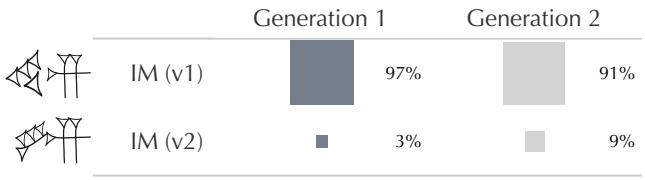


Figure 250: Distribution of variants of IM between generations

% of Sign Instances (size) broken down by Generation (colour) vs. IM Variants. Sample size (in count of sign instances): 43. Sample size (in count of tablets): 20.

There is also little distinction to be observed between generations on signs composed of a KAŠ element, such as GA, ŠA or TA [Figure 251]. The *winkelhaken* (v2) form prevails

in equal proportions throughout. Within the group, the distribution of variants shows the same pattern per individual sign [Figure 252]. Furthermore, instance location on the tablet, whether on the body or the edges, does not appear to influence the use of either form.

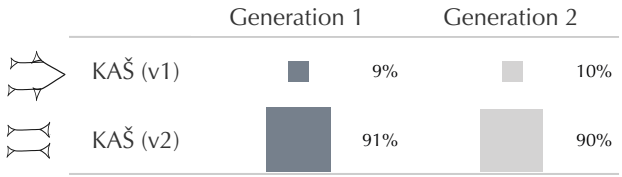


Figure 251: Distribution of KAŠ-based variants between generations

% of Sign Instances (size) broken down by Generation (colour) vs. KAŠ-based Variants. Sample size (in count of sign instances): 469. Sample size (in count of tablets): 32.

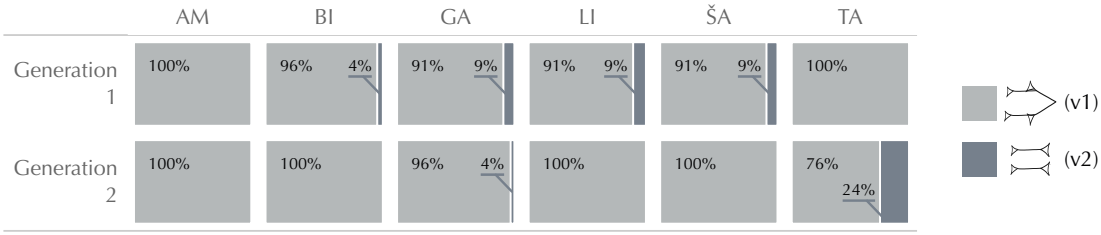


Figure 252: Distribution of KAŠ-based variants across signs and between generations

% of Sign Instances (size) broken down by Sign Name and by Generation vs. KAŠ-based Variants (colour). Sample size (in count of sign instances): 443. Sample size (in count of tablets): 32.

The distribution of variants of KAŠ-based signs in this sample resonates with what could be observed in Chapter 3. The limited dataset of dated tablets in the benchmark sample suggested a marginal use of the diagonal (v1) form yet sustained over time and still attested on a late tablet dated to REL 132 (1841 BCE) [§3.2.3]. The present dataset therefore supports the pattern observed in the benchmark sample, suggesting that the prevalence of the *winkelhaken* (v2) variant form is not related to chronology and that both diagonal (v1) and *winkelhaken* (v2) forms are part of the Old Assyrian writing set.

Signs composed of a box frame, such as LU and MA, show a more nuanced picture. At group level, patterns of distribution between the two generations of merchants are similar, with the adjoining (v2) frame being favoured overall [Figure 253].

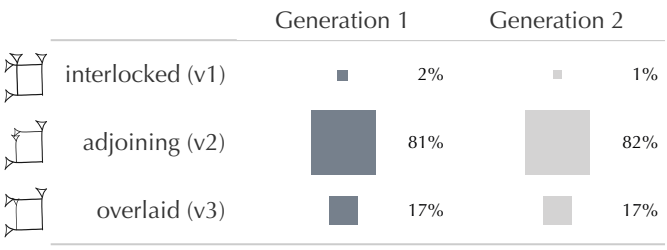


Figure 253: Distribution of Box-framed variants between generations

% of Sign Instances (size) broken down by Generation (colour) vs. Box-framed Variants. Sample size (in count of sign instances): 197. Sample size (in count of tablets): 24.

Distribution patterns at sign level within the group are, however, more nuanced [Figure 254]. The prevalence of the adjoining (v2) form of KU and LU on earlier tablets shifts towards exclusivity on later tablets, whereas forms of $TUG_2$ on later tablets introduce the interlocked (v1) form that was absent on earlier tablets. Both adjoining (v2) and overlaid (v3) forms of MA are constant over time.


Figure 254: Distribution of Box-framed variants across signs and between generations

% of Sign Instances (size) broken down by Sign Name and by Generation vs. Box-framed Variants (colour). Sample size (in count of sign instances): 197. Sample size (in count of tablets): 24.

Although more nuanced, distribution patterns per sign still mirror the trend observed at group level favouring the adjoining (v2) form to write signs composed of a box frame.

Conversely, signs such as $KU_3$, SUR, and signs composed of a ŠE cluster, reveal distinctive trends over time between the two generations of merchants.

Four variants of $KU_3$ can be observed in the present study sample [Figure 255]. They are determined by wedge placement and the arrangement of the lower row of *winkelhaken*, whether continuous (v3) or broken (v6), clustered to the left (v4) or to the right (v5). Although the forms (v4) and (v6) are similar, they differ in that the (v6) variant displays an extra *winkelhaken* to the left.

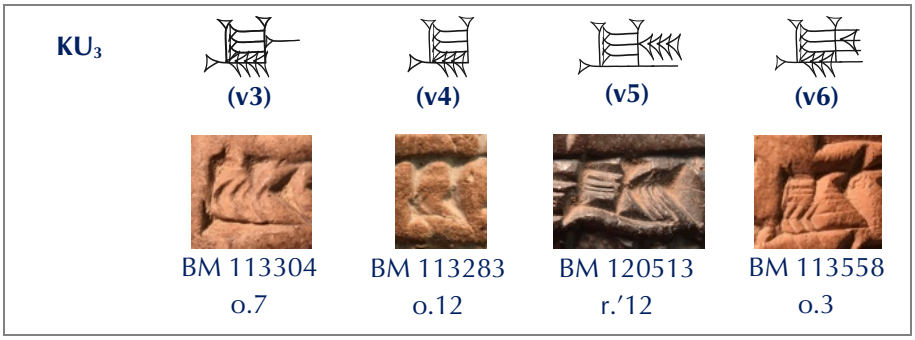


Figure 255: Four Old Assyrian variants of $KU_3$

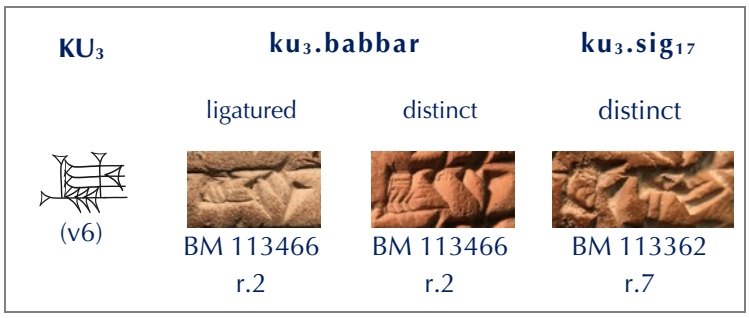


Figure 256: Variants of $KU_3$ in $ku_3$.babbar and $ku_3.sig_{17}$

When used in $ku_3$.babbar, the (v6) variant of $KU_3$ can be ligatured to the following BABBAR, with the last *winkelhaken* of the former and first oblique wedge of the latter written in sequence [Figure 256]. The (v6) form is also used in $ku_3.sig_{17}$, identifying it as a distinct variant from the (v4) one since the extra wedge to the left is impressed although there is no possible ligature with the following $SIG_{17}$.

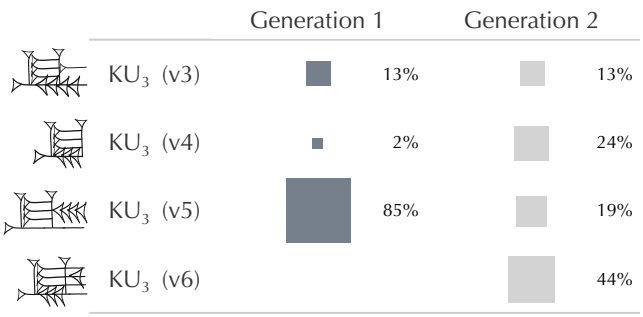


Figure 257: Distribution of variants of $KU_3$ between generations

% of Sign Instances (size) broken down by Generation (colour) vs. $KU_3$ Variants.
Sample size (in count of sign instances): 57. Sample size (in count of tablets): 19.

The distribution of variants of $KU_3$ between generations shows a clear preference of the (v5) form on earlier tablets and the remarked absence of the (v6) variant, while later tablets show a mixed use of all four identified variants of $KU_3$ in similar proportions [Figure 257]. Only the (v3) form is equally used across generations. The two forms (v4) and (v6) are respectively rare and absent on earlier tablets. Conversely, their use seems

to have spread on later tablets, especially the (v6) form prevailing overall on tablets from the second generation.

The three variants of SUR found in the sample reveal distinctive patterns of distribution between generations [Figure 258]. Although all three variants are present throughout, the prevalence of either the (v1) or the (v2) variant changed over time while the (v3) form is rarely used on both earlier and later tablets.

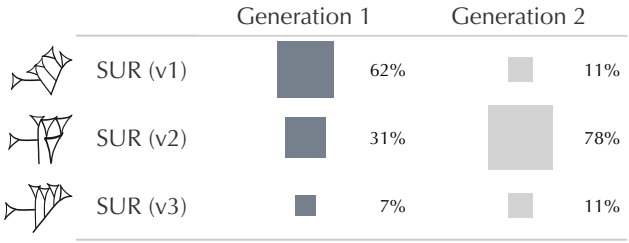


Figure 258: Distribution of variants of SUR between generations

% of Sign Instances (size) broken down by Generation(colour) vs. SUR Variants. Sample size (in count of sign instances): 22. Sample size (in count of tablets): 11.

Due to their respective component wedges, the three variants of SUR involve distinct patterns of hand movements in order to be impressed in clay [Figure 259]. Both the (v1) and (v3) forms imply three hand positions whereas the (v2) form only requires the hand to switch positions once.

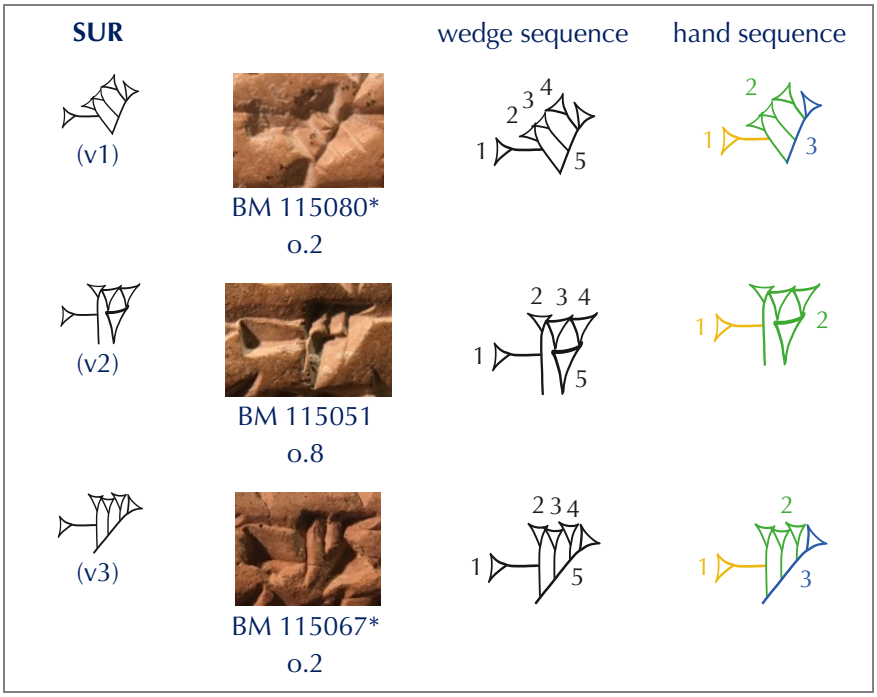


Figure 259: Writing sequence of wedges and hand movements in variants of SUR

(*) Examples marked with an asterisk are extracted from the benchmark sample for instances when the wedge order could not be read on tablets in this dataset.

The extent of variation observed on SUR in this sample is remarkable given the relatively small amount of data. Not only does SUR appear to be distinguishing generational groups, with earlier tablets favouring the (v1) form and later tablets preferring its (v2) counterpart, the shift from one form to the other is also matched by a shift in the makeup of each variant.

A similar shifting pattern of forms can be observed on variants of BA. Later tablets show a clear preference for the oblique (v1) form while both oblique (v1) and horizontal (v2) variants are proportionately found on earlier tablets [Figure 260].

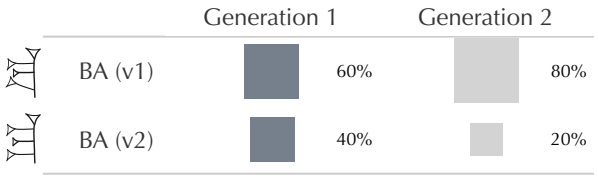


Figure 260: Variants of BA between generations

% of Sign Instances (size) broken down by Generation (colour) vs. BA Variants. Sample size (in count of sign instances): 25. Sample size (in count of tablets): 16.

The writing sequences observable in the two variants of BA yield three patterns for both wedges and hand.[249] In instances of the oblique (v1) variant of BA, the displacement of clay where the wedge heads meet clearly shows that the lower oblique wedge was impressed before the upper horizontal. The sequence of the horizontal (v2) form suggests two hand positions while two distinct sequences can be observed on the oblique (v1) form [Figure 261]. On the latter, each sequence implies respectively four (a) and three hand positions (b). The writing sequences of both wedge and hand on variants of BA reveal patterns that do not resonate with what could be observed on SUR. The form of BA requiring fewer hand movements, the horizontal (v2), is not favoured on later tablets, suggesting that the shift in form is not matched by a shift in makeup.

[249] On the writing sequence of wedges in BA over time, see Taylor, 'Wedge Order in Cuneiform: A Preliminary Survey', in Devecchi et al., eds., (2015), p. 21.

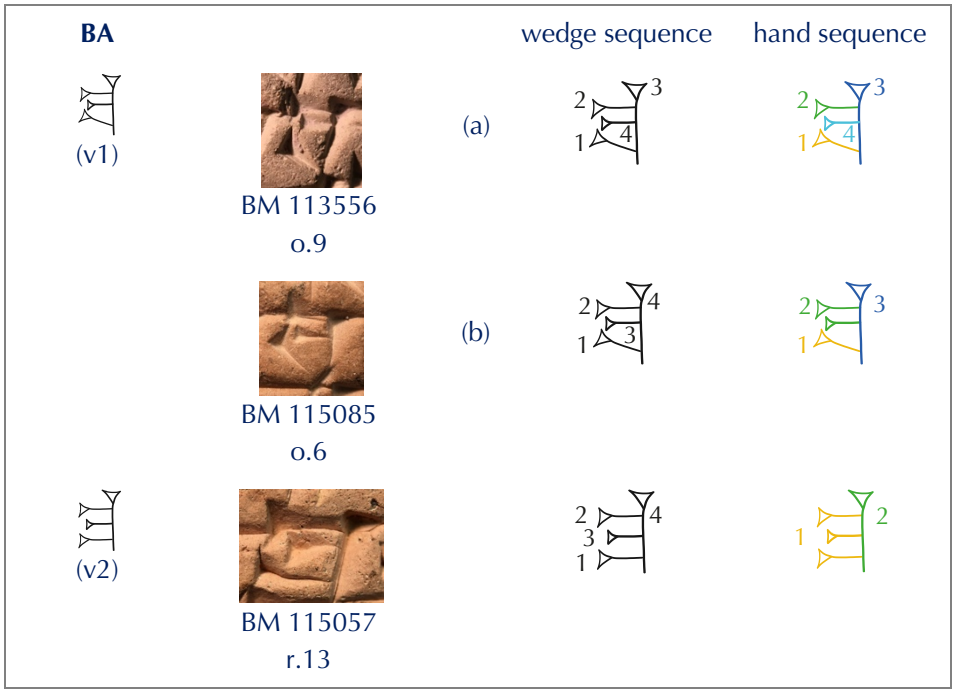


Figure 261: Writing sequence of wedges and hand movements in variants of BA

While groups of signs composed of a KAŠ element or of a box frame showed no distinctive patterns between generations, variation in the ŠE-cluster group reveals more contrast [Figure 262]. The 2 unequal-row (v3) form is the most represented across both generations and is not in itself distinctive. Its usage, however, is exclusive on later tablets whereas earlier tablets showed a diversity of forms, mixing the prevailing (v3) variant with less frequent occurrences of the 3-row (v1) and 2-equal row (v2) forms.

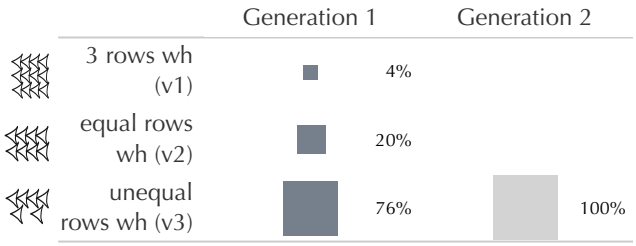


Figure 262: Variants of ŠE-cluster signs between generations

% of Sign Instances (size) broken down by Generation (colour) vs. ŠE-cluster Variants. Sample size (in count of sign instances): 150. Sample size (in count of tablets): 31.

Variants of the ŠE cluster on earlier tablets are not evenly distributed between individual signs [Figure 263]. The 3-row (v1) form is exclusively found on instances of IN and SAR, while the 2-equal row (v2) variant is used across instances of IN, LI and ZI. ZI especially displays the greater variation with equivalent proportions of both (v2) and (v3) forms.


Figure 263: Distribution of ŠE-cluster variants across signs and between generations

% of Sign Instances (size) broken down by Sign Name and by Generation vs. ŠE-cluster Variants (colour). Sample size (in count of sign instances): 148. Sample size (in count of tablets): 31.

The distribution of variants of the leading stack of horizontal wedges on signs such as ŠA and ŠU mirrors the evolution towards less diversity observed on signs of the ŠE-cluster group, albeit to a lesser extent [Figure 264]. Three variants – aligned (v1), inset (v3) and stepped (v4) – are equivalently represented on earlier tablets, while on later tablets, the clamped (v2) form is almost abandoned and the inset (v3) variant takes over.

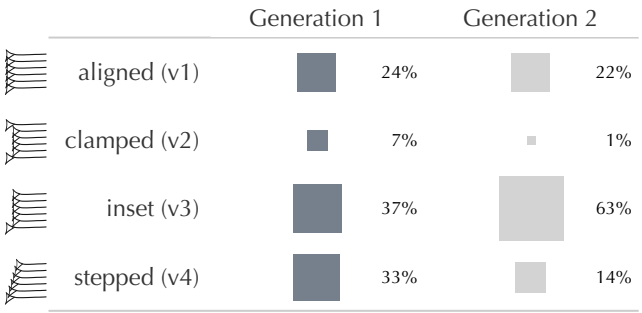


Figure 264: Distribution of Horizontal-stack variants between generations

% of Sign Instances (size) broken down by Generation (colour) vs. Horizontal-stack Variants. Sample size (in count of sign instances): 305. Sample size (in count of tablets): 33.

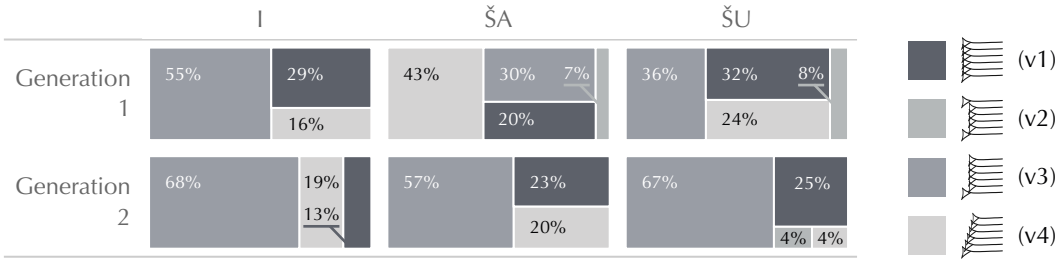


Figure 265: Distribution of Horizontal-stack variants across signs and between generations

% of Sign Instances (size) broken down by Sign Name and by Generation vs. Horizontal-stack Variants (colour). Sample size (in count of sign instances): 263. Sample size (in count of tablets): 32.

The trend observed at group level is also visible at sign level [Figure 265]. Earlier tablets show distinct patterns per sign, with, for example, the stepped (v4) form most often found on instances of ŠA and less frequently applied to I or ŠU. Conversely, later tablets favour the inset (v3) variant across all three signs.

### *Time-related diplomatic variations*

In the benchmark sample studied in Chapter 3, the limited dataset of dated tablets did not enable to assess diplomatic variation over time. In the present dataset, patterns of diplomatic variation suggest a community of practice across both generations with only a few distinctive features between earlier and later tablets.

Inscription and layout features such as text justification, line ruling and writing slant do not reveal distinct practices between generations. As such, both generations show equivalent proportions of tablets displaying a slanting script and those with a straight script [Figure 266].

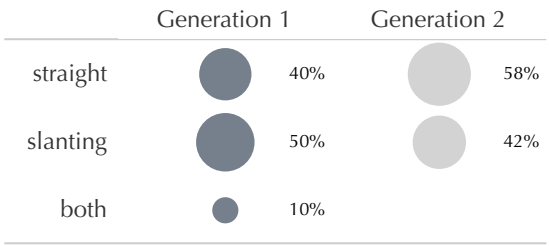


Figure 266: Distribution of writing slant types between generations

% of Tablets (size) broken down by Generation (colour) vs. Writing Slant Type. Sample size (in count of tablets): 32.

There are also equivalent proportions of tablets ending with a closing ruling after the last line of text in both generational groups [Figure 267].

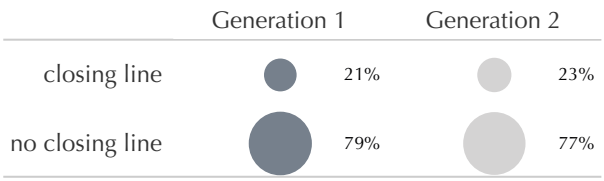


Figure 267: Distribution of ruling types between generations (closing line)

% of Tablets (size) broken down by Generation (colour) vs. Ruling Type: Closing Line. Sample size (in count of tablets): 32.

Similarly, object features such as format and small edges or corner profiles reveal shared practices over time.

Three formats are attested in the sample, with portrait-oriented tablets prevailing across generations, whereas landscape and square tablets are less favoured throughout [Figure 268]. The variation between the three tablet formats appears therefore unrelated to chronology.

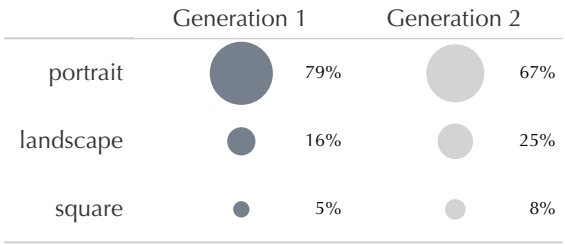


Figure 268: Distribution of tablet formats between generations

% of Tablets (size) broken down by Generation (colour) vs. Format. Sample size (in count of tablets): 31.

In terms of shape, the profiles of the upper and lower edges as well as of the corners show strikingly similar patterns between the two generations [Figure 269 and Figure 270]. Not only are the same profile types represented throughout, but they are also distributed in equivalent proportions.

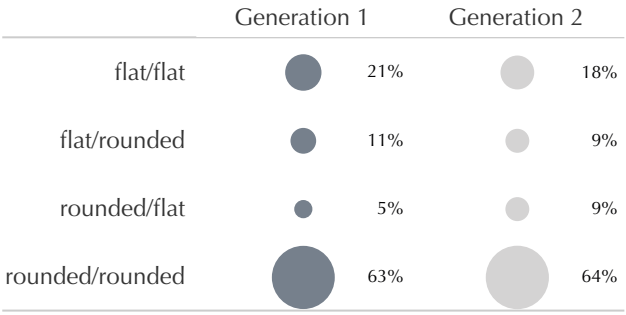


Figure 269: Distribution of tablet profiles (upper/lower edge) between generations

% of Tablets (size) broken down by Generation (colour) vs. Profile Type: Upper/Lower Edge. Sample size (in count of tablets): 30.

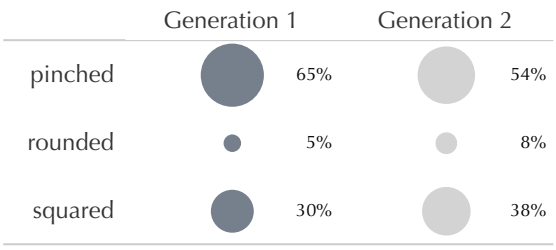


Figure 270: Distribution of tablet profiles (corners) between generations

% of Tablets (size) broken down by Generation (colour) vs. Profile Type: Corners. Sample size (in count of tablets): 33.

The distribution of profile types of the left and right edges reveals greater yet undistinctive variation [Figure 271]. Both earlier and later tablets are typically shaped with rounded left and right edges regardless of text layout. Although later tablets are indeed more often inscribed on their left edge than earlier ones, both favour the rounded profile type. Furthermore, there is strictly no variation in left edge text layout: when inscribed, the text on the left edge runs from top to bottom on all tablets.

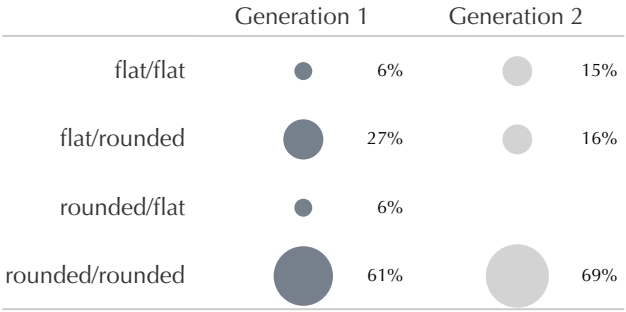


Figure 271: Distribution of tablet profiles (left edge/right edge) between generations

% of Tablets (size) broken down by Generation (colour) vs. Profile Type: Left/Right Edge. Sample size (in count of tablets): 31.

While left and right edges profile types and text layout reveal no distinctive patterns between generations, considering these features against script density and tablet dimensions creates a more refined picture of diplomatic practices over time and will be discussed further in this section.

The diplomatic features presented above showed remarkably consistent patterns of variation, both qualitative and quantitative. Although such patterns could reflect the main trend attached to diplomatic practices in the study sample, a limited set of features tends towards a clearer distinction between the two generations of Old Assyrian merchants.

Ruling practices, especially regarding closing lines, appeared similar throughout generations. However, two distinct practices emerge when considering separation lines, i.e. marking the break between the end of the text on the body of the tablet (upper edge) and the continuation on the left edge [Figure 272].

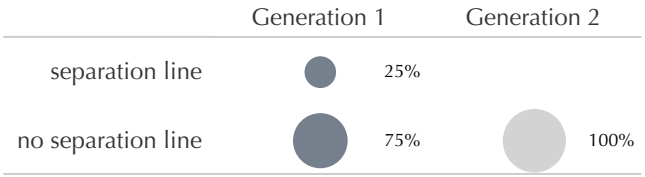


Figure 272: Distribution of ruling types between generations (separation line)

% of Tablets (size) broken down by Generation (colour) vs. Ruling Type: Separation Line. Sample size (in count of tablets): 22.

Later tablets never show a separation line although they are also more often inscribed on their left edge than earlier tablets. Meanwhile, there is greater variation on earlier tablets but also favour not marking the break in text layout.

Considering tablet shapes, the main type created by the profiles of both obverse and reverse reveals distinct patterns amongst the three types represented [Figure 273]. Earlier tablets favour the convex/convex type while also using, albeit rarely, the flat/convex and flat/flat types. The convex/flat type is not attested on earlier tablets. Later tablets maintain the use of the convex/convex type, almost equally represented alongside the heretofore unobserved convex/flat type. The flat/convex type is rarely attested, and the flat/flat type is positively absent.

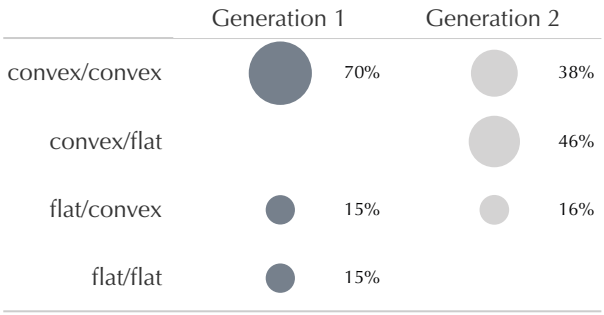


Figure 273: Distribution of tablet profiles (obverse/reverse) between generations

% of Tablets (size) broken down by Generation (colour) vs. Profile: Obverse/Reverse. Sample size (in count of tablets): 33.

Overall, both generations disregard tablets with a flat obverse, preferring convex profiles instead. The flat/convex profile, probably one of the most traditional tablet profiles in general, is known throughout but rarely used. No correlation between profile types and

format could be identified, so that, for example, the convex/flat type is found on later portrait, landscape and square tablets alike in the second generation.

Conversely, profile types appear related to dimensions, so that on later tablets the convex/flat type is constrained to short tablets (< H.5 cm) and the convex/convex type to taller tablets (> H.5 cm) [Figure 274].

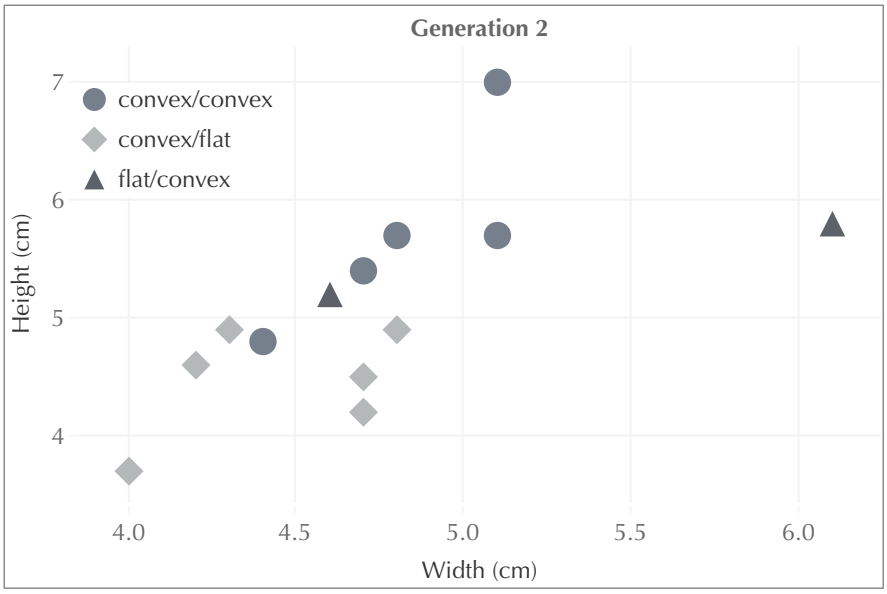


Figure 274: Tablet dimensions and shapes across tablets (Generation 2)

Tablet Width (x-axis) vs. Tablet Height (y-axis). Colour and shape show details about Profile Type: Obverse/Reverse. Sample size (in count of tablets): 13.

Although dimensions are dependent on the length of the text to be inscribed on each tablet, earlier tablets are overall larger than later ones [Figure 275].

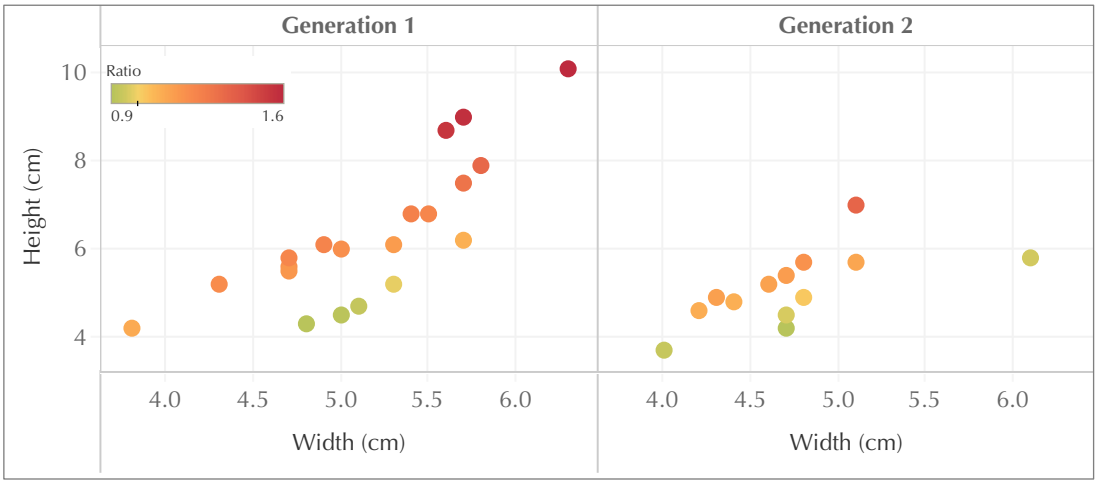


Figure 275: Distribution of tablet dimensions between generations

Tablet Width (x-axis) vs. Tablet Height (y-axis) broken down by Generation. Colour shows details about Ratio. Sample size (in count of tablets): 33.

Earlier tablets range between H.4.2 x W.3.8 cm and H.10.1 x W.6.3 cm for a median computed value of H.6 x W.5.1 cm. Later tablets range between H.3.7 x W.4 cm and H.7 x W.5.1 cm for a median computed value of H.4.9 x W.4.7 cm. While later tablets are shorter than their earlier counterparts, variation in dimensions does not affect formats with portrait tablets prevailing throughout.

Distinct practices also appear between generations when considering script density [Figure 276]. Overall, later tablets show a denser script than earlier ones. Although both generations respective median script density values are close (2.3 lines of text per 1 cm high on later tablets against 2.1 lines on earlier tablets), the range of values is narrower and higher for later tablets.

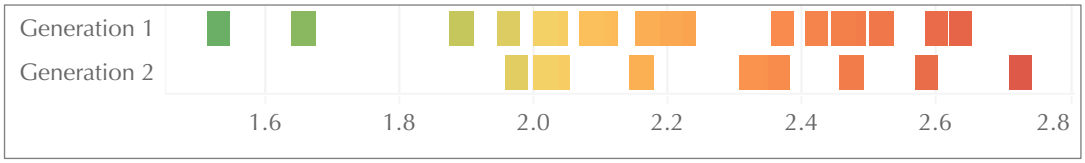


Figure 276: Distribution of script density between generations

Overall Script Density per Generation. Colour shows details about Script Density. Partially inscribed tablets are excluded. Sample size (in count of tablets): 29.

The patterns of script density between generations echoes that observed with tablet dimensions, suggesting later tablets being both shorter and more densely inscribed.

### 5.1.2 Gender-related patterns of variations?

Cuneiform writing has generally been associated with men, although a few women are also known to have practiced writing, whether as scribes or as authors, such as Nin-UN-il$_2$, a woman scribe from Nippur in the Akkad Period (ca. 2340-2220 BCE), or Enheduana, the daughter of Sargon of Akkad and *en*-priestess of Nanna in Ur, to whom are attributed literary compositions.[250] As previously mentioned, the Old Assyrian corpus is associated with widespread literacy amongst merchants, and women are attested as letter-authors.[251] Although male-authors form the majority of letter senders in the Old Assyrian corpus, letters authored by women enable a study of written variation between genders. This section therefore investigates the nature of the palaeographic and

[250] Lion, 'Literacy and Gender', in Radner et al., eds., (2011), pp. 90-112 esp. pp. 96-98 and 98-101.

[251] Michel, 'Les femmes et l'écrit dans les archives paléo-assyriennes', *Topoï Supplément* 10 (2009), pp. 253-272; Michel, *Women of Assur and Kanesh*, (2020).

diplomatic variation between female- and male-authored letters, distinguishing genders based on onomastics [Figure 277; Appendix 3.b].

| | Male-authored | Female-authored | |
|---|---|---|---|
| **Tablets** | 34 | 12 | **46** |
| **Sign instances** | 2,335 | 510 | **2,845** |

Figure 277: Distribution of sampled data per gender

### *Gender-related palaeographic variations*

Palaeographic variations between genders are generally hindered by the imbalance in data between male and female letter authors, especially for individual signs. However, the structural approach to palaeographic variants enables balanced datasets to be compared by grouping individual signs according to their structure.[252]

While the imbalance of data especially affects individual signs, some remarks may still be made about palaeographic variation between genders.

The two close signs $TI_2$ and IM respectively present similar patterns between genders. The (v1) form of $TI_2$ prevails on both sets of letters in equivalent proportions [Figure 278]. The matching (v1) form of IM, with its similarly arranged *winkelhaken* cluster, is also favoured on both male- and female-authored letters [Figure 279]. Distribution patterns between genders mirror those observed across generations in the previous case study, favouring the respective (v1) forms of $TI_2$ and IM.

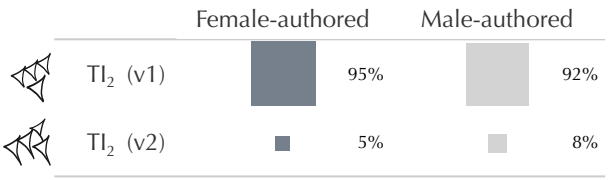


Figure 278: Distribution of variants of $TI_2$ between genders

% of Sign Instances (size) broken down by Gender (colour) vs. $TI_2$ Variants. Sample size (in count of sign instances): 145. Sample size (in count of tablets): 36.

[252] Following the principles outlined in Chapter 2 and demonstrated in Chapter 3.

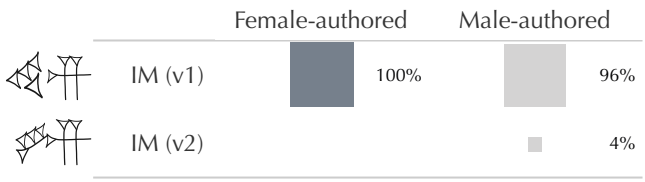


Figure 279: Distribution of variants of IM between genders

% of Sign Instances (size) broken down by Gender (colour) vs. IM Variants. Sample size (in count of sign instances): 51. Sample size (in count of tablets): 25.

Across generations, variants of $KU_3$ had shown a shift towards more diversity with four variants almost used equally on later tablets against the overall prevalence of the (v5) form on earlier tablets. A different pattern emerges when contrasting genders [Figure 280].

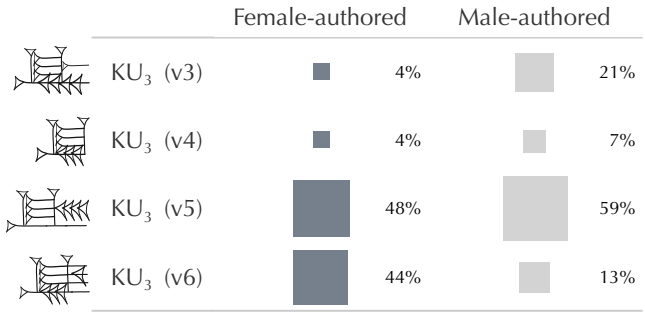


Figure 280: Distribution of variants of $KU_3$ between genders

% of Sign Instances (size) broken down by Gender (colour) vs. $KU_3$ Variants. Sample size (in count of sign instances): 79. Sample size (in count of tablets): 29.

While the (v5) variant prevails on male-authored letters, female-authored tablets show equal proportions of both (v5) and (v6) forms. Both forms have a similar horizontal module, formed of an elongated basal wedge supporting a vertical wedge to the left and in the middle, but differ in that the row of *winkelhaken* is located to the right on the (v5) form and to the left on the (v6) one. Beyond the different patterns between genders, the wider forms – (v3), (v5) and (v6) – are overall favoured whereas the narrower (v4) is rarely attested throughout.

Palaeographic variation considered within groups of similarly composed signs also reveal an overall community of practice between male and female letter authors.
Signs composed of a KAŠ element show similar variation across genders with the *winkelhaken* (v2) form favoured overall [Figure 281]. This group pattern is mirrored at sign level [Figure 282].

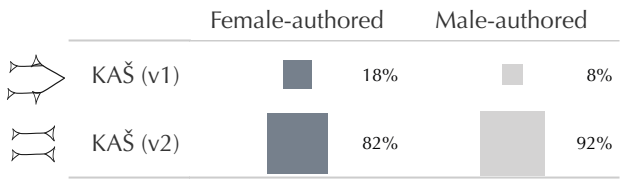


Figure 281: Distribution of KAŠ-based variants between genders

% of Sign Instances (size) broken down by Gender (colour) vs. KAŠ-based Variants. Sample size (in count of sign instances): 614. Sample size (in count of tablets): 45.

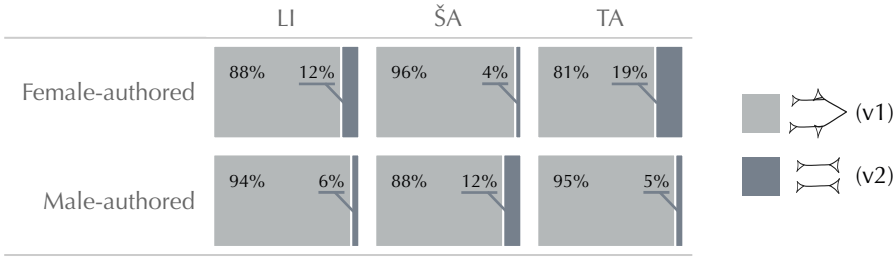


Figure 282: Distribution of KAŠ-based variants across signs and between genders

% of Sign Instances (size) broken down by Sign Name and by Gender vs. KAŠ-based Variants (colour). Sample size (in count of sign instances): 410. Sample size (in count of tablets): 44.

Similarly, signs composed of a box frame display similar patterns of variation at both group level and sign level. The adjoining (v2) form prevails overall while the overlaid form is slightly more frequently attested on male-authored letters [Figure 283].

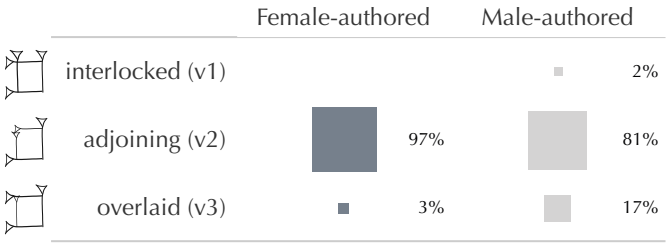


Figure 283: Distribution of Box-framed variants between genders

% of Sign Instances (size) broken down by Gender (colour) vs. Box-framed Variants. Sample size (in count of sign instances): 234. Sample size (in count of tablets): 32.

A close-up view at sign level reveals the same pattern, with, however, more exclusivity on female-authored letters than on male-authored tablets [Figure 284].

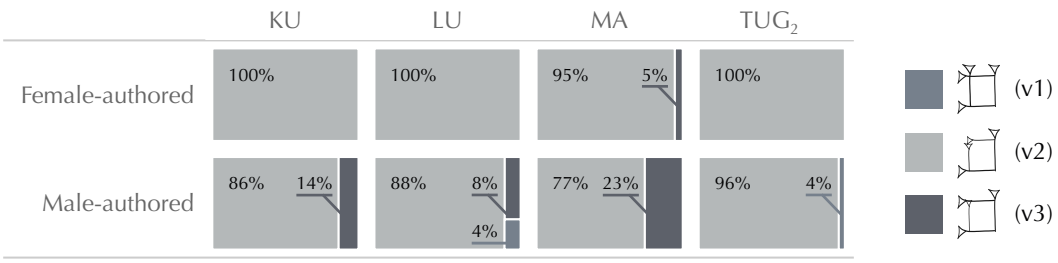


Figure 284: Distribution of Box-framed variants across signs and between genders

% of Sign Instances (size) broken down by Sign Name and by Gender vs. Box-framed Variants (colour). Sample size (in count of sign instances): 230. Sample size (in count of tablets): 32.

While the two groups of KAŠ-based and Box-framed signs reveal similar patterns across genders at both group and sign level, the variation observable on ŠE-cluster and Horizontal-stack signs display specific patterns per group and per sign.

Overall, the 2-unequal row (v3) form of ŠE-cluster signs prevails throughout [Figure 285]. Considering the distribution of variants per individual sign shows two different patterns [Figure 286]. There is a consistency of practice between signs on male-authored letters, with the 2-unequal row (v3) form favoured across IN, LI and ZI. Conversely, variants appear more sign-specific on female-authored tablets and while the (v3) form is mostly used for LI or IN, ZI favours the 2-equal row (v2) variant.

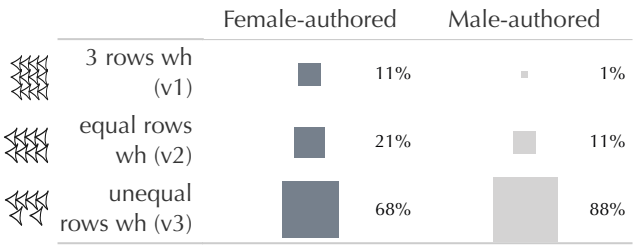


Figure 285: Distribution of ŠE-cluster variants between genders

% of Sign Instances (size) broken down by Gender (colour) vs. ŠE-cluster Variants. Sample size (in count of sign instances): 199. Sample size (in count of tablets): 42.

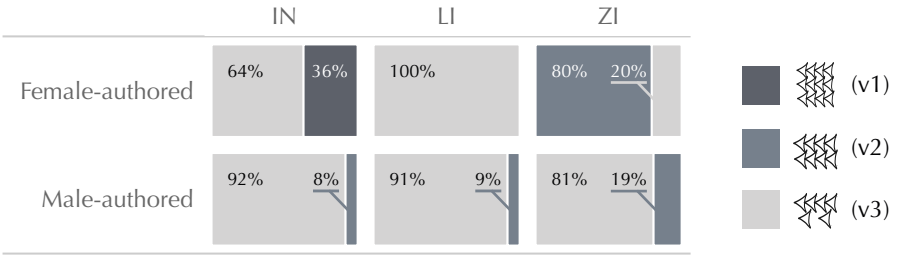


Figure 286: Distribution of ŠE-cluster variants across signs and between genders

% of Sign Instances (size) broken down by Sign Name and by Gender vs. ŠE-cluster Variants (colour). Sample size (in count of sign instances): 190. Sample size (in count of tablets): 42.

A similar pattern can also be observed on Horizontal-stack signs such as ŠA or ŠU. There is no outstanding variation emerging at group level with variants similarly distributed between genders although nuanced [Figure 287 and Figure 288].

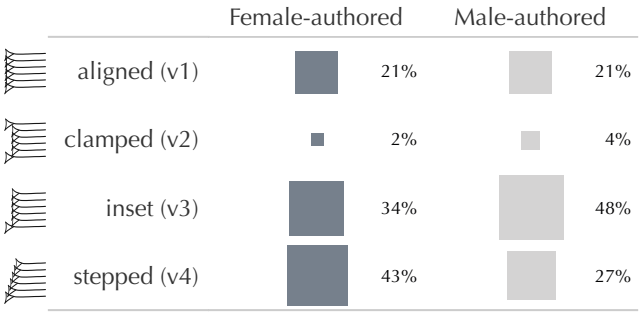


Figure 287: Distribution of Horizontal-stack variants between genders

% of Sign Instances (size) broken down by Gender (colour) vs. Horizontal-stack Variants. Sample size (in count of sign instances): 413. Sample size (in count of tablets): 45.


Figure 288: Distribution of Horizontal-stack variants across signs and between genders

% of Sign Instances (size) broken down by Sign Name and by Gender vs. Horizontal-stack Variants (colour). Sample size (in count of sign instances): 347. Sample size (in count of tablets): 44.

Overall, palaeographic variation between male- and female-authored letters are not strongly contrasted and the distinction between the two groups appears limited. While

the imbalance of data between the two groups may hinder a finer grained picture of practices between genders, the community observable through palaeography is matched by similarities of diplomatic features.

### *Gender-related diplomatic variations*

The three formats represented in the study sample are similarly distributed between male- and female-authored letters with an overall preference for portrait-oriented tablets [Figure 289]. The two other formats are less frequently attested throughout, although the proportions vary with fewer landscape-oriented male-authored than female-authored letters.

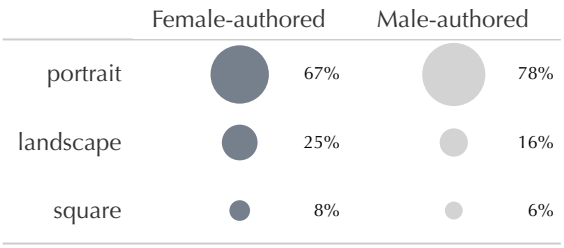


Figure 289: Distribution of tablet formats between genders

% of Tablets (size) broken down by Gender (colour) vs. Format. Sample size (in count of tablets): 44.

Text layout features also appear similar between both groups and shared ruling practices can be observed within the sample. Overall, the last line of text on letters is predominantly not marked by a closing ruling [Figure 290]. On those few tablets displaying a closing line, the proportion is higher on male-authored letters.

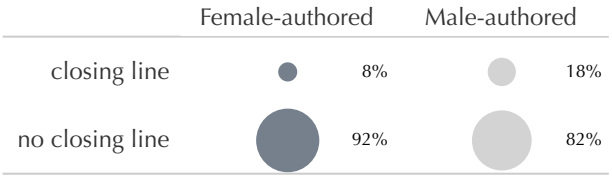


Figure 290: Distribution of ruling types between genders (closing line)

% of Tablets (size) broken down by Gender (colour) vs. Ruling Type: Closing Line. Sample size (in count of tablets): 45.

Ruling practices as regards closing line appear shared between genders and nuances are limited. Furthermore, considering separation lines, both male- and female-authored letters show mirroring distribution patterns with an overall preference for unruled tablets

[Figure 291]. Overall, text layout markers show matching patterns between genders, the two groups similarly not favouring the use of either closing or separation lines.

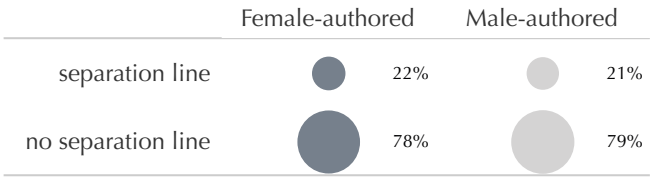


Figure 291: Distribution of ruling types between genders (separation line)

% of Tablets (size) broken down by Gender (colour) vs. Ruling Type: Separation Line. Sample size (in count of tablets): 33.

Tablet shapes also reveal similarities between genders, although to a lesser extent. Both pinched and squared corner profiles appear equally distributed within and between groups, while male-authored letters also attest of few rounded corners not represented on female-authored tablets [Figure 292]. The distribution pattern of corner profiles between genders mirrors that observed between generations in the previous section.

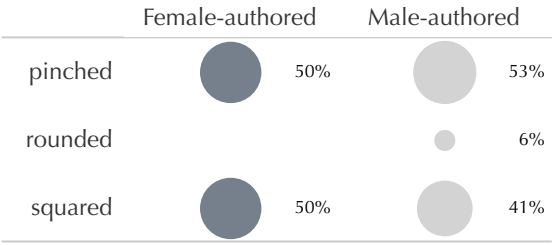


Figure 292: Distribution of tablet profiles (corners) between genders

% of Tablets (size) broken down by Gender (colour) vs. Profile: Corners. Sample size (in count of tablets): 46.

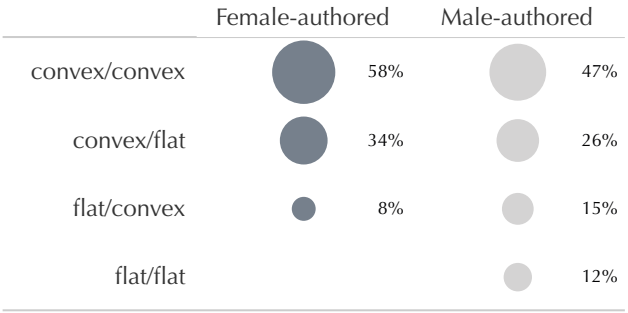


Figure 293: Distribution of tablet profiles (obverse/reverse) between genders

% of Tablets (size) broken down by Gender (colour) vs. Profile: Obverse/Reverse. Sample size (in count of tablets): 46.

Nuances between genders also appear when considering the profiles displayed by both obverse and reverse faces. While convex/convex tablets prevail overall, four profile

types are attested on male-authored tablets whereas female-authored letters in the sample never display a flat/flat profile [Figure 293].

The preference for tablets with a convex obverse, observed between generations in the previous section, also emerges when considering genders and may be a characteristic feature of Old Assyrian tablets. Distribution patterns of profile types, however, also suggest specific trends between generations or genders, and possibly between individuals.

The distribution of profile types of the small edges – left and right, upper and lower – suggests specific practices between genders. The overall preference for rounded small edges observable on male-authored letters is not reciprocated on female-authored tablets [Figure 294 and Figure 295].

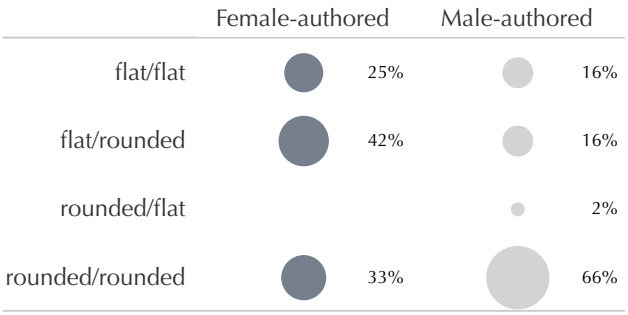


Figure 294: Distribution of tablet profiles (left edge/right edge) between genders

% of Tablets (size) broken down by Gender (colour) vs. Profile: Left/Right Edge. Sample size (in count of tablets): 44.

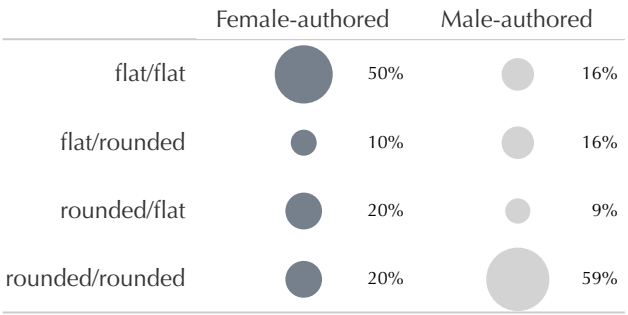


Figure 295: Distribution of tablet profiles (upper edge/lower edge) between genders

% of Tablets (size) broken down by Gender (colour) vs. Profile: Upper/Lower Edge. Sample size (in count of tablets): 44.

The contrast is especially appreciable on the upper and lower edges. While the same four profile types are represented across, female-authored letters appear to favour flat edges while rounded edges prevail on male-authored tablets.

## 5.2 Individuality in Old Assyrian cuneiform

Following on the previous section of this dissertation that analysed the wider trends of writing practices in the Old Assyrian Period, the next paragraphs delve further into the corpus to investigate writing practices within a network of related individuals and singling out one of its members. In doing so, this section addresses the ambivalence of writing as a set of rules and standards performed by individuals, and the extent to which both aspects interact.

### 5.2.1 Family-related patterns of variations?

This case study investigates the interplay of palaeographic and diplomatic variation between genders and generations in a well-documented family of Old Assyrian merchants. Attested from REL 78 to REL 112 (1895 to 1861 BCE), the family of Pušu-ken is known from a court log about the dissolution of a commercial partnership following the death of both parties.[253] The court log includes the list of Pušu-ken's children and relatives, as heirs and trade partners [Figure 296].

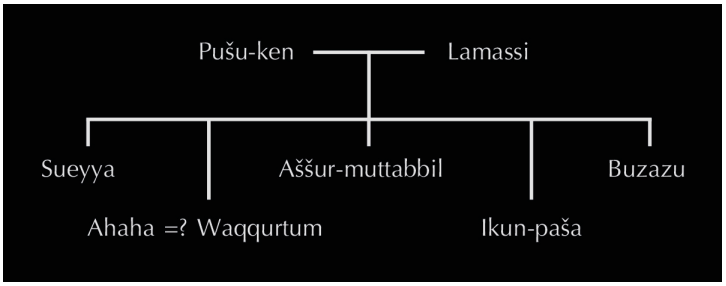


Figure 296: Pušu-ken's family tree

In order to investigate writing practices amongst members of a group, Pušu-ken's family network was selected as one of the best documented families of Old Assyrian traders and for the distinctiveness of its members' personal names to avoid issues related to homonymy. The family of Pušu-ken is also well represented in the collections of the British Museum on which this research focusses, thus ensuring that tablets could be inspected in the original. In addition, Pušu-ken's son Sueyya is also the author of the only direct reference to scribal training in the Old Assyrian corpus.[254] Questions on

[253] ATHE 24 = CDLI: P358356. Kienast, *Die altassyrischen Texte des orientalischen Seminars der Universität Heidelberg und der Sammlung Erlenmeyer-Basel*, (1960), pp. 27-33; Larsen, *Ancient Kanesh: A Merchant Colony in Bronze Age Anatolia*, (2015), pp. 286-287.
[254] BM 115085 = CDLI: P358735.

Old Assyrian scribal training, whether domestic or institutional, and literacy, whether practical or professional, are discussed further in this chapter and in the Conclusion.

Although well-represented in the collections of the British Museum on which this research focusses, not all family members could be equally assessed due to the uneven data available for each. Ikun-paša (son), for example, is not represented at all in the collections, while there is only one letter authored by Aššur-muttabbil (son). Furthermore, uncertainties remain on the family tree about Pušu-ken's daughter or daughters. Although the court log listing Pušu-ken's relatives and heirs only mentions one daughter, Ahaha, a series of lawsuits between Pušu-ken's children over his succession also mentions a certain Waqqurtum.[255] Whether Ahaha and Waqqurtum are distinct individuals or one and the same remains a debated question. Analysing the social ranking of both names in letter introductory formulas, Anderson concludes that Ahaha and Waqqurtum are the name and nickname of the same person, whereas they refer to two distinct individuals according to Kryszat.[256] Since this study assesses palaeographic and diplomatic variation per author, letters from Ahaha and from Waqqurtum are considered separately.

The resulting dataset thus consists of seven authors representing both genders over two generations [Figure 297; Appendix 3.b].

| | **Lamassi** | **Pušu-ken** | **Buzazu** | **Sueyya** | **Ahaha** | **Waqqurtum** | **Aššur-muttabbil** | |
|---|---|---|---|---|---|---|---|---|
| **Tablets** | 3 | 6 | 6 | 3 | 2 | 1 | 1 | **22** |
| **Sign instances** | 184 | 465 | 497 | 109 | 83 | 56 | 43 | **1,437** |

Figure 297: Distribution of sampled data per family member

The proceedings investigate writing practices amongst members of Pušu-ken's family, looking first at palaeographic variations to then assess diplomatic features.

### *Family-related palaeographic variations*

The four variants of $KU_3$ observed in the previous case studies on identity in the Old Assyrian corpus are also represented between members of Pušu-ken's family and

[255] Hertel, *Old Assyrian Legal Practices*, (2013), pp. 347-363.

[256] Anderson, *The Old Assyrian Social Network*, (PhD Dissertation, 2017), pp. 80-81; Kryszat, *Zur Chronologie der Kaufmannsarchive aus der Schicht 2 des Karum Kaneš*, (2004), p. 42.

display distinctive individual patterns [Figure 298]. Both Pušu-ken (father) and Aššur-muttabbil (son) exclusively use the (v5) form, which is also preferred by Lamassi (mother), although not exclusively. In contrast, both Buzazu and Sueyya (sons) disregard the (v5) form altogether.

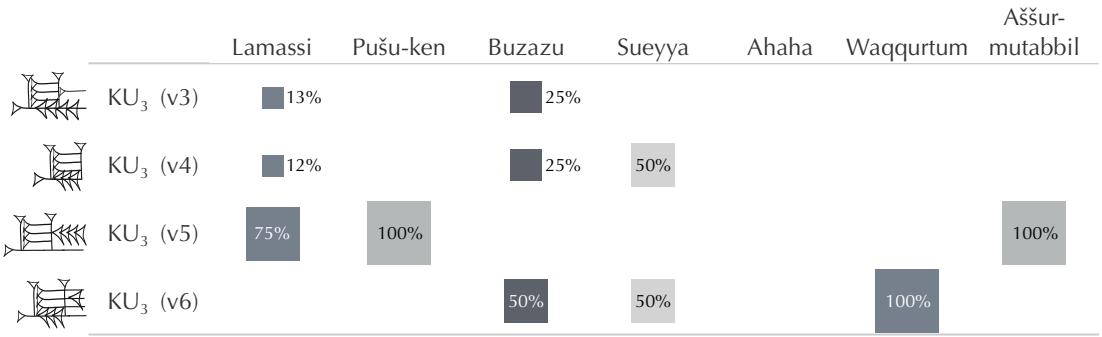


Figure 298: Distribution of variants of $KU_3$ between family members

% of Sign Instances (size) broken down by Family Member (colour) vs. $KU_3$ Variants. Sample size (in count of sign instances): 50. Sample size (in count of tablets): 16.

Individual patterns of variation do not appear related to generations or genders. The (v5) form favoured by mother and father is also used by one of their sons (Aššur-muttabbil) but not by their two others (Buzazu and Sueyya), each using a distinct set of alternative forms but excluding the (v5) variant. Although the limited data available for Aššur-muttabbil, represented by one tablet, may hinder the observation of more variation, it is noteworthy that he uses a variant that is not represented on either of his brothers', Buzazu and Sueyya. Also, the exclusive use of the (v5) form is also found on the larger sample of six letters authored by his father Pušu-ken, while his mother Lamassi favours the (v5) variant amongst others. What is more, Waqqurtum also disregards the (v5) form of $KU_3$ in her letter and should she be one of the family's siblings, Aššur-muttabbil would be the only member of his generation to use a variant of $KU_3$ otherwise only used by his parents.

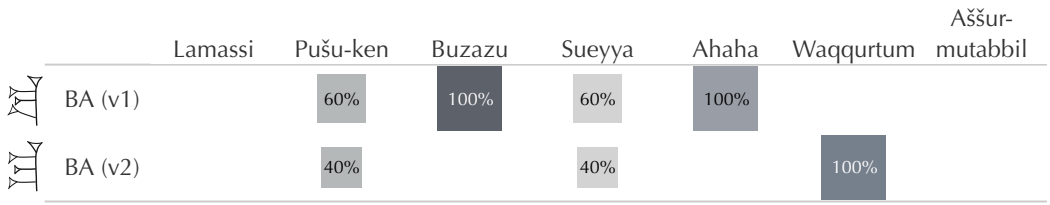


Figure 299: Distribution of variants of BA between family members

% of Sign Instances (size) broken down by Family Member (colour) vs. BA Variants. Sample size (in count of sign instances): 20. Sample size (in count of tablets): 14.

Generation or gender does not seem to influence variation of BA either, with the two variants of the sign unequally represented between family members [Figure 299]. Both Pušu-ken (father) and Sueyya (son) combine both forms of BA, whereas Buzazu (son) exclusively uses the oblique (v1) variant. Ahaha (daughter) and Waqqurtum (presumed daughter) also use variants exclusively yet distinctively, the former favouring the oblique (v1) form and the latter the horizontal (v2) one.

The use of SUR in the family network under study is not widespread and the sample gathered here is therefore limited. Although limited, the distribution of variants of SUR in the sample reveals trends per individual also possibly related to gender [Figure 300]. The upright (v2) form is positively not used by Lamassi (mother) and Ahaha (daughter), whereas it is exclusively preferred by Pušu-ken (father), Buzazu (son) and Aššur-muttabbil (son). This distribution of variants may suggest preferences per gender with the tilted (v1) form favoured on female-authored letters, and the upright (v2) on male-authored letters.

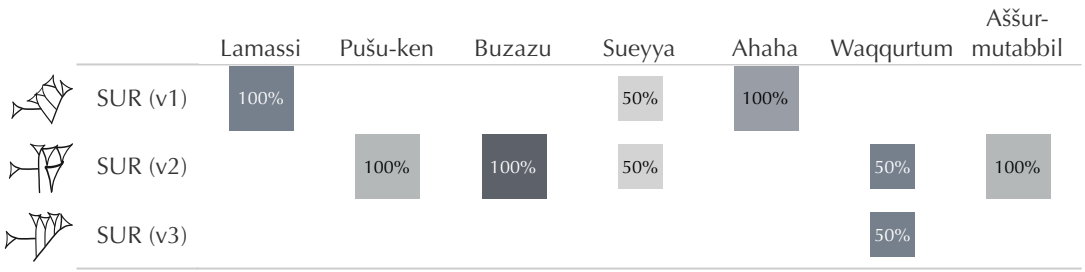


Figure 300: Distribution of variants of SUR between family members

% of Sign Instances (size) broken down by Family Member (colour) vs. SUR Variants. Sample size (in count of sign instances): 17. Sample size (in count of tablets): 8.

Two family members, however, reveal distinctive patterns, each combining variants of SUR differently. Although the upright (v2) form is also used by Sueyya (son), it is combined with the upright (v1) variant. Furthermore, the upright (v2) form is also used by Waqqurtum (presumed daughter), along with the otherwise unattested in the network (v3) variant. The contrast previously observed between Ahaha (daughter) and Waqqurtum (presumed daughter) can thus also be observed here.

Variation of SUR had previously appeared related to chronology, with the upright (v2) form characteristic of later tablets. Within this family network, however, SUR appears more closely related to gender than to chronology.

While previous signs revealed distinctive patterns between family members, the distribution of variants of IM and $TI_2$ both appear consistent within the sample. Regardless of age or gender, all but one family members represented in the sample exclusively use the (v1) form of IM [Figure 301]. Only letters authored by Buzazu (son) stand out by also displaying the (v2) form of IM, although not predominantly.

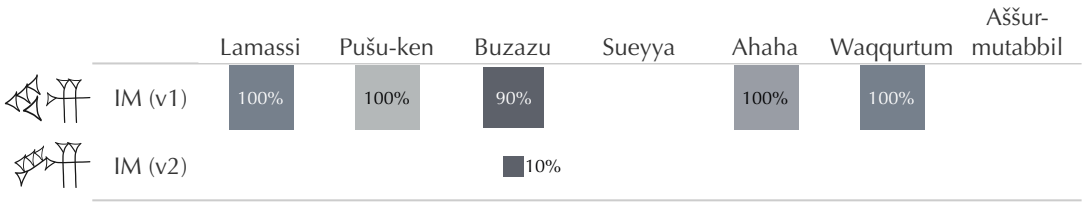


Figure 301: Distribution of variants of variants of IM between family members

% of Sign Instances (size) broken down by Family Member (colour) vs. IM Variants. Sample size (in count of sign instances): 27. Sample size (in count of tablets): 12.

The distribution of variants of $TI_2$ across individuals reveals a similar pattern [Figure 302]. With all family members represented in the sample, only Buzazu and Sueyya (sons) make use of the two variants of $TI_2$, although both overall favour the (v1) form like their relatives.

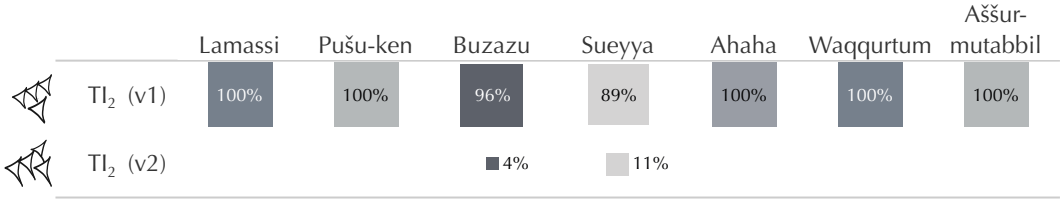


Figure 302: Distribution of variants of variants of $TI_2$ between generations

% of Sign Instances (size) broken down by Family Member (colour) vs. $TI_2$ Variants. Sample size (in count of sign instances): 81. Sample size (in count of tablets): 21.

The unequivocal preference for the respective (v1) forms of both IM and $TI_2$ mirrors the patterns previously observed over time and between genders.

To summarise, signs such as $KU_3$, BA and SUR appear distinctive between individuals regardless of age or gender on the one hand, while on the other hand, IM and $TI_2$ both reveal consistent patterns across individuals, with little to no variation at all. The consistent practices observed on IM and $TI_2$ within this family network had already been observed between genders and generations, suggesting a unifying trait of Old Assyrian cuneiform. Furthermore, considering the special case of Ahaha (daughter) and Waqqurtum (presumed daughter), it is noteworthy that the two authors show distinct practices in their use of $KU_3$, BA and SUR and none at all in their use of IM and $TI_2$.

The individual signs analysed above reveal distinct patterns of palaeographic variation between members of Pušu-ken's family, whether suggesting individual practices or echoing wider trends related to gender and chronology.

Similarly, the palaeographic variation observed amongst structural groups of signs reveal this same mixed pattern of shared practices and individual nuances. Overall, however, practices between family members appear more consistent and shared across when considering palaeographic variants within structural groups of signs.

The distribution of variants of KAŠ-based signs, such as BI or GA, mirrors the patterns previously observed between generations and genders. Both diagonal (v1) and *winkelhaken* (v2) forms are used across all members of Pušu-ken's family, although the (v2) variant is favoured overall [Figure 303].

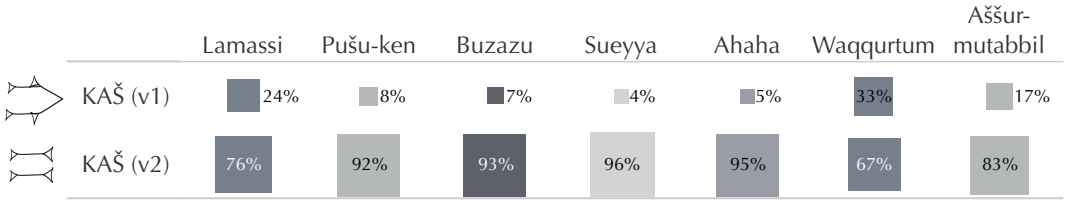


Figure 303: Distribution of KAŠ-based variants between family members

% of Sign Instances (size) broken down by Family Member (colour) vs. KAŠ-based Variants. Sample size (in count of sign instances): 275. Sample size (in count of tablets): 21.

Nuances can, however, be observed in the distribution of the two variants per author, inasmuch as both Lamassi (mother) and Waqqurtum (presumed daughter) use the diagonal (v1) variant more frequently than their relatives.

Variation of signs composed of a Box-frame, such as KU or MA, does not suggest strongly distinctive patterns within the family network under study, with the adjoining (v2) form prevailing throughout [Figure 304]. The interlocked (v1) variant is only used by Pušu-ken and rarely, while the overlaid (v3) form is widespread yet not frequent. At group level, tablets authored by Sueyya stand out as almost equally favouring both adjoining (v2) and overlaid (v3) forms. This distinctive pattern can also be observed at sign level and suggests a specific use of the (v3) variant to write instances of MA [Figure 305].

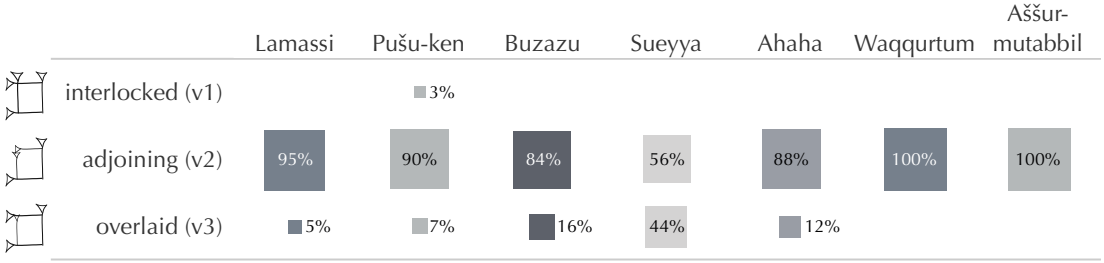


Figure 304: Distribution of Box-framed variants between family members

% of Sign Instances (size) broken down by Family Member (colour) vs. Box-framed Variants. Sample size (in count of sign instances): 180. Sample size (in count of tablets): 21.

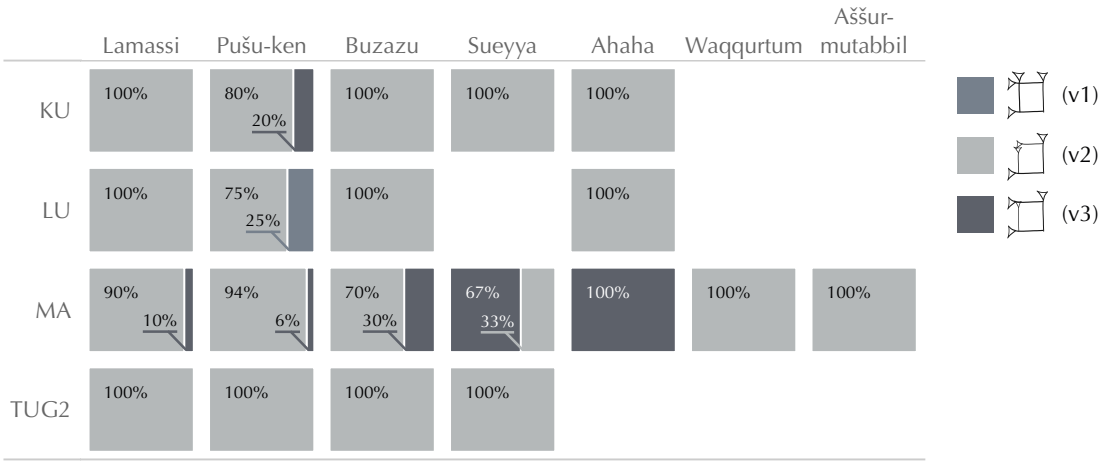


Figure 305: Distribution of Box-framed variants across signs and between family members

% of Sign Instances (size) broken down by Sign Name and by Family Member vs. Box-framed Variants (colour). Sample size (in count of sign instances): 178. Sample size (in count of tablets): 21.

The distribution of palaeographic variants in the ŠE-cluster group reveals consistent practices between family members [Figure 306]. There is strictly no variation between father, sons and daughters, all exclusively using the 2-unequal row (v3) variant. In contrast, Lamassi (mother) stands out as the only family member using three variants of the ŠE cluster almost equally and not favouring the (v3) form like her relatives. Furthermore, considering individual signs within the ŠE-cluster group also reveals distinctive and specific practices on letters authored by Lamassi (mother) [Figure 307]. Within the sample, LI is exclusively written with two unequal rows of *winkelhaken* (v3), and while this variant is also attested for ZI and IN, both these signs seem to be attached to distinct variants: two equal rows of *winkelhaken* (v2) for ZI and three rows (v1) for IN.

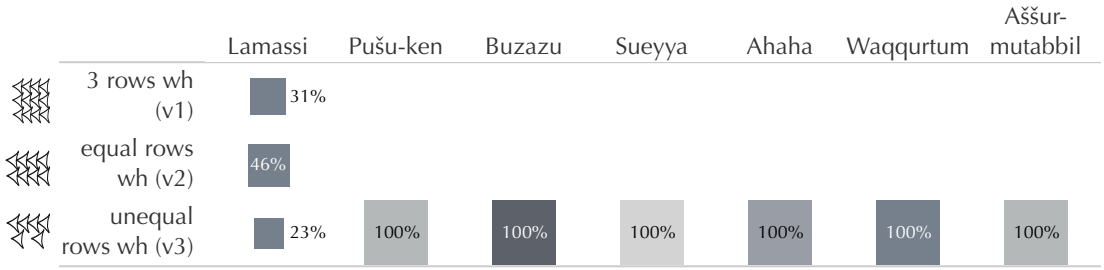


Figure 306: Distribution of ŠE-cluster variants between family members

% of Sign Instances (size) broken down by Family Member (colour) vs. ŠE-cluster Variants. Sample size (in count of sign instances): 74. Sample size (in count of tablets): 22.


Figure 307: Distribution of ŠE-cluster variants across signs and between family members

% of Sign Instances (size) broken down by Sign Name and by Family Member vs. ŠE-cluster Variants (colour). Sample size (in count of sign instances): 69. Sample size (in count of tablets): 22.

Whereas Lamassi's relatives all use the same ŠE cluster regardless of the sign it is part of, such distinctive pattern, only observed on letters authored by Lamassi, suggests that each sign would have been considered individually rather than all being signs composed of a ŠE cluster. In turn, it would be tempting to postulate that it also suggests that each sign could have been learnt separately. There is, however, little evidence available about how Old Assyrian merchants learnt to write. Whereas practice tablets from Old Babylonian Nippur attest of the curriculum starting with mastering the impression of elementary cuneiform wedges, only a few school texts and no practice tablets are known for Old Assyrian cuneiform.[257] Whether the distinctiveness of Lamassi's letters observed above relates to her training is difficult to ascertain, and

[257] On Old Babylonian practise tablets, see Tinney, 'Texts, Tablets, and Teaching. Scribal Education in Nippur and Ur', *Expedition* 40 (1998), pp. 40-50. On Old Assyrian school texts and scribal education, see Hecker, 'Schultexte vom Kültepe', in Mellink et al., eds., (1993), pp. 281-291; Michel, 'Écrire et compter chez les marchands assyriens du début du IIe millénaire av. J.-C.', in Tarhan et al., eds., (2008), pp. 349-351. For a list of Old Assyrian school texts, see Michel, 'Old Assyrian Bibliography 2', *AfO* 52 (2011), p. 432.

questions relating to scribal education in the Old Assyrian Period will be addressed at the end of this chapter and in the Conclusion.

The distribution of palaeographic variants within structural groups of signs displays practices generally shared between family members, and while nuances may appear between individuals, they do not reveal consistently idiosyncratic patterns overall. Altogether, palaeographic variation considered on individual signs as well as within structural groups of signs, highlights a multiplicity of practices differently combined per tablet and per author. As such, there are no two tablets showing the exact same combination of variants for every feature assessed above. While no consistently idiosyncratic pattern could be identified through palaeography, the above analysis brought new evidence to the case of Ahaha and Waqqurtum, and whether they are two persons or one and the same. On palaeographic grounds, the former would appear more likely insofar as tablets authored by Ahaha or Waqqurtum consistently use different sign variants. However, considering the array of variation observed across family members, the palaeographic analysis alone cannot ascertain if Ahaha and Waqqurtum are one or two persons. Furthermore, the palaeographic profiles of each tablet should also be understood in the broader context of writing practices and literacy in the Old Assyrian Period, especially the use of scribes by merchants and their relatives. The palaeographic assessment of letters authored by members of Pušu-ken's family and the question of identity and individuality in writing practices therefore needs to be supplemented by diplomatic data to investigate the interaction between signs and the tablets they are impressed on.

### *Family-related diplomatic variations*

Tablet formats are relatively consistent within the sample, with the portrait format prevailing throughout [Figure 308]. Both Pušu-ken (father) and Ahaha (daughter) exclusively use portrait letters. While Buzazu and Sueyya (sons) also favour this format, their letters also attest to landscape tablets, albeit to a lesser extent. Buzazu also stands out from the sample as the only author also using the square format for his letters. In contrast, Lamassi (mother) seems to follow a different trend, favouring the landscape format over the otherwise prevailing portrait letters.

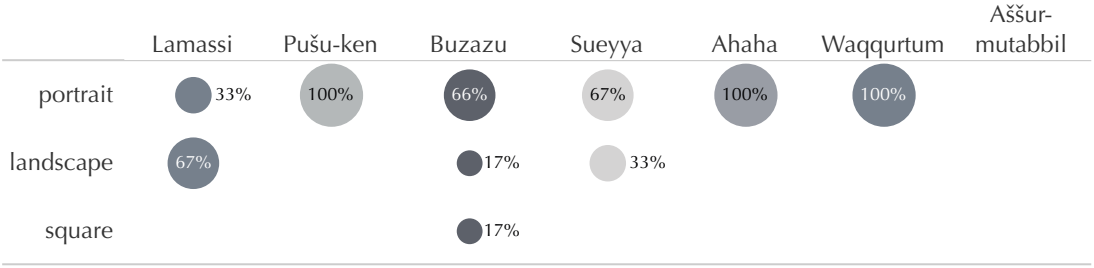


Figure 308: Distribution of tablet formats between family members

% of Tablets (size) broken down by Family Member (colour) vs. Formats. Sample size (in count of tablets): 20.

Tablet formats had previously displayed a consistent and undistinctive distribution over time and between genders. Within this family network, tablet formats appear more distinctive across individuals, and it is noteworthy that the letters authored by Pušu-ken (father) are exclusively in portrait format, that his sons Buzazu and Sueyya opt for more variation while following the same main trend, and his wife Lamassi goes in an opposite direction preferring landscape-oriented letters.

The distribution of tablet profile types distinguishes between family members across generations and genders [Figure 309]. Convex/convex tablets are attested for Lamassi (mother), Pušu-ken (father) and Ahaha (daughter), whereas Sueyya's tablets all display a convex/flat profile. Both profiles – convex/convex and convex/flat – are, on the other hand, attested on letters authored by Buzazu (son). Aššur-muttabbil (son) and Waqqurtum (presumed daughter) stand out with their use of flat/convex tablets. This tablet profile type had previously already been observed as undistinctive over time and between genders.

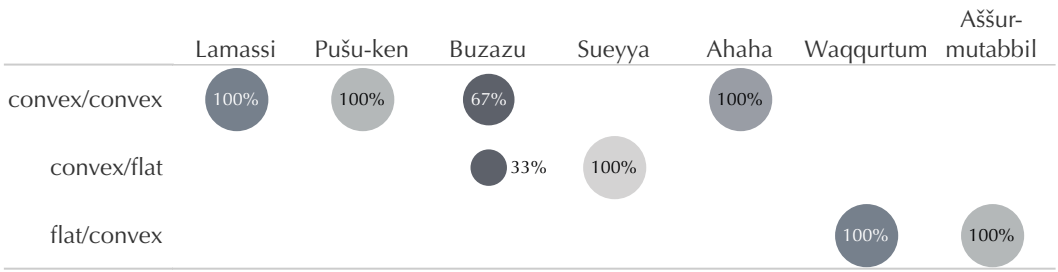


Figure 309: Distribution of tablet profiles (obverse/reverse) between family members

% of Tablets (size) broken down by Family Member (colour) vs. Profile: Obverse/Reverse. Sample size (in count of tablets): 22.

Considering the profile types of corners and small edges, whether left and right or upper and lower edges, also reveals patterns attached to individuals rather than relating to wider generational trends or to gender.

This is especially true of tablet corner profiles, displaying a wide array of variation across family members whereas they had previously revealed no distinction at all between neither generations nor genders. Across family members, however, corner profiles vary regardless [Figure 310]. Lamassi (mother) and Buzazu (son) both favour pinched corners while also attesting other profile types. Conversely, Pušu-ken (father) and Sueyya (son) prefer squared corners over pinched ones. Of the five children, only Ahaha (daughter) and Aššur-muttabbil (son) display similar practices regarding corner profiles, exclusively squared, although such exclusivity may also come from the limited data available for each.

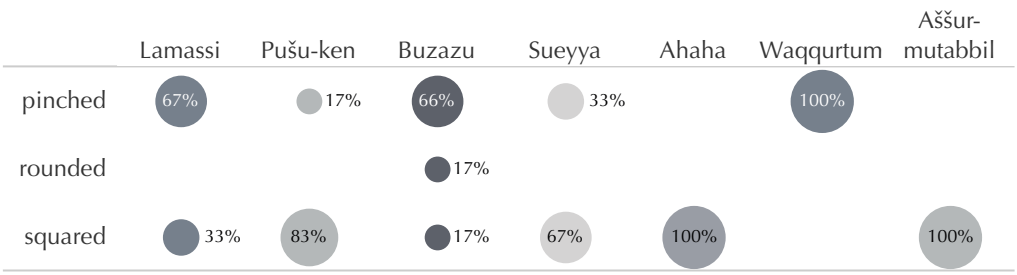


Figure 310: Distribution of tablet profiles (corners) between family members

% of Tablets (size) broken down by Family Member (colour) vs. Profile: Corners. Sample size (in count of tablets): 22.

The profile types of both upper and lower edges which had previously revealed no distinction between generations are more distinctive across individuals [Figure 311]. Furthermore, the distribution of profiles between family members also does not mirror the patterns already observed between genders whereby the flat/flat profile was more widespread on female-authored letters, whereas male-authored tablets favoured the rounded/rounded type. While within this sample, the flat/flat profile is indeed preferred by Lamassi (mother) and Waqqurtum (presumed daughter), it is completely overlooked by Ahaha (daughter). She, instead, favours the rounded/rounded type, like her father Pušu-ken and brother Buzazu. Across family members, it is also noteworthy that only letters authored by Buzazu and Sueyya also display flat/rounded and rounded/flat edges, two profile types otherwise unattested within the sample.

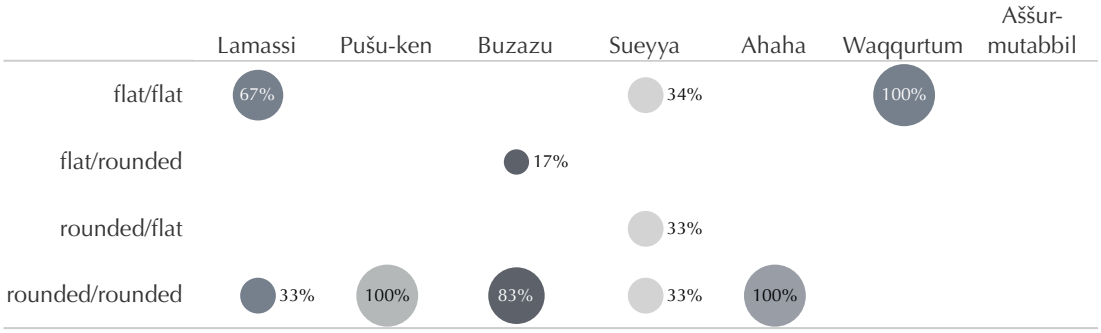


Figure 311: Distribution of tablet profiles (upper edge/lower edge) between family members

% of Tablets (size) broken down by Family Member (colour) vs. Profile: Upper/Lower Edge. Sample size (in count of tablets): 19.

Finally, the profile types of both left and right edges also appear attached to individuals rather than to the generational or gender-related trends presented earlier [Figure 312]. For instance, while the flat/flat type was equally used amongst other types on a third of female-authored tablets, it is only found on one tablet in this sample.

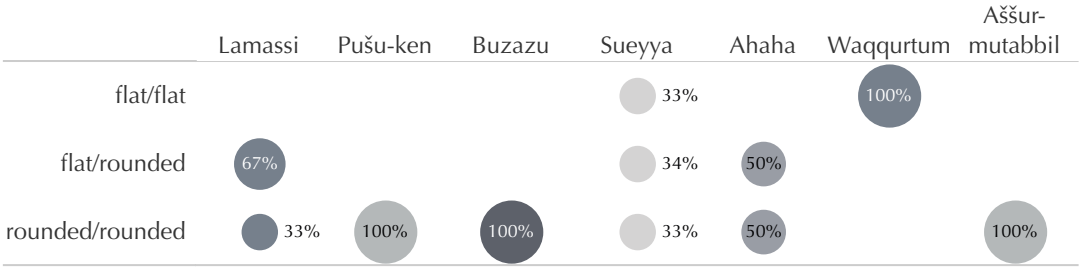


Figure 312: Distribution of tablet profiles (left edge/right edge) between family members

% of Tablets (size) broken down by Family Member (colour) vs. Profile: Left/Right Edge. Sample size (in count of tablets): 20.

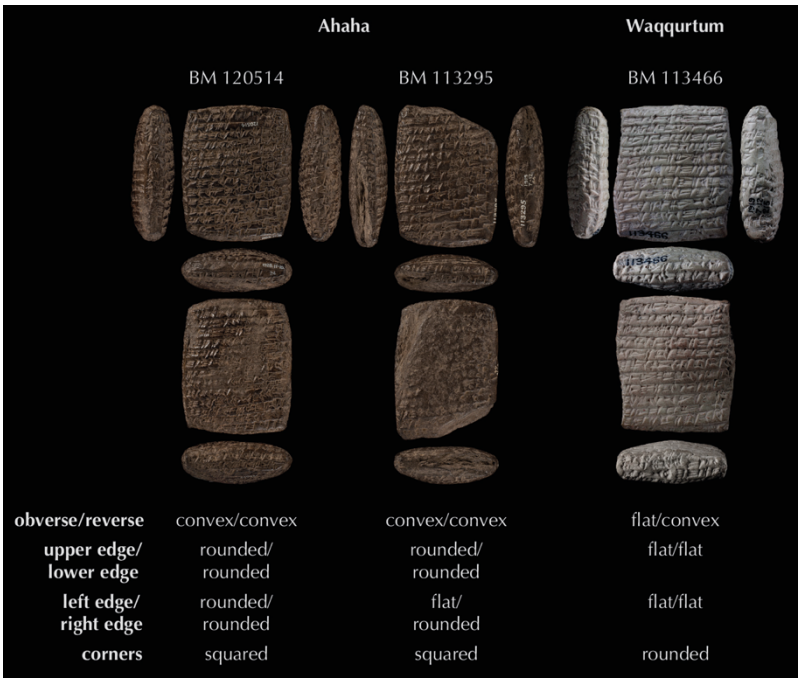


Figure 313: Morphological types between tablets authored by Ahaha and Waqqurtum

Noticeably, Ahaha (daughter) and Waqqurtum (presumed daughter) each display distinct patterns of diplomatic variation, adding to the differences already observed through palaeography, and further suggesting that they were two individuals and not the same person [Figure 313].

In contrast to tablet formats and tablet profile types, ruling practices appear consistent between family members. The break between lines of text on the upper edge and the left edge is never marked by a separation line while closing lines are seldom attested to mark the end of the letter [Figure 314].

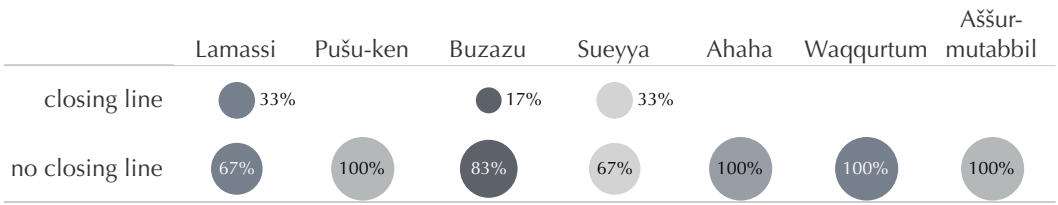


Figure 314: Distribution of ruling types (closing line) between family members

% of Tablets (size) broken down by Family Member (colour) vs. Ruling Type: Closing Line. Sample size (in count of tablets): 21.

Closing lines are nonetheless found on a few letters authored by Lamassi (mother), and Buzazu and Sueyya (sons). Those Lamassi's and Sueyya's letters bearing a closing line are partially inscribed, following a practice already observed in previous case studies

whereby the end of a letter is physically marked when the text does not cover the whole writing surface on the reverse of a tablet. Conversely, none of Buzazu's letters are partially inscribed, yet a line is drawn to mark the end of the letter even if the text ends on the lower edge of the tablet on BM 113394.

Text alignment across the writing surface shows a consistent practice across family members [Figure 315]. A few letters authored by Pušu-ken (father) and Buzazu (son) have, however, sections of text that appear justified across the length of the tablet.

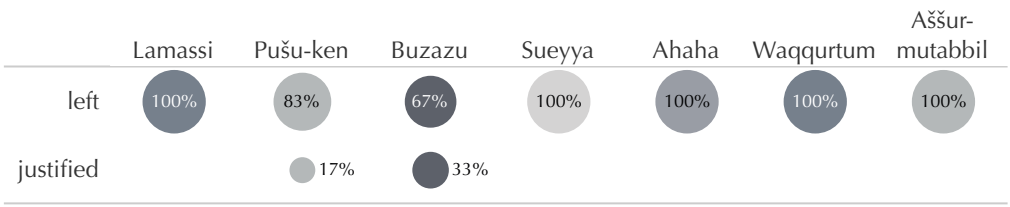


Figure 315: Distribution of text justification practices between family members

% of Tablets (size) broken down by Family Member (colour) vs. Text Justification. Sample size (in count of tablets): 22.


Figure 316: Text justification on a letter authored by Buzazu

This is especially visible on BM 113433, authored by Buzazu [Figure 316]. Although not all lines are justified on this letter, with some also overstepping on the edge of the tablet, the text on the obverse seems to align to the right. Assessing the alignment of the text can prove challenging and it is all too often impossible to ascertain whether justified lines of text were voluntarily laid out that way or by pure happenstance. Be that as it may, whether the distinctive text alignment on BM 113433 was planned or not, text justification is not a consistent feature amongst letters authored by Buzazu, or even amongst his relatives. In this case, text alignment therefore singles out one tablet in the sample, rather than identifying a consistent pattern attached to an individual author.

The above assessment of diplomatic variation across members of Pušu-ken's family thus reveals varying practices in terms of tablet formats and shapes whereas text formatting and layout appear more consistent throughout. Tablet formats and shapes also appear more closely related to individual authors and less to wider generational trends or to genders. As such, diplomatics joins palaeography in also highlighting a multiplicity of practices differently combined per tablet and per author.

This case study, investigating writing practices amongst members of Pušu-ken's family, segregated tablets per author, and the analysis revealed no idiosyncratic patterns combining recurring palaeographic or diplomatic features that would consistently identify an individual amongst the group. It would therefore be tempting to conclude that there was no characteristically recognisable hand in the study sample. However, the identification of individual writing hands may also have been hindered by the original postulate taken for this case study, attaching letters to their respective authors. The next case study therefore looks at letters from one author only to investigate whether the author and the writer of a letter must be the same person or if the two roles can be performed by different individuals.

### 5.2.2 Pušu-ken: letter author, letter writer?

This final case study draws from the previous one and focusses on letters authored by Pušu-ken, one of the most influential Old Assyrian merchants. Whereas Pušu-ken's archives have not yet been located and thus edited and published, his career and activities were recently reconstructed through social network analysis, confirming his position at the centre of Old Assyrian trade that already transpired from his papers, scattered across museum collections.[258] This case study assesses palaeographic and diplomatic variation on the letters authored by Pušu-ken housed in the collections of the British Museum, excluding co-authored letters. The resulting dataset consists of six letters and 465 sign instances [Appendix 3.b].

[258] On the possible location of Pušu-ken's archives, see Hertel, 'The Lower Town of Kültepe: Urban Layout and Population', in Atici et al., eds., (2014), p. 34. On the social network analysis of Pušu-ken's activities, see Anderson, *The Old Assyrian Social Network*, (PhD Dissertation, 2017), pp. 77-83, 270 figure 6.1.

## *Palaeographic variations*

Overall the array of palaeographic variation on Pušu-ken's letters is consistent with what could be observed in previous case studies in Chapter 3 and earlier in this chapter. Drawing in new criteria, however, reveals distinctive traits. Focussing on a smaller dataset indeed enables a closer look into palaeographic and diplomatic variations while keeping a manageable dataset, even with the addition of new criteria. In this case study, the writing sequence of wedges, for instance, receives a greater attention than could be managed and achieved in other datasets, helped also by the excellent condition of the tablets to observe this feature.

The consistency of the two signs IM and $TI_2$, already observed in previous samples in this chapter, also appears on letters authored by Pušu-ken. The respective (v1) forms of both IM and $TI_2$ are exclusively used across tablets. This holds true for variants of ŠE-cluster signs, exclusively written with two unequal rows of *winkelhaken* (v3) across instances of IN, LI or ZI. Similarly consistent patterns can also be observed on signs composed of a KAŠ element, predominantly written with two *winkelhaken* (v2) [Figure 317]. When the two KAŠ-based variants are used, they reveal consistent patterns per sign, so that on BM 115135, for example, the diagonal (v1) form is exclusively used for instances of ŠA whereas all other signs display the *winkelhaken* (v2) form.

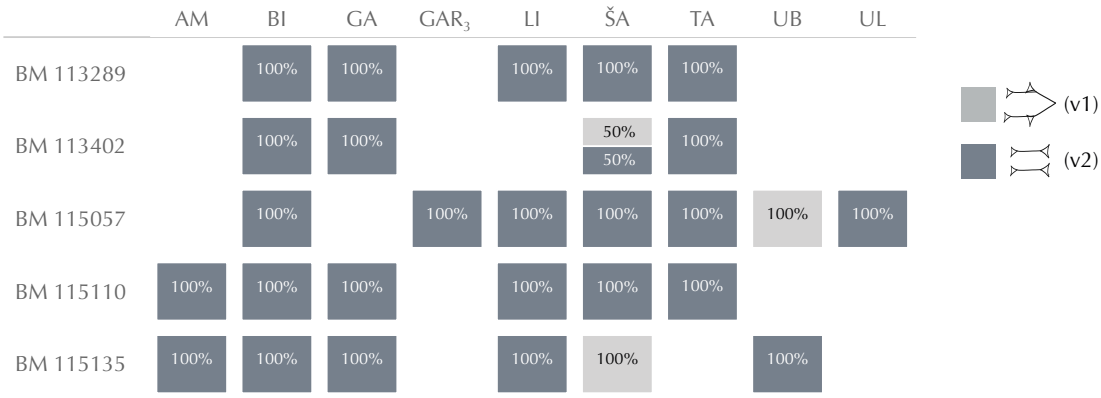


Figure 317: Distribution of KAŠ-based variants across signs on letters authored by Pušu-ken

% of Sign Instances (size) broken down by Sign Name and by Tablet vs. KAŠ-based Variants (colour). Sample size (in count of sign instances): 76. Sample size (in count of tablets): 5.

Different variants being used across instances of a same sign are only attested for ŠA on BM 113402 [Figure 318]. The two variants of ŠA are also equally used on BM 113402, with four instances each.

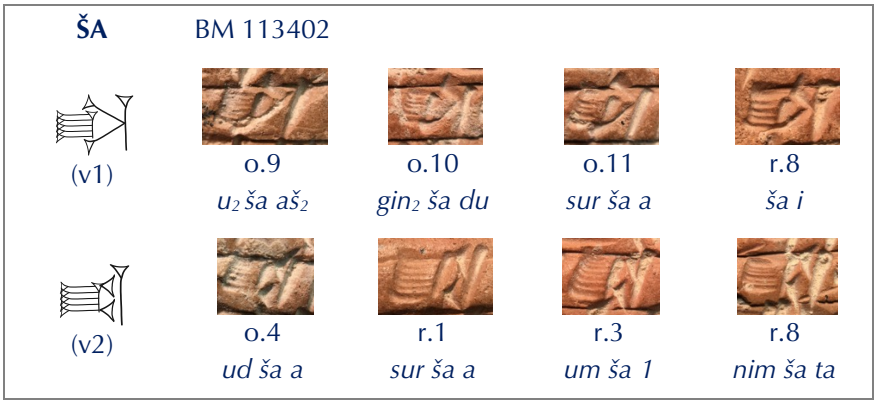


Figure 318: Two variants of ŠA on BM 113402

All instances of ŠA on BM 113402, regardless of variant, are located on the body of the tablet, suggesting that the choice of variants is not related to the location of the instance on the tablet. However, diagonal (v1) forms are mostly found on the obverse while their *winkelhaken* (v2) counterparts appear on the reverse of the tablet. On r.8, a line carrying two instances of ŠA, the *winkelhaken* (v2) form is found on the instance located in the middle of the line whereas the diagonal (v1) variant is used at the beginning of the line, where ŠA is also the first sign to be inscribed. Considering strings of preceding and following signs, however, does not suggest any correlation with the choice of variant. Similarly, sign value seems to have no bearing on sign variant. The personal name Uṣur-ša-Aššur, for example, is mentioned twice on BM 113402, each mention using a different variant of ŠA (diagonal (v1) on o.11, *winkelhaken* (v2) on r.1). The variation of ŠA on BM 113402 appears unrelated to either instance location, sign value or sign sequence, therefore suggesting that both forms are known to the writing hand and used almost interchangeably.

On letters authored by Pušu-ken, the sign KI is consistently written with the same variant form composed of an open three-wedge frame encasing a stack of horizontals. Visible variation between sign instances regards the slant of the framing wedges and the length of the inner stack of horizontal wedges, whether extending outside the frame to the right or enclosed within the limits of the frame. The number of horizontal wedges within the frame also varies, from three to six.

BM 115057 stands out from the set of Pušu-ken's letters with a unique variation of KI written with a four-wedge frame [Figure 319]. All other instances of KI on BM 115057 are written with a three-wedge frame. This peculiar form of KI is used on the first line of the tablet in the opening formula *qi₂-bi-ma*, whereas on all other letters authored by Pušu-ken, instances of KI in the opening formula do not differ from those in the rest of

the text. Sign instance location or sign value appear unrelated to the choice of variants of KI on BM 115057, therefore suggesting that the two forms of KI are known of and belong to the same writing hand.


Figure 319: Variant of KI on BM 115057

The sign UD attests of two variants used on letters authored by Pušu-ken [Figure 320 and Figure 321]. Consistent and exclusive patterns between the two variants segregate tablets into two distinct groups.

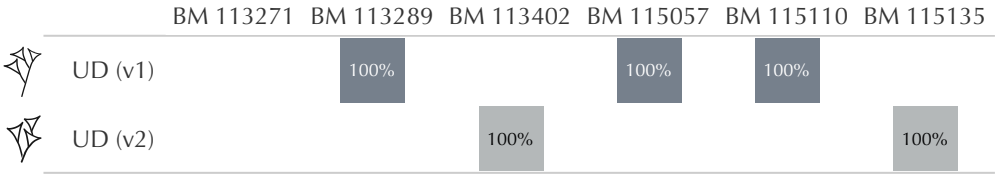


Figure 320: Distribution of variants of UD on letters authored by Pušu-ken

% of Sign Instances (size) broken down by Tablet vs. UD Variants (colour). Sample size (in count of sign instances): 22. Sample size (in count of tablets): 5.

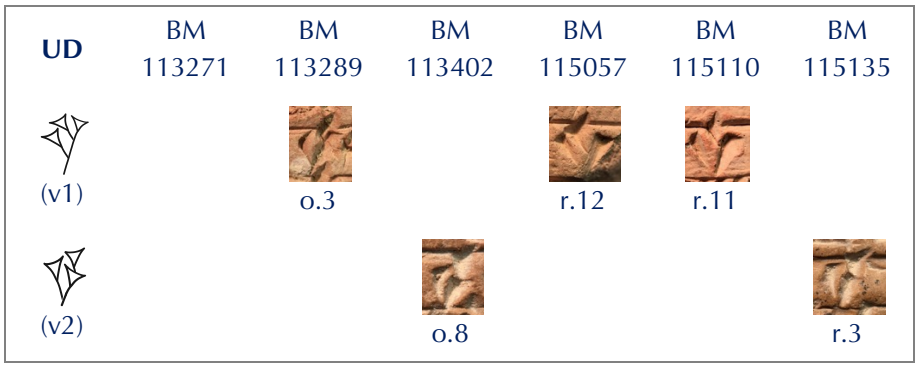


Figure 321: Variants of UD on letters authored by Pušu-ken (detail)

Distinction between tablets can also be observed through a set of signs only represented by small datasets of one instance per tablet [Figure 322]. Although the limited amount of data for such signs does not enable to assess intra-manuscript variation, the distribution between tablets may be compared to that of signs with larger datasets.

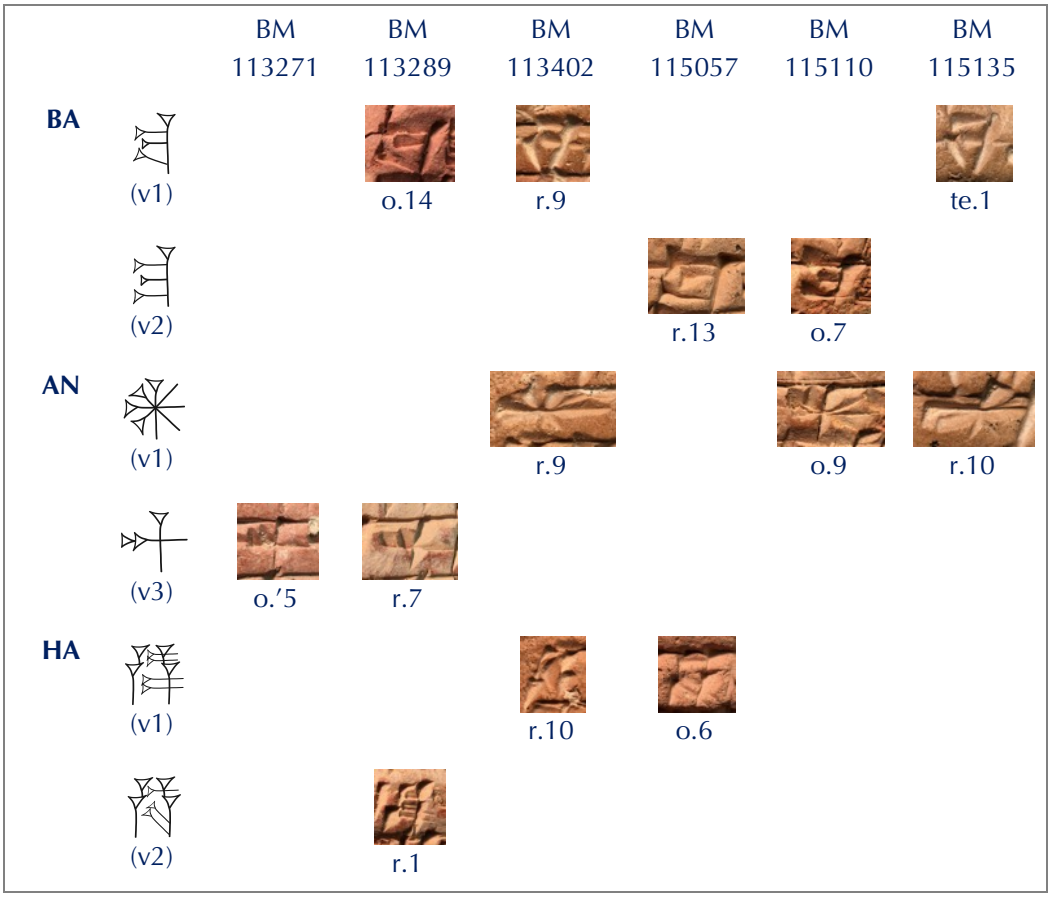


Figure 322: Variants of BA, AN and HA on letters authored by Pušu-ken

Two variants of NU can be observed on Pušu-ken's letters. The (v1) variant is composed of a horizontal wedge overlapping two nested *winkelhaken*. This is the most common form of NU in Old Assyrian cuneiform, known from manuscripts and sign lists.[259] The (v2) form is not attested in known Old Assyrian sign lists. It is composed of a horizontal wedge overhanging two *winkelhaken*. The distribution of variants between manuscripts segregates tablets into two groups [Figure 323]: those using the common (v1) form, BM 113402 and BM 115135; and those using the unusual (v2) variant, BM 113289, BM 115057 and BM 115110.

[259] Smith, ed., *CCT 1*, (1921), plate A; Kouwenberg, *Introduction to Old Assyrian*, (2019), p. 30. Although these are not palaeographic sign lists, it is interesting to note that they all include a single form of NU. As for the general sign lists, Labat's also include a single form of NU, while Old Assyrian manuscripts are not well represented in Fossey's.

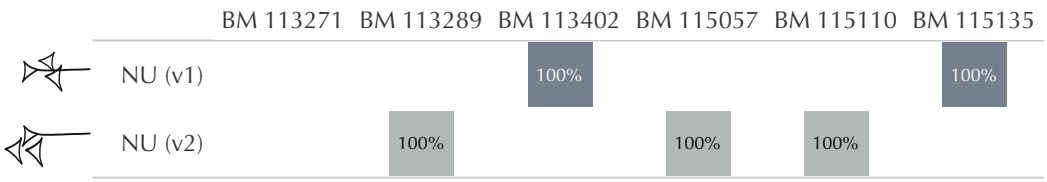


Figure 323: Distribution of variants of NU on letters authored by Pušu-ken

% of Sign Instances (size) broken down by Tablet vs. NU Variants (colour). Sample size (in count of sign instances): 9. Sample size (in count of tablets): 5.

While other palaeographic features studied in this section also segregate letters authored by Pušu-ken into groups based on community of practice, they do so by relying on widely observed variants and sorting tablets accordingly. In the case of NU, tablets are singled out for their peculiarity, and the otherwise unattested use of the (v2) form.

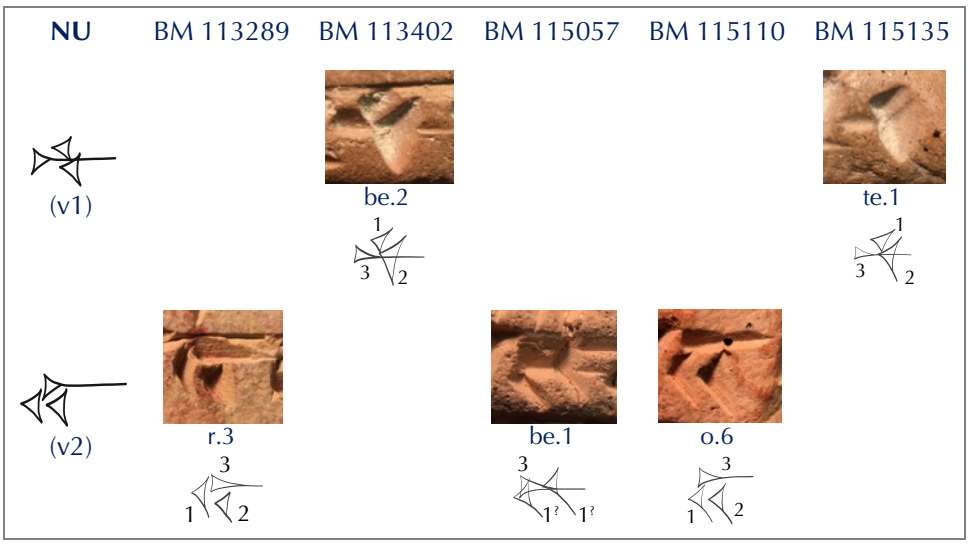


Figure 324: Writing sequence in variants of NU on letters authored by Pušu-ken

While the form (v2) is unusual, it displays a similar writing sequence of wedges as its more common counterpart (v1), with the horizontal impressed last [Figure 324]. As noted by Taylor in his diachronic study of the writing sequence of wedges, NU is a particularly stable sign in that the horizontal wedge is consistently impressed last, from Early Dynastic to Neo-Assyrian times.[260] It is therefore interesting to note that the fundamentals of sign formation are observed on all forms of NU, whether common (v1) or unusual (v2). This could also mean that the writing hand behind the (v2) form of NU learned how to form signs correctly, in turn suggesting that although Old Assyrian cuneiform appears non-uniform, it would still be based on formal scribal training.

The sign $LA_2$ has a limited palaeographic potential due to its composition – two wedges at an angle – only little prone to variation in wedge count, wedge type or wedge

[260] Taylor, 'Wedge Order in Cuneiform: A Preliminary Survey', in Devecchi et al., eds., (2015), p. 16.

placement. The two-wedge composition of $LA_2$ also tends to hinder the writing sequence of wedges, as also observed for other two-wedge signs, especially crossing wedges, although the wedges in $LA_2$ are not crossing per se, rather meeting.[261] While instances of $LA_2$ on letters authored by Pušu-ken do not depart from the rules mentioned above, their writing sequence can be observed clearly on three tablets. This is partly due to the wetness of the clay when the letters were written, highlighting the displacement of matter from which the order of impression can be deduced. The writing sequence of wedges on instances of $LA_2$ on those three letters is consistently applied: horizontal first, vertical last [Figure 325].[262]

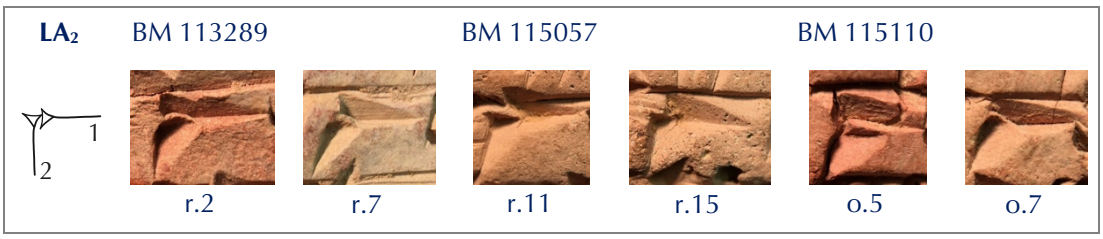


Figure 325: Writing sequence of $LA_2$ on letters authored by Pušu-ken

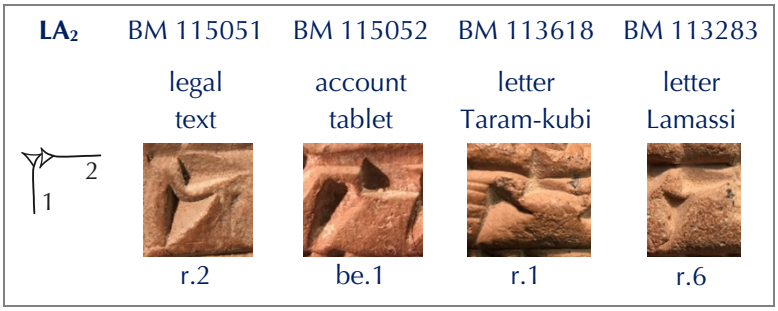


Figure 326: Writing sequence of $LA_2$ on Old Assyrian tablets (legal, account, letters)

Although instances of $LA_2$ revealing the order of impression of wedges are rare, the sequence observed on Pušu-ken's letters contradicts other examples observed across samples in this study where the horizontal wedge is impressed first [Figure 326]. It is also interesting that the sign MAŠ, also composed of two wedges, should follow the 'standard' sequence (horizontal, vertical) on letters authored by Pušu-ken as well as on the documents shown in Figure 326. Considering that those same letters also display similar writing sequences of NU, as presented above, the example of $LA_2$ certainly questions the nature of Old Assyrian cuneiform and how scribal choice may contradict scribal training in the practice of writing. Although the lack of comparative data hinders

[261] Sallaberger, 'Sign List: Palaeography and Syllabary', in Ismail et al., eds., (1996), p. 61. The interactions between crossing wedges are further investigated by Taylor in his Group 1: MAŠ, PA, AN (Taylor, 'Wedge Order in Cuneiform: A Preliminary Survey', in Devecchi et al., eds., (2015), pp. 3-6 and 13-14).

[262] This peculiar sequence was already observed on BM 113289 by Taylor (Taylor, 'Wedge Order in Cuneiform: A Preliminary Survey', in Devecchi et al., eds., (2015), p. 16).

any conclusive interpretation, it remains that the writing sequence of $LA_2$ observed on Pušu-ken's letters stands out as an unusual feature, specifically attached to this sign.

Considered together, the palaeographic variation per sign and per group of signs observed on letters authored by Pušu-ken reveal two groups of tablets with fully or closely matching combination of patterns [Figure 327]. On the one hand, BM 115057 and BM 115110 are palaeographically similar and both display the same respective variants of BA, NA, UD, NU and AN. BM 113289 is also palaeographically close to tablets in Group 1, with matching variants of NA, UD and BA, in addition to the very specific (v2) form of NU. On the other hand, BM 113402 and BM 115135 are palaeographically close to each other with matching variants of NU, UD and BA.


Figure 327: Two sets of palaeographically matching letters authored by Pušu-ken

Beyond sharing similar features, the two groups differ in the nature of their respective shared features. The tablets in Group 2 show matching palaeographic profiles in that they both display a similar combination of features, although the variations are otherwise attested and could be observed throughout study samples in this research. Although the tablets in Group 1 also share similar combination of attested features, they single themselves out by the peculiar variations they display, otherwise unattested: the (v2) form of NU, the writing sequence of $LA_2$. On palaeographic grounds, therefore, the letters authored by Pušu-ken could have been inscribed by two distinct writing hands, at least. However, considering the observation made in the previous case study and that an individual hand could know more than one sign variant, it could also be that the balance of forms shifted from one manuscript to the other. Although the evidence is

rather compelling, it also mainly emphasizes the contrasting palaeographic patterns between tablets in Group 2 and those in Group 1.

### *Diplomatic variations*

Diplomatic features such as ruling, format and profile do not reveal distinctive patterns between letters authored by Pušu-ken. All six tablets display an overall convex profile with rounded small edges. There also seems to be no obvious correlation between left edge profile and text layout since the rounded profile is applied to bare left edge and to those inscribed with up to four lines alike.

Conversely, inscription features such as script density and writing slant reveal distinctive patterns between tablets.

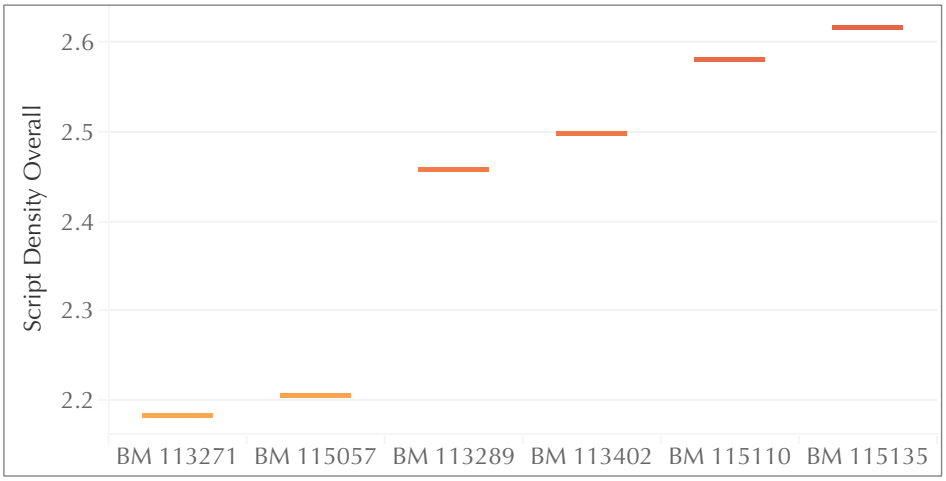


Figure 328: Distribution of script density (overall) on letters authored by Pušu-ken

Tablets (x-axis) vs. Overall Script Density (y-axis). Colour shows details about Script Density. Sample size (in count of tablets): 6.

Overall script density figures distinguish tablets with a dense script of 2.5 to 2.6 lines of text per 1 cm high, and tablets with a lower density script of 2.2 lines [Figure 328]. The same patterns and groupings are replicated when considering density figures between the obverse and the reverse script, suggesting a degree of consistency of the hand sustained over the writing surface. BM 113402, however, does not reveal such degree of consistency, with a lowest density on the obverse (2.3 lines) than on the reverse (2.7 lines).

Letters authored by Pušu-ken also display varyingly slanting signs and ruling. The slant of the ruling, considered against the side of the tablet, can be observed on the two letters BM 113271 and BM 113289, while BM 115110 displays inconsistently straight and slanting lines [Figure 329]. Rulings are straight on all three letters BM 113402, BM 115057 and BM 115135.

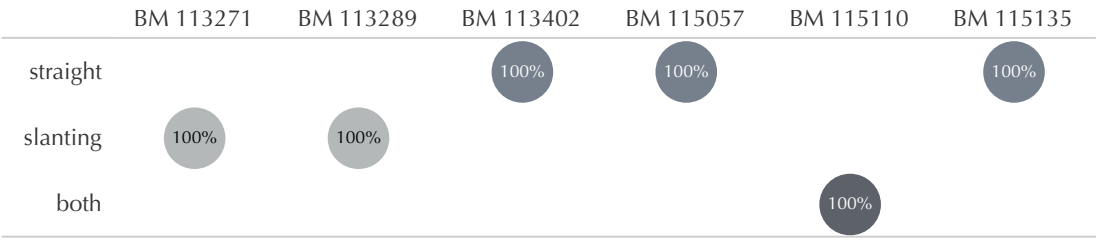


Figure 329: Ruling slant on letters authored by Pušu-ken

% of Tablets (size) broken down by Tablet vs. Ruling Slant (colour). Sample size (in count of tablets): 6.

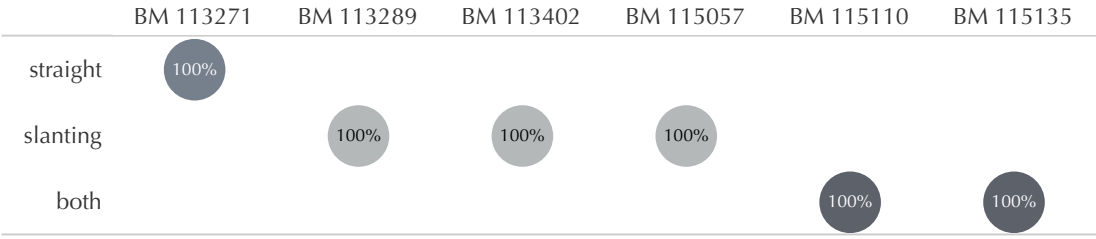


Figure 330: Writing slant on letters authored by Pušu-ken

% of Tablets (size) broken down by Tablet vs. Writing Slant (colour). Sample size (in count of tablets): 6.

While some of the letters authored by Pušu-ken also display a slanting writing, it is not consistently related to the slant of the ruling [Figure 330]. BM 113271 and BM 113289 both have slanting ruling, yet the former displays a straight writing while the latter is slanting. BM 115135 and BM 115110 respectively show straight and combined rulings but they both have alternatively straight and slanting signs. BM 113402 and BM 115057, however, display an overall slanting style for both rulings and signs.

Pušu-ken's letters do not offer as much contrast in terms of diplomatics as they did on palaeographic grounds. The six tablets display identical format, profile types and ruling practices (i.e. closing line and separation line), and diplomatic variations are limited to a small set of distinctive features such as script density and writing or ruling slant.

## 5.3 On writing in the Old Assyrian Period

Following the analysis of a benchmark sample of Old Assyrian documents in Chapter 3, palaeographic and diplomatic variations were assessed through four case studies to investigate the nature of Old Assyrian writing practices against broader trends of time and gender, as well the interrelation between group and individual within a family network.

Although most Old Assyrian business letters are not explicitly dated, patterns of palaeographic and diplomatic variations over time were analysed on groups of tablets indirectly dated by generations of merchants [§5.1.1]. Distribution patterns of $TI_2$ and IM, as well as of signs belonging to the KAŠ-based and Box-framed structural groups, revealed no distinctive patterns between generations. Conversely, signs such as $KU_3$ and SUR, and those of the ŠE-cluster group, revealed generational patterns [Figure 257]. The multiple patterns of diplomatic variation were mostly found evenly distributed between generations. Tablet dimension and script density, however, offered a contrast between the two groups, with later tablets being found overall smaller and more densely written [Figure 275 and Figure 276]. Considering the assumed widespread literacy associated with the Old Assyrian corpus, writing practices were assessed between genders, distinguishing male- and female-authored letters [§5.1.2]. The analysis revealed consistent patterns of both palaeographic and diplomatic variation throughout, with only a tenuous contrast restricted to a few features, such as variants of $KU_3$ and signs belonging to the ŠE-cluster structural group, as well as small edges profile [Figure 280, Figure 285 and Figure 294].

The analysis of writing practices against generations and genders was taken further in a case study dedicated to investigating patterns of variation between members of Pušu-ken's family [§5.2.1]. The distribution of palaeographic variants between family members revealed multiple patterns related to individuals rather than resonating with generations or genders. Moreover, the two signs IM and $TI_2$ showed mirroring patterns to those observed in previous case studies, revealing a consistent feature of the Old Assyrian script [Figure 301 and Figure 302]. Similarly, diplomatic features suggested patterns shared across family members, such as text formatting and layout, whereas tablet formats and shapes revealed multiple trends between individuals. In order to investigate the dynamics between shared patterns amongst family members and individual patterns, a final case study focussed on letters authored by Pušu-ken [§5.2.2].

Although the palaeographic analysis substantiated the findings of the previous case study, new data drawn in from the variations of UD, HA, NU and $LA_2$ revealed two distinct scribal hands in the sample [Figure 327]. Variants of NU and $LA_2$, especially, displayed idiosyncratic writing sequences [Figure 324 and Figure 325]. Such distinction was not mirrored by diplomatic features, which offered little contrast.

Writing practices were investigated in this chapter through four case studies against factors of time and gender on the one hand, and of group membership and individuality on the other hand. Across case studies, multiple patterns of variation, either shared between groups, or conversely attached to individuals, reasserted the variability of Old Assyrian cuneiform between tablets as observed in Chapter 3, while also revealing singularities of practice.

### 5.3.1 Communities of writing practices

The benchmark study of Old Assyrian cuneiform undertaken in Chapter 3 suggested patterns of variation overall distributed per manuscript, while the case studies presented in this chapter also revealed shared practices within the corpus.

Over time, palaeographic variation in Old Assyrian cuneiform appears punctual rather than generalised. Tablets across two generations of merchants considered in this study show similar variants of $TI_2$ and IM whereas contrasting patterns emerge over time on variants of $KU_3$ and SUR. Furthermore, while variants of BA and SUR both reveal a shift in form and makeup, each tends towards a distinct pattern. The observable shift in the use of variants of SUR is also matched by a shift in sign formation towards fewer hand movements. Conversely, the palaeographic variation of BA shows that specific sign formation sequences are attached to variants of the sign but that the use of varying forms of BA is not related to generational trends.

Considering time-related patterns in parallel with genders reveals shared practices overall, and nuances are limited in scale between male- and female-authored letters [Figure 331]. The (v5) variant of $KU_3$, for example, prevails on earlier tablets as well as on male-authored letters, whereas female-authored tablets show no preference between the (v5) and the (v6) forms. Overall, diplomatic features suggest greater consistency over time and across gender. Distinctive patterns can, however, be observed in ruling

practices, tablet profile types and script density, suggesting that later tablets tend to be shorter and more densely written than their earlier counterparts. Between genders, meanwhile, distinctive features are few and mildly contrasting, predominantly contained to edges profiles (upper and lower, left and right).

| | Trends over time | Male authors | Female authors |
|---|---|---|---|
| **ŠE-cluster** | · 2-unequal rows wh form (v3) prevails overall<br>· more diversity on earlier tablets<br>· exclusivity on later tablets | (v3) prevails | (v3) prevails |
| **Horizontal-stack** | · all variants on earlier tablets<br>· inset (v3) variant takes over on later tablets | later form (v3) equally (v1) (v2) | earlier forms prevail |
| **$KU_3$** | · (v5) prevails on earlier tablets<br>· all variants on later tablets | earlier form (v5) prevails | earlier form (v5) equally (v6) |
| **KAŠ-based** | · *winkelhaken* form (v2) prevails overall<br>· diagonal form (v1) rare but maintained | (v2) prevails | (v2) prevails |
| **Box-framed** | · adjoining (v2) form prevails overall<br>· overlaid (v3) rare but maintained | (v2) prevails | (v2) prevails |
| **$TI_2$** | · (v1) prevails overall | (v1) prevails | (v1) prevails |
| **IM** | · (v1) prevails overall | (v1) prevails | (v1) prevails |

Figure 331: Crosstab of palaeographic trends over time and across genders Old Assyrian

Although Old Assyrian cuneiform shows a wide array of variation, it appears more standardised than usually conceived and communities of writing practices can be observed in both palaeographic and diplomatic features over time and across genders. A detailed study of writing practices between related individuals highlights these two trends of Old Assyrian cuneiform, between community and singularity. The (v5) form of $KU_3$, for example, favoured by Lamassi and Pušu-ken (parents) is disregarded by Sueyya and Buzazu (sons), and while Pušu-ken never strays away from it, Lamassi also uses other variants of $KU_3$. While this pattern applies to observed variants of $KU_3$, singularities are differently distributed when considering variants of SUR, for example, so that both Pušu-ken and Buzazu favour the (v2) form, Lamassi the (v1) variant and Sueyya both the (v1) and the (v2) ones.

The respective palaeographic patterns of IM and $TI_2$ are the most consistent throughout case studies. In Chapter 2, four variants of IM and three variants of $TI_2$ could be observed across a benchmark sample of Old Assyrian letters, administrative and legal tablets. The distribution of variants of IM and $TI_2$ in Chapter 3 revealed the consistent use of one variant over the others. Of the four variants of IM, the (v1) form was found prevailing across tablets and between text genres. A similar pattern could be observed with the (v1) form of $TI_2$, preferred over its other variants. In the present chapter, not all variants of IM or $TI_2$ could be observed. Yet, of the two forms of IM and the two variants of $TI_2$ found across study samples, the respective (v1) forms of the two signs prevailed, mirroring patterns already seen throughout case studies. The case of IM and $TI_2$ therefore highlights a unifying trait of Old Assyrian cuneiform, expressed amongst many possible options.

### 5.3.2 Singularities of writing practices

Considering palaeographic and diplomatic variation across family members after looking at writing practices at corpus level in Chapter 3, and over time as well as between genders in this chapter, further emphasizes the great extent of variation allowed in Old Assyrian cuneiform. Yet, while the deeper the analysis delves into the corpus the more variation it reveals, no consistent idiosyncratic patterns that would combine features – either palaeographic, diplomatic, or both – seems to emerge. Rather, variations are expressed differently per author, per tablet and per feature. Individuality in Old Assyrian cuneiform therefore relates to the array of variation offered to each writing hand to lay down signs on a tablet, thus producing a multiplicity of patterns combining individual and shared practices.

Letters authored by Pušu-ken selected in this study reveal distinctive patterns of variation. While distinctive, such patterns are generally consistent with the array of variation that could be observed on Old Assyrian tablets in previous sections of this dissertation. The palaeographic variations of the sign NU and especially the (v2) form of the sign, otherwise unattested, encapsulate most vividly the ambivalence of writing as a standardised system of graphic forms laid out by an individual hand. While unusual, the writing sequence of the (v2) form of NU follows the order observed by Taylor over time, with priority given to the *winkelhaken*, therefore relating to the wider cuneiform

tradition.[263] The palaeographic and diplomatic analysis of the letters authored by Pušu-ken presented above further defines the boundaries of individuality in Old Assyrian cuneiform, confirming the non-uniformity of the script and the extent to which variation is allowed. In turn, it also emphasizes the distinction between distinctiveness and idiosyncrasy, the former being expressed as a specific combination of attested variations, the latter expressing otherwise unattested variations.

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Scribal hand identification follows different methodologies across corpora, adapting to the nature of the script and the questions each research wishes to address. For instance, Ernst-Pradal's 'méthode des catégories' relies on evaluating the relevance of variants attached to a particular sign across Ugaritic texts.[264] Focussing on sign components, Cammarosano approaches the relationship between specific features across different wedge types as well as wedge configurations.[265] His digital-based method looks at the behaviour of a single wedge feature across various wedge types in order to identify consistent groupings based on hierarchical clustering. As such, his method intends to understand patterns of variations as a prelude to identifying scribal hands. Other features of writing can also inform research on scribal hands. Parpola suggests, for example, that the authorship of Neo-Assyrian letters could be determined by analysing a set of distinctive features expressed through linguistic forms and orthography.[266] Outside cuneiform studies, research on the Dead Sea Scrolls also investigates the typological development of writing styles through textural-based feature extraction as an alternative to grapheme-based methods of handwriting recognition.[267] Considering the author-centred nature of the Old Assyrian corpus, Stratford advocated handwriting identification as particularly relevant to the study of literacy as well as a corollary to prosopographical studies, relating even acephalous tablets to specific authors and in

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[263] Taylor, 'Wedge Order in Cuneiform: A Preliminary Survey', in Devecchi et al., eds., (2015), pp. 16-17.

[264] Ernst-Pradal, 'Paléographie des textes hourrites syllabiques de Ras Shamra/Ougarit (suite). Les vocabulaires à colonne hourrite', in Devecchi et al., eds., (2015), pp. 103-128. See also Ernst-Pradal et al., 'Les écritures mises au jour sur le site d'Ougarit (Syrie) et leur déchiffrement: 1930-2010', in Bordreuil et al., eds., (2013), p. 219.

[265] Cammarosano, '3D-Joins und Schriftmetrologie. A Quantitative Approach to Cuneiform Palaeography', in Devecchi et al., eds., (2015), pp. 162-166.

[266] Parpola, *Letters from Assyrian Scholars to the Kings Esarhaddon and Assurbanipal Part II: Commentary and Appendices*, (1983), pp. 443-446.

[267] Dhali et al., 'A Digital Palaeographic Approach Towards Writer Identification in the Dead Sea Scrolls', in De Marisco et al., eds., (2017), pp. 693-702.

turn to archival dossiers.[268] His new methodology draws a clear distinction between 'chirography' and 'palaeography'. While palaeography would be a systematic collection and analysis of all signs in a corpus in order to understand sign development and variation over time or within socio-professional groups, chirography is understood as the direct comparison of sign forms attached to an individual between small sets of documents at one given time.[269] However, the claim that scribal hand identification through chirography is more relevant to the study of the Old Assyrian corpus than understanding its variations and development through palaeography only stands if the two approaches are indeed distinct. Moreover, such an approach also focusses on one aspect of writing – that it is performed by an individual hand – without acknowledging its other fundamental aspect – that it is a normative system of communication based on agreed rules and standards.

Be that as it may, this study revealed that singularities of writing practices cannot be approached without considering communities first and may only be revealed by contrast. The palaeographic analysis carried out on the benchmark sample analysed in Chapters 2 and 3, gathering letters, administrative and legal texts, revealed three distinct variants of $TI_2$ based on wedge arrangement and count [Figure 53]. Yet, the third variant (v3) is not represented in the case studies presented in this chapter. Similarly, the singular nature of the (v2) form of NU attested on a few letters authored by Pušu-ken only becomes obvious when compared to other tablets and variants. It follows that singularities may reveal the existence of different traditions in the Old Assyrian corpus, distinguishing groups, or they may be diagnostic of a single hand and distinguish individuals. As much as singular and contrasting features may identify different scribal trends and traditions, such array of possible palaeographic profiles may also hinder individuality. In the family network studied above, letters authored by Lamassi, for example, stand out by the very distinctive variations applied to the ŠE cluster of wedges in signs such as ZI, LI and IN, but also remain common by the very undistinctive patterns applied to Box-framed signs such as KU or $TUG_2$. Old Assyrian cuneiform allows individuals to express variation to a great extent, and individuality in this case mainly means the possibility for individual writing hands to choose between a wide array of palaeographic and diplomatic options.

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[268] Stratford, 'Old Assyrian Literacy: Formulating a Method for Graphic Analysis and Some Initial Results', in Kulakoğlu et al., eds., (2015), pp. 117-128.
[269] *Ibid.*, p. 119.

# CONCLUSION

This research investigated individuality and identity in cuneiform by analysing writing practices through palaeographic and diplomatic means, drawing on the contrast between the two corpora selected for this study: the administrative production of Ur III scribes at the end of the 3rd millennium BCE in Mesopotamia and the business papers of Old Assyrian merchants in the early 2nd millennium BCE in Anatolia.

## Summary of the dissertation

In order to harness the contrasting characteristics of these two corpora for the study of writing practices, Chapter 1 and Chapter 2 introduced and developed an integrated methodology for cuneiform palaeography and diplomatics applicable to both Ur III and Old Assyrian writing. Chapter 1 envisaged the array of features observable on cuneiform tablets. Considering all aspects of writing medium, inscription, and written signs, Chapter 1 – *Palaeographic and diplomatic variation in cuneiform writing* – described such features and their variations, drafting terminologies and typologies designed to systematise data collection throughout this study. Drawing on the preliminary work undertaken in Chapter 1, Chapter 2 – *Crafting cuneiform: a structural approach to writing practices* – introduced an integrated methodology for cuneiform palaeography and diplomatics. Although this methodology was designed for the study of Ur III and Old Assyrian cuneiform, it could be adapted to other cuneiform corpora. Assessing variations in terms of measurability and usability, significant features and patterns were identified within two study samples gathered to act as benchmark for the study of Ur III and Old Assyrian cuneiform. For instance, Chapter 2 found that morphologically close signs, whether composed of a similar element or formed on a similar structure, can also reveal shared patterns of variation.

Applying the methodology developed throughout Chapters 1 and 2, Chapter 3 analysed two benchmark samples in order to identify characteristic palaeographic and diplomatic trends in Ur III and Old Assyrian cuneiform. Chapter 3 – *Outline of writing practices in Ur III and Old Assyrian cuneiform* – assessed palaeographic and diplomatic variations against chronological and geographic factors, as well as between manuscripts. The

analysis found that the main patterns of variation could be observed over time and across sites in Ur III cuneiform, while variations appeared distributed across manuscripts in Old Assyrian cuneiform rather than relating to wider trends. The work undertaken in Chapter 3 thus provided the backdrop for the corpus-specific analysis of writing practices in Ur III and Old Assyrian cuneiform, presented in Chapter 4 and 5 respectively. Drawing on six case studies assessing patterns of palaeographic and diplomatic variation, Chapter 4 – *Identity and individuality in Ur III cuneiform* – found that Ur III cuneiform is overall less uniform than usually conceived. The palaeographic and diplomatic trends observed over time and across sites in Chapter 3 were confirmed and could further be related to the evolution of writing at the end of the 3rd millennium BCE. The four case studies presented in Chapter 5 – *Identity and individuality in Old Assyrian cuneiform* – assessed the extent of palaeographic and diplomatic variations against time, genders, and individuals. While the analysis in Chapter 5 confirmed the characteristically wide array of palaeographic and diplomatic variations in Old Assyrian cuneiform already observed in Chapter 3, it also revealed that variations are mainly distributed between manuscript and more rarely converging to form consistent patterns attached to wider trends.

## Ur III cuneiform: reformed or adapted?

Also sometimes referred to as a 'Sumerian Renaissance', the Neo-Sumerian Period is characterised by a politico-cultural symbiosis of the preceding Presargonic and Sargonic periods, especially with the advent of the Ur III dynasty at the end of the 22nd century BCE, reviving the Sumerian 'culture' of Presargonic Mesopotamia whilst drawing on the political unity established under Sargonic rule. The collapse of the centralised Ur III rule is succeeded by the re-emergence in Mesopotamia of a network of kingdoms in Isin, in Larsa, or in Babylon. From a diachronic perspective, the Ur III Period materialises a transition period in the history of Mesopotamia as well as in the development of the cuneiform script, imbued with ideas of reform and standardisation.

Writing and schooling are often mentioned as being part of the so-called reforms of Šulgi of Ur, along with other key changes in the administrative, political, military and religious spheres. However, there is no consensus in the scholarship as to what domains the reforms of Šulgi would have covered. In the literary composition Šulgi Hymn B, the figure of the ruler claims to have established scribal centres in Ur and in Nippur but

there are no other such claims and both the date and the authorship of the text are subject to debate.[270] According to Steinkeller and Sigrist, a reform of the writing system and of schooling would have taken place in the Ur III Period under the reign of Šulgi.[271] Conversely, neither writing nor schooling are listed by Sollberger in one of the earliest publications to address the reforms of Šulgi.[272] Moreover, both Waetzoldt and Sallaberger have argued that there is no hard evidence that writing should be included in the list of Šulgi's reforms.[273] Similarly, Qin Shi Huang, the First Emperor, in 3rd century BCE China, is credited with implementing a vast programme of reforms, including writing, but specialists doubt that his reforms were implemented all at once, and that the figure of the reformer ruler could have been a myth constructed at the time and after.[274] Palaeography and diplomatics, as means of interpreting material variations in writing, may have appeared less relevant for Ur III cuneiform, generally perceived as a standardised script produced by professional scribes trained in centrally reformed schools: "*Each Ur III document is very carefully executed, with sign forms so standardized that no attempts have been made so far to distinguish between individual hands*".[275] Nevertheless, to what extent Ur III writing practices would have been standardised, whether by means of a reform of writing or through a reform of schooling, is undoubtedly a question best addressed through palaeography and diplomatics.

Writing as a term has many definitions, essentially covering three main aspects: writing is a mental construct, as much as it is a practical activity and its material, tangible, outcome. What it may mean to reform writing also appears to have more than one implication. Studies in modern writing systems have addressed this same question, and a recent study on writing reforms in Eastern Europe in the 20th century concluded that 'reform of writing' is an umbrella term for the three different aspects of writing that a reform may affect.[276] A 'reform of writing' may involve a change of characters, e.g. from Cyrillic to Latin, thus a script reform; it may be a change of character variants, e.g. from blackletter to roman type, thus a glyphic reform; or it may affect spelling, thus an

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[270] *Šulgi Hymn B*, lines 308-319 (Castellino, *Two Šulgi Hymns (B C)*, (1972), pp. 60-63).

[271] Steinkeller, 'The Administrative and Economic Organization of the Ur III State: The Core and the Periphery', in Gibson et al., eds., (1991), p. 17; Sigrist, *Drehem*, (1992), p. 9.

[272] Sollberger, 'Sur la chronologie des rois d'Ur et quelques problèmes connexes', *AfO* 17 (1954-1956), pp. 17-18.

[273] Waetzoldt, 'Review of: The Organization of Power: Aspects of Bureaucracy in the Ancient Near East by McGuire Gibson and Robert D. Biggs', *JAOS* 111 (1991), p. 638; Sallaberger et al., *Mesopotamien: Akkade-Zeit und Ur III-Zeit*, (1999), p. 148.

[274] Galambos, 'The Myth of the Qin Unification of Writing in Han Sources', *Acta Orientalia Academiae Scientiarum Hungaricae* 57 (2004), pp. 181-203.

[275] Veldhuis, 'Cuneiform: Changes and Developments', in Houston, ed., (2012), p. 12.

[276] Bunčić, 'Factors Influencing the Success and Failure of Writing Reforms', *Studi Slavistici* 14 (2017), p. 22.

orthographic reform. Conversely, in the Blackwell Encyclopedia of Writing Systems a distinction is drawn between writing reform and orthographic reform: writing reform is thus defined as "*a deliberate and often officially sanctioned change in a speech community's script, to be distinguished from orthography reform which affects spelling conventions but not the script*".[277] Although the definitions vary in these two examples, both emphasizes the fundamental aspects of a reform: a reform is a deliberate and official act, and a reform covers a specific scope. One such reform of writing is attested in the late 19th century BCE in the cuneiform corpus of Mari, in modern-day Syria, revealed to be graphic as much as orthographic. Durand and Charpin identified the same named officials on two sets of documents each displaying distinctively 'archaic' and 'modern' features, including a 'modern' duplicate and its 'archaic' original.[278] According to Durand, while the 'archaic' texts of Mari are usually associated with the Šakkanakku Dynasty that reigned over Mari at the end of the 3rd millennium BCE, their writing practices would have lasted until the advent of Yahdun-Lim around 1820 BCE.[279] The new ruler is therefore credited with the reform of writing that took place in Mari affecting palaeography, diplomatics, spelling and language, and implemented by officials already in place.

The study of palaeographic variations in this research revealed a fundamental change in the Ur III Period affecting the composition and the making of signs. This shift does not affect all aspects of writing practices and is not mirrored by a diplomatic shift. Furthermore, palaeographic features are not simultaneously affected and shifting trends are expressed through different patterns between sites. A reform being a deliberate and official act, it would likely have originated in the capital and spread to provincial centres. Yet, site-related patterns of variation suggest otherwise. Both the capital city of Ur and the provincial city of Girsu attest to a change in variants over time but the change is more widespread and comes earlier in Girsu than in Ur [§4.1.1; §4.1.2; Figure 247]. In addition, writing practices in Ur overall showed less variation than what could be observed in Girsu. The Ur III Period lasted about 100 years, but the bulk of the documentation available for us to study is concentrated over some 40 years, its volume

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[277] Coulmas, *The Blackwell Encyclopedia of Writing Systems*, (1996), p. 454.

[278] Durand, 'La situation historique des Šakkanakku: nouvelle approche', *MARI* 4 (1985), pp. 161-172; Durand, 'Unités et diversités au Proche-Orient à l'époque amorrite', in Charpin et al., eds., (1992), pp. 121-123. The duplicate texts are T.518 (Dossin, 'Un « panthéon » d'Ur III à Mari', *RA* 61 (1967), pp. 97-104) and T.519 (Talon, 'Un nouveau panthéon de Mari', *Akkadica* 20 (1980), pp. 12-17).

[279] Durand reconstructed the Šakkanakku Dynasty from 2266 to 2008 BCE, suggesting an intermediary rule before the advent of Yadhun-Lim in 1820 BCE (Durand, 'La situation historique des Šakkanakku: nouvelle approche', *MARI* 4 (1985), pp. 156, 166-171).

rocketing under the reigns of Amar-Suen and Šu-Suen and plummeting with the advent of Ibbi-Suen, the last ruler of the Dynasty. The observed palaeographic shift could therefore directly relate to an increasing production of tablets during the Ur III Period, with such shorter-handed and streamlined forms born from convenience. In a period that has been portrayed as having been dominated by an administrative machinery minutely recording transactions and activities, such developments towards a quicker and more streamlined writing process would certainly have helped sustain an increased production of tablets.

In parallel to the palaeographic development of Ur III cuneiform, writing also operated an orthographic shift which, according to Veldhuis, would be tied to individual scribes with different educational backgrounds rather than be the result of an orthographic reform of writing.[280] It is thought that scribal training underwent a major restructuring during the Ur III Period, and according to Steinkeller, the reforms of Šulgi would have included "*the creation of an enormous bureaucratic apparatus, as well as of a system of scribal schools that provided highly uniform scribal and administrative training for the prospective members of the bureaucracy*".[281] Although such claim is not supported by other scholars, it points out to fundamental aspects of writing in the Ur III Period: namely its bureaucratic context and the distinction between scribal and administrative training.[282]

There are no direct sources on scribal training during the Ur III Period, whether archaeological or textual. The earliest sources come from the later Old Babylonian Period in the early 2nd millennium BCE. Archaeological finds in Ur and Nippur especially suggest that schooling would have then taken place in private dwellings.[283]

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[280] Veldhuis, 'Orthography and Politics: adda, "carcass" and kur$_9$, "to enter"', in Michalowski, ed., (2008), p. 228. See also Rubio, 'On the Orthography of the Sumerian Literary Texts from the Ur III Period', *Acta Sumerologica (ASJ)* 22 (2000), pp. 203-225.

[281] Steinkeller, 'The Administrative and Economic Organization of the Ur III State: The Core and the Periphery', in Gibson et al., eds., (1991), p. 17.

[282] Sollberger, 'Sur la chronologie des rois d'Ur et quelques problèmes connexes', *AfO* 17 (1954-1956), pp. 17-18; Waetzoldt, 'Review of: The Organization of Power: Aspects of Bureaucracy in the Ancient Near East by McGuire Gibson and Robert D. Biggs', *JAOS* 111 (1991), p. 638; Sallaberger et al., *Mesopotamien: Akkade-Zeit und Ur III-Zeit*, (1999), p. 148.

[283] House F in Area TA at Nippur (Stone, *Nippur Neighborhoods*, (1987), pp. 56-59; Charpin, 'Un quartier de Nippur et le problème des écoles à l'époque paléo-babylonienne (suite)', *RA* 84 (1990), pp. 4-7; Robson, 'The Tablet House: A Scribal School in Old Babylonian Nippur', *Revue d'Assyriologie et d'Archéologie Orientale (RA)* 95 (2001), pp. 39-66); No. 7 Quiet Street at Ur (Woolley et al., *Ur Excavations VII: The Old Babylonian Period*, (1976), pp. 109-113; Brusasco, 'Family Archives and the Social Use of Space in Old Babylonian Houses at Ur', *Mesopotamia* 34-35 (1999-2000), pp. 152-154; Charpin, *Le clergé d'Ur au siècle d'Hammurabi (XIXe-XVIIIe siècle av. J.-C.)*, (1986), pp. 27-93). On private dwellings identified as 'schools' in other cities, such as Isin and Sippar, see also Waetzoldt et al., 'Schule', *RlA* 12 (2009), p. 296.

In fact, all the buildings identified as possible schooling facilities are modest in size, therefore suggesting classes run for small groups of students. In the absence of archaeological evidence, speculations on school facilities in the Ur III Period can hardly be supported. Nevertheless, some insight may be gained from literary Old Babylonian sources. The 'Edubba texts', written in Sumerian, evoke the everyday aspects of life as a learner scribe, perhaps depicting schools as institutional complexes rather than private establishments. As such, in Edubba A, also known as 'Schooldays', a passage mentions about ten different school staff, including a 'gate keeper' and a 'Sumerian monitor'.[284] Although part of the Old Babylonian curriculum, the image of the scribal school transpiring from the 'Edubba texts' contrasts with the archaeological evidence available for the period, and it may be that these literary compositions portrayed an ideal and imagined school rather than an actual institution.[285] However, as George pointed out, the 'Edubba texts' would refer back to the Ur III tradition and as such to the Neo-Sumerian scribal school as "*an architectural as well as an institutional reality*".[286] Keeping in mind the literary nature of the Edubba texts, the 'institutional reality' of the Ur III scribal school nevertheless concords with the practicalities of a central administration and some form of state influence.[287] Michalowski suggested that schooling in the Ur III Period was intended to create a class of bureaucrats and that scribal centres were their dedicated spaces of socialisation.[288] Who, then, were these scribes at the service of the Ur III administration? More than 1,500 individuals referred to as dub.sar 'scribe' have been identified in the Ur III corpus and Waetzoldt estimated that the actual number of scribes should be two to three times this figure.[289] The title seems to describe graduates of a scribal school rather than being an honorary title or a rank designation since many dub.sar were also referred to by the office they held, e.g. nu-banda$_3$ or sanga.[290] Scribal training would have taken place in small structures

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[284] Edubba A 'Schooldays', lines 29-41 (Kramer, 'Schooldays: A Sumerian Composition Relating to the Education of a Scribe', *JAOS* 69 (1949), pp. 199-215; Civil, 'Sur les "livres d'écolier" à l'époque paléo-babylonienne', in Durand et al., eds., (1985), pp. 67-78).

[285] Veldhuis suggested that the different functions enumerated in 'Schooldays' were all assumed by the teacher (Veldhuis, *Elementary education at Nippur. The lists of trees and wooden objects*, (PhD Dissertation, 1997), p. 25). See also Cohen et al., 'Teacher-Student Relationships: Two Case Studies', in Radner et al., eds., (2011), p. 230.

[286] George, 'In Search of the é.dub.ba.a: The Ancient Mesopotamian School in Literature and Reality', in Sefati et al., eds., (2005), pp. 127-137.

[287] Waetzoldt, 'Keilschrift und Schulen in Mesopotamien un Ebla', in Kriss-Rettenbeck et al., eds., (1986), p. 39; Nissen et al., *Archaic Bookkeeping*, (1993), p. 108.

[288] Michalowski, 'Charisma and Control: On Continuity and Change in Early Mesopotamian Bureaucratic Systems', in Biggs et al., eds., (1991), pp. 51-53. See also Veldhuis, *Religion, Literature, and Scholarship: The Sumerian Composition Nanše and the Birds, with a Catalogue of Sumerian Bird Names*, (2004), p. 66.

[289] Amongst which 599 named individuals (Waetzoldt, *Das Schreiberwesen in Mesopotamien nach den Texten aus neusumerischer Zeit (ca. 2164 - 2003 v.Chr.)*, (Habilitation Thesis, 1975), pp. 5-6).

[290] Goetze, 'Šakkanakkus of the Ur III Empire', *JCS* 17 (1963), p. 17. See also Landsberger, 'Scribal Concepts of Education', in Kraeling et al., eds., (1960), pp. 94-102.

and transmitted from father to son or from one generation to a small group of the younger generation, similarly to other crafts, and ration lists from Girsu mention bread issued for groups of 3 to 12 dub.sar tur.tur 'learner scribes'.[291]

In parallel to broader considerations of state organisation, much direct insight into the educational background of Ur III scribes and the nature of their training could certainly be gained through the study of their production in palaeographic and diplomatic terms. In this research, case studies have portrayed Ur III cuneiform as less uniform than how writing in this period is traditionally assumed. Variations, both palaeographic and diplomatic, could be related to many and often non-exclusive influencing factors of time, place or context. As already mentioned, the palaeographic shift observed over time towards simpler sign forms – in both outline and makeup – was not matched by a diplomatic shift. Between sites, however, distinct patterns emerged between Ur and Girsu; such distinctions already transpiring between Drehem and Ur on the one hand, and Umma and Girsu on the other hand [§3.1.2; §4.1.2]. Most importantly, the distinctive patterns observable on tablets from Ur and from Girsu involved both palaeographic and diplomatic practices. Within the Girsu corpus, factors influencing writing practices could also be observed between genres, so that legal Di til-la tablets showed less palaeographic and diplomatic variation overall than issuing receipts or letter-orders [§4.1.3; §4.2.3]. From a material perspective, writing practices in the Ur III Period therefore appear multiple rather than uniform. If schooling was indeed reformed, or at least placed under state influence, its effects could be expected to have produced greater uniformity across administrative tablets than what could be observed through palaeography and diplomatics. While this matter of facts alone may not invalidate the idea that schooling could have been taken over by the state, it suggests that such takeover would not have affected all aspects of writing practices, at least not its palaeographic or diplomatic aspects. Considering the distinction pointed out earlier between scribal and administrative training in turn emphasizes the distinction between scribe and bureaucrat, the former being trained locally to read and write cuneiform tablets, the latter being trained to serve the broader purpose of an expanding and increasingly centralised administration.

[291] Waetzoldt, 'Der Schreiber als Lehrer in Mesopotamien', in Johann et al., eds., (1989), pp. 39-42.

All aspects considered, the palaeographic developments observed in Ur III cuneiform throughout this research appear related to the broader evolution of the cuneiform script, the Ur III Period acting as a transition between the archaic script of the 3rd millennium BCE and the cursive script of the Old Babylonian tradition.[292] Strictly speaking, there is no such thing as cursive cuneiform on clay since signs are impressed wedge by wedge whereas the term 'cursive' identifies a type of handwriting in which strokes are connected.[293] If, however, cursive defines a flowing type of writing, the term is relevant to those variants of cuneiform already widespread in the Ur III Period whose makeup is dictated by the ease of movement of the writing hand. Similar gradually implemented shifts and developments were, for instance, observed by Taylor in his diachronic survey of wedge order, in which he concluded that standardised writing sequences emerged as a result of a series of changes rather than being implemented at one point in time.[294] The changes in writing practices in the Ur III Period would thus relate to a broader trend of development of the cuneiform script, also illustrated by the reduction in wedge orientation types observed by Deimel and the obsolescence of wedges pointing up and left.[295] The evolution of writing might have been an enacted reform, of the script or of schooling, although the evidence suggests an alternative: that it might have been part of a broader process driven by the necessity of adapting writing to the needs of its users, the scribes, and to its context, bureaucracy.

## Old Assyrian cuneiform: individuality or singularity?

The Old Assyrian corpus characteristically revolves around the private enterprise of traders between Mesopotamia and Anatolia in the form of letters, debt notes, legal documents, private contracts, and personal memoranda. Of the 23,000 published Old Assyrian documents, fewer than a hundred did not belong to the private business archives of traders, including royal inscriptions and treaties, incantations, and school texts.[296] Unlike administrative documents from the Ur III Period, Old Assyrian business documents offer a direct link to the individuals whose activities they record. This is especially true for letters, authored by and addressed to named individuals, and written

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[292] Guichard, 'Histoire de l'écriture cunéiforme : la formation de la cursive paléo-babylonienne', *Pasiphae* (2021).

[293] *"Cursive handwriting: rapid handwriting, protean by nature, in which letter shapes are recognizable but not invariable because of the priority given to speed and ease of movement"* (Parkes, *Their Hands Before Our Eyes*, (2008), p. 150).

[294] Taylor, 'Wedge Order in Cuneiform: A Preliminary Survey', in Devecchi et al., eds., (2015), p. 22.

[295] Deimel, *LAK*, (1922), p. 12.

[296] Michel, *Old Assyrian Bibliography*, (2003), pp. 133-141; Veenhof, 'Archives of Old Assyrian Traders', in Brosius, ed., (2003), pp. 78-123.

in the first person. The particular nature of the corpus has, as such, guided previous and current research and the focus placed on individuals, how they relate to and interact with each other.[297]

As observed throughout this dissertation, Old Assyrian documents indeed show peculiar traits and their script certainly contrasts with other, maybe more uniform, cuneiform corpora. Those traits were so peculiar that in the 1870-1880s, the first Old Assyrian tablets to be studied were not recognised as such. Rather, both the language and the appearance of these 'Cappadocian' tablets, as they were then known, baffled scholars. In Pinches's words: "*[the tablet] was written neither in Assyrian nor Akkadian" and "written in a rather rough and peculiar style*".[298] While the Akkadian origin of the Old Assyrian language was established in 1890s, the 'rough and peculiar style' of Old Assyrian tablets still feeds research to this day.[299] The extent of variations observable on Old Assyrian documents has since been seen as evidence of widespread literacy amongst merchants, itself attested by scribal hand identification, or, in other words: "*The enormous diversity in calligraphic ability found in the Old Assyrian corpus likewise seems to suggest that people wrote their own texts (Larsen 1976: 304-307)*".[300]

The widely accepted link between literacy and individual handwritings in turn poses the question of scribal training amongst Old Assyrian merchants. The only known direct reference to formal training appears in a letter from Sueyya to his father Pušu-ken: *"(…) we are learning the scribal art (*DUB.SAR-*tam = tupšarrutum). Send us an* epattum *textile for our master (um-mi*$_2$*-a-ni-a)"*.[301] The use of the first person plural, "*we are learning"* (*la*$_2$*-am-da-ni*), is noteworthy and may refer to a collective class. Apart from Sueyya's letter, only a few Old Assyrian texts shed some light on scribal training. Furthermore, it has been hypothesised that merchants' children were educated in Assur whereas

[297] Whether it be archival dossier reconstruction, social network analysis or scribal hand identification, e.g. Larsen, *The Aššur-nada Archive*, (2002); Anderson, *The Old Assyrian Social Network*, (PhD Dissertation, 2017); Beyer, *The Identification of Scribal Hands on the Basis of an Old Assyrian Archive*, (PhD Dissertation, 2019).
[298] Pinches, 'Cappadocian Tablets in the British Museum and the Louvre', *PSBA* 4 (1881), pp. 11-12; BM 30230 = CDLI: P358848, registered as 1876,0102.1, later published as CCT 5 44.
[299] Golenishchev, *Vingt-quatre tablettes cappadociennes de la collection W. Golénischeff*, (1891); Jensen, 'Die kappadokischen Keilschrifttäfelchen', *ZA* 9 (1894), pp. 62-81. Before then, it had also been suggested that the language used on 'Cappadocian' tablets was "*a dialect allied to the Aryan or Indo-European tongues, and especially to Armenian*" (Bertin, 'The Cappadocian Tablets Published by Mr Pinches', *PSBA* 4 (1881), p. 20).
[300] Barjamovic, 'Contextualizing Tradition. Magic, Literacy and Domestic Life in Old Assyrian Kanesh', in Delnero et al., eds., (2015), p. 67.
[301] BM 115085 = CDLI: P358735.

Old Assyrian tablets essentially come from Kültepe.[302] Although the Old Assyrian levels in Assur are yet to be fully excavated, about ten small lenticular tablets have been retrieved from the site.[303] They consist of calculation exercises, based on the conversion and calculation of prices. Discoveries of school texts in level Ib at Kültepe, including a near duplicate of an exercise tablet also known in Assur, suggest that scribal training would have first taken place in Assur before being also transferred to Anatolia, in parallel with the increasing development of the Assyrian settlement there.[304] The distribution of palaeographic and diplomatic variations observed throughout case studies in this research and the multiplicity of patterns they reveal suggests that literacy would have been widespread amongst individuals but also that the practice of writing rested on some sort of formal training. Indeed, while there are many variations in Old Assyrian cuneiform, there also are recurring variations that can be found across groups of tablets. In a recent study on teaching and learning in the Old Assyrian Period, Beyer related the patterns of variation in writing observed on tablets authored by members of Elamma's family to their educational backgrounds while also pointing out the challenges of precisely identifying such backgrounds or even the identity of the writer in an inherently varied script.[305] Similar conclusions could be drawn from the study of Pušu-ken's family in this research whereby variation emerging between relatives did not appear recurrently attached to individuals [§5.2.1]. Moreover, even in rarer cases of idiosyncratic variation, such as the peculiar form of NU observed on Pušu-ken letters, the standard writing sequence of wedges suggests that the deviation from the norm is limited to the outline of the sign but that its makeup follows fundamental principles likely learnt and practiced by the writing hand.

The question of literacy in the Old Assyrian corpus also relates more widely to the use of writing in the particular context of a colony of merchants. Even if most traders were able to read and write, professional scribes, designated by the Sumerian title of dub.sar

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[302] Michel, 'Les marchands et les nombres: l'exemple des Assyriens à Kaniš', in Prosecký, ed., (1998), p. 251; Kryszat, 'The Use of Writing among the Anatolians', in Dercksen, ed., (2008), p. 232.

[303] Donbaz, 'More Old Assyrian Tablets from Aššur', *Akkadica* 42 (1985), pp. 1-23; Pedersén, *Archives and libraries in the City of Assur: a survey of the material from the German excavations. Part 1*, (1985), pp. 76-77.

[304] Hecker, 'Schultexte vom Kültepe', in Mellink et al., eds., (1993), pp. 281-291; Hecker, 'Schultexte aus Kültepe: ein Nachtrag', *NABU* 1996:1 (1996), pp. 20-21; Michel, 'Les marchands et les nombres: l'exemple des Assyriens à Kaniš', in Prosecký, ed., (1998), p. 253; Michel, 'Écrire et compter chez les marchands assyriens du début du IIe millénaire av. J.-C.', in Tarhan et al., eds., (2008), pp. 349-351. Kt a/k 178 Hecker, 'Schultexte aus Kültepe: ein Nachtrag', *NABU* 1996:1 (1996), pp. 20-21 is almost identical to Ass.13058e Donbaz, 'More Old Assyrian Tablets from Aššur', *Akkadica* 42 (1985), pp. 1-23. List of Old Assyrian school texts in Michel, 'Old Assyrian Bibliography 2', *AfO* 52 (2011), p. 432.

[305] Beyer, 'Teaching in Old Babylonian Nippur, Learning in Old Assyrian Aššur?', in Brinkmann et al., eds., (2021), pp. 22-32.

'scribe' are attested in the Old Assyrian texts, although it is unclear in which capacity they acted, whether as officials or as employed in the service of merchants.[306] When stating that "*texts belonging to certain individuals, such as Šalim-ahum, are recognizable for their beauty and clearly legible hand from five feet away*", Barjamovic may have referred to the letter BM 113258, a tablet otherwise described by Larsen as the paragon of "*classical Old Assyrian paleography*" written "*in a professional hand*".[307] This letter indeed catches the observer's attention by its carefully shaped profile and the neatness of its writing. Yet, such features do not apply to all the letters authored by Šalim-ahum, and Stratford's chirographic analysis identified two distinct hands within the group.[308] Considering the presence of professional scribes amongst literate merchants therefore also resonates with handwriting identification: when distinct scribal hands are found in a group of texts, to whom do they belong? Did Pušu-ken write any of the letters he authored? Did he employ another literate merchant to act as his secretary? Did Šalim-ahum employ a professional scribe? Such questions are easy to ask and have no obvious or straight forward answers. They can, however, inform the nature of Old Assyrian writing practices and literacy.

Alongside professional scribes, it is commonly accepted that many Old Assyrian traders were themselves literate, an assumption essentially founded on the specificities of the Old Assyrian script.[309] The limited number of cuneiform signs and the restricted use of logograms have long been considered the defining features of Old Assyrian, reflecting the practical needs of a tightly organised trading society to document international exchanges between Mesopotamia and Anatolia.[310] This portrait of Old Assyrian literacy and writing mainly relies on the number of cuneiform signs used throughout the corpus. One of the first Old Assyrian sign list, published in 1921 in appendix to CCT 1, indexed 138 signs, while latest estimates now suggest that between 150 and 200 cuneiform signs were in use, including Sumerian logograms used as a shorthand to write frequent words

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[306] Larsen, *The Old Assyrian City-State and its Colonies*, (1976), pp. 304-305; Michel, 'Les marchands et les nombres: l'exemple des Assyriens à Kaniš', in Prosecký, ed., (1998), p. 250; Erol, 'Exercise Tablet of a Scribe-to-Be', in Kulakoğlu et al., eds., (2010), pp. 94-95.

[307] Barjamovic, 'Contextualizing Tradition. Magic, Literacy and Domestic Life in Old Assyrian Kanesh', in Delnero et al., eds., (2015), p. 67; Veenhof et al., *Mesopotamia: The Old Assyrian Period*, (2008), p. 246.

[308] Stratford, 'Old Assyrian Literacy: Formulating a Method for Graphic Analysis and Some Initial Results', in Kulakoğlu et al., eds., (2015), pp. 122-123.

[309] Renger, 'Überlegungen zum akkadischen Syllabar', *ZA* 61 (1971), pp. 23-43 esp. p. 33.

[310] Schousboe et al., eds., *Literacy and Society*, (1989); Michel, 'Écrire et compter chez les marchands assyriens du début du IIe millénaire av. J.-C.', in Tarhan et al., eds., (2008), p. 354; Barjamovic, 'Contextualizing Tradition. Magic, Literacy and Domestic Life in Old Assyrian Kanesh', in Delnero et al., eds., (2015), pp. 60-61.

associated with trading activities, such as animal names and raw materials.[311] On average, writing a business letter required fewer than 100 signs.[312] "*If writing were about efficiency and simplicity, the cuneiform system could have developed into an efficient and simple syllabographic system—as it did in Old Assyrian times. The Old Assyrian experience, however, remains an isolated case and the history of cuneiform shows that complexity was an asset that was valued*".[313] Based on these specificities, the Old Assyrian script is often described as 'simplified' or 'simple' and its widespread literacy associated with such 'simplicity'.[314] "*L'usage de l'écriture par une fraction importante de la population justifie par contrecoup sa simplicité : le nombre d'individus qui écrivent sans avoir suivi une formation approfondie croissant, le syllabaire utilisé se réduit, avec l'abandon des signes complexes. La simplification du système paléo-assyrien a alors facilité l'accès à l'écriture.*"[315]

Although this is a frequent postulate in Old Assyrian studies, the causal relationship between literacy and simplicity remains undetermined: which is the cause, which is the effect? Did literacy spread because the script was simplified, or did the script became simplified to meet the multiple needs of a literate group? Other studies have dismissed altogether the causal link between script simplicity and literacy levels.[316] Powell, for instance, put the question of literacy to perspective with the evolution and ultimately waning of the logographic/syllabic cuneiform system following the development of the alphabet.[317] He specifically dismissed the relationship between the simplicity of alphabetic systems and increased levels of literacy, in fact arguing the opposite.[318] Veldhuis offers a more nuanced view and understands, for example, the development of the Old Babylonian cursive script as indicative of a wider literacy, although he also points out that cursive hands are to the benefit of the writer and not the reader since cursive signs requires more familiarity with written texts to be able to distinguish small

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[311] 138 signs listed in Smith, ed., *CCT 1*, (1921), plates A-B; 193 signs listed in Kouwenberg, *Introduction to Old Assyrian*, (2019), pp. 29-39.

[312] Average calculation by the author based on the number of signs displayed throughout the letters studied for this research. Edzard estimated that a minimum of 68 signs was enough to produce a text (Edzard, 'Keilschrift', *RlA* 5 (1980), p. 561).

[313] Veldhuis, 'Levels of Literacy', in Radner et al., eds., (2011), p. 86.

[314] Larsen, *The Old Assyrian City-State and its Colonies*, (1976), p. 305; Larsen, *The Aššur-nada Archive*, (2002), pp. xl-xli; Veldhuis, 'Levels of Literacy', in Radner et al., eds., (2011), p. 86; Barjamovic, 'Contextualizing Tradition. Magic, Literacy and Domestic Life in Old Assyrian Kanesh', in Delnero et al., eds., (2015), pp. 60-61.

[315] Michel, 'Écrire et compter chez les marchands assyriens du début du IIe millénaire av. J.-C.', in Tarhan et al., eds., (2008), p. 354.

[316] Cooper, 'Babbling On: Recovering Mesopotamian Orality', in Vogelzang et al., eds., (1992), pp. 103-122.

[317] Powell, 'Three Problems in the History of Cuneiform Writing: Origins, Direction of Script, Literacy', *Visible Language* 15 (1981), pp. 431-436.

[318] *Ibid.*, p. 436. See also Charpin, *Lire et écrire à Babylone*, (2008), p. 53.

differences that are otherwise more obvious in more archaic signs.[319] Furthermore, the limited number of cuneiform signs in use in Old Assyrian is not an absolute marker of a simplified script, although it may facilitate learning.[320] Comparatively, Charpin estimated that an Old Babylonian scribe could write a text with as little as 82 signs, a figure not much greater that the 68 signs estimated sufficient by Edzard to write a text in Old Asssyrian.[321] From a letter sent by a Neo-Assyrian governor to Sargon II, Parpola deduced that the scribe must have known 112 signs to write the 40-sign text inscribed on the tablet.[322]

Considering altogether the informal context of the documentation, the specific nature of the Old Assyrian script, the proficiency of the writers as literate merchants or as professional scribes along their educational backgrounds, all aspects appear intertwined and even entangled since all aspects inform each other but depend on each other. In each case, however, hand identification is believed to be, and could indeed be, the key to reconstruct archival dossiers, to understand documentation practices in the Old Assyrian Period along with the organisation of trading firms, or to shed light on scribal training and levels of literacy.[323] Such approach is further being developed at the Centre for the Study of Manuscript Cultures at the University of Hamburg and the project 'Archives and Literacy in 2nd Millennium Assyrian Manuscript Culture' led by Michel and Beyer.[324] This is especially relevant to historic collections gathered before the start of official excavations at Kültepe in 1948 and, as such, uncontextualized. Scribal hand identification has been an objective of the present research from the outset. The multiplicity of writing practices found through the systematic analysis of both

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[319] Veldhuis, 'Levels of Literacy', in Radner et al., eds., (2011), p. 72. See also Wilcke, *Wer las und schrieb in Babylonien und Assyrien: Überlegungen zur Literalität im Alten Zweistromland*, (2000), pp. 34-49.

[320] Charpin, *Lire et écrire à Babylone*, (2008), p. 53. See also Lion, 'Literacy and Gender', in Radner et al., eds., (2011), p. 103. On comparing sign numbers across cuneiform corpora, see the summary in Charpin, 'Lire et écrire en Mésopotamie : une affaire de spécialistes?', *Comptes rendus des séances de l'Académie des Inscriptions et Belles-Lettres* 148 (2004), pp. 501-503.

[321] Charpin, 'Lire et écrire en Mésopotamie : une affaire de spécialistes?', *Comptes rendus des séances de l'Académie des Inscriptions et Belles-Lettres* 148 (2004), p. 502; Edzard, 'Keilschrift', *RlA* 5 (1980), p. 561.

[322] K 652 = CDLI: P334097. Parpola, 'The Man without a Scribe and the Question of Literacy in the Assyrian Empire', in Pongratz-Leisten et al., eds., (1997), p. 321 note 17.

[323] As illustrated by the many recent studies approaching the topic, e.g. Barjamovic, 'Contextualizing Tradition. Magic, Literacy and Domestic Life in Old Assyrian Kanesh', in Delnero et al., eds., (2015), pp. 48-86; Stratford, 'Old Assyrian Literacy: Formulating a Method for Graphic Analysis and Some Initial Results', in Kulakoğlu et al., eds., (2015), pp. 117-128; Beyer, *The Identification of Scribal Hands on the Basis of an Old Assyrian Archive*, (PhD Dissertation, 2019); Beyer, 'Teaching in Old Babylonian Nippur, Learning in Old Assyrian Aššur?', in Brinkmann et al., eds., (2021), pp. 15-32.

[324] Michel et al., 'Archives and Literacy in 2nd Millennium Assyrian Manuscript Culture (2019-2022)', (https://www.csmc.uni-hamburg.de/written-artefacts/field-e/rfe04.html - accessed 27/02/2021). The project is part of the Cluster of Excellence 'Understanding Written Artefacts'. See also Michel et al., 'Private Archives as a Source for Literacy in the Old Assyrian Society (2011-2019)', (https://www.csmc.uni-hamburg.de/sfb-950/posters/c11-a4-p2-eng-pdf.pdf - accessed 27/02/2021).

palaeographic and diplomatic features over time, between text genres and across genders as well as between individual family members appear to confirm that literacy was widespread amongst Old Assyrian traders and reflected by the palaeographic and diplomatic variety of Old Assyrian cuneiform. This multiplicity of writing practices also revealed the great extent of variations offered and allowed to the writing hand, in turn blurring the boundary between distinctiveness and idiosyncrasies in writing by highlighting that a single distinctive feature does not necessarily identify a single hand. This was similarly pointed out by Ernst-Pradal in her palaeographic study of Ugaritic tablets where her proposed identification of individual hands is based on a "*faisceau de concordances*" rather than isolated features.[325] In the present study of Old Assyrian cuneiform, patterns of palaeographic and diplomatic variation are indeed most often not consistently attached to individuals. Rather, they are expressed differently per author, per manuscript and per feature.

As a means to overcome the limitations of naked-eye observation, much insight could be gained from computer-aided technologies to distinguish scribal hands. The collaborative initiative 'Computer-unterstützte Keilschriftanalyse' and its bespoke digital tool based on 3D scans of cuneiform documents (CuneiformAnalyser) enables to reach levels of observation and measurement beyond the ability of the human eye, such as the depth of impression of wedges into clay, the angle of incidence of the stylus when impressing the clay, or the length of the imprints.[326] This approach has yielded positive and promising results on different cuneiform corpora, e.g. Hittite, Mittanian, Late Babylonian.[327] In fact, in continuation of the present research, groups of Old Assyrian documents have already been 3D-scanned in preparation for a new computer-aided palaeographic study.[328] Although the data is yet to be collected and processed with the CuneiformAnalyser, it is hoped that the results of this study will help us get closer to identifying scribal hands and clusters of scribal habits through the minute details that the eye cannot see.

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[325] Ernst-Pradal, 'Paléographie des textes hourrites syllabiques de Ras Shamra/Ougarit (suite). Les vocabulaires à colonne hourrite', in Devecchi et al., eds., (2015), pp. 103-128 esp. p. 123.

[326] A collaborative project involving the Academy of Sciences and Literature Mainz, the Faculty of Computer Science at TU Dortmund University, and the Julius Maximilians University of Würzburg: 'Cuneiform: 3D-Joins und Schriftmetrologie Projekt', (n.d.), (http://www.cuneiform.de/projekt/aktuelles.html - accessed 28/10/2021).

[327] Cammarosano, '3D-Joins und Schriftmetrologie. A Quantitative Approach to Cuneiform Palaeography', in Devecchi et al., eds., (2015), pp. 145-186; Homan, *Mittani Palaeography*, (2019); Müller et al., 'Current Research in Cuneiform Palaeography 2', in Devecchi et al., eds., (2019), pp. 177-209.

[328] The analysis will be conducted on three groups of tablets: letters authored by Šalim-ahum; letters authored by Aššur-idi; contrasting group of documents of different genres and dates. I wish to thank Prof Dr Gerfrid Müller (University of Würzburg) for his collaboration on this project.

## Identity and individuality in cuneiform

The variability of Old Assyrian cuneiform, in terms of palaeography and diplomatics, certainly singles it out from other corpora. Comparatively, the official documentation of the Ur III Period showed more standardisation than the business papers of Old Assyrian merchants, in turn emphasizing the influence of context on cuneiform writing practices. Homan's recent comparative palaeographic study revealed that although the Mittani Amarna letters would have been produced by different scribes identified through small variations, the script they used was similar and standardised, therefore highlighting the identity of the scribes as members of a group.[329] This research on identity and individuality in cuneiform approached the ambivalent nature of writing as a conventional system performed by an individual hand and investigated the multiplicity or unity of writing in time and place as well as between groups and individuals. Understanding identity and individuality in terms of sameness and difference, the study of identity in writing thus focussed on the similarities and communities of practices amongst groups, while individuality was sought from the idiosyncrasies attached to individual handwritings. Throughout case studies, the analysis of palaeographic and diplomatic features attempted to gather tiers of evidence by looking at both Ur III and Old Assyrian cuneiform at corpus-level, group-level and individual level. Although the two corpora are of contrasting nature, the study found that the normative nature of writing systems supersedes the individual. That being said, its normative character does not represent such a constraint to the writing hand, who is allowed to choose, whether consciously or not, between various forms and options available to the writer to adapt to contexts and situations as they arise. Thus follows the distinction between writing as a normative system and handwriting as an adaptive practice. By applying a systematic methodology to the two study corpora, this research also found that the possibilities for variations are almost endless, given the number of possible combinations of paleographic and diplomatic features on every single tablet. By distinguishing patterns of variation, however, shared writing practices could be identified that related individual scribes, even if not identified, to identity groups, whether unified by their belonging to a certain point in time or in space, or to a particular official or informal context. The research also found, in both corpora, that individuality in cuneiform can only be identified by contrast and expressed through consistently distinctive patterns.[330] In this

[329] Homan, *Mittani Palaeography*, (2019), pp. 266-269.
[330] Finkel, 'Strange Byways in Cuneiform Writing', in de Voogt et al., eds., (2010), pp. 9-25.

regard, the informal context of Old Assyrian cuneiform yielded more results than the official contexts of Ur III documents. Although the Ur III corpus essentially relates to official administration, there are also business documents produced by merchants.[331] A recent study of the archives of the merchant Eṣidum remarked on the material features of the tablets, pointing out the untidiness of loan texts and relating it to scribes trained outside of the official administration, but interestingly also the neatness of the sale contracts.[332] It appears, therefore, that a systematic palaeographic and diplomatic study of non-institutional Ur III documents could yield interesting results to better understand writing practices with respect to context, thus perhaps also putting the present research into perspective by bridging the gap between the business papers of merchants and the official documentation of scribes.

[331] Namely the archives of SI.A-a and Turam-ili. On non-institutional archives from the Ur III Period see Garfinkle, 'Turam-ili and the Community of Merchants in the Ur III Period', *JCS* 54 (2002), pp. 29-48; Garfinkle, *Entrepreneurs and enterprise in early Mesopotamia*, (2012); Studevent-Hickman, *Sumerian texts from Ancient Iraq*, (2018). See also Neumann, 'Ur-Dumuzida and Ur-DUN: Reflections on the Relationship between State-initiated Foreign Trade and Private Economic Activity in Mesopotamia towards the End of the Third Millennium BC', in Dercksen, ed., (1999), pp. 43-53.

[332] Kamil, 'Une nouvelle archive privée d'un marchand de l'époque d'Ur III', in Attinger et al., eds., (2018), pp. 207-223 esp. p. 209.

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# APPENDICES

## Appendix 1: Research corpus

The following lists all the objects that were studied for this research, referenced by their museum numbers with a concordance to the Cuneiform Digital Library Initiative (CDLI).[333] Each CDLI record can be directly accessed by inserting the 'P number' at the end of the URL https://cdli.ucla.edu/, e.g. https://cdli.ucla.edu/P357663 links directly to the record for AO 9375. When there is no available record on CDLI, the concordance gives the primary publication reference instead.

| Museum Number | CDLI/Publication | Museum Number | CDLI/Publication |
|---|---|---|---|
| AO 2451 | CDLI: P112981 | AO 8234 | CDLI: P357607 |
| AO 2452 | CDLI: P108814 | AO 8247 | CDLI: P357665 |
| AO 2455 | CDLI: P112987 | AO 8248 | CDLI: P357580 |
| AO 2460 | CDLI: P112980 | AO 8629 | CDLI: P357590 |
| AO 2462 | CDLI: P112984 | AO 8694 | CDLI: P357514 |
| AO 2464 | CDLI: P108813 | AO 8715 | CDLI: P357536 |
| AO 2464 (A) | CDLI: P108813 | AO 9246 | CDLI: P357606 |
| AO 2473 | CDLI: P108825 | AO 9247 | CDLI: P357601 |
| AO 2514 | CDLI: P112989 | AO 9264 | CDLI: P357610 |
| AO 2515 | CDLI: P112988 | AO 9275 | CDLI: P357600 |
| AO 2526 | CDLI: P109082 | AO 9293 | CDLI: P357581 |
| AO 2531 | CDLI: P112983 | AO 9362 | CDLI: P357579 |
| AO 2535 | CDLI: P112986 | AO 9375 | CDLI: P357663 |
| AO 2561 | CDLI: P112991 | AO 10385 | CDLI: P357871 |
| AO 3556 | CDLI: P112993 | AO 12129 | CDLI: P357582 |
| AO 3561 | CDLI: P112992 | AO 12131 | CDLI: P357664 |
| AO 3562 | CDLI: P112990 | AO 19540 | CDLI: P115529 |
| AO 3603 | CDLI: P112985 | AO 27502 | CDLI: P109029 |
| AO 5481 | CDLI: P131571 | AO 27503 | CDLI: P128462 |
| AO 5496 | CDLI: P131586 | AO 27504 | CDLI: P109031 |
| AO 5499 | CDLI: P131589 | AO 27518 | CDLI: P109045 |
| AO 5534 | CDLI: P131623 | AO 27529 | CDLI: P109055 |
| AO 5536 | CDLI: P131625 | BM 12239 | CDLI: P108653 |
| AO 5599 | CDLI: P131688 | BM 12244 | CDLI: P116704 |
| AO 5637 | CDLI: P131726 | BM 12249 | CDLI: P119657 |
| AO 7154 | CDLI: P357365 | BM 12263 | CDLI: P130012 |
| AO 7462 | CDLI: P357385 | BM 12277 | CDLI: P119668 |

[333] 'CDLI - Cuneiform Digital Library Initiative', (https://cdli.ucla.edu/ - accessed 31/10/2021).

| Museum Number | CDLI/Publication | Museum Number | CDLI/Publication |
|---|---|---|---|
| AO 7873 | CDLI: P112998 | BM 12280 | CDLI: P119671 |
| BM 12281 | CDLI: P119672 | BM 12784 | CDLI: P102546 |
| BM 12316 | CDLI: P101911 | BM 12886 | CDLI: P104962 |
| BM 12326 | CDLI: P102067 | BM 12887 | CDLI: P104961 |
| BM 12344 | CDLI: P104920 | BM 12888 | CDLI: P104960 |
| BM 12345 | CDLI: P104980 | BM 12890 | CDLI: P104956 |
| BM 12361 | CDLI: P119720 | BM 12893 | CDLI: P104959 |
| BM 12367 | CDLI: P119726 | BM 12895 | CDLI: P104955 |
| BM 12368 | CDLI: P119727 | BM 12896 | CDLI: P104957 |
| BM 12386 | CDLI: P119739 | BM 12899 | CDLI: P104964 |
| BM 12462 | CDLI: P315536 | BM 12900 | CDLI: P104965 |
| BM 12477 | CDLI: P129997 | BM 12901 | CDLI: P104963 |
| BM 12477 A | CDLI: P129997 | BM 12902 | CDLI: P104979 |
| BM 12481 | CDLI: P129795 | BM 12903 | CDLI: P104958 |
| BM 12481 A | CDLI: P129795 | BM 12920 | CDLI: P204542 |
| BM 12493 | CDLI: P104875 | BM 12934 | CDLI: P108494 |
| BM 12498 | CDLI: P315560 | BM 13002 | CDLI: P129937 |
| BM 12501 | CDLI: P104915 | BM 13335 | CDLI: P315726 |
| BM 12511 | CDLI: P104922 | BM 13364 | CDLI: P315745 |
| BM 12524 | CDLI: P104925 | BM 13387 | CDLI: P127886 |
| BM 12555 | CDLI: P315599 | BM 13448 | CDLI: P200984 |
| BM 12605 | CDLI: P141841 | BM 13585 | CDLI: P116381 |
| BM 12608 | CDLI: P120196 | BM 13644 | CDLI: P200991 |
| BM 12619 | CDLI: P120131 | BM 13735 | CDLI: P205545 |
| BM 12624 | CDLI: P120159 | BM 13742 | CDLI: P205555 |
| BM 12625 | CDLI: P120184 | BM 13746 | CDLI: P205556 |
| BM 12659 | CDLI: P104952 | BM 13747 | CDLI: P205542 |
| BM 12663 | CDLI: P120160 | BM 13750 | CDLI: P205538 |
| BM 12671 | CDLI: P104951 | BM 13754 | CDLI: P205552 |
| BM 12674 | CDLI: P120161 | BM 13756 | CDLI: P205539 |
| BM 12683 | CDLI: P120162 | BM 13757 | CDLI: P205551 |
| BM 12693 | CDLI: P120163 | BM 13759 | CDLI: P205554 |
| BM 12699 | CDLI: P141854 | BM 13761 | CDLI: P205541 |
| BM 12701 | CDLI: P120164 | BM 13779 | CDLI: P200601 |
| BM 12707 | CDLI: P120165 | BM 13798 | CDLI: P205536 |
| BM 12708 | CDLI: P120166 | BM 13799 | CDLI: P205558 |
| BM 12711 | CDLI: P120167 | BM 13800 | CDLI: P205534 |
| BM 12718 | CDLI: P120168 | BM 13815 | CDLI: P205543 |
| BM 12726 | CDLI: P120169 | BM 13824 | CDLI: P205544 |
| BM 12727 | CDLI: P120180 | BM 13825 | CDLI: P205527 |
| BM 12730 | CDLI: P102545 | BM 13842 | CDLI: P205549 |
| BM 12732 | CDLI: P120170 | BM 13847 | CDLI: P205528 |

| Museum Number | CDLI/Publication | Museum Number | CDLI/Publication |
|---|---|---|---|
| BM 12754 | CDLI: P102544 | BM 13850 | CDLI: P205547 |
| BM 13853 | CDLI: P205529 | BM 15350 | CDLI: P101744 |
| BM 13872 | CDLI: P206226 | BM 15496 | CDLI: P200983 |
| BM 13888 | CDLI: P108436 | BM 15659 | CDLI: P316965 |
| BM 13898 | CDLI: P205531 | BM 15717 | CDLI: P129941 |
| BM 13993 | CDLI: P141909 | BM 15839 | CDLI: P101749 |
| BM 14019 | CDLI: P206195 | BM 15885 | CDLI: P317145 |
| BM 14118 | CDLI: P206020 | BM 16144 | CDLI: P317482 |
| BM 14173 | CDLI: P206073 | BM 16159 | CDLI: P200600 |
| BM 14176 | CDLI: P206072 | BM 16213 | CDLI: P317526 |
| BM 14194 | CDLI: P206071 | BM 16418 | CDLI: P200596 |
| BM 14195 | CDLI: P206016 | BM 17772 | CDLI: P108561 |
| BM 14493 | CDLI: P130007 | BM 17799 | CDLI: P129999 |
| BM 14572 | CDLI: P200981 | BM 17799 A | CDLI: P129999 |
| BM 14587 | CDLI: P200988 | BM 17900 | CDLI: P200990 |
| BM 14661 | CDLI: P200597 | BM 17936 | CDLI: P204173 |
| BM 14661 A | CDLI: P200597 | BM 17978 | CDLI: P102547 |
| BM 14668 | CDLI: P116767 | BM 18066 | CDLI: P203711 |
| BM 14668 A | CDLI: P116767 | BM 18164 | CDLI: P200985 |
| BM 14678 | CDLI: P316078 | BM 18188 | CDLI: P200989 |
| BM 14706 | CDLI: P116736 | BM 18258 | CDLI: P205452 |
| BM 14736 | CDLI: P129933 | BM 18268 | CDLI: P205310 |
| BM 14741 | CDLI: P200599 | BM 18544 | CDLI: P112518 |
| BM 14745 | CDLI: P129868 | BM 18571 | CDLI: P204186 |
| BM 14747 | CDLI: P141834 | BM 18583 | CDLI: P112521 |
| BM 14766 | CDLI: P200595 | BM 19080 | CDLI: P283812 |
| BM 14772 | CDLI: P200590 | BM 19097 | CDLI: P203003 |
| BM 14784 | CDLI: P200587 | BM 19174 | CDLI: P205228 |
| BM 14796 | CDLI: P200977 | BM 19356 | CDLI: P101745 |
| BM 14821 | CDLI: P101742 | BM 19359 | CDLI: P101746 |
| BM 14880 | CDLI: P145696 | BM 19360 | CDLI: P101747 |
| BM 14911 | CDLI: P200982 | BM 19381 | CDLI: P205616 |
| BM 14916 | CDLI: P130011 | BM 19404 | CDLI: P321108 |
| BM 14930 | CDLI: P200589 | BM 19429 | CDLI: P205878 |
| BM 14933 | CDLI: P204452 | BM 19452 | CDLI: P145587 |
| BM 14939 | CDLI: P316210 | BM 19502 A | CDLI: P205662 |
| BM 15040 | CDLI: P129846 | BM 19504 A | CDLI: P202255 |
| BM 15146 | CDLI: P200986 | BM 19958 | CDLI: P204601 |
| BM 15149 | CDLI: P200987 | BM 19958 A | CDLI: P204601 |
| BM 15170 | CDLI: P200980 | BM 20204 | CDLI: P131171 |
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| Museum Number | CDLI/Publication | Museum Number | CDLI/Publication |
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| BM 20661 | CDLI: P131504 | BM 26429 | CDLI: P202780 |
| BM 20664 | CDLI: P131497 | BM 26461 | CDLI: P145606 |
| BM 20668 | CDLI: P131118 | BM 26467 | CDLI: P205985 |
| BM 20780 | CDLI: P131179 | BM 26770 | CDLI: P205988 |
| BM 20781 | CDLI: P131183 | BM 27028 | CDLI: P206506 |
| BM 20789 | CDLI: P131173 | BM 27028 A | CDLI: P206506 |
| BM 20794 | CDLI: P131161 | BM 27332 | CDLI: P205670 |
| BM 20797 | CDLI: P131383 | BM 27594 | CDLI: P205525 |
| BM 20799 | CDLI: P131162 | BM 27667 | CDLI: P202765 |
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| BM 21024 | CDLI: P206117 | BM 86114 | CDLI: P205855 |
| BM 21055 | CDLI: P107191 | BM 86496 | CDLI: P378017 |
| BM 21064 | CDLI: P131465 | BM 86716 | CDLI: P378198 |
| BM 21110 A | CDLI: P205207 | BM 86816 | CDLI: P378290 |
| BM 21111 | CDLI: P131463 | BM 88544 | CDLI: P379534 |
| BM 21111 A | CDLI: P131463 | BM 93356 | CDLI: P374313 |
| BM 21173 | CDLI: P131462 | BM 93586 A | CDLI: P374467 |
| BM 21263 | CDLI: P131464 | BM 93966 | CDLI: P374672 |
| BM 21348 | CDLI: P108600 | BM 93975 | CDLI: P374676 |
| BM 21749 | CDLI: P204859 | BM 93976 | CDLI: P374677 |
| BM 22133 | CDLI: P205311 | BM 93977 | CDLI: P374678 |
| BM 22374 | CDLI: P206427 | BM 93981 | CDLI: P374682 |
| BM 22867 | CDLI: P145896 | BM 93983 | CDLI: P374684 |
| BM 22897 | CDLI: P204930 | BM 93985 | CDLI: P374686 |
| BM 24108 | CDLI: P145596 | BM 94035 | CDLI: P374730 |
| BM 24230 | CDLI: P211384 | BM 94057 | CDLI: P374747 |
| BM 24450 | CDLI: P203688 | BM 94080 | CDLI: P374760 |
| BM 24731 | CDLI: P145475 | BM 94087 | CDLI: P374764 |
| BM 24879 | CDLI: P145694 | BM 94097 | CDLI: P374771 |
| BM 25055 | CDLI: P102233 | BM 94100 | CDLI: P374774 |
| BM 25077 | CDLI: P145897 | BM 94114 | CDLI: P356048 |
| BM 25236 | CDLI: P283849 | BM 94115 | CDLI: P374783 |
| BM 25353 | CDLI: P145655 | BM 94116 | CDLI: P374784 |
| BM 25739 | CDLI: P211381 | BM 94122 | CDLI: P374788 |

| Museum Number | CDLI/Publication | Museum Number | CDLI/Publication |
|---|---|---|---|
| BM 25752 | CDLI: P204353 | BM 94502 | CDLI: P374981 |
| BM 94942 | CDLI: P375087 | BM 105379 | CDLI: P101687 |
| BM 94985 | CDLI: P375116 | BM 105381 | CDLI: P101688 |
| BM 95011 | CDLI: P356049 | BM 105382 | CDLI: P101689 |
| BM 95029 | CDLI: P375145 | BM 105384 | CDLI: P101690 |
| BM 95097 | CDLI: P375203 | BM 105393 | CDLI: P110463 |
| BM 95113 | CDLI: P375217 | BM 105919 | CDLI: P201843 |
| BM 95121 | CDLI: P375224 | BM 105978 | CDLI: P201901 |
| BM 95131 | CDLI: P375233 | BM 106021 | CDLI: P201944 |
| BM 95140 | CDLI: P375238 | BM 106097 | CDLI: P209262 |
| BM 95145 | CDLI: P375242 | BM 106157 | CDLI: P130295 |
| BM 95169 | CDLI: P375260 | BM 106161 | CDLI: P130133 |
| BM 95666 | CDLI: P380008 | BM 106170 | CDLI: P130120 |
| BM 95668 | CDLI: P380010 | BM 106172 | CDLI: P130132 |
| BM 95705 | CDLI: P380045 | BM 106209 | CDLI: P130080 |
| BM 95709 | CDLI: P380049 | BM 106210 | CDLI: P130288 |
| BM 95716 | CDLI: P380056 | BM 106218 | CDLI: P130081 |
| BM 95717 | CDLI: P380057 | BM 106219 | CDLI: P200924 |
| BM 95722 | CDLI: P380062 | BM 106239 | CDLI: P130279 |
| BM 95843 | CDLI: P375915 | BM 106358 | CDLI: P130119 |
| BM 98158 | CDLI: P355955 | BM 106404 | CDLI: P130134 |
| BM 98268 | CDLI: P205858 | BM 106427 | CDLI: P130094 |
| BM 100335 | CDLI: P206544 | BM 106428 | CDLI: P130301 |
| BM 100336 | CDLI: P206545 | BM 106430 | CDLI: P130093 |
| BM 100466 | CDLI: P206576 | BM 106439 | CDLI: P200721 |
| BM 100648 | CDLI: P206612 | BM 106442 | CDLI: P200742 |
| BM 102146 | CDLI: P206638 | BM 106451 | CDLI: P200743 |
| BM 102147 | CDLI: P206639 | BM 106457 | CDLI: P200725 |
| BM 102174 | CDLI: P206649 | BM 106466 | CDLI: P200710 |
| BM 102176 | CDLI: P206650 | BM 106468 | CDLI: P200925 |
| BM 103439 | CDLI: P108670 | BM 106470 | CDLI: P200717 |
| BM 103441 | CDLI: P108679 | BM 106476 | CDLI: P200729 |
| BM 103442 | CDLI: P108680 | BM 106479 | CDLI: P375916 |
| BM 103449 | CDLI: P108685 | BM 106482 | CDLI: P200719 |
| BM 103895 | CDLI: P375438 | BM 106495 | CDLI: P200720 |
| BM 104457 | CDLI: P108686 | BM 106498 | CDLI: P375917 |
| BM 104650 | CDLI: P200193 | BM 106509 | CDLI: P200926 |
| BM 104713 | CDLI: P200255 | BM 106527 | CDLI: P200722 |
| BM 105339 | CDLI: P208747 | BM 106536 | CDLI: P382676 |
| BM 105346 | CDLI: P110465 | BM 106537 | CDLI: P200712 |
| BM 105347 | CDLI: P101686 | BM 106540 | CDLI: P200724 |
| BM 105369 | CDLI: P208680 | BM 106550 | CDLI: P200715 |

| Museum Number | CDLI/Publication | Museum Number | CDLI/Publication |
|---|---|---|---|
| BM 105377 | CDLI: P112634 | BM 106551 | CDLI: P200723 |
| BM 106614 | CDLI: P375920 | BM 107066 | CDLI: P380820 |
| BM 106641 | CDLI: P200714 | BM 107073 | CDLI: P339442 |
| BM 106658 | CDLI: P339042 | BM 107074 | CDLI: P339443 |
| BM 106773 | CDLI: P339153 | BM 107078 | CDLI: P339447 |
| BM 106841 | CDLI: P339219 | BM 107079 | CDLI: P339448 |
| BM 106864 | CDLI: P339242 | BM 107081 | CDLI: P339450 |
| BM 106870 | CDLI: P339248 | BM 107083 | CDLI: P339452 |
| BM 106878 | CDLI: P339256 | BM 107086 | CDLI: P145649 |
| BM 106880 | CDLI: P339258 | BM 107087 | CDLI: P339455 |
| BM 106944 | CDLI: P339320 | BM 107088 | CDLI: P339456 |
| BM 106945 | CDLI: P339321 | BM 107090 | CDLI: P339458 |
| BM 106952 | CDLI: P339328 | BM 107091 | CDLI: P339459 |
| BM 106957 | CDLI: P339333 | BM 107093 | CDLI: P339461 |
| BM 106959 | CDLI: P339334 | BM 107095 | CDLI: P339463 |
| BM 106962 | CDLI: P340515 | BM 107141 | CDLI: P339508 |
| BM 106963 | CDLI: P339337 | BM 107173 | CDLI: P339534 |
| BM 106965 | CDLI: P339339 | BM 107243 | CDLI: P320505 |
| BM 106973 | CDLI: P339347 | BM 107262 | CDLI: P339615 |
| BM 106975 | CDLI: P339349 | BM 107277 | CDLI: P209369 |
| BM 106979 | CDLI: P339353 | BM 107284 | CDLI: P339633 |
| BM 106982 | CDLI: P339356 | BM 107315 | CDLI: P339657 |
| BM 106994 | CDLI: P339368 | BM 107365 | CDLI: P320506 |
| BM 107002 | CDLI: P339376 | BM 107379 | CDLI: P339710 |
| BM 107003 | CDLI: P339377 | BM 107391 | CDLI: P339722 |
| BM 107006 | CDLI: P339380 | BM 107413 | CDLI: P339741 |
| BM 107012 | CDLI: P380817 | BM 107531 | CDLI: P339851 |
| BM 107014 | CDLI: P339387 | BM 107570 | CDLI: P339887 |
| BM 107015 | CDLI: P339388 | BM 107574 | CDLI: P339889 |
| BM 107016 | n/a | BM 107626 | CDLI: P339940 |
| BM 107019 | CDLI: P339391 | BM 107681 | CDLI: P145736 |
| BM 107020 | CDLI: P339392 | BM 107799 | CDLI: P340100 |
| BM 107030 | CDLI: P339402 | BM 107800 | CDLI: P375569 |
| BM 107031 | CDLI: P339403 | BM 107831 | CDLI: P340128 |
| BM 107040 | CDLI: P339412 | BM 107873 | CDLI: P145646 |
| BM 107044 | CDLI: P380819 | BM 107948 | CDLI: P208952 |
| BM 107046 | CDLI: P339416 | BM 107955 | CDLI: P208683 |
| BM 107048 | CDLI: P339418 | BM 108004 | CDLI: P208528 |
| BM 107049 | CDLI: P339419 | BM 108042 | CDLI: P208534 |
| BM 107050 | CDLI: P339420 | BM 108184 | CDLI: P208663 |
| BM 107054 | CDLI: P339424 | BM 108291 | CDLI: P202163 |
| BM 107057 | CDLI: P339427 | BM 109378 | CDLI: P340212 |

| Museum Number | CDLI/Publication | Museum Number | CDLI/Publication |
|---|---|---|---|
| BM 107059 | CDLI: P339429 | BM 109408 | CDLI: P340565 |
| BM 109460 | CDLI: P340594 | BM 113286 | CDLI: P358630 |
| BM 109497 | CDLI: P340613 | BM 113289 | CDLI: P358543 |
| BM 110140 | CDLI: P376004 | BM 113294 | CDLI: P358674 |
| BM 110171 | CDLI: P375923 | BM 113295 | CDLI: P358688 |
| BM 110193 | CDLI: P376054 | BM 113302 | CDLI: P358591 |
| BM 110216 | CDLI: P320513 | BM 113304 | CDLI: P358571 |
| BM 110223 | CDLI: P376083 | BM 113308 | CDLI: P358557 |
| BM 110306 | CDLI: P376155 | BM 113313 | CDLI: P358609 |
| BM 110379 | CDLI: P375924 | BM 113314 | CDLI: P358593 |
| BM 110408 | CDLI: P376349 | BM 113329 | CDLI: P358584 |
| BM 110490 | CDLI: P375925 | BM 113335 | CDLI: P358608 |
| BM 110603 | CDLI: P375926 | BM 113359 | CDLI: P358515 |
| BM 110614 | CDLI: P375927 | BM 113361 | CDLI: P358597 |
| BM 110781 | CDLI: P376676 | BM 113362 | CDLI: P358539 |
| BM 110975 | CDLI: P376211 | BM 113365 | CDLI: P358631 |
| BM 111009 | CDLI: P376244 | BM 113366 | CDLI: P358585 |
| BM 111032 | CDLI: P375929 | BM 113372 | CDLI: P358587 |
| BM 111052 | CDLI: P375930 | BM 113379 | CDLI: P358999 |
| BM 111148 | CDLI: P375932 | BM 113383 | CDLI: P358697 |
| BM 111173 | CDLI: P375933 | BM 113387 | CDLI: P358698 |
| BM 111186 | CDLI: P375931 | BM 113390 | CDLI: P358699 |
| BM 111318 | CDLI: P145636 | BM 113394 | CDLI: P358537 |
| BM 111452 | CDLI: P340644 | BM 113402 | CDLI: P358544 |
| BM 111628 | CDLI: P340356 | BM 113416 | CDLI: P358497 |
| BM 111634 | CDLI: P340362 | BM 113421 | CDLI: P358558 |
| BM 111691 | CDLI: P340403 | BM 113433 | CDLI: P358536 |
| BM 112125 | CDLI: P341025 | BM 113454 | CDLI: P358517 |
| BM 112243 | CDLI: P341139 | BM 113456 | CDLI: P358577 |
| BM 112255 | CDLI: P375857 | BM 113458 | CDLI: P358514 |
| BM 112793 | CDLI: P362935 | BM 113463 | CDLI: P358722 |
| BM 112804 | CDLI: P377560 | BM 113464 | CDLI: P358797 |
| BM 112949 | CDLI: P101692 | BM 113466 | CDLI: P358614 |
| BM 113020 | CDLI: P112565 | BM 113468 | CDLI: P358721 |
| BM 113035 | CDLI: P101693 | BM 113469 | CDLI: P358419 |
| BM 113258 | CDLI: P358523 | BM 113470 | CDLI: P358503 |
| BM 113259 | CDLI: P358431 | BM 113472 | CDLI: P358463 |
| BM 113266 | CDLI: P358542 | BM 113481 | CDLI: P358632 |
| BM 113268 | CDLI: P358510 | BM 113482 | CDLI: P358491 |
| BM 113271 | CDLI: P358728 | BM 113483 | CDLI: P358707 |
| BM 113277 | CDLI: P358672 | BM 113496 | CDLI: P358498 |
| BM 113278 | CDLI: P358535 | BM 113500 | CDLI: P358576 |

| Museum Number | CDLI/Publication | Museum Number | CDLI/Publication |
|---|---|---|---|
| BM 113283 | CDLI: P358578 | BM 113501 | CDLI: P358586 |
| BM 113503 | CDLI: P358624 | BM 115074 | CDLI: P358662 |
| BM 113516 | CDLI: P358504 | BM 115078 | CDLI: P358730 |
| BM 113520 | CDLI: P358506 | BM 115079 | CDLI: P358731 |
| BM 113525 | CDLI: P358458 | BM 115080 | CDLI: P358683 |
| BM 113526 | CDLI: P358481 | BM 115085 | CDLI: P358735 |
| BM 113527 | CDLI: P358460 | BM 115086 | CDLI: P358744 |
| BM 113528 | CDLI: P358508 | BM 115092 | CDLI: P358833 |
| BM 113530 | CDLI: P358421 | BM 115105 | CDLI: P358740 |
| BM 113531 | CDLI: P358500 | BM 115110 | CDLI: P358742 |
| BM 113532 | CDLI: P358473 | BM 115115 | CDLI: P358825 |
| BM 113534 | CDLI: P358470 | BM 115125 | CDLI: P358801 |
| BM 113535 | CDLI: P358415 | BM 115126 | CDLI: P358834 |
| BM 113538 | CDLI: P358456 | BM 115130 | CDLI: P358844 |
| BM 113539 | CDLI: P358538 | BM 115135 | CDLI: P358641 |
| BM 113541 | CDLI: P358625 | BM 115172 | CDLI: P358930 |
| BM 113542 | CDLI: P358461 | BM 115175 | CDLI: P358666 |
| BM 113545 | CDLI: P358413 | BM 115176 | CDLI: P358813 |
| BM 113547 | CDLI: P358449 | BM 115179 | CDLI: P358663 |
| BM 113550 | CDLI: P358467 | BM 115181 | CDLI: P358768 |
| BM 113554 | CDLI: P358490 | BM 115191 | CDLI: P358777 |
| BM 113556 | CDLI: P358582 | BM 115198 | CDLI: P358650 |
| BM 113558 | CDLI: P358533 | BM 115808 | CDLI: P320524 |
| BM 113563 | CDLI: P358509 | BM 115812 | CDLI: P320527 |
| BM 113565 | CDLI: P358472 | BM 115826 | CDLI: P320536 |
| BM 113566 | CDLI: P358428 | BM 115852 | CDLI: P320537 |
| BM 113571 | CDLI: P358409 | BM 117179 | CDLI: P320539 |
| BM 113571 A | CDLI: P358934 | BM 117191 | CDLI: P320550 |
| BM 113575 | CDLI: P358858 | BM 117194 | CDLI: P320553 |
| BM 113575 A | CCT 5 48 | BM 117279 | CDLI: P320629 |
| BM 113587 | CDLI: P358500 | BM 117345 | CDLI: P320822 |
| BM 113604 | CDLI: P359032 | BM 117351 | CDLI: P320831 |
| BM 113618 | CDLI: P358583 | BM 117392 | CDLI: P320919 |
| BM 113982 | CDLI: P412675 | BM 119403 | CDLI: P358879 |
| BM 115049 | CDLI: P358661 | BM 119412 | CDLI: P358881 |
| BM 115050 | CDLI: P358754 | BM 120143 | CDLI: P321021 |
| BM 115051 | CDLI: P358755 | BM 120496 | CDLI: P359045 |
| BM 115052 | CDLI: P358843 | BM 120504 | CDLI: P358771 |
| BM 115057 | CDLI: P358894 | BM 120513 | CDLI: P358806 |
| BM 115059 | CDLI: P358828 | BM 120514 | CDLI: P358885 |
| BM 115064 | CDLI: P358684 | BM 130101 | CDLI: P136318 |
| BM 115067 | CDLI: P358765 | BM 130115 | CDLI: P136383 |

| Museum Number | CDLI/Publication | Museum Number | CDLI/Publication |
|---|---|---|---|
| BM 115070 | CDLI: P358923 | BM 130124 | n/a |
| BM 130137 | CDLI: P136470 | U 16073 | CDLI: P331068 |
| BM 130174 | CDLI: P136628 | U 16510 | CDLI: P331070 |
| BM 130177 | CDLI: P136640 | U 16513 | CDLI: P331071 |
| BM 130182 | CDLI: P136663 | U 16525 | CDLI: P331073 |
| BM 130182 A | UET 3 342 | U 16563 | CDLI: P331074 |
| BM 130188 | CDLI: P136687 | U 17249,23 | Nisaba 5/1 16 |
| BM 130195 | CDLI: P136716 | U 17641 | CDLI: P331079 |
| BM 130199 | CDLI: P136730 | U 18735 | CDLI: P331083 |
| BM 130204 | CDLI: P136749 | U 18795 | CDLI: P331085 |
| BM 130215 | CDLI: P136797 | U 18809 | CDLI: P331086 |
| BM 130423 | CDLI: P137675 | U 18814 | CDLI: P331088 |
| BM 130424 | CDLI: P137680 | U 18815 | CDLI: P331089 |
| BM 130425 | CDLI: P137683 | U 18831 | CDLI: P331093 |
| BM 130426 | CDLI: P137687 | U 18833 | CDLI: P331095 |
| BM 130436 | CDLI: P137728 | U 18839 | CDLI: P331096 |
| BM 130470 | CDLI: P137863 | U 18840 | CDLI: P331097 |
| BM 130474 | CDLI: P137881 | U 18841 | CDLI: P331098 |
| BM 130494 | CDLI: P137962 | U 18857 | CDLI: P331101 |
| BM 130528 | CDLI: P138107 | U 18876 | CDLI: P331104 |
| BM 132982 | CDLI: P321029 | U 20085 | CDLI: P331109 |
| BM 134634 | CDLI: P145622 | U 30115 | CDLI: P331645 |
| BM 134953 | CDLI: P321030 | U 30176 | CDLI: P331250 |
| U 708 | CDLI: P331066 | U 30182 | CDLI: P331255 |
| U 7810 i | CDLI: P331640 | U 30594 | CDLI: P331595 |
| U 16070 | CDLI: P331067 | 2010,6022.7 (BM) | CDLI: P429935 |

## Appendix 2: Case studies samples: Ur III

The following lists all the objects that were analysed in dedicated case studies covering the Ur III Period in this dissertation, referenced by their museum numbers and organised by case study, with reference to the relevant sections in the dissertation.

### a. Ur III study samples: Chapters 2 and 3

- **Ur III benchmark sample (by museum number)**

*See §2.1.3 Sampling and data collection protocols (p. 86)*

*See §2.2 Diplomatic criteria and variation (p. 93)*

*See §2.3 Palaeographic criteria and variation (p. 97 and p. 108)*

*See §3.1.3 Patterns between tablets (p. 128)*

| | | | |
|---|---|---|---|
| AO 5481 | BM 14747 | BM 107050 | BM 117279 |
| AO 5496 | BM 14880 | BM 107054 | BM 120143 |
| AO 5534 | BM 19429 | BM 107073 | BM 130101 |
| AO 5536 | BM 24450 | BM 107074 | BM 130115 |
| AO 5599 | BM 25236 | BM 107087 | BM 130124 |
| AO 5637 | BM 25752 | BM 107090 | BM 130137 |
| AO 19540 | BM 26429 | BM 107091 | BM 130174 |
| BM 12249 | BM 26461 | BM 107093 | BM 130177 |
| BM 12277 | BM 27594 | BM 107243 | BM 130182 |
| BM 12280 | BM 27667 | BM 107365 | BM 130182 A |
| BM 12326 | BM 85441 | BM 107570 | BM 130188 |
| BM 12345 | BM 103441 | BM 107799 | BM 130195 |
| BM 12481 | BM 103442 | BM 107800 | BM 130199 |
| BM 12481 A | BM 103449 | BM 107873 | BM 130204 |
| BM 12493 | BM 106210 | BM 108004 | BM 130215 |
| BM 12498 | BM 106841 | BM 110216 | BM 130423 |
| BM 12511 | BM 106864 | BM 111318 | BM 130424 |
| BM 12608 | BM 106952 | BM 111691 | BM 130425 |
| BM 12619 | BM 106962 | BM 112255 | BM 130426 |
| BM 13993 | BM 106965 | BM 113020 | BM 130436 |
| BM 14668 | BM 106979 | BM 115808 | BM 130470 |
| BM 14668 A | BM 106994 | BM 115812 | BM 130474 |
| BM 14678 | BM 107016 | BM 115826 | BM 130494 |
| BM 14706 | BM 107020 | BM 117179 | BM 130528 |
| BM 14736 | BM 107046 | BM 117191 | BM 134634 |
| BM 14745 | BM 107048 | BM 117194 | BM 134953 |

- **Ur III benchmark sample (by date)**

*See §3.1.1 Patterns over time (p. 118)*

Dated to Šulgi's reign (2092-2045 BCE)

| | | | |
|---|---|---|---|
| BM 12277 | BM 27667 | BM 108004 | BM 130177 |
| BM 12326 | BM 85441 | BM 110216 | BM 130188 |
| BM 12481 | BM 107016 | BM 111691 | BM 130470 |
| BM 12481 A | BM 107090 | BM 115808 | BM 130474 |
| BM 12493 | BM 107243 | BM 117179 | |
| BM 24450 | BM 107365 | BM 117194 | |
| BM 26429 | BM 107570 | BM 130174 | |

Dated to Amar-Suen's reign (2044-2036 BCE)

| | | | |
|---|---|---|---|
| BM 12249 | BM 103442 | BM 106994 | BM 115812 |
| BM 12345 | BM 103449 | BM 107020 | BM 115826 |
| BM 12498 | BM 106864 | BM 107087 | BM 117191 |
| BM 12608 | BM 106952 | BM 107091 | BM 130115 |
| BM 25752 | BM 106962 | BM 107800 | BM 130436 |
| BM 103441 | BM 106979 | BM 107873 | BM 130528 |

Dated to Šu-Suen's reign (2035-2027 BCE)

| | | | |
|---|---|---|---|
| BM 12511 | BM 106965 | BM 107093 | BM 130182 |
| BM 13993 | BM 107046 | BM 107799 | BM 130182 A |
| BM 14678 | BM 107050 | BM 112255 | BM 130425 |
| BM 14706 | BM 107054 | BM 117279 | BM 130494 |
| BM 27594 | BM 107074 | BM 120143 | BM 134953 |

Dated to Ibbi-Suen's reign (2026-2003 BCE)

| | | | |
|---|---|---|---|
| AO 5481 | BM 14668 A | BM 107048 | BM 130199 |
| AO 5534 | BM 14736 | BM 113020 | BM 130204 |
| AO 5599 | BM 14747 | BM 130101 | BM 130215 |
| AO 5637 | BM 19429 | BM 130124 | |
| AO 19540 | BM 25236 | BM 130137 | |
| BM 14668 | BM 106210 | BM 130195 | |

- **Ur III benchmark sample (by provenance)**

*See §3.1.2 Patterns across place (p. 124)*

Provenanced from Drehem, ancient Puzriš Dagan

| | | | |
|---|---|---|---|
| AO 5481 | BM 103441 | BM 110216 | BM 117194 |
| AO 5496 | BM 103442 | BM 112255 | BM 117279 |
| AO 5534 | BM 103449 | BM 115808 | BM 120143 |
| AO 5536 | BM 106962 | BM 115812 | BM 134953 |
| AO 5599 | BM 107243 | BM 115826 | |
| AO 5637 | BM 107365 | BM 117179 | |
| AO 19540 | BM 107800 | BM 117191 | |

Provenanced from Girsu, modern Tello

| | | | |
|---|---|---|---|
| BM 12249 | BM 12498 | BM 14706 | BM 25752 |
| BM 12277 | BM 12511 | BM 14736 | BM 26461 |
| BM 12280 | BM 12608 | BM 14745 | BM 27594 |
| BM 12326 | BM 12619 | BM 14747 | BM 27667 |
| BM 12345 | BM 13993 | BM 14880 | BM 107050 |
| BM 12481 | BM 14668 | BM 19429 | |
| BM 12481 A | BM 14668 A | BM 24450 | |
| BM 12493 | BM 14678 | BM 25236 | |

Provenanced from Umma, modern Jokha

| | | | |
|---|---|---|---|
| BM 26429 | BM 106979 | BM 107073 | BM 107799 |
| BM 85441 | BM 106994 | BM 107074 | BM 107873 |
| BM 106210 | BM 107016 | BM 107087 | BM 108004 |
| BM 106841 | BM 107020 | BM 107090 | BM 111318 |
| BM 106864 | BM 107046 | BM 107091 | BM 111691 |
| BM 106952 | BM 107048 | BM 107093 | BM 113020 |
| BM 106965 | BM 107054 | BM 107570 | |

Provenanced from Ur, modern Tell Muqayyar

| | | | |
|---|---|---|---|
| BM 130101 | BM 130182 | BM 130215 | BM 130470 |
| BM 130115 | BM 130182 A | BM 130423 | BM 130474 |
| BM 130124 | BM 130188 | BM 130424 | BM 130494 |
| BM 130137 | BM 130195 | BM 130425 | BM 130528 |
| BM 130174 | BM 130199 | BM 130426 | BM 134634 |
| BM 130177 | BM 130204 | BM 130436 | |

## b. Ur III study samples: Chapter 4

### ▪ Ur III dated tablets

*See §4.1.1 Time-related patterns of variations? (p. 164)*

Sorted by museum number:

| | | | |
|---|---|---|---|
| AO 2464 | BM 18268 | BM 94100 | U 708 |
| AO 2561 | BM 18571 | BM 94115 | U 7810 i |
| AO 3556 | BM 19174 | BM 95029 | U 16070 |
| AO 3561 | BM 19356 | BM 95131 | U 16073 |
| AO 27503 | BM 19359 | BM 95716 | U 16510 |
| AO 27518 | BM 19360 | BM 95843 | U 16513 |
| BM 12249 | BM 19429 | BM 100648 | U 17641 |
| BM 12277 | BM 19958 | BM 107050 | U 18735 |
| BM 12326 | BM 22133 | BM 130101 | U 18795 |
| BM 12345 | BM 22867 | BM 130115 | U 18809 |
| BM 12481 | BM 22897 | BM 130124 | U 18814 |
| BM 12493 | BM 24450 | BM 130137 | U 18815 |
| BM 12498 | BM 25236 | BM 130174 | U 18831 |
| BM 12511 | BM 25739 | BM 130177 | U 18833 |
| BM 12608 | BM 25752 | BM 130182 | U 18839 |
| BM 13779 | BM 27028 | BM 130188 | U 18840 |
| BM 13993 | BM 27594 | BM 130195 | U 18841 |
| BM 14668 | BM 27667 | BM 130199 | U 18857 |
| BM 14678 | BM 93975 | BM 130204 | U 18876 |
| BM 14706 | BM 93976 | BM 130215 | U 20085 |
| BM 14736 | BM 93981 | BM 130423 | U 30115 |
| BM 14747 | BM 93983 | BM 130425 | U 30176 |
| BM 14772 | BM 93985 | BM 130436 | U 30182 |
| BM 14821 | BM 94035 | BM 130470 | U 30594 |
| BM 14933 | BM 94057 | BM 130474 | |
| BM 17936 | BM 94087 | BM 130494 | |
| BM 18258 | BM 94097 | BM 130528 | |

Sorted by date:

Dated to Šulgi's reign (2092-2045 BCE)

| | | | |
|---|---|---|---|
| BM 12277 | BM 24450 | BM 130470 | U 18839 |
| BM 12326 | BM 27667 | BM 130474 | U 18840 |
| BM 12481 | BM 130174 | U 16070 | U 18876 |
| BM 12493 | BM 130177 | U 18809 | U 30115 |
| BM 14821 | BM 130188 | U 18815 | U 30182 |

Dated to Amar-Suen's reign (2044-2036 BCE)

| | | | |
|---|---|---|---|
| BM 12249 | BM 17936 | BM 27028 | U 7810 i |
| BM 12345 | BM 18571 | BM 100648 | U 18795 |
| BM 12498 | BM 19958 | BM 130115 | U 18814 |
| BM 12608 | BM 22897 | BM 130423 | U 18831 |
| BM 14772 | BM 25739 | BM 130436 | U 30594 |
| BM 14933 | BM 25752 | BM 130528 | |

Dated to Šu-Suen's reign (2035-2027 BCE)

| | | | |
|---|---|---|---|
| AO 2464 | BM 18258 | BM 93983 | BM 130425 |
| AO 2561 | BM 18268 | BM 94035 | BM 130494 |
| AO 3561 | BM 19174 | BM 94087 | U 708 |
| AO 27503 | BM 19356 | BM 95029 | U 18833 |
| AO 27518 | BM 19359 | BM 95131 | U 18857 |
| BM 12511 | BM 19360 | BM 95716 | U 30176 |
| BM 13993 | BM 22133 | BM 95843 | |
| BM 14678 | BM 22867 | BM 107050 | |
| BM 14706 | BM 27594 | BM 130182 | |

Dated to Ibbi-Suen's reign (2026-2003 BCE)

| | | | |
|---|---|---|---|
| AO 3556 | BM 93976 | BM 130124 | U 16513 |
| BM 13779 | BM 93981 | BM 130137 | U 17641 |
| BM 14668 | BM 93985 | BM 130195 | U 18735 |
| BM 14736 | BM 94057 | BM 130199 | U 18841 |
| BM 14747 | BM 94097 | BM 130204 | U 20085 |
| BM 19429 | BM 94100 | BM 130215 | |
| BM 25236 | BM 94115 | U 16073 | |
| BM 93975 | BM 130101 | U 16510 | |

- **Ur III tablets provenanced from Ur and Girsu**

*See §4.1.2 Place-related patterns of variations? (p. 175)*

Sorted by museum number:

| | | | |
|---|---|---|---|
| BM 12249 | BM 25077 | BM 130137 | U 17641 |
| BM 12277 | BM 25236 | BM 130174 | U 18735 |
| BM 12326 | BM 25739 | BM 130177 | U 18795 |
| BM 12345 | BM 25752 | BM 130182 | U 18809 |
| BM 12481 | BM 27594 | BM 130188 | U 18814 |
| BM 12493 | BM 27667 | BM 130195 | U 18815 |
| BM 12498 | BM 93975 | BM 130199 | U 18831 |
| BM 12511 | BM 93976 | BM 130204 | U 18833 |
| BM 12608 | BM 93981 | BM 130215 | U 18839 |
| BM 13993 | BM 93983 | BM 130423 | U 18840 |
| BM 14668 | BM 94035 | BM 130425 | U 18841 |
| BM 14678 | BM 94057 | BM 130436 | U 18857 |
| BM 14706 | BM 94087 | BM 130470 | U 18876 |
| BM 14736 | BM 94097 | BM 130474 | U 20085 |
| BM 14747 | BM 94100 | BM 130494 | U 30115 |
| BM 14821 | BM 94115 | BM 130528 | U 30176 |
| BM 15839 | BM 95029 | U 708 | U 30182 |
| BM 19356 | BM 95131 | U 7810 i | U 30594 |
| BM 19359 | BM 95843 | U 16070 | |
| BM 19360 | BM 107050 | U 16073 | |
| BM 19429 | BM 130101 | U 16510 | |
| BM 22867 | BM 130115 | U 16513 | |
| BM 24450 | BM 130124 | U 16525 | |

Sorted by provenance:

Provenanced from Girsu, modern Tello

| | | | |
|---|---|---|---|
| BM 12249 | BM 14678 | BM 24450 | BM 94035 |
| BM 12277 | BM 14706 | BM 25077 | BM 94057 |
| BM 12326 | BM 14736 | BM 25236 | BM 94087 |
| BM 12345 | BM 14747 | BM 25739 | BM 94097 |
| BM 12481 | BM 14821 | BM 25752 | BM 94100 |
| BM 12493 | BM 15839 | BM 27594 | BM 94115 |
| BM 12498 | BM 19356 | BM 27667 | BM 95029 |
| BM 12511 | BM 19359 | BM 93975 | BM 95131 |
| BM 12608 | BM 19360 | BM 93976 | BM 95843 |
| BM 13993 | BM 19429 | BM 93981 | BM 107050 |
| BM 14668 | BM 22867 | BM 93983 | |

Provenanced from Ur, modern Tell Muqayyar

| | | | |
|---|---|---|---|
| BM 130101 | BM 130215 | U 16073 | U 18833 |
| BM 130115 | BM 130423 | U 16510 | U 18839 |
| BM 130124 | BM 130425 | U 16513 | U 18840 |
| BM 130137 | BM 130436 | U 16525 | U 18841 |
| BM 130174 | BM 130470 | U 17641 | U 18857 |
| BM 130177 | BM 130474 | U 18735 | U 18876 |
| BM 130182 | BM 130494 | U 18795 | U 20085 |
| BM 130188 | BM 130528 | U 18809 | U 30115 |
| BM 130195 | U 708 | U 18814 | U 30176 |
| BM 130199 | U 7810 i | U 18815 | U 30182 |
| BM 130204 | U 16070 | U 18831 | U 30594 |

- **Ur III dossiers**

*See §4.1.3 Dossier-related patterns of variations? (p. 185)*

Sorted by museum number:

| | | | |
|---|---|---|---|
| AO 2464 | BM 14821 | BM 19360 | BM 27833 |
| AO 2561 | BM 14880 | BM 19452 | BM 27850 |
| AO 3556 | BM 14933 | BM 19958 | BM 29468 |
| AO 3561 | BM 15839 | BM 21055 | BM 29894 |
| AO 27503 | BM 17936 | BM 22133 | BM 29908 |
| AO 27518 | BM 18258 | BM 22867 | BM 94080 |
| AO 27529 | BM 18268 | BM 22897 | BM 94502 |
| BM 12477 | BM 18544 | BM 24108 | BM 95716 |
| BM 13335 | BM 18571 | BM 24879 | BM 95843 |
| BM 13364 | BM 18583 | BM 25077 | BM 100648 |
| BM 13779 | BM 19174 | BM 25739 | BM 102147 |
| BM 14745 | BM 19356 | BM 25835 | BM 109497 |
| BM 14772 | BM 19359 | BM 27028 | |

Sorted by dossier:

Blacksmiths

| | | | |
|---|---|---|---|
| AO 2464 | AO 27529 | BM 18258 | BM 22897 |
| AO 2561 | BM 12477 | BM 18268 | BM 27028 |
| AO 3556 | BM 13779 | BM 18571 | BM 95716 |
| AO 3561 | BM 14772 | BM 19174 | BM 100648 |
| AO 27503 | BM 14933 | BM 19958 | |
| AO 27518 | BM 17936 | BM 22133 | |

Letters

| | | | |
|---|---|---|---|
| BM 13335 | BM 18583 | BM 25835 | BM 29908 |
| BM 13364 | BM 19452 | BM 27833 | BM 94080 |
| BM 14745 | BM 21055 | BM 27850 | BM 94502 |
| BM 14880 | BM 24108 | BM 29468 | BM 102147 |
| BM 18544 | BM 24879 | BM 29894 | BM 109497 |

Di til-la

| | | |
|---|---|---|
| BM 14821 | BM 19359 | BM 25077 |
| BM 15839 | BM 19360 | BM 25739 |
| BM 19356 | BM 22867 | BM 95843 |

- **The Blacksmiths tablets**

*See §4.2.1 The Blacksmiths tablets from Girsu (p. 196)*

| | | | |
|---|---|---|---|
| AO 2464 | BM 14741 | BM 19958 | BM 27332 |
| AO 2561 | BM 14784 | BM 20342 | BM 95668 |
| AO 3556 | BM 14930 | BM 20438 | BM 95716 |
| AO 3561 | BM 14933 | BM 21064 | BM 100466 |
| AO 27503 | BM 15040 | BM 21111 | BM 100648 |
| AO 27518 | BM 17936 | BM 21173 | BM 102146 |
| BM 12477 | BM 18258 | BM 22133 | BM 102174 |
| BM 13779 | BM 18268 | BM 22897 | BM 102176 |
| BM 14493 | BM 18571 | BM 24230 | BM 109378 |
| BM 14661 | BM 19174 | BM 27028 | BM 109460 |

- **The Shepherds tablets**

*See §4.2.2 The Shepherds tablets from Girsu (p. 206)*

| | | | |
|---|---|---|---|
| BM 93975 | BM 93985 | BM 94087 | BM 94115 |
| BM 93976 | BM 94035 | BM 94097 | BM 95029 |
| BM 93981 | BM 94057 | BM 94100 | BM 95131 |
| BM 93983 | | | |

- **The Di til-la tablets**

*See §4.2.3 The Di til-la tablets from Girsu (p. 215)*

| | | |
|---|---|---|
| BM 14821 | BM 19359 | BM 25077 |
| BM 15839 | BM 19360 | BM 25739 |
| BM 19356 | BM 22867 | BM 95843 |

## Appendix 3: Case studies samples: Old Assyrian

The following lists all the objects that were analysed in dedicated case studies covering the Old Assyrian Period in this dissertation, referenced by their museum numbers and organised by case study, with reference to the relevant sections in the dissertation.

### a. Old Assyrian study samples: Chapters 2 and 3

- **Old Assyrian benchmark sample (by museum number)**

*See 2.1.3 Sampling and data collection protocols (p. 86)*

*See 2.2 Diplomatic criteria and variation (p. 93)*

*See 2.3 Palaeographic criteria and variation (p. 101 and p. 113)*

*See 3.2.1 Patterns between tablets (p. 138)*

| | | | |
|---|---|---|---|
| BM 113259 | BM 113526 | BM 113554 | BM 115067 |
| BM 113304 | BM 113527 | BM 113556 | BM 115079 |
| BM 113416 | BM 113528 | BM 113558 | BM 115080 |
| BM 113454 | BM 113530 | BM 113563 | BM 115086 |
| BM 113458 | BM 113531 | BM 113565 | BM 115092 |
| BM 113470 | BM 113534 | BM 113566 | BM 115115 |
| BM 113472 | BM 113535 | BM 113571 | BM 115125 |
| BM 113496 | BM 113538 | BM 113575 | BM 115126 |
| BM 113503 | BM 113542 | BM 113575 A | BM 115130 |
| BM 113516 | BM 113545 | BM 115051 | BM 115176 |
| BM 113520 | BM 113547 | BM 115052 | |
| BM 113525 | BM 113550 | BM 115059 | |

## ▪ Old Assyrian benchmark sample (by text type)

*See 3.2.2 Patterns across text types (p. 153)*

administrative texts

| | | | |
|---|---|---|---|
| BM 113259 | BM 113534 | BM 113565 | BM 115115 |
| BM 113472 | BM 113538 | BM 113566 | BM 115125 |
| BM 113525 | BM 113542 | BM 115052 | BM 115126 |
| BM 113527 | BM 113547 | BM 115059 | BM 115176 |
| BM 113530 | BM 113550 | BM 115092 | |

correspondence

| | | | |
|---|---|---|---|
| BM 113304 | BM 113503 | BM 113558 | BM 115079 |
| BM 113454 | BM 113556 | BM 113563 | BM 115080 |
| BM 113458 | | | |

legal texts

| | | | |
|---|---|---|---|
| BM 113416 | BM 113526 | BM 113554 | BM 115067 |
| BM 113470 | BM 113528 | BM 113571 | BM 115086 |
| BM 113496 | BM 113531 | BM 113575 | BM 115130 |
| BM 113516 | BM 113535 | BM 113575 A | |
| BM 113520 | BM 113545 | BM 115051 | |

## ▪ Old Assyrian benchmark sample (by date)

*See 3.2.3 Patterns over time (p. 159)*

| | | | |
|---|---|---|---|
| 1925 BCE (REL 48) | BM 113571 | 1867 BCE (REL 106) | BM 113542 |
| 1897 BCE (REL 76) | BM 113416 | 1864 BCE (REL 109) | BM 113259 |
| 1890 BCE (REL 83) | BM 113496 | 1862 BCE (REL 111) | BM 113470 |
| 1883 BCE (REL 90) | BM 113516 | 1860 BCE (REL 113) | BM 113575 |
| 1880 BCE (REL 93) | BM 113528 | | BM 113575 A |
| 1875 BCE (REL 98) | BM 113520 | 1841 BCE (REL 132) | BM 113554 |

## b. Old Assyrian study samples: Chapter 5

### ▪ Old Assyrian generations

*See 5.1.1 Time-related patterns of variations? (p. 231)*

Sorted by museum number:

| | | | |
|---|---|---|---|
| BM 113258 | BM 113362 | BM 113466 | BM 115110 |
| BM 113268 | BM 113372 | BM 113501 | BM 115135 |
| BM 113271 | BM 113379 | BM 113503 | BM 115172 |
| BM 113278 | BM 113394 | BM 113539 | BM 115175 |
| BM 113283 | BM 113402 | BM 113556 | BM 119403 |
| BM 113289 | BM 113421 | BM 115057 | BM 120513 |
| BM 113294 | BM 113433 | BM 115078 | |
| BM 113295 | BM 113456 | BM 115080 | |
| BM 113308 | BM 113463 | BM 115085 | |

Sorted by generation:

Generation 1

| | | | |
|---|---|---|---|
| BM 113258 | BM 113289 | BM 113456 | BM 115080 |
| BM 113268 | BM 113294 | BM 113503 | BM 115110 |
| BM 113271 | BM 113308 | BM 113556 | BM 115135 |
| BM 113278 | BM 113402 | BM 115057 | BM 115175 |
| BM 113283 | BM 113421 | BM 115078 | BM 119403 |

Generation 2

| | | |
|---|---|---|
| BM 113295 | BM 113433 | BM 113539 |
| BM 113362 | BM 113463 | BM 115085 |
| BM 113372 | BM 113466 | BM 115172 |
| BM 113379 | BM 113501 | BM 120513 |
| BM 113394 | | |

## ▪ Old Assyrian genders

*See 5.1.2 Gender-related patterns of variations? (p. 245)*

Sorted by museum number:

| | | | |
|---|---|---|---|
| BM 113258 | BM 113362 | BM 113466 | BM 115085 |
| BM 113268 | BM 113366 | BM 113501 | BM 115105 |
| BM 113271 | BM 113372 | BM 113503 | BM 115110 |
| BM 113277 | BM 113379 | BM 113539 | BM 115135 |
| BM 113278 | BM 113394 | BM 113556 | BM 115172 |
| BM 113283 | BM 113402 | BM 113558 | BM 115175 |
| BM 113289 | BM 113421 | BM 113563 | BM 115179 |
| BM 113294 | BM 113433 | BM 113618 | BM 115198 |
| BM 113295 | BM 113454 | BM 115057 | BM 119403 |
| BM 113304 | BM 113456 | BM 115078 | BM 120513 |
| BM 113308 | BM 113458 | BM 115079 | |
| BM 113329 | BM 113463 | BM 115080 | |

Sorted by gender:

Female-authored letters

| | | | |
|---|---|---|---|
| BM 113277 | BM 113329 | BM 113466 | BM 115175 |
| BM 113283 | BM 113366 | BM 113618 | BM 115179 |
| BM 113295 | BM 113456 | BM 115105 | BM 115198 |

Male-authored letters

| | | | |
|---|---|---|---|
| BM 113258 | BM 113372 | BM 113501 | BM 115080 |
| BM 113268 | BM 113379 | BM 113503 | BM 115085 |
| BM 113271 | BM 113394 | BM 113539 | BM 115110 |
| BM 113278 | BM 113402 | BM 113556 | BM 115135 |
| BM 113289 | BM 113421 | BM 113558 | BM 115172 |
| BM 113294 | BM 113433 | BM 113563 | BM 119403 |
| BM 113304 | BM 113454 | BM 115057 | BM 120513 |
| BM 113308 | BM 113458 | BM 115078 | |
| BM 113362 | BM 113463 | BM 115079 | |

- **Old Assyrian family network**

*See 5.2.1 Family-related patterns of variations? (p. 254)*

Sorted by museum number:

| | | | |
|---|---|---|---|
| BM 113271 | BM 113394 | BM 113501 | BM 115172 |
| BM 113283 | BM 113402 | BM 113539 | BM 115175 |
| BM 113289 | BM 113433 | BM 115057 | BM 120513 |
| BM 113295 | BM 113456 | BM 115085 | BM 120514 |
| BM 113362 | BM 113463 | BM 115110 | |
| BM 113379 | BM 113466 | BM 115135 | |

Sorted by family member:

| | | | |
|---|---|---|---|
| Lamassi | BM 113283 | Sueyya | BM 113463 |
| | BM 113456 | | BM 113501 |
| | BM 115175 | | BM 115085 |
| Pušu-ken | BM 113271 | Buzazu | BM 113362 |
| | BM 113289 | | BM 113379 |
| | BM 113402 | | BM 113394 |
| | BM 115057 | | BM 113433 |
| | BM 115110 | | BM 113539 |
| | BM 115135 | | BM 115172 |
| Aššur-mutabbil | BM 120513 | Waqqurtum | BM 113466 |
| Ahaha | BM 113295 | | |
| | BM 120514 | | |

- **Old Assyrian letters from Pušu-ken**

*See 5.2.2 Pušu-ken: letter author, letter writer? (p. 268)*

| | | |
|---|---|---|
| BM 113271 | BM 113402 | BM 115110 |
| BM 113289 | BM 115057 | BM 115135 |

## Appendix 4: Glossary of cuneiform palaeography and diplomatics

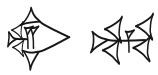
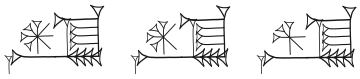
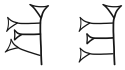
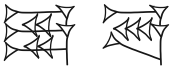
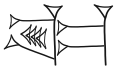
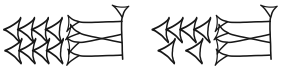
| | |
|---|---|
| *Abutting wedge* | Wedge interaction by which two or more wedge heads or tails meet<br>Alternative name *Meeting wedge* |
| *Basal wedge* | Wedge function by which a lower horizontal carries other wedges impressed above it |
| *Broken horizontal* | Horizontal alignment of horizontal wedges |
| *Broken vertical* | Vertical alignment of vertical wedges |
| *Character-spanning wedge* | Wedge function by which one wedge meets and connects other component wedges of a sign<br>See *Connecting wedge* |
| *Closing line* | Line traced under the last line of an inscription to mark its end |
| *Connecting wedge* | Wedge function by which one wedge crosses and connects other component wedges of a sign<br>See *Character-spanning wedge* |
| *Contained element* | Group of wedges impressed inside a container, or frame, formed by another group of wedges<br>See *Container* |
| *Container* | Group of wedges forming a container, or frame, element<br>See *Contained element* |
| *Crossing wedges* | Wedge interaction by which two or more wedge tails overlap |
| *Diagonal wedge* | Long tilted wedge<br>Variations of the diagonal wedge are determined by its orientation, either downward rightward, downward leftward, upward rightward or upward leftward<br>Alternative name *Oblique wedge* |
| *Floating* | Placement of signs by which the characters are inscribed between two lines |
| *Folding* | Manufacturing technique by which a tablet is formed by folding a sheet of clay |

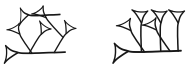
| | |
|---|---|
| *Hand moulding* | Manufacturing technique by which a tablet is formed by shaping a lump of clay by hand |
| *Hanging* | Placement of signs by which the characters are hanging from the line above |
| *Horizontal stack* | Vertical alignment of horizontal wedges |
| *Horizontal wedge* | Long lying wedge<br>Variations of the horizontal wedge are determined by its orientation, either leftward or rightward |
| *Justified text* | Arrangement of characters by which written signs are evenly spread out between the left and right margins |
| *Landscape* | Format by which the inscription runs along the longest side of a tablet |
| *Module* | Distance between the bases of vertical wedges on two consecutive lines |
| *Oblique wedge* | See *Diagonal wedge* |
| *Portrait* | Format by which the inscription runs along the shortest side of a tablet |
| *Profile* | Profile displayed by each writing surface of a tablet<br>Either rounded or flat for small edges<br>Either convex or flat for obverse and reverse<br>Either squared, pinched or rounded for corners |
| *Ratio* | Shape of a tablet measured by computing the ratio between the height and the width of the tablet<br>A ratio of 1 thus represents a square tablet<br>A ratio lesser than 1 represents a rectangular tablet (landscape)<br>A ratio greater than 1 represents a rectangular tablet (portrait) |
| *Script density* | Vertical distribution of signs on the writing surface, expressed as the average number of lines of text per measured unit (e.g. cm) and calculated by dividing the total line count by the height of the inscribed surface |
| *Separation line* | Line traced under the last line of text on a writing surface (e.g. an edge) where the inscription carries over the following surface |

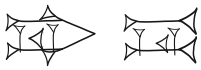
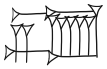
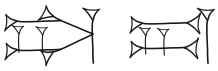
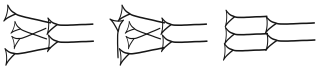
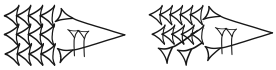
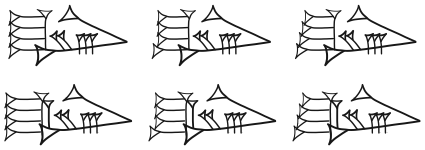
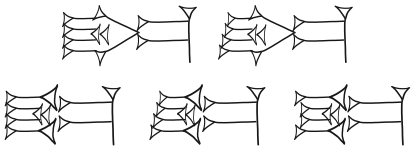
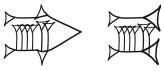
| | |
|---|---|
| *Shading wedge* | Thick wedge imprint characterised by unequal surfaces between the left and right inner faces |
| *Sign* | Individual written entity |
| *Sign form* | See *Variant* |
| *Sign instance* | Unique imprint of a sign as found on a clay tablet |
| *Slanting wedge* | Intended vertical wedge deviated from its axis and, as a result, not perpendicular to the writing line; not to be confused with the oblique wedge |
| *Structural wedge* | Wedge or group of wedges forming the structural frame of a sign and its characteristic outline |
| *Variant* | Graphic variation of a cuneiform sign |
| *Vertical sequence* | Horizontal alignment of vertical wedges |
| *Vertical wedge* | Long upright wedge<br>Variations of the vertical wedge are determined by its orientation, either upward or downward |
| *Winkelhaken* | Corner-wedge characterised by a large aperture and no tail |
| *Wrapping* | Manufacturing technique by which a tablet is formed of a sheet of clay wrapped around a core lump of clay |

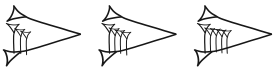
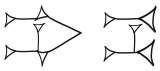
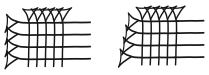
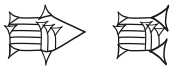
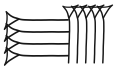
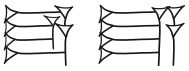
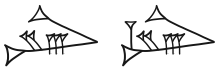
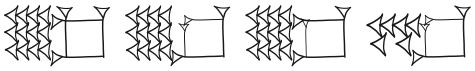
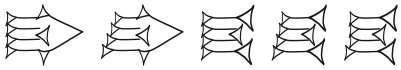
## Appendix 5: Sign list: Ur III

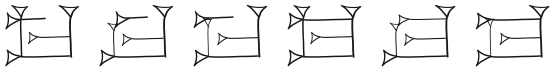
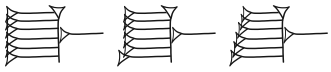
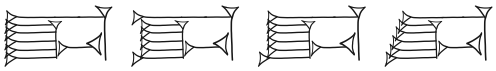
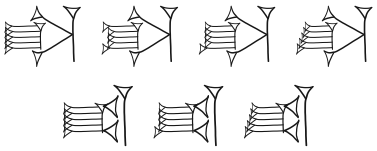
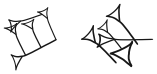
The following presents a selection of cuneiform signs extracted from the Ur III corpus analysed in this research. The list thus gathers the palaeographic variants identified and categorised following the structural approach to palaeographic variation presented and applied in this dissertation, e.g. the two structural variants of the sign $GIR_2$ as part of the KAŠ-based group ('diagonal' (v1) and '*winkelhaken*' (v2)). The list also presents variants of standalone signs, such as BA or AN, and signs for which no variant could be observed within the research corpus, such as KA.

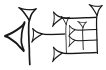
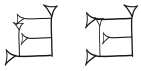
| | | MesZL | Labat |
|---|---|---|---|
| **$GIR_2$** |  | 6 | 10 |
| **AN** |  | 10 | 13 |
| **$^{d}$EN** |  | 10+164 | 13+99 |
| **BA** |  | 14 | 5 |
| **ITI** |  | 20 | 52 |
| **KA** |  | 24 | 15 |
| **LI** |  | 85 | 59 |
| **TU** |  | 86 | 58 |

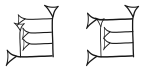
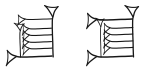
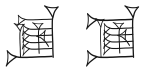
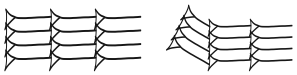
| | | MesZL | Labat |
|---|---|---|---|
| **LA** |  | 89 | 55 |
| **SILA$_3$** |  | 99 | 62 |
| **NA** |  | 110 | 70 |
| **RU** |  | 111 | 68 |
| **NU** |  | 112 | 75 |
| **TI** |  | 118 | 73 |
| **MAŠ$_2$** |  | 130 | 76 |
| **ZI** |  | 140 | 84 |
| **GI** |  | 141 | 85 |
| **RI** |  | 142 | 86 |
| **NUN** |  | 143 | 87 |
| **EN** |  | 164 | 99 |

| | | MesZL | Labat |
|---|---|---|---|
| **$GU_2$** |  | 176 | 106 |
| **DUB** |  | 242 | 138 |
| **TA** |  | 248 | 139 |
| **I** |  | 252 | 142 |
| **TUR** |  | 255 | 144 |
| **IN** |  | 261 | 148 |
| **LUGAL** |  | 266 | 151 |
| **GAB** |  | 298 | 167 |
| **NE** |  | 313 | 172 |
| **BI** |  | 358 | 214 |
| **GAG** |  | 379 | 230 |

| | | MesZL | Labat |
|---|---|---|---|
| **NI** |  | 380 | 231 |
| **UŠ** |  | 381 | 211 |
| **IR** |  | 437 | 232 |
| **$GU_4$** |  | 472 | 297 |
| **$U_2$** |  | 490 | 318 |
| **GA** |  | 491 | 319 |
| **LUH** |  | 494 | 321 |
| **E** |  | 498 | 308 |
| **$GI_4$** (GI-gunû) |  | 507 | 326 |
| **$LU_2$** |  | 514 | 330 |
| **SAR** |  | 541 | 152 |
| **$GAR_3$** |  | 543 | 333 |

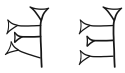
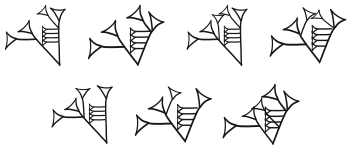
| | | MesZL | Labat |
|---|---|---|---|
| **AŠ$_2$** |  | 548 | 339 |
| **MA** |  | 552 | 342 |
| **GAL** |  | 553 | 343 |
| **A$_2$** |  | 560 | 334 |
| **DA** |  | 561 | 335 |
| **ŠA** |  | 566 | 353 |
| **ŠU** |  | 567 | 354 |
| **ŠE** |  | 579 | 367 |
| **UZ** |  | 583 | 372 |
| **KAM** |  | 595 | 406 |
| **UD** |  | 596 | 381 |
| **ŠA$_3$** |  | 599 | 384 |

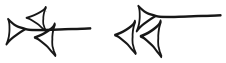
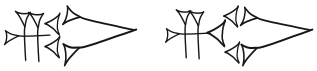
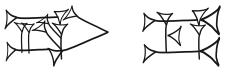
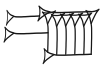
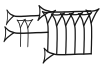
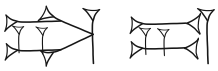
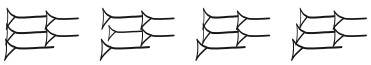
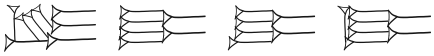
| | | MesZL | Labat |
|---|---|---|---|
| **HI** |  | 631 | 396 |
| **IM** |  | 641 | 399 |
| **HAR** |  | 644 | 401 |
| **$AB_2$** |  | 672 | 420 |
| **AMAR** |  | 695 | 437 |
| **UL** |  | 698 | 441 |
| **$PAD_3$** |  | 725 | 450 |
| **$U_3$** |  | 731 | 455 |
| **DI** |  | 736 | 457 |
| **KI** |  | 737 | 461 |
| **$KU_3$** |  | 745 | 468 |
| **KU** |  | 808 | 536 |

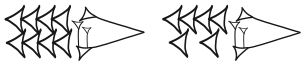
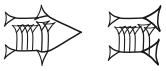
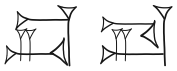
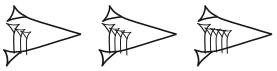
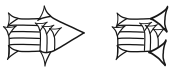
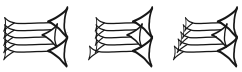
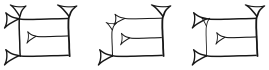
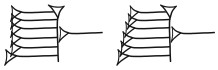
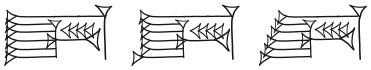
| | | MesZL | Labat |
|---|---|---|---|
| **TUG$_2$** |  | 809 | 536 |
| **ŠE$_3$** |  | 810 | 536 |
| **LU** |  | 812 | 537 |
| **SIG$_2$** |  | 816 | 539 |
| **UR** |  | 828 | 575 |
| **AM$_3$** (A.AN) |  | 839+10 | 579+13 |
| **NIG$_2$** |  | 859 | 597 |
| **LUM** |  | 900 | 565 |

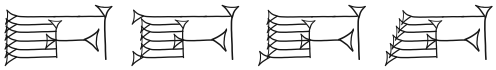
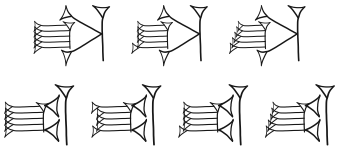
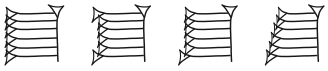
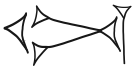
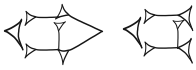
## Appendix 6: Sign list: Old Assyrian

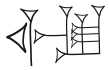
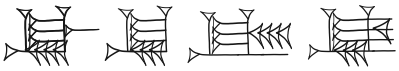
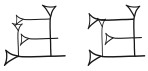
The following presents a selection of cuneiform signs extracted from the Old Assyrian corpus analysed in this research. The list thus gathers the palaeographic variants identified and categorised following the structural approach to palaeographic variation presented and applied in this dissertation, e.g. the structural variants of the sign LI as part of the KAŠ-based group ('diagonal' (v1) and '*winkelhaken*' (v2)) and as part of the ŠE-cluster group ('2 equal rows *winkelhaken*' (v2) and '2 unequal rows *winkelhaken*' (v3)). The list also presents variants of standalone signs, such as AN or NU, and signs for which no variant could be observed within the research corpus, such as RU.

| | | MesZL | Labat |
|---|---|---|---|
| **AN** |  | 10 | 13 |
| **BA** |  | 14 | 5 |
| **LI** |  | 85 | 59 |
| **LA** |  | 89 | 55 |
| **SILA$_3$** |  | 99 | 62 |
| **NA** |  | 110 | 70 |
| **RU** |  | 111 | 68 |

| | | MesZL | Labat |
|---|---|---|---|
| **NU** |  | 112 | 75 |
| **TI** |  | 118 | 73 |
| **ZI** |  | 140 | 84 |
| **GI** |  | 141 | 85 |
| **RI** |  | 142 | 86 |
| **SUR** |  | 151 | 101 |
| **DIM** |  | 167 | 94 |
| **GU$_2$** |  | 176 | 106 |
| **UM** |  | 238 | 134 |
| **DUB** |  | 242 | 138 |
| **TA** |  | 248 | 139 |
| **I** |  | 252 | 142 |
| **TUR** |  | 255 | 144 |

| | | MesZL | Labat |
|---|---|---|---|
| **IN** |  | 261 | 148 |
| **BI** |  | 358 | 214 |
| **NI** |  | 380 | 231 |
| **UŠ** |  | 381 | 211 |
| **IR** |  | 437 | 232 |
| **GA** |  | 491 | 319 |
| **UB** |  | 504 | 306 |
| **SAR** |  | 541 | 152 |
| **GAR$_3$** |  | 543 | 333 |
| **MA** |  | 552 | 342 |
| **GAL** |  | 553 | 343 |
| **A$_2$** |  | 560 | 334 |

| | | MesZL | Labat |
|---|---|---|---|
| **DA** |  | 561 | 335 |
| **ŠA** |  | 566 | 353 |
| **ŠU** |  | 567 | 354 |
| **ŠE** |  | 579 | 367 |
| **KAM** |  | 595 | 406 |
| **UD** |  | 596 | 381 |
| **HI** |  | 631 | 396 |
| **TI$_2$** |  | 633 | 396 |
| **IM** |  | 641 | 399 |
| **AB$_2$** |  | 672 | 420 |
| **NIM** |  | 690 | 433 |
| **UL** |  | 698 | 441 |

| | | MesZL | Labat |
|---|---|---|---|
| **$U_3$** |  | 731 | 455 |
| **KI** |  | 737 | 461 |
| **$KU_3$** |  | 745 | 468 |
| **$LA_2$** |  | 750 | 481 |
| **ME** |  | 753 | 532 |
| **KU** |  | 808 | 536 |
| **$TUG_2$** |  | 809 | 536 |
| **LU** |  | 812 | 537 |
| **UR** |  | 828 | 575 |
| **ZA** |  | 851 | 586 |
| **HA** |  | 856 | 589 |