Association for Written Language & Literacy 12

Diversity of Writing Systems: Embracing Multiple Perspectives: Programme

Day 1: Tuesday March 26 2019

08:30-09:00 Registration

09:00-09:30 Opening remarks (Robin Osborne, Chair of the Faculty of Classics; Terry Joyce, President of the Association for Written Language & Literacy; Robert Crellin & Anna Judson, local organisers)

09:30-10:30 **Keynote presentation 1: Kathryn Piquette**, Title TBC (Chair: Lynne Cahill)

10:30-11:00 Tea/coffee break

11:00-12:30 **Oral session 1** (Chair: Anna Judson)

> 11:00-11:30 **Dimitrios Meletis**, 'How we model writing: The relationship between language, speech, and writing in a universal model of writing'

> 11:30-12:00 **Sven Osterkamp & Gordian Schreiber**, '<Th>e Ubi<qu>ity of Polygra<ph>y and its Significance for <th>e Typology of <Wr>iti<ng> Systems'

> 12:00-12:30 **Terry Joyce**, 'The significance of the partial versus full writing dichotomy for the typology of writing systems'

12:30-1:30 Lunch

1:30-3:00 **Poster session 1**

> **Sarah Finlayson**, 'Writing material matters: a discussion of the use of clay in the Bronze Age Aegean'

> **Taylor Gray**, 'The Iconic Function of Texts in the Ancient Near East'

> **Yannis Haralambous**, 'Phonocentrism in Greece: Side effects of two centuries of diglossia'

> **Keisuke Honda**, 'Modelling kanji as a subsignary of the current Japanese writing system'

> **Yoolim Kim & Sandra Kotzor**, 'Investigating the "hidden" effects of Hanja script on Korean processing'

> **Rachel Schiff, Dorit Ravid & Shlomit Rosenshtok**, 'Spelling affix letters in Hebrew: a psycholinguistic outlook'

> **Karin Westin Tikkanen**, 'Alphabetic adaptations on the Apennine Peninsula'

> **Mira E. Valkama**, 'Graphisation, representation and inclusion in orthography development'

3:00-4:30 **Oral session 2** (Chair: Sonali Nag):

> 3:00-3:30 **Christopher Miller**, 'The unexpected diversity of *abugida* or *alphasyllabic* scripts'

> 3:30-4:00 **Amalia Gnanadesikan**, 'Brahmi's children: variation and stability in a script family'

> 4:00-4:30 **Anurag Rimzhim**, 'Transposition Effects Underscore the Alphabetic Nature of Reading Hindi'

4:30-5:00 Tea/coffee break

5:00-6:30 **Symposium: Research into ancient writing systems at Cambridge** (Chair: Natalia Elvira Astoreca)

5:00-5:05 **Introduction: Chair**

5:05-5:25 **Philippa Steele & Robert Crellin**, 'Contextualising writing in the ancient world: two case studies' (CREWS Project, Faculty of Classics)

5:25-5:45 **Ester Salgarella & Anna Judson**, 'Diversity and variation in the writing systems of Bronze Age Greece' (Mycenaean Epigraphy Group, Faculty of Classics)

5:45-6:05 **Imre Galambos**, 'The Chinese script among China's neighbours' (Faculty of Asian & Middle Eastern Studies)

6:05-6:30 **Discussion**

6:30-8:00 Reception (Museum of Classical Archaeology, Faculty of Classics)

Day 2: Wednesday March 27

9:00-10:30 **Oral session 3** (Chair: Ester Salgarella):

    9:00-9:30 **Victoria Beatrix Fendel**, 'The Coptic alphabet: Taking the initiative or seizing an opportunity?'

    9:30-10:00 **Kelly Minot Rafey**, 'The Character of Writing in Early Modern Shorthand, 1588–1700'

    10:00-10:30 **Philip Boyes**, 'Multiscriptality and Society in Late Bronze Age Ugarit'

10:30-11:00 Tea/coffee break

11:00-12:00 **Keynote presentation 2: Sonali Nag**, Title TBC (Chair: Terry Joyce)

12:00-1:00 Lunch

1:00-2:30 **Poster session 2**

    Aija Katriina Ahlberg, 'Changing a writing system: the case of Konso'

    Cassandra Donnelly, 'Regional Pressures in the Formation and Use of Cypro-Minoan' (*presented in absentia*)

    Hana Jee & Richard Shillcock, 'Measuring how orthographic form correlates with phonological form'

    Hisashi Masuda & Terry Joyce, 'A database of three-kanji compound words in Japanese, with particular focus on their morphological structures'

    Kazuhiro Okada, 'Diverse standards in the pre-modern Japanese orthography'

    Chiara Truppi & Barbara Hans-Bianchi, 'The emergence of writing in multilingual settings: comparing two case studies'

    Martin Uildriks, 'Markings in Emerging States: What is their Socio-Cultural Context?' (*presented in absentia*)

    Lieke Verheijen & Tess van der Laan, 'Is Digi-talk Dangerous? The Effects of Social Media on Dutch Youths' School Writing'

    Małgorzata Zadka, 'Semasiographic aspects of glottographic writing systems'

2:30-4:00 **Oral session 4** (Chair: Robert Crellin):

    2:30-3:00 **Lynne Cahill**, 'Recording verbatim speech in UK court reporting'

    3:00-3:30 **Dorit Ravid, Rachel Schiff & Michal Kahanoovitch**, 'Root letter spelling in Hebrew: a developmental study in two populations'

    3:30-4:00 **Des Ryan**, 'How do we know if a spelling is a good fit for a word? Interactions between 'morphemic' and 'phonemic' spelling'

4:00-4:30 Tea/coffee break

4:30-6:00 **Oral session 5** (Chair: Philippa Steele):

4:30-5:00 **Daniel Harbour**, 'Grammatical typology predicts writing system evolution: A case study in Sumerosphere and Sinosphere logography'

5:00-5:30 **James Myers**, 'The influence of Chinese character form on neighboring orthographic systems'

5:30-6:15 **Association for Written Language & Literacy business meeting**

7:15 for 7:30 Conference dinner (Selwyn College)

Day 3: Thursday March 28

09:00-10:30 **Oral session 6** (Chair: TBC):

09:00-09:30 **Christian Prager**, 'What's in a Sign? Unbridled Aesthetics and Calligraphic Constraints in Classic Maya Palaeography'

09:30-10:00 **Sam Butler**, 'Inscribing Communities across the Mediterranean: A Comparative Approach to the Lycian and Oscan Alphabets in the first Millennium BCE'

10:00-10:30 Tea/coffee break

10:30-11:30 **Oral session 7** (Chair: Dorit Ravid):

10:30-11:00 **David Roberts, Matthew Harley & Stephen L. Walter**, 'The contribution of full tone marking to fluency and comprehension in Yoruba and Ife'

11:00-11:30 **Maayan Tadmor-Troyansky & David L. Share**, 'Phonological Awareness in the Hebrew Abjad: Consonants, Vowels, and Core Syllables'

11:30-12:00 **Panel discussion** (led by conference organisers/AWLL committee)

12:00-12:15 Closing remarks (conference organisers)

Association for Written Language and Literacy's 12th International Workshop

Diversity of Writing Systems: Embracing Multiple Perspectives

<u>Abstracts</u>

Keynote presentation 1: Kathryn E. Piquette, 'Developing Integrated Perspectives on Writing Systems'

Current research on written language systems and literacy increasingly and productively regards these mechanisms of meaning-making as a complex set of socially-situated practices. Such studies often benefit from investigating living practitioners in their inhabited worlds, as part of teaching and learning or aspects of everyday life. Others explore Katherine Hayles' notion of the posthuman, examining the roles nonhuman 'actors' and 'artefacts' (e.g. digital devices) play in textual practices of the present and speculative future. In this keynote, I take up the theme of the 'text-artefact' but direct attention back in time to the ancient past, with a focus on evidence for writing and literacy from Egyptian, Near Eastern and Classical worlds. Here, however, we are confronted with only the material traces past practitioners left behind – fragmentary and differentially-preserved physical residues of writing acts and literacy events. Given the fundamentally material nature of this evidence, it is curious that the physical aspects of graphical expression and their implications for meaning-making have been a much neglected strand of research. Only in the past two decades have we witnessed growing momentum in the study of ancient writing systems from more materially- and practice-centred perspectives. There is still much work to do in this arena, however, and at various scales of inquiry, whether for reconstructing the wider 'ecology' of writing systems or for understanding the choices and acts of individual practitioners. Detailed and systematic interrogation of primary surviving written evidence with the aid of advanced techniques promises new insight for multi-scalar, integrated approaches. Interweaving archaeological and social theories of practice together with notions of materiality, I present case studies illustrative of the windows which advanced optical imaging techniques are opening onto past writing practices, overlooked or unseen until now. I conclude with thoughts on their implications for how we conceptualise readers and writers, writing systems and notions of literacy, in order to develop more situated perspectives and integrated explanatory frameworks for this rich domain of social practice – whether past or present.

Oral session 1

Dimitrios Meletis, 'How we model writing: The relationship between language, speech, and writing in a universal model of writing'

There exists no model of writing that can handle the typological diversity of the world's writing systems. Thus, different studies presuppose different conceptualizations of writing, becoming incomparable in the process.

A problem inherent in the modeling of writing is the question of the relationship between language, speech, and writing. In this context, predominantly Eurocentric efforts to define a graphematics autonomous from phonology have been misguided. This becomes evident when the approach is extended to non-phonographic writing systems, which yields the following question: if writing in morphographic systems such as Chinese is clearly dependent on morphology, why should writing in phonographic systems not be dependent on phonology, which is vehemently rejected by autonomists?

In this talk, I argue that writing and speech are two modalities of an abstract, amodal language system. What characterizes them and renders them so distinct is their materiality – visual on the one hand, acoustic on the other. They are not dependent on each other, but they are equally dependent on abstract linguistic levels such as phonology and morphology. Crucially, phonology does not equal speech, but is interpreted amodally, offering minimal lexical contrasts that can be either spoken or written. Thus, while writing is always independent of speech, it can be dependent on phonology. Systems such as Chinese, however, can bypass this (direct) connection to phonology and relate to morphological units instead. Consequently, *minimal* lexical contrasts cannot be expressed in these systems. Ultimately, what has been termed *grapheme* in the autonomous approach and defined in analogy to the phoneme is exposed as an alphabetocentric concept not viable for a universal model of writing.

Using a variety of examples from diverse writing systems, I propose such a model that accounts for typological diversity and offers both graphetic and graphematic concepts and terminology for the description and comparison of historical and contemporary writing systems.

Sven Osterkamp & Gordian Schreiber, '<Th>e Ubi<qu>ity of Polygra<ph>y and its Significance for <th>e Typology of <Wr>iti<ng> Systems'

It is often tacitly if not even explicitly assumed that there is a one-to-one correspondence between graphs and linguistic units in writing systems as the norm. The common expectation is therefore that "in an alphabetic system, *cut* would be written with three graphemes; in a moraic system, with two, and in a syllabic system, with one grapheme" (Rogers 2005:14; similarly e.g. Sproat 2000:140). Conceptualizing writing systems in such a way has profound consequences for the application of typological categories to specific cases. Thus, the terms "logographic" and "morphographic" are occasionally rejected as appropriate categories for Chinese characters, as many characters cannot write words or morphemes in isolation (Matsunaga 1996); also, since Poser (1992/2004) traditional syllabaries are increasingly reinterpreted as moraic systems, as they do not cover all possible syllables.

Under closer scrutiny, however, it becomes apparent that polygraphy – the phenomenon that two or more graphs form functional units to be interpreted *en bloc*, as with the digraph <ph> for the single phoneme /f/ – is fundamental to a significant number of typologically diverse writing systems. Given that the size of the inventory generally increases the larger the unit (morphemes > syllables > phonemes), it is unsurprising that writing systems based on larger units resort to polygraphy on a regular basis if monophonemic systems already do.

In this talk we will thus argue in favor of a typology of writing systems taking the ubiquity of polygraphy into due account, with definitions going beyond one-to-one correspondences as the default. Further issues to be addressed in this context are the sometimes problematic demarcation from adjacent concepts (chiefly diacritics and ligatures) as well as the heterogeneous nature of polygraphs as such, e.g. with regard to the transparency of their internal makeup.

References
Matsunaga, Sachiko (1996): "The Linguistic Nature of Kanji Reexamined: Do Kanji Represent Only Meanings?" In: *The Journal of the Association of Teachers of Japanese* 30.2: 1–22.
Poser, William J. (1992): "The Structural Typology of Phonological Writing". Handout for a presentation to the Linguistic Society of America, Philadelphia, 12 January 1992.
—— (2004): "Phonological Writing and Phonological Representation". Handout for a presentation given at Harvard University, 10 December 2004.
Rogers, Henry (2005): *Writing Systems. A Linguistic Approach*. Oxford: Blackwell.
Sproat, Richard (2000): *A Computational Theory of Writing Systems*. Cambridge UP.

Terry Joyce, 'The significance of the partial versus full writing dichotomy for the typology of writing systems'

A typology of writing systems should ideally endeavor to coherently explain both how *writing systems* function, in the term's primary meaning of the abstract relationships between signs and linguistic units, and how they differ, in term's secondary sense of sign inventory and representational rules for a specific language (Coulmas, 2013; Joyce, 2016; Joyce & Borgwaldt, 2011). Moreover, as typology proposals ineluctably embody certain theoretical assumptions, their value is highly dependent on how explicitly those assumptions are elucidated to aid assessment of their validity (Coulmas, 1996, Joyce, 2016).

This talk will tender some reflections on the partial versus full writing dichotomy and its general significance. While implicit in Gelb (1963), arguably, the first classification to accord the distinction appropriate prominence is that proposed by DeFrancis (1989), even though its formulation is not without flaw. DeFrancis characterized partial writing as capable of only conveying "some thought" in contrast to full writing's potential to "convey any and all thought" (p. 5). The first caveat to lodge is that, more precisely, the distinction relates to the potentiality to convey, or represent, language (system that codifies thought), while a second caveat emphasizes that the division is an idealization. Once suitably revised, a number of interrelated consequences fall out. Firstly, from a typology perspective (primary sense), the range of tenable relationship categories patently excludes pictography, semasiography, and ideography, regardless of misconceptions regrettably reemerging due to emoji (Danesi, 2017). Secondly, the contrast has ramifications for appropriately interpreting Haas' (1976) cenemic versus pleremic binary. Thirdly, the general axiom of no *pure* writing systems (secondary sense) (Gelb, 1963) is not incompatible, as the division is only an idealization. In illustrating these matters, the talk will primarily reference the Japanese writing system; the prototypical example of typological mixing involving morphographic kanji, syllabographic kana and phonemic rōmaji.

Poster session 1

Sarah Finlayson, 'Writing material matters: a discussion of the use of clay in the Bronze Age Aegean'

Three scripts were used during the course of the Bronze Age in the Aegean: Cretan Hieroglyphic (c. 1800 to 1600 BC) and Linear A (1700 to c. 1400 BC), on Crete and the Cyclades; and Linear B (c. 1425 to 1100 BC), probably created on Crete but soon adopted on mainland Greece. All three were primarily written on *unbaked* clay documents, for administrative use alongside seals and sealings. There is an additional very small group of writing bearing objects with no obvious administrative function, which includes jewellery and stone vessels.

Malafouris has made the provocative suggestion that clay is one of the earliest "truly neuro-compatible materials in the history of humanity", that is, it is a material which affords the flow of noetic activity beyond the skin and skull, bridging neural and cultural plasticity, and allowing the hand to navigate upon the surface of the clay with a minimal need of storage and internal processing (2008: 22); in this paper, I examine how significant the choice of raw clay as a writing material was in shaping the forms that reading and writing practices took in the Bronze Age Aegean.

Following a review of the other options realistically available for writing substrates, based on both the evidence from Crete and mainland Greece and on what was being used in contemporary Egypt and the Near East, I unpick how deliberate a choice this might have been and who might have made it. This informs a discussion of the effects these choices had, particularly on how literacy skills might have been transmitted, or alternatively restricted.

Taylor Gray, 'The Iconic Function of Texts in the Ancient Near East'

It is rather ironic that as the birthplace of writing, the literacy rate of the ancient Near East was strikingly low. Only the elite classes of Near Eastern societies were capable of deciphering written language. Nevertheless, written language was a gift from on high and therefore only special access was granted to those deemed worthy. Due to the significance placed on the origin of writing and its sacred character, the written word was far more than a linguistic phenomenon. In many instances texts functioned more akin to how divine or royal statuary functioned. Just as the statue of a god or king existed as an ontological proxy for its referent, so, too, did texts operate as ontological extensions of what they semantically encoded. Put simply, texts were also images, or icons. This paper will consequently focus on the supra-linguistic functions of texts in the ancient Near East, with

the aim of demonstrating how texts of various sorts were closely related to pictorial domains of communication and signification. Whereas in the modern world, text and image are routinely distinguished, in the ancient Near East, text and image were closely connected, and understood as synonymous modes of representation. That is, texts and images both belong on the spectrum of the icon. To highlight the iconic function of texts, the paper will further consider three textual traditions from the Near East: onomastic (name) traditions, monumental/royal traditions and amuletic traditions. For each case, I argue that the text functions above and beyond its linguistic capacity and participates in the broader domain of the iconic image.

Yannis Haralambous, 'Phonocentrism in Greece: Side effects of two centuries of diglossia'

The Greek writing system is well known. In this communication we will explore the way it is used, and how this usage has changed in the last hundred years, due to explicit or tacit reforms.

We will consider three aspects of the written language:
1. *diacritics*: the reduction of diacritics to two instead of seven has decreased information carried by graphemes and in particular the amount of morphosyntactic redundancy;

2. *hyphenation*: while Greek shares with German a high level of morphological compositionality, contrarily to German, the current hyphenation rules of Greek are strictly phonological;

3. *foreign word transcription*: instead of being motivated by the morphology or graphemic representation of the source language, the current transcription strategy is purely phonetic, and avoids adaptation to Greek morphology, even in trivial cases.
After a thorough description of these phenomena, we will show that they are in fact side effects of the diglossia issue (*glôssikon zêtêma*, Mackridge (2009)) that lasted for almost two centuries, dividing Greek society and profoundly affecting the language spoken and written in Greece, even today.

Our claim is that Greek linguists such as Psycharis or Triantafyllidis have acted in accordance with the phonocentric principle (in the sense of Anis (1988), i.e., the fact that written language is merely a representation of the spoken one and therefore should not carry any additional information than the one needed for speech). Furthermore we claim that the priority given to *parole* by Saussure and the Neogrammarians has been used as an argument in favour of demotic language, and that it still prevails in the current Greek linguistic mainstream, despite criticism by several generations of Western graphematicians.

References
[Anis 1988] Anis, Jacques: *L'écriture, théories et descriptions*. Bruxelles : De Boeck Université, 1988
[Mackridge 2009] Mackridge, Peter: *Language and National Identities in Greece*, 1766-1976. Oxford : Oxford University Press, 2009

Keisuke Honda, 'Modelling kanji as a subsignary of the current Japanese writing system'

Every writing system has a particular signary that contains a certain number of written signs, each consisting of a graph or graph combination associated with a specific linguistic value. It is common for a signary to include different classes of written signs carrying different types of linguistic values. In such a case, one may speak of a complex signary made up of functionally distinct subparts, which this paper refers to as 'subsignaries'. A detailed description of a writing system with a complex signary should account for how individual subsignaries function and are organised into one united whole.

In this context, special focus should be placed on Japanese kanji. The current Japanese writing system employs a large number of sinographs known as *kanji* graphs, together with two sets of siniforms and the Latin alphabet. In the literature, there is a broad agreement that kanji graphs constitute a subsignary that is functionally distinct from the other subparts of the signary (Honda 2012). However, there are conflicting views on the type of linguistic value that is most fundamental to this subsignary. Some studies argue that the vast majority of kanji graphs represent individual morphemes (e.g. Joyce 2011), while others claim that they represent pronunciations that may or may not correspond to morphemes (e.g. Matsunaga 1996).

This paper discusses the pros and cons of previous studies and presents a new, unifying model of kanji as a subsignary of the present-day Japanese writing system. In this model, kanji graphs are viewed as the formal building blocks of written signs that are either structurally simplex or complex. These signs are characterised as denoting the phonological exponents of individual morphemes or, less typically, morphologically complex words. The validity of this model is demonstrated by a strictly synchronic analysis of various types of kanji-written words.

References

Honda, Keisuke. 2012. *The relation of orthographic units to linguistic units in the Japanese writing system: An analysis of kanji, kana and kanji-okurigana writing*. Ph.D. thesis. Ibaraki: University of Tsukuba.

Joyce, Terry. 2011. The significance of the morphographic principle for the classification of writing systems. *Written Language and Literacy* 14(1). 58-81.

Matsunaga, Sachiko. 1996. The linguistic nature of kanji reexamined: Do kanji represent only meanings? *Journal of the Association of Teachers of Japanese* 30(2). 1-22.

Yoolim Kim & Sandra Kotzor, 'Investigating the "hidden" effects of Hanja script on Korean processing'

Korean uses both an alphabetic (*Hangul*) and a logographic (*Hanja* – borrowed Chinese characters) script. Hangul characters derive their meaning from the meanings of Hanja characters. This is because Korean used Chinese sounds and meanings before the innovation of Hangul. Oftentimes, a single Hangul representation can have multiple meanings. This multiplicity is because Korean does not have tone, which could originally disambiguate homophonous (semantically different) Chinese characters. Thus, multiple Hanja characters (and their meanings) end up with the same Hangul representation, whereby the number of available meanings can vary between just two (1a) or multiple (1b). This creates a deeply entrenched but opaque/hidden relationship between Hanja meanings and Hangul. Studies have yet to elucidate not only how exactly this relationship is represented in the mental lexicon, but also how it is affected by the cohort of available meanings.
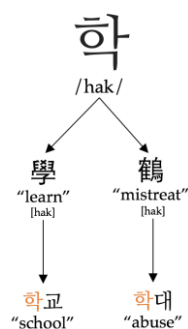

Figure 1a. Exemplar Hangul character that has two available meanings, i.e., cohort size = 2.
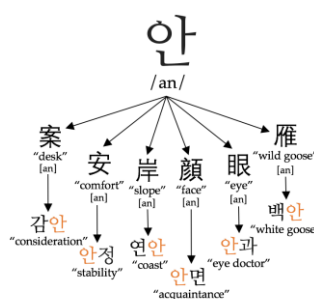
Figure 1b. Exemplar Hangul character that has multiple available meanings, i.e., cohort size = 6.

To investigate, we conducted a visual intra-modal lexical decision task with semantic priming, with native Korean participants (n=184). Our stimuli of disyllabic words (wherein only the colored block was of interest) were divided into four cohort sizes (2, 3-5, 6-10, or > 10 meanings). We matched for salience and frequency of meanings. Each target was paired with three different primes: one which is directly semantically related (e.g. ABUSE), one which is another Hanja meaning with the same Hangul representation but is not directly related to the target (e.g. SCHOOL), and an unrelated control condition.

Target	Hangul of interest	Cohort size	Incongruous	Congruous	Unrelated
상처 /saŋ.tɕʰʌ/ "wound"	학	2	학교 /hak.gjo/ "school"	학대 /hak.dɛ/ "abuse"	액자 /ɛk.dʑa/ "frame"
눈병 /nun.bjʌŋ/ "eye infection"	안	6	안정 /an.dʑʌŋ/ "stability"	안과 /an.gwa/ "eye doctor"	감자 /kam.dʑa/ "potato"

Our findings show equally salient meanings embedded in a larger cohort of > 6 meanings to prime in both semantically congruous (p=.0007*) and incongruous conditions (p=.0113*). However, when cohort size was restricted to just two (equally salient) meanings, there was no difference in priming effect between the two conditions. Restricting competition distributes priming effects between equally salient contenders, thereby overriding or "cancelling" the pronounced effects of one over the other.

Rachel Schiff, Dorit Ravid & Shlomit Rosenshtok, 'Spelling affix letters in Hebrew: a psycholinguistic outlook'

The history of Hebrew has left its marks in its current orthography in the form of phonology-orthography mismatches. Modern Hebrew orthography reflects defunct phonological distinctions (e.g., emphatics, former stop / spirant pairs) in the form of distinct graphemes, a major source of spelling errors (e.g., spelling *t* by both ת and ט) (Ravid, 2005). Cognitive and linguistic development involves gaining command of morphological knowledge to override spelling homophony in native-speaking Hebrew spellers (Ravid, 2012). Spelling affix letters is generally less challenging than root letters, as most affixes have lower type and higher token frequencies, coupled with higher morpho-orthographic transparency, than roots (Ravid, 2001). For example, as ט is only a root letter, it does not compete with ת in marking the feminine plural suffix in *ktuvot* כתובות 'written, FmPl'. The current psycholinguistic study examines the full array of Hebrew affixes and their functions, focusing on a class of affix letters where a confluence of factors masks morphological cues.

Study participants were 83 monolingual Hebrew-speaking students in four grade levels – 2nd, 4th, 7th and 10th grades. The research instrument was a spelling task of 244 words containing affix letters in 57 morphological categories, presented in the context of short sentences to assure clarity of meaning. Affix letters were analyzed on the basis of five criteria taking into account morphological category frequency, morpho-orthographic sites, morpho-orthographic prevalence, morphological "enemies", and phonological transparency. While correct spelling increased across grade levels, a hierarchy emerged in interaction with grade level regarding these criteria: Younger spellers were mostly assisted by morpho-orthographic sites, morphological category frequency, and phonological transparency -- while spelling in higher grade levels was more affected by morpho-orthographic prevalence. Thus, knowledge of how morphological roles are deployed in the orthography emerges as the most significant factor that affects learning to spell affix letters in Hebrew.

References
Ravid, D. 2001. Learning to spell in Hebrew: Phonological and morphological factors. *Reading and Writing, 14*, 459-485.
Ravid, D. 2005. Hebrew orthography and literacy. In R.M. Joshi & P.G. Aaron (Eds*.), Handbook of orthography and literacy*. Mahwah, NJ: Erlbaum, 339-363.
Ravid, D. 2012. *Spelling morphology: the psycholinguistics of Hebrew spelling*. New York: Springer.

Karin Westin Tikkanen, 'Alphabetic adaptations on the Apennine Peninsula'

This paper will discuss the differences that appear in the alphabetic reinterpretation of the concept of script on the Apennine peninsula in the early historical period. At that time there existed a range of languages in the region, Indo-European as well as non-Indo-European, and most of these developed their own specific alphabets in the period from the early 7th century down to the late 3rd century BCE. These different alphabets symbolize language-specific "translations" of a source or matrix alphabet, which differs depending on the type of writing employed in the community with which the new scribes came into contact.

Such differences are sometimes the result of mutual changes from one perceived source script, such as the shared lack of signs for voiced stops in the Latin, Faliscan and Sabine alphabets, which were based on the Etruscan alphabet. Differences can also represent individually coined developments, such as the added vowel signs in the South Picene and Oscan alphabets, both Sabellian languages that underwent the same pre-historic sound change, the Sabellian vowel shift; there were no such additions in the Umbrian alphabet, although Umbrian, a Sabellian language, also underwent the same sound change.

The paper will address these and a few other attested differences in the alphabetic design used by these early language, and will attempt to analyze the reasons for these differences, based on the varying cultural context and background for the adoption of writing.

Mira E. Valkama, 'Graphisation, representation and inclusion in orthography development'

On the surface, orthography development appears as a mechanical task of determining units of language and units of writing and designating correspondences between them. However, orthography development is also a complex act of language planning that validates or even establishes a language community. Leaning on orthography design literature and especially on insights found in Cahill & Rice (2014), this poster sketches a model of the structure of orthography development. The model divides the orthography process into three components. Graphisation (graphical signs and their correspondences) is the component that is traditionally highlighted in orthography literature. It is complemented with the more sociolinguistically oriented components of inclusion and representation. Inclusion answers who the orthography is for and representation determines the specific lect used in the orthography and who represent(s) the community. Though inclusion and representation are less visible and do not need to be explicitly tackled in all orthography development cases, this poster suggests that they are as integral part of orthography development as the more prominent graphisation component. This incorporates and theoretically validates some of the "non-linguistic" considerations that have been seen as problematic in orthography development. The three components of orthography development suggested here, emphasize the role of a writing system as an emblem of a community and offer a possibility to elaborate the definition of orthography.

Oral session 2

Christopher Miller, 'The unexpected diversity of *abugida* or *alphasyllabic* scripts'

The prototypical representatives of the class of abugida scripts are the traditional or classical Brahmic scripts, of which the two basic defining features are an "inherent /a/" pronounced on a bare consonant letter, with any other postconsonantal vowels spelled as subordinate, bound signs attached to a consonant letter. A third feature of these scripts is the use of bound conjunct forms of consonant letters that form clusters with a main letter to represent vowelless consonants.

This typology applies relatively well to Ethiopic script as well, however it is less adequate to describe scripts in the Canadian Aboriginal syllabics family, where all vowels are represented by the orientation of each base consonant or zero-initial letter. Further difficulties arise with applying the "inherent /a/" theory to modern Indic scripts such as Hindi, Gujarati or Kapampangan scripts in the Philippines, where an alternative analysis based on knowledge of principles of syllabification in a language's phonology is descriptively simpler and has greater explanatory power. Furthermore, in the otherwise alphabetic Armenian script, it is clear that exactly these principles apply to the choice of how to syllabify and read the schwa vowel off complex sequences of initial plain consonant letters.

This presentation surveys these issues and how they affect the form of these and other putative abugidas including the North American Great Lakes syllabary and its Ho-chunk/ Winnebago offshoots, as well as the development, due to the mainly CV structure of the languages that adopted it, of a coda-less variety of Brahmic script in South Sulawesi, which spread to the Philippines where it was used to write languages with a rich variety of coda contrasts, motivating further reconsideration of the nature of abugida scripts.

Amalia Gnanadesikan, 'Brahmi's children: variation and stability in a script family'

The descendants of Brahmi comprise a large script family whose members are widely used in South and Southeast Asia for languages of multiple families. Grammatological typologies group them together as abugidas or alphasyllabaries, and overviews of writing systems usually treat them together, with perhaps one individual script illustrated, often Devanagari.

Yet the Brahmic scripts are not all the same. Not only do they differ widely visually, but they also differ in many functional features: use of distinct initial vowel letters, possible placements of vowels, obligatory use of *virama*, conjunct consonants, word spacing, and more. The use of an inherent vowel, however, is remarkably stable both historically and geographically. Thus at some level the family has remained typologically unified.

By contrast, the Arabic script, which is also used over a large geographic area and for languages of multiple families, maintains a remarkable uniformity of letter forms. However, its treatment of vowels is far from stable across languages. While the Arabic language writes long vowels with letters that are also used for consonants and short vowels only occasionally and with diacritics, Sorani Kurdish, Kashmiri, and Uyghur are examples of three different ways in which the Arabic script has been adapted to write all vowels or all but one vowel. Thus the "Arabic script" is not a typologically unified entity.

What accounts for the difference in form stability versus typological stability? Reverence for the oral tradition over the written word is often cited as the reason for the diversity among Brahmic scripts. By contrast, the written tradition has been elevated in Islamic culture. It might be expected, then, that Brahmic scripts would freely vary typologically and that Arabic scripts would not. It is therefore hypothesized that the use of an inherent vowel represents a particularly stable state of script evolution.

Anurag Rimzhim, 'Transposition Effects Underscore the Alphabetic Nature of Reading Hindi'

Alphasyllabary is the term generally used to describe the orthographies of South and Southeast Asia. The written unit is an akshar that transcribes $(C_n)V$ syllable, whose most phonemes are transparently represented by discrete written units. This gives the orthography both an alphabetic as well as a syllabic characteristic. However, Rimzhim, Katz and Fowler (2014) proposed that this alphasyllabic description is more appropriate for typological purposes (they proposed aksharic as more appropriate term), but functionally, that is, when reading these akshar-based orthographies, the orthographies are predominantly alphabetic. In this paper, I will present results from a psycholinguistic study that further examine these issues.

We used the transposition effect (TE) to examine the functionally alphabetic nature of Hindi, an aksharic orthography. TE can be observed in a lexical decision task as lower accuracy to nonwords such as PSATE (compare to PASTE) than PLUTE. We are using TE to underscore the functional nature of written units in Hindi. We call this unit letter, which encodes all the phonemes, except the unwritten schwa. In three experiments, we transposed the following units: C-Cə, M-M, M-Cə, C-M, C-CM, Cə-CM, and CM-CM (M denotes vowel diacritics called matra).

Accuracy analysis showed TE for simple akshars but also for its constituent letters. Results show skilled readers fail to detect transpositions that disrupt the aksharic structure, including when the transposed units are matras, which are dependent orthographic units that are mandatorily attached to a written C unit. The effects exist independent of exposure to reading English, as measured by TOWRE. To further examine these results, we repeated these experiments on a sample from a village in India where exposure to reading English was comparatively lower than the previous sample. The results were replicated. Findings from these six experiments underscore the alphabetic nature of reading aksharic orthographies.

Symposium: Research into ancient writing systems at Cambridge

Philippa Steele & Robert Crellin, 'Contextualising writing in the ancient world: two case studies' (CREWS Project, Faculty of Classics)

'The Contexts of and Relations between Early Writing Systems (CREWS)' project, based in the Faculty of Classics, is concerned with innovative and interdisciplinary approaches to writing systems of the ancient eastern Mediterranean and Near East, developing new methodologies for studying writing and its social context. In this section, two members of the project will outline their work. First the PI Philippa Steele will discuss her research on the relationship between script features (e.g. writing system, sign repertoire, orthography) and context of use (e.g. document types, methods of inscription, types of literacy), considering the value of holistic approaches to writing with a focus on the ancient Aegean and eastern Mediterranean. After this, Robert Crellin will talk about his research into understanding how writing systems were understood and thought about in antiquity using the testimonies of ancient writers, and how different this can be from modern conceptions of writing.

Ester Salgarella & Anna Judson, 'Diversity and variation in the writing systems of Bronze Age Greece' (Mycenaean Epigraphy Group, Faculty of Classics)

This presentation will discuss two related writing systems from Bronze Age Crete and mainland Greece: Linear A, used to write an unknown language known as 'Minoan' (c.1750-1450 BCE), and its daughter script Linear B, adapted in order to write the 'Mycenaean' dialect of Greek (c.1400-1200 BCE).

Ester's current work is focused on the palaeography and structure of Linear A. In particular, she is currently exploring the extent of regional/local variation detectable in Linear A with respect to both writing and administrative practices. On palaeographic grounds, by linking Linear A to Linear B, she is looking at how, how many and which Linear A graphic variants were transmitted onto Linear B, which gives us insights into the adaptation process. As to structure, she is working on a partial re-classification of the Linear A sign inventory, favouring a formal over a functional approach and pointing out configurational patterns which seem to have been followed in making up composite signs. This framework will give us a better understanding of the inner workings of the Linear A writing system, especially if compared to Linear B.

It is often remarked that, despite Linear B being attested over a 200-year period, many aspects of this writing system remain remarkably similar at all the palatial sites on Crete and the Greek mainland at which it appears; this similarity has even been described as a 'Mycenaean Koine'. However, a significant degree of palaeographic and orthographic variation is still present within individual sites and even within the work of individual writers. Anna's presentation will discuss a range of ways in which her past and current research into this variation furthers our understanding not just of how writers used Linear B, but also of how their writing relates to their wider activities within the Mycenaean palatial administrations.

Imre Galambos, 'The Chinese script among China's neighbours' (Faculty of Asian & Middle Eastern Studies)

The spread of Chinese writing to China's neighbours has been well documented in the case of Japan, Korea and Vietnam. Either as a result of direct political dependency or because of the cultural prestige of their powerful neighbour, these regions have all adopted the Chinese script and employed it in their administration and religious literature. Much less attention has been given, however, to other regions which no longer exist as independent countries. Particularly interesting is the case of Uighurs to the west of China, who used Chinese characters along with their own script, which ultimately derived from West Asia. The particulars of how Chinese characters were manipulated to read and write both Chinese and Uighur are gradually becoming clear through the large body of manuscripts and printed fragments that have been discovered in tombs and cave temples in the region of Turfan. A related issue is the creation of new scripts by borrowing and modifying existing Chinese characters, which was the path taken by the Khitans and the Jurchens in the north. A slightly different approach was that of the Tanguts, who invented a unique script by largely relying on the structural principles according to which Chinese characters are composed. This paper examines these diverse methods of adoption and invention among China's neighbours during the 9th-13th centuries and shows that often the specific techniques were similar to those seen in other regions.

Day 2
Oral session 3

Victoria Beatrix Fendel, 'The Coptic alphabet: Taking the initiative or seizing an opportunity?'

The reasons for the creation of the Coptic alphabet after more than a century without a writing system for the native Egyptian language (cf. Bagnall 1993) are widely debated. Explanations emphasise primarily the importance of social factors and the iconic function of Coptic as the writing system of a specific group of people, for example, the early Christians (cf. Zakrzweska 2009) or the indigenous population (cf. Choat 2009).

Without denying the importance of considering these social factors and their role when it came to the promotion of the Coptic script (cf. Richter 2009), this paper seeks to draw attention to two more aspects, the more mechanical aspect of writing the numerous Greek loanwords in Coptic and the changing status of Egyptian as compared to Greek. In essence, this paper argues that the adaptation of the Greek alphabet for the Egyptian language was a pragmatic choice under the given circumstances.

On the one hand, the insertion of Greek loanwords in Demotic involved a significant amount of adaptation (cf. Clarysse 1987, 2013) not least because the Demotic script was not an alphabet but a combination of logograms and ideograms. In the same way, the first attempts of writing Egyptian (Coptic) with the Greek alphabet show the difficulty of adapting the script of one language to the needs of another (cf. Richter 2009). Yet in the end, after a period of experimentation, a Coptic alphabet was established and used alongside the Greek alphabet.

On the other hand, while the status of Egyptian seems to have declined during Roman rule (cf. also Depauw 2012), the situation was changing at the beginning of the fourth century with the central power weakened (cf. Van Minnen 2007, Kiss 2007, Keenan 2007). Early Coptic texts related to business (cf. Choat 2012), that is outside the private sphere, reflect that Coptic was taking ground in formerly Greek-dominated domains.

References
Allen, J. (2013). *The ancient Egyptian language: an historical study*. Cambridge.
Bagnall, R. (1993). *Egypt in late Antiquity*. Princeton.
Bagnall, R. (ed.) (2007). *Egypt in the Byzantine world, 300–700*. Cambridge.
Choat, M. (2009). 'Language and culture in late antique Egypt', in Rousseau and Raithel (eds.), 342–356.
Choat, M. (2012). 'Coptic', in Riggs (ed.), 581–593.
Clarysse, W. (1987). 'Greek loan-words in Demotic', in Vleeming (ed.), 9–33.
Clarysse, W. (2013). 'Determinatives in Greek loan-words and proper names', in Vleeming (ed.), 1–24.
Cotton, H., and Hoyland, R., and Price, J., and Wasserstein, D. (eds.) (2009). *From Hellenism to Islam: Cultural and linguistic change in the Roman Near East*. Cambridge.
Depauw, M. (2012). 'Language use, literacy and bilingualism', in Riggs (ed.), 493–506.
Gabra, G., and Takla, H. (eds.) (2015). *Christianity and monasticism in Middle Egypt*. Cairo.
Keenan, J. (2007). 'Byzantine Egyptian villages', in Bagnall (ed.), 226–243.
Kiss, Z. (2007). 'Alexandria in the fourth to seventh centuries', in Bagnall (ed.), 187–206.
Richter, T. (2009). 'Greek, Coptic and the 'language of the Hijra', in Cotton *et al.* (eds.), 401–446.
Riggs, C. (ed.) (2012). *The Oxford handbook of Roman Egypt*. Oxford.
Rousseau, P., and Raithel, J. (eds.) (2009). *A Companion to late antiquity*. Chicester.
van Minnen, P. (2007). 'The other cities in later Roman Egypt', in Bagnall (ed.), 207–225.
Vleeming, S. (ed.) (1987). *Aspects of Demotic lexicography: Acts of the second international conference for Demotic studies, Leiden, 19–21 September 1984*. Studia Demotica 1. Leuven.
Vleeming, S. (ed.) (2013). *Aspects of Demotic orthography: Acts of an international colloquium held in Trier, 8 November 2010*. Studia Demotica 11. Leuven.
Zakrzweska, E. (2015). 'L* as a secret language', in Gabra and Takla (eds.), 185–198.

Kelly Minot Rafey, 'The Character of Writing in Early Modern Shorthand, 1588–1700'

From 1588 through the seventeenth century, an estimated 152 shorthand manuals were published in England, each purporting to contain the key to a new kind of writing said to be so fast the pen could keep pace with the tongue. The scale at which these systems were learned and employed has gone widely unrecognized; shorthand competency was not only a valued skill in professional spheres, but was considered a fashionable accomplishment for every educated gentleman. Shorthand's popularity was all the more impressive given the idiosyncratic nature of the systems. Early modern shorthands are not simply codes or systems of abbreviation, but the complex inventions of writing masters seeking a radically different method of recording language. They do not fit tidily into any mold: alphabetic, syllabic, or ideographic, yet they feature elements of all three, with a mixture of characters derived from sounds, spellings, and an increasing number of pictographic symbols and visual puns.

Although early modern shorthand was an exclusively English phenomenon, this study is not a study of the English language specifically, but rather an inquiry into the attitudes toward speech, script, and language in seventeenth-century England. Drawing primarily from shorthand manuals — specifically 74 copies of 37 different titles written by 29 different authors — this paper traces the influences and development of shorthand from its inception to the end of the seventeenth century. After providing an overview of the underlying principles of early modern shorthand, this paper will focus on the assumptions shorthand inventors' display with reference to the alphabet (an arbitrary order to which they ascribe significant reverence), the ideal shape and aesthetics of letters, and the conflicting advantages of a phonetic system versus an ideographic one. At the core of this project is a historical question of timeless relevance: What did writing masters, or those with a professional engagement in literacy, view to be the principles, purposes, and unlocked potential of writing?

Philip Boyes, 'Multiscriptality and Society in Late Bronze Age Ugarit'

In the second half of the thirteenth century BC, the city of Ugarit on the Syrian coast was an extremely multilingual and multiscriptal place. Ugarit is best known for its innovative cuneiform alphabet, but examples of at least six writing systems have been found in the city (Alphabetic cuneiform, logosyllabic cuneiform, Hittite cuneiform, Egyptian hieroglyphics, Luwian hieroglyphics and Cypro-Minoan), of which all but Hittite and Luwian hieroglypic are likely to have been used in the city itself. The core scribal bureaucracy was fundamentally bilingual and biscriptal, with very large and roughly equal corpora of alphabetic and logosyllabic cuneiform.

This paper will use epigraphic, archaeological and historical data to explore the social background for this situation and how changes in writing systems and scribal practices reflect and feed into broader social changes in Ugaritian society and culture at the end of the Late Bronze Age. In particular, it will explore two interrelated questions. Firstly, how unique was the situation in Ugarit compared to its Levantine neighbours, especially with regard to the use of the alphabet? Evidence for writing in much of the Levant at this time is patchy, so while we know it existed, questions remain over the form it took and how extensively the alphabet had been adopted. Some see it as essentially marginal within a cuneiform- and hieratic- dominated scribal landscape; others reconstruct widespread alphabetic bureaucracies using perishable materials that no longer survive. Secondly, what motivated the choices writers in Ugarit made about which scripts to use in which contexts? As with any practice, writing is political, ideological and conditioned by social context. At Ugarit, it was deeply implicated in questions of identity, political status and attitudes towards local and international culture, which in turn relate to wider processes in the regional crisis that ended the Bronze Age and led to Ugarit's destruction.

Keynote presentation 2: Sonali Nag, 'Emergent and early literacy: how children learn to use a writing system'

Writing systems capture spoken language and, as signalled by popular typology, symbol sets may map to a variety of linguistic units. Despite this diversity, the linkages between linguistic units and symbols are typically rule-governed and hence learnable. Writing systems also differ in orthographic breadth and depth. These attributes—the number of unique symbols in the set and the consistency with which each symbol maps to a specific linguistic unit—define the learning task for a novice learner. For example, children, unsurprisingly, learn contained sets of 20 and 30 symbols in a shorter span of time compared to extensive sets of 2000 and more, and, similarly, sets that are transparent in symbol-sound mapping allow a head start in acquiring basic literacy. But recognising the linguistic anchors for individual symbols is not enough for a learner to achieve proficiency in reading and spelling. Children have to also make inferences about unseen (and often unstated) encoding principles. The learning task therefore is to recognise both what is visible and what is hidden.

In this talk, I describe how examining children's performance on symbol- and word-lists has deepened our understanding of what gains prominence during the first use of a writing system, and how this changes with experience. In these carefully constructed studies, items are made to differ on parameters of interest such as familiarity with and transparency of symbol-sound linkages. The pattern of performance on these item sets is thought to mirror children's insights about the inner workings of the writing system. In this learning journey, children rethink decoding approaches and perhaps this happens when what has been considered by the child as a useful approach does not work all the time. On occasion, the preferred decoding approach leads to a misreading or a misspelling. These missteps are valuable from a learning point of view because they can trigger repair strategies and generate inferences about how a writing system transcribes spoken language. At the pedagogical level, this line of research suggests what, when and how to support children's literacy learning; at a theoretical level, these studies show the limitations of building models of literacy development when specifics about different writing systems are ignored. I will use literacy acquisition in the akshara-based languages of South Asia to illustrate these points.

Poster session 2

Aija Katriina Ahlberg, 'Changing a writing system: the case of Konso'

Konso language community in South West Ethiopia is undergoing a change of a writing system from abugida to alphabetic writing. This study presents the two Konso orthographies and examines adult Konso transfer literacy learners' (N=66) written reflections about the two, with the aim of finding out what an ordinary reader values in an orthography and how that affects a script choice.

Konso transfer literacy learners found learning of alphabetic literacy difficult because more characters were needed for spelling each word than they were used to in abugida writing. However, despite of the difficulty most learners preferred the alphabetic orthography for its transparency of denoting phoneme length. In Konso phonology vowel length and gemination are typical features for making semantic differences, but they are not marked exclusively in the abugida orthography. Konso alphabetic orthography marks phoneme length by doubling the character.

Konso abugida uses the traditional Ge'ez (Ethiopic) script, each character denoting primarily a CV sequence. The inventory of characters reflects the seven-vowel system typical for Ethio-Semitic languages, consisting of sets of seven characters to denote each consonant with seven vowels. As Konso represents the Cushitic vowel system of five short and five long vowels, there is a shortage of characters for denoting length of all vowels. Because geminate consonants are not marked either, the frequency of heterophonic homographs is high, explaining the learners' preference for the transparent alphabetic orthography. However, when Konso abugida was developed an attempt was made to launch a modified version of Ge'ez script for a more transparent orthography, but the modifications were rejected because the script looked different from the traditional. The sociolinguistic values intertwined with the readers' preference for orthographic transparency make the Konso case illustrative about the complexity of a script choice and orthography development.

Cassandra Donnelly, 'Regional Pressures in the Formation and Use of Cypro-Minoan' (*presented in absentia*)

The Cypro-Minoan script, the Late Bronze Age script of Cyprus, is unique within its chronological and geographical context for at least two reasons: 1) the almost total absence of evidence for the administrative use of the script, and 2) the script's hybridity, which combines Aegean Linear sign forms with a cuneiform-inspired ductus (a process often termed *cuneiformization*). The script's hybridity is generally explained in terms of external influences. Rarely do scholars point to intra-island factors. My paper, "Regional Pressures in the Formation and Use of Cypro-Minoan," argues that the proposed *cuneiformization* of Cypro-Minoan arose not through contact with the east *strictu sensu*, but with the island's western center of power, probably Alassa, where Akkadian cuneiform was used for diplomatic exchange. The near total lack of Cypro-Minoan inscribed objects from Alassa, itself perhaps suggestive of an identification with cuneiform script traditions over Cypro-Minoan, inhibits a direct comparison between Alassan and Enkomian writing practices. Evidence for regional writing practices can be demonstrated instead in the distinctive pot-marking traditions of Enkomi and Kition. Having established regional patterns in script use, the remainder of the paper will discuss the implications of these findings. It hypothesizes that regionalization reflects the politicization of the script for certain Cypriot identities. The strong association between script and identity may account for Cypro-Minoan's largely non-administrative uses. To conclude, the paper will compare the use of Cypro-Minoan to that of other local, contemporary Mediterranean scripts, such as Luwian Hieroglyphic and Proto-Sinaitic. It asks whether the administrative catalyst for script formation and adoption in the Mediterranean has been overstated. For peripheral polities within the reach of literate empires, script formation and adoption allowed for the assertion pf political distinctive identities more so than the recording or conveyance of phonetic information.

Hana Jee & Richard Shillcock, 'Measuring how orthographic form correlates with phonological form'

Is there a relationship between the form of a written character or letter and the sound with which it is typically associated? How might such a relationship be measured? We investigated this potential correlation. Uniquely, Korean characters were originally consciously designed to represent their sounds. We therefore expected a maximal correlation for Korean. We vectorized the phonemes according to their IPA features. We measured the phonological distance between any two phonemes as the feature edit distance and as the Euclidean distance between their respective vectors. We measured the orthographic distance between any two characters as the Stroke Share Rate between the two collections of lines and as the Hausdorff distance (Huttenlocker, Klanderman & Rucklidge, 1993) between their respective images. Correlations were calculated between the set of all possible orthographic distances (378 different distances) and the corresponding set of all possible phonological distances (cf. Monaghan, Shillcock, Christiansen & Kirby, 2014). Korean consistently showed significant, positive character-sound correlations. Stroke Share Rate and Euclidean distance returned the highest correlation coefficient (rho = 0.45 ***). We confirmed these results using a Monte-Carlo permutation test. Korean vowels contributed to this correlation more than the consonants. We suggest that this finding has pedagogical implications. It also raises the question of correlations between orthography and phonology in other writing systems. Korean is a target against which we can compare such a potential correlation in other languages.

Hisashi Masuda & Terry Joyce, 'A database of three-kanji compound words in Japanese, with particular focus on their morphological structures'

Reflecting the morphographic nature of Japanese kanji (Joyce, 2011), the Japanese language offers especially fascinating opportunities for investigating the morphology of compound words (Joyce & Masuda, 2018). Although two-kanji compound words (2KCW) represent the most frequent word structure (Joyce, Masuda, & Ogawa, 2014), many threekanji compound words (3KCW) also exist, involving more diverse structures than 2KCW. For example, denoting the constituent kanji as ABC, respectively, their morphological structures include A+B+C, AB+C and A+BC. This presentation outlines a database of 3KCW, featuring both the morphological structures, frequencies, and phonology of the compound words and their constituent elements.

The majority of 3KCW have transparent morphological structures, such as either AB+C or A+BC. The final morpheme of AB+C compounds tends to be either a generic noun, such as location (映画館 /ei-ga-kan/ [movie+hall] 'movie theater') or person (利用者 /ri-yō-sha/ [use+person] 'user'), the adjectival suffix (伝統的 /den-tō-teki/ [tradition+-al] 'traditional') or the verbal suffix (映画化 /ei-ga-ka/ [movie+-ization] 'make into movie'). The initial morpheme of A+BC compounds is typically either a modifier (新学期 /shin-gak-ki/ [new+semester] 'new semester') or an affix (不可能 /fu-ka-nō/ [not+possible] 'impossible').

However, some 3KCW have more opaque morphological structures. These include monomorphemic words (真面目 /majime/ 'serious'), phonetic transcriptions (歌舞伎 /kabu-ki/ 'Kabuki (traditional theater)'), and partially opaque compounds, where the word's original etymology is no longer clear (雰囲気 /fun-i-ki/ 'atmosphere'). Interestingly, there are also 3KCW where, although the morphological structure and constituents' meanings are both clear, the compound word's meaning has undergone a semantic shift (新幹線 /shin-kansen/ [new+main line] now means 'bullet train'). These observations highlight the importance of investigating 3KCW, in terms of their morphological structures, meanings and semantic shifts.

Kazuhiro Okada, 'Diverse standards in the pre-modern Japanese orthography'

This paper explores the pre-modern Japanese (pmJ) orthography. The Modern Japanese (MJ) orthography was established in the first half of the 20th century. Major differences between pmJ and MJ orthographies can be captured by the term: diverse standards. The MJ orthography standardised its graphic inventories and orthographic variations. Its standardisation was largely a response to demands from the modernised education, industries and military. The graphic inventory standardisation reduced variants in hiragana, katakana, and Chinese characters, all the scripts used in the Japanese orthography. Standardisation in orthography regularised choices of scripts and orthographies: in other words, one word and one orthography.

The situation was quite different before the standardisation. For example, there were several concurrent variants: hiragana had about 150 graphs or more (vs 47 in modern), and Chinese characters not rarely had two or three choices for each. For example, a modern hiragana letter か /ka/ was interchangeable, rather preferred, with う /ka/ (derived from a cursive rendering of 可). The difference between 峰 and 峯 /mine/ (*mountain peak*) was not noticed. As for orthography, 寿(壽)司, 鮨 and 寿し are all orthographic variations for /sushi/. 'Spelling' variations, such as しやう and せふ /sʲoː/ in the Edo period, are so popular that no one needs to know frequency. Such graphic and orthographic variations could be observed even in one sentence. This diverse orthography lasted for several centuries.

It does not mean that the pmJ orthography allowed any kind of writing. Rather, the pmJ orthography is characterised with interactions of diverse and concurrent standards, none of which was implicitly discarded (and actually often reclaimed). The MJ standardisation can thus be considered as a choice of some popular and straightforward standard, such as simplified Chinese characters.

Chiara Truppi & Barbara Hans-Bianchi, 'The emergence of writing in multilingual settings: comparing two case studies'

The present study examines two historically and geographically different multilingual settings in which formerly unwritten languages develop written forms. We will explore both similarities and differences of writing practices and orthographic choices.

The first case study deals with Pennsylvania German (PG), a minority language spoken in North America, that has been publicly written with many different spelling systems since the 1840's-1850's. Observing the spelling patterns that appear since the first period, the heavy influence of both reference orthographies – German and English – cannot be denied. On the other hand, writers often look for independent solutions. Over the years, written language users replied those spelling patterns they judged fittest both from a linguistic and a cultural perspective, without reaching yet a fully standardized orthography.

The second case will be that of Kriyol (Guinea-Bissau Creole), *lingua franca* in a complex multilingual setting. Despite its importance in the country, Kriyol has no official written form. There is a small but increasing literature production in Kriyol. Moreover, it is largely used in informal written contexts (chats, SMSs etc.). Despite the existence of a general pattern of orthographic choices, a certain degree of variation is clearly recognizable, shifting from a more Portuguese-like orthography to a more 'intuitive' phoneme-grapheme correspondence.

Through their orthographic choices, writers position the language itself, in relation to the written languages sharing the same complex multilingual space, expressing in a visual form the identity of the community of speakers.

We intend to focus on the following issues:
i) Are there common practices and motivations in the emergence of writing a formerly unwritten language among the different multilingual settings?
ii) Which linguistic and sociocultural aspects guide the authors' orthographic choices, particularly in the initial phase of writing emergence?

Martin Uildriks, 'Markings in Emerging States: What is their Socio-Cultural Context?' (*presented in absentia*)

The earliest evidence for writing manifested itself around 3,300 BCE in Mesopotamia and Egypt, within what are often considered the first states. This earliest evidence developed alongside a range of other graphic repertoires that not all encoded speech. One of these consists of incised markings on pottery that did exhibit a similar structure and systematicity to writing, yet cannot be confidently related to language. Similar evidence occurs in ancient Sudan (Nubia) where around 800 BCE writing and such markings appeared concurrently within the developing Kushite kingdom. To explain the markings in such cases, the last forty years of scholarship have mostly sought comparison with known scripts, seeking semantic contents. However, scholars have not yet been able to yield any significant insights into what these markings aimed to express during the development of such political systems, either in Egypt, Mesopotamia or Nubia.

Their functions seem multiple, from communicating aspects and processes of ceramic production to denoting ownership and contents, but they remain to be disentangled and explained holistically within emerging bureaucracy, and ultimately clarified within relationships between writing and social distinctions. Who made and used these markings, and under what circumstances? In this poster, I introduce some markings from early Egypt and present ongoing research that aims to answer some of the above questions, using modern digital techniques. Specifically, I will elaborate on a custom-built highly flexible database system, which aggregates data on these markings and their wider contexts. This database system will allow subjecting these obscure symbols to machine learning and deep learning algorithms, while keeping their relations to other associated material culture intact. This approach can extract otherwise difficult to detect patterns, which will help us understand the social environments in which these markings circulated.

Lieke Verheijen & Tess van der Laan, 'Is Digi-talk Dangerous? The Effects of Social Media on Dutch Youths' School Writing'

Today's youths are avid users of social media. In their informal digital writings, they use a language variant called 'digi-talk'. Many parents fear that digi-talk harms youths' literacy skills or formal writings, e.g. at school (Spooren 2009; Verheijen 2013). We conducted two large-scale studies to discover if such worries are justified with respect to spelling. The first study measured youths' (*N* = 338) social media use through extensive surveys. In the second study (*N* = 408), half of the participants were primed with social media, specifically WhatsApp, while the other half performed a non-CMC related control task. All participants wrote school texts: essays in the survey study, stories in the experimental study. The 746 school writings were manually analysed for three kinds of orthographic 'deviations': misspellings, textisms, and non-standard orthographic details (punctuation, capitalisation, spacing, diacritics). We calculated the relative frequency of these features to the total number of words per school text. Perhaps surprisingly, fewer spelling errors were found in the school writings of (a) youths who were primed with WhatsApp immediately before writing a story in the experiment, than youths in the control groups, especially for adolescents, as well as (b) youths who reported owning smartphones in the survey, than youths who owned old-fashioned or no mobile phones. Yet more textisms occurred in the essays of youths who reported using predictive and corrective dictionaries in CMC, than in those of youths who did not. Dutch youths' CMC and smartphone use were thus positively related to their orthographic performance in school writings, in terms of fewer spelling errors, but their use of auto-correction and auto-completion were negatively related, evident from more textisms. This suggests that digi-talk is not dangerous to orthography, as long as youths formulate their own words and sentences rather than passively rely on word predictors and correctors.

References

Spooren, W. (2009). Bezorgde ouders? De relatie tussen chat en schrijfkwaliteit. In W. Spooren, M. Onrust, & J. Sanders (Eds.), *Studies in Taalbeheersing* 3 (pp. 331–342). Assen: Van Gorcum.
Verheijen, L. (2013). The effects of text messaging and instant messaging on literacy. *English Studies*, 94(5), 582–602.

Małgorzata Zadka, 'Semasiographic aspects of glottographic writing systems'

The typological distinction between writing systems is usually based on their relation to spoken language and the ways of representing it: graphic signs may strictly refer to a language (glottography) or to non-linguistic ideas (semasiography) (Bennett, 1996; Coulmas, 1996; Daniels & Bright, 1996; DeFrancis, 1989; Diringer, 1962; Sampson, 1985). Purely semasiographic systems are often thought to be not the 'full writing' because they are strongly contextual and restricted to a narrow use, e.g. tallies, knotted cords, traffic signs or laundry symbols. But, in fact, semasiographic practices and strategies are much more common, even in seemingly purely phonographic systems: phonetic signs, in specific contexts, can be used 'semasiographically', without referring to their phonetic values, e.g. letters of alphabet as school grades or mathematical symbols; pictures can play a crucial role in seemingly glottographic text, as graphs, tables or visual representations of molecular structures (Boone, 1994; Gelb, 1963; Sampson, 1985).

In my presentation I want to show that typologies based on the sharp distinction between glottographic and semasiographic systems do not fully reflect the actual application of signs and their combinations (Dehaene, Cohen, Sigman & Vinckier 2005; Joyce & Borgwaldt 2011; Olson, D.R. 1994). By analyzing the structure and use of both mixed systems (e.g. Linear B logo-syllabary) and uniform phonographies (e.g. Latin alphabet) I intend to show that in the studied examples glottograms and semasiograms are combined together in order to make the most effective communication. Both ancient and modern inscriptions were intentionally composed as complex compositions intended to be logically and spatially interpreted as a whole message instead of being read linearly. From the social and cognitive point of view, the boundary between semasiographic and glottographic systems may be not as sharp, as it is commonly believed and the semasiographic aspect of the glottographically based writing systems deserves more attention.

Literature:
Bennett Jr., E.L. (1996). Aegean Scripts. In: P.T. Daniels & W. Bright (Eds.), *The World's Writing Systems* (pp. 125–133). Oxford: Oxford University Press.
Boone, E. (1994). Introduction: Writing and Recording Knowledge. In: E. Boone & W.D. Mignolo (Eds.), *Writing Without Words* (pp. 3–26). Durham: Duke University Press.
Coulmas, F. (1996). *Encyclopedia of Writing Systems*. Oxford: Blackwell.
Daniels, P.T. & Bright, W. (Eds.). (1996). *The World's Writing Systems*. New York: Oxford University Press.
DeFrancis, J. (1989). *Visible Speech: The Diverse Oneness of Writing Systems*. Honolulu: University of Hawaii Press.
Dehaene, S., Cohen, L., Sigman, M. & Vinckier, F. (2005). The neural code for written words: a proposal. *Trends in Cognitive Sciences 9* (7), 335–341.
Diringer, D. (1962). *Writing*. New York, NY: Frederick A. Praeger.
Gelb, I.J. (1963). *A Study of Writing* (2nd ed.). Chicago: University of Chicago Press.
Joyce T. & Borgwaldt S.R. (2011). Typology of Writing Systems. *Written Language and Literacy*, 14 (1), 1–11.
Olson, D.R. (1994). *The World on Paper. The Conceptual and Cognitive Implications of Writing and Reading*. Cambridge: Cambridge University Press.
Sampson, G. (1985). *Writing Systems: a Linguistic Introduction*. Stanford: Stanford University Press.

Oral session 4
Lynne Cahill, 'Recording verbatim speech in UK court reporting'

The proceedings of legal courts offer an opportunity to study the written representation of everyday spoken language going back several centuries. In contrast to the majority of written language that exists from the Middle Ages, which reflects formal language use by a small proportion of the population, there are court records which purport to record verbatim speech of ordinary people transcribed from shorthand records. However, there are very few remaining examples of the original shorthand transcriptions and different systems were used at different times.

The Old Bailey Online project [1] has made the proceedings of the Old Bailey from 1674-1913 publicly available. The earliest records in this collection are summaries of the trials, and even in 1905 it was reported that although full shorthand notes were taken of what was said at trials, the reports in the Proceedings were "much condensed to save the cost of printing". A key development was the switch from publishing third-person summaries of witness testimony to first-person accounts which began in the 1710s. Around 1712 the Proceedings began to include some verbatim testimonies, especially in trials which were thought to be salacious, amusing, or otherwise entertaining.

Other court records provide earlier examples of verbatim speech reporting. The Cause Papers were produced by law suits at the Archbishop's of York courts and are kept at the Borthwick Institute for Archives, University of York. They date from the 14th century. These papers include verbatim witness statements. Up to the fifteenth century their comments were translated into Latin, but any direct speech reported was usually left in English, particularly in defamation cases.

In this paper we compare the reporting of verbatim statements in the different centuries and different parts of the country, considering issues about the accuracy and reliability of the transcriptions.

References
[1] Tim Hitchcock, Robert Shoemaker, Clive Emsley, Sharon Howard and Jamie McLaughlin, *et al.*, *The Old Bailey Proceedings Online, 1674-1913* (www.oldbaileyonline.org, version 7.0, 24 March 2012).

Dorit Ravid, Rachel Schiff & Michal Kahanovitch, 'Root letter spelling in Hebrew: a developmental study in two populations'

Historical processes of loss and merger, mainly in emphatic, guttural / pharyngeal and spirantizing segments (Bolozky, 1997; Ravid, 1995), have resulted in five cases of consonantal homophony in Modern Hebrew – *k* spelled by ק and כ , *x* by ח and כ , *b* by ב and ו , *t* by ט and ת , and *s* by ס and ש. Homophonous root letters constitute a major spelling challenge (Ravid, 2012), given about 1,500 different roots with the Zipfian frequency typical of lexical elements. Moreover, root spelling is conditioned by a complex set of characteristics including root radical position, letter frequency, and morpho-phonological considerations. These challenges are exacerbated in the context of different socio-economic (SES) backgrounds, known to impact linguistic development (Golinkoff et al., 2018).

The current study investigated the factors affecting the acquisition of Hebrew root letter spelling in a judgment task requiring the selection of one of two possible spellings of words containing homophonous root letters (e.g., מרקבה / מרכבה 'carriage'). Each of the five consonantal homophones were represented in the three root positions in 88 words. Participants heard a sentence containing a target word and saw both spelling options. Participants were 337 native-Hebrew speaking elementary and high school students in 11 consecutive grade levels from 2nd to 12th grade, half from high and half from low SES. Results indicated that morpho-phonological factors such as vowel lowering and stop/spirant assisted in learning correct root letter spelling, mediated by root radical position. While most learning of homophonous root letters took place in elementary school in both populations, the the high SES advantage in many cases did not close even in 12th grade. As the root is the basic lexical prime in Hebrew (Ravid & Schiff, 2006), results point to the difficulty Hebrew-speaking students from low SES experience in extracting morphological information from words.

References
Bolozky, S. 1997. Israeli Hebrew phonology. In Alan S. Kaye & Peter T. Daniels (eds.) *Phonologies of Asia and Africa.* Winona Lake, Indiana: Eisenbrauns, 287-311.
Golinkoff, R. M., Hoff, E., Rowe, M. L., Tamis-LeMonda, C. S., & Hirsh-Pasek, K. 2018. Language matters: Denying the existence of the 30-million-word gap has serious consequences. *Child Development, 26*(7), 1071-1083.
Ravid, D. 1995. *Language change in child and adult Hebrew*. New York: Oxford University Press.
Ravid, D. 2012. *Spelling morphology: the psycholinguistics of Hebrew spelling*. New York: Springer.
Ravid, D. & R. Schiff. 2006. Roots and patterns in Hebrew language development: evidence from written morphological analogies. *Reading and Writing, 19,* 789-818.

Des Ryan, 'How do we know if a spelling is a good fit for a word? Interactions between 'morphemic' and 'phonemic' spelling'

It has long been known that polymorphemic English words are spelt by concatenating the spelling of the input morphemes. Venezky (1965) provides examples such as <up + hill> and <notice + able> and this idea of 'morphemic spelling' has become accepted in the literature (notwithstanding some terminological variation, c.f. C. Chomsky 1970, Stubbs 1986, Carney 1994). Nevertheless, not all complex words follow the pattern displayed by <jump, jumped, jumping>. Why, therefore, do spellings such as <dope, doped, doping> and <bop, bopped, bopping> deviate slightly from the pattern? Berg et al (2014) observe that the spelling of affixes is more stable than the spelling of base forms, and hence we do not have *<dopeng>. However, this does not explain the absence of *<dopeing> and *<boping>. Intuitively, it may seem obvious why such spellings are not in use — they do not provide 'good' matches for the phonological forms of these words. Yet no theory of English spelling has explained how we know that such spellings are 'bad'. In other words, how does the English writing system resolve conflicts between two of its fundamental principles: representing the sound and the meaning of each word.

This talk will present an algorithm for predicting the spelling of polymorphemic English words. This is followed by a new method of visualising the mappings between spelling and sound at all hierarchical levels (e.g. segments, syllables and feet — c.f. Evertz and Primus 2013). The final part of the model builds on Evertz's (2014) OT-model of 'graphematic weight', providing rigorous evidence that a spelling such as <dopeing> suggests the 'wrong' stress pattern (compare the spondees <protein> and <caffeine> etc.).

Finally, the theory can be expanded to predict spelling pronunciation and provide solid evidence that readers often use spellings as a guide to pronunciation in very many, although not all, English words.

***

Berg, K., Buchmann, F., Dybiec, K., & Fuhrhop, N. (2014). Morphological spellings in English. *Written Language & Literacy*, 17(2), 282-307.
Carney, E. (1994). *A survey of English spelling*. London: Routledge.
Chomsky, C. (1970). *Reading, writing and phonology*. Harvard Educational Review, 40(2), 287-309.
Evertz, M. (2014). *Visual Prosody: The graphematic foot in English and German*. (PhD), Cologne.
Evertz, M., & Primus, B. (2013). The graphematic foot in English and German. *Writing Systems Research*, 5(1), 1-23.
Stubbs, M. (1986). The synchronic organisation of English spelling. *CLIE Working Papers: The Linguistics association of Great Britain, 10*.
Venezky, R. L. (1965). A study of Engilsh spelling-to-sound correspondences on historical principles. (PhD), Stanford University.

Oral session 5

Daniel Harbour, 'Grammatical typology predicts writing system evolution: A case study in Sumerosphere and Sinosphere logography'

The world's four pristine writing systems (Sumerian cuneiform, Egyptian hieroglyphs, Chinese characters, and Mayan glyphs) show quite different levels of phonography versus logography, that is, of sound- versus meaning-based writing. A comparative study of Sumerian and Chinese and their descendant systems Akkadian, Japanese, and Vietnamese shows that grammar strongly constrains the extent and longevity of logography. Two grammatical properties especially militate against logography.

1. *Functional vocabulary* — Sumerian logography is largely confined to lexical vocabulary. Abundant functional vocabulary (agreement, aspect, case, directionality, . . .) is written phonographically; logographic event/nominal plurality is a rare exception, but a sound-symbolic one reflecting reduplication. Old Chinese exhibits far less functional vocabulary (many sentences have none). The obvious conclusion—that functional items are less susceptible to logography—is supported by logography in descendant systems. Where Vietnamese parallels Chinese in functional vocabulary and logography, Japanese develops a Sumerian division of labour to accommodate case and inflection. Meanwhile, Akkadian generally abandons logography in the verb, its most morphologically complex domain.

2. *Syllabic integrity* — Much Old Chinese functional vocabulary respected syllable boundaries (utilising tone/onset ablaut). By contrast, Sumerian inflection involved many vowel-initial suffixes. In the syllable-based writing systems that Chinese and Sumerian (mostly) were, morphological derivation thus preserved meaningful units in Chinese but created meaningless one in Sumerian (cf, English lo-ving). Meaninglessness clearly militates against meaning-based writing. The effect of shifting syllable boundaries may even be evident in the logograms themselves. Old Chinese alternations, if written, mostly deployed phonetic complements. Sumerian glyph-internal phonetic complements were far less frequent. Inflection arguably rendered them redundant: when root codas resyllabify and are written via phonograms, these act as phonetic complements. Developments in Akkadian support this view: root codas did not reliably resyllabify, especially for verbs, leading to overhaul of the writing system and the aforementioned retreat of logography in verbs.

James Myers, 'The influence of Chinese character form on neighboring orthographic systems'

Regular Chinese script (楷書) displays many formal regularities that corpus analyses and experiments show to be productive (http://personal.ccu.edu.tw/~lngmyers/CharGram.htm): semantic radicals favor the left and top, left-edge constituents often change horizontal strokes to rising diagonals (土~地) or falling diagonals to dots (木~根), reduplication favors certain configurations (吅 is more common than 呂), a constituent's lowermost stroke is usually enlarged (土 types outnumber 士 types), the leftmost vertical stroke is usually curved (周 types outnumber 同 types), and leftward hooking favors asymmetry and/or stroke contact at the top (寸丁 are more typical than 小). The present study argues that these patterns have been adapted into neighboring orthographies even when the characters themselves have not.

Tangut script not only had semantic radicals, but they strongly favored the left and top edges. Tangut also favored horizontal doubling (𗴼 = 𗁅 + 𗁅) over vertical doubling (𗴼 = 𗁅 + 𗁅), enlargement of the lowest stroke (𘟛 𗁅 𗁅 𗁅 𗁅 𗁅), left-edge curving (𗁅 𗁅 𗁅 𗁅 𗁅 𗁅 𗁅), and leftward hooking with asymmetry and top contact (𗁅 𗁅). Korean hangeul shows reduplication horizontally (ㅃ) but not vertically, stroke diagonalization (ㅗ~ㅘ) and dotting (ㅈ~ㅉ), and enlargement in bottommost strokes (ㅗㅛ vs. ㅜㅠ). Leftmost vertical strokes are not curved, but they are shortened (ㅐ ㅐ ㅔ ㅖ). Mandarin zhuyin fuhao and Japanese katakana also show systematic over- or undergeneralization of Chinese patterns.

Universal motoric and visual constraints help explain only some of these similarities. Moreover, whether a given pattern appears in neighboring systems relates in part to its productivity in Chinese script. It seems, then, that formal orthographic regularities can take on a mental life of their own even when they do not directly relate to the encoding of spoken language information.

Day 3
Oral session 6
Christian Prager, 'What's in a Sign? Unbridled Aesthetics and Calligraphic Constraints in Classic Maya Palaeography'

The subject of my presentation is the semi-deciphered written language of the Classic Maya, whose cultural area extended across the present-day nation states of Mexico, Guatemala, Belize and Honduras. Maya writing is a mixed morpho-syllabic hieroglyphic system consisting of about 800 signs and was used between 300 BC and 1500 AD.

Using a wide range of graphemic and graphotactic strategies, Maya scribes created a variety of texts that avoided repeating the same graphs and spellings. Artists sought to maximize visual splendor and designed texts as individual pieces. Usually, morphographs and syllabographs were combined to provide morpho-syllabic spellings of words, but it was also possible to write words entirely with syllabic signs or only with morphographs. Another level of calligraphic complexity was achieved through allographic notation and by modifying the shape of graphs allowing scribes to compose texts that were aesthetically ambitious without repeating signs.

In my presentation I focus on the "identity" of Maya hieroglyphs, contrasting features that distinguish one sign from another. The remarkable range of variant spellings for one and the same word raises the question of which factors influenced the morphology of a sign and how one sign's form affected others associated with it. The design of the text field had a significant influence on the morphology of signs: they could be varied through compression, stretching, rotation, reduction, or overlapping. While these latter phenomena often resulted in loss of detail or truncation, we also observe aesthetic exaltation, artistic release, splendid design, decorative elegance and playful details in the creation of sign variants. The range of variations seems wide, but where are the boundaries of this writing game that seems to oscillate between unbridled aesthetics and calligraphic constraints? What features of a sign are stable and preserve its "identity" and readability? What is the "core" of a sign?

Figure 1. Spellings for *i' uht* „then it occurred" from the corpus of Maya hieroglyphic texts. Drawings by David Stuart.

Sam Butler, 'Inscribing Communities across the Mediterranean: A Comparative Approach to the Lycian and Oscan Alphabets in the first Millennium BCE'

Over the course of the first millennium BCE, the use of alphabetic writing spread from the Levant to cover large portions of southern Europe and western Asia. Satisfactory assessments of this explosive growth remain elusive, however, due to lack of collaboration among specialists in different areas, and the tendency to analyze writing as separate from other products of material culture.

This paper examines the proliferation of alphabetic writing through the ancient Mediterranean by means of a comparative study. Using two epigraphic corpora of first millennium BCE alphabetic scripts, it tracks how differences in their material and socio-political environments affected their form and function.

My two corpora are the inscriptions used to encode Lycian, an Indo-European language of the Anatolian sub-family, and those used to encode Oscan, another Indo-European language of the Italic sub-family. I compare these two in respect to letterforms, writing media, and social contexts, paying attention to the regional power dynamics affecting their script-using communities. I then situate both corpora within the context of other changes in the material culture of their communities.

In both cases, writing provided a community with an avenue for negotiating the tug-and-pull between regional connectivity and local identity. The political pressure applied by other communities in Italy led to the Oscan script having an application as a salient mark of community identity in a wide variety of physical contexts. By contrast, in Lycia, the lack of any such pressure resulted in writing having a more restricted application as a marker of distinction within the community of Lycian script users.

This paper demonstrates that a two-fold comparative approach, comparing writing systems to each other and to other facets of material culture, gives us a better understanding of the processes that lead to the spread and diversification of alphabetic scripts in Europe and Asia.

Oral session 7
David Roberts, Matthew Harley & Stephen L. Walter, 'The contribution of full tone marking to fluency and comprehension in Yoruba and Ife'

We undertook a series of classroom experiments with 308 participants in ten Niger-Congo languages across five countries to test the hypothesis: "*To what extent does full tone marking contribute to oral reading fluency, comprehension and writing accuracy, and does that contribution vary from language to language?*" Participants read full tone and zero tone texts and also added accents to unmarked versions of the texts.

Two of the languages, Yoruba and Ife, are closely related and are linguistically and orthographically similar. Yet their reading and writing results are highly dissimilar. In Ife, full tone marking contributes to speed, tone accuracy and comprehension, and writing accuracy is the most accurate of all the languages. In Yoruba, on the other hand, full tone marking does not contribute to any of these measures and tone writing skills are generally poor.

This stark difference can be explained by comparing the social profiles of the two samples. The Yoruba have the highest levels of formal education of any of the languages, while the Ife have the lowest. Furthermore, Yoruba is the only language that is taught at school, and Yoruba literates benefit from more exposure to print than do Ife literates.

This suggests that full tone marking is beneficial for less educated readers with less experience of L1 literacy and less exposure to print. As these increase, readers need full tone marking less. The results also suggest that the social profiles of the participant and the ethno-literacy context are more predictive of reading and writing performance than the linguistic and orthographic profile of the language.

Maayan Troyansky & David L. Share, 'Phonological Awareness in the Hebrew Abjad: Consonants, Vowels, and Core Syllables'

This study examined the early development of phonological awareness in Hebrew, with special consideration of the characteristics of the Hebrew writing system. A huge literature has now confirmed the importance of phonological awareness in reading acquisition, but much of this work is disproportionally based on the English language and English speakers (Share, 2008). Hebrew, a Semitic nonconcatenative root-and-pattern language, is written with an abjad (or consonantary), in which the letters first and foremost indicate consonants, with vowels represented in a subsidiary manner (Daniels, 1996, 2018). This contrasts with alphabets such as English which accord consonants and vowels equal orthographic status. We asked how the consonantal architecture of the Hebrew abjad influences the nature of phonological awareness and, in particular, whether young children have superior *consonantal* awareness compared to *vowel* awareness. In a combination cross-sectional and staggered longitudinal design, we tested phonological awareness (as well as reading and writing) in a total of 254 native Hebrew-speaking children ranging in age from pre-kindergarten to fourth grade.

Contrary to our predictions, the awareness of single phonemes was not determined by their type (consonant or vowel) or their position in the word (syllable-initial versus syllable-final), but rather by their position with regard to the CV core unit which appears to be the most accessible phonological unit for Hebrew speakers. Intra-core phonemes, those located inside the core CV unit, whether vowels or consonants, were far more difficult to isolate than extra-core phonemes. This (not coincidentally) matches the CV architecture of pointed Hebrew in which diacritic-like vowel signs are appended sublinearly to the consonantal letters forming an integral CV unit (tseruf) in the vertical plane (e.g., אַ). The theoretical and educational/instructional implications of these findings are discussed. Our findings highlight the importance of investigating these issues through the lens of a writing-system approach.

Bibliography

Daniels, P. T. (1996). The Study of Writing Systems. In: P.T. Daniels and W. Bright Eds. *The World's Writing Systems*. New York: Oxford University Press.

Daniels, P. T. (2018). *An Exploration of Writing*. Sheffield, UK: Equinox Publishing Limited.

Share, D. L. (2008). On the Anglocentricities of Current Reading Research and Practice: The Perils of Overreliance on an "Outlier" Orthography. *Psychological Bulletin, 134*, 584–615.