Writing systems: Past, present (… and future?)
Special issue introduction
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1. Introduction

This special issue consists of a selection of papers originally presented at the *Association of Written Language and Literacy*'s (AWLL) *Eleventh Workshop on Writing Systems and Literacy* for which the theme was *Writing systems: Past, present (… and future?)*.

AWLL11 took place at the end of August 2017 at Nanzan University, Nagoya, Japan, and was thus the first AWLL workshop to be held outside of Europe. AWLL11 was also the first gathering to include a themed symposium session, chaired by Hye Pae (University of Cincinnati, USA), of four short talks on the Asian writing systems of China, Japan and Korea. Moreover, the workshop, which extended over 2.5 days, was able to welcome three invited speakers. They were Florian Coulmas (University of Duisburg-Essen, Germany) *The diversity of writing systems past and present: some general considerations*, Dorit Ravid (Tel Aviv University, Israel) *The two orthographies of Modern Hebrew: historical change and current phenomena*, and David Roberts (independent researcher, Togo, West Africa) *Tone orthography in African languages: past present and futur*e. The AWLL11 programme also included 16 oral and nine poster presentations, which stimulated lively discussions amongst the workshop participants of various research disciplines, who came from 15 different countries (Austria, Canada, Finland, Germany, Hong Kong, India, Israel, Japan, Korea, Malaysia, Spain, Taiwan, Togo, UK, and USA). The five contributions to this special issue have developed out of papers presented during the AWLL11 workshop.

2. Writing systems along the temporal dimension

As already noted, the AWLL11 workshop was about *Writing systems: Past, present (… and future?)*. In seeking to foster beneficial synergies between diachronic and synchronic perspectives on how writing systems develop and function, the conference's call for papers included research questions about the potential contributions of historical studies to understanding writing systems, about enhancing existing typologies of writing systems,

about the influences of technology, and about approaches to orthography development. As the AWLL11 papers addressed these topics, and numerous others, from a diverse range of interesting perspectives, it has been beholden on us, as the guest editors, to select representative papers that aptly capture the temporal perspective of the workshop theme. Accordingly, this collection consists of two papers on historical writing systems, two on contemporary ones, and one future-orientated paper.

In the first historical paper, *Orthographic variation as evidence for the development of the Linear B writing system*, Anna Judson takes us back in time to the second millennium BCE in examining a corpus of Mycenaean administrative records for its orthographic variation. The tablet corpus is significant for a couple of interrelated reasons. The first is that because all the tablets are from the palace at Pylos, they can be securely dated to its final destruction of circa 1200 BCE. The second factor is that, consistent with Mycenaean administrative practices of not retaining written records beyond the current administrative cycle of approximately one year, it is reasonable to assume that all were written within a relatively short period prior to the palace's destruction. This narrow production timeframe makes the considerable levels of orthographic variation described in the paper even more remarkable. Indeed, as Judson eloquently argues, the inescapable conclusion to draw is that, within certain circumstances, synchronic orthographic variation must have been both acceptable and common in Linear B, even to the extent of individual hands (neutral term for the text creators without implications of 'scribe' role or status) exhibiting considerable variation in their writings. The paper's analysis focuses on the open syllable signs of Linear B and, more specifically, on two kinds of extra signs—namely, the doublet and complex signs—for two key reasons. The first is that writing Mycenaean Greek with an open syllabary necessitated orthographic conventions—either the omissions of *partial spelling* or disregarding the dummy vowel of *plene spelling*—to represent the additional consonants of closed syllables and consonant clusters; both frequent in the language. The second reason is that the majority of orthographic variations involve alternations between core signs and their equivalent extra signs. As Judson emphasizes, although reasonable motivations have been advanced for the creation of the extra signs, such as reducing ambiguity with the doublet signs and increasing writing efficiency with the complex signs, a more nuanced picture of such diachronic developments emerges once one carefully considers the synchronic practices of use. Clearly, other factors need to be taken into

account in order to explain the persistence of the orthographic variation attested for Linear B within the Pylos tablet corpus, such as the writing system's core structure, its orthographic conventions, and the extent to which ambiguity was actually regarded as being problematic.

In contrast to Judson's paper which offers a synchronic snapshot of the state of Linear B circa 1200 BCE, in *Writing vowels in Punic: from morphography to phonography*, Crellin adopts a diachronic view of the orthographies under his purview. Consisting largely of inscriptions on stone, pottery, or coins, the Punic material as a whole may be dated from the first half of the first millennium BCE to the first half of the first millennium CE. Crellin sets out to provide a typological framework to address the issue of vowel representation in Punic. Notwithstanding the considerable difficulties in dating Punic inscriptions that Crellin highlights, the paper argues that a trajectory of development may be discerned. Specifically, Punic moves from an inherited situation where vowels are in principle not written at all, through a morphographic orthography where vowels are noted according to their morphological presence rather than phonological character, and ultimately to a phonographic orthography where it is vowel quality, rather than morphological presence, that is notated. A mid-stage combining features of both of these orthographies, viz. morpho-phonographic, is also identified. The transitions between these stages are characterized by the shifts in the ways that what were originally Phoenician-Punic guttural graphemes, namely, <ʾ>, <ʿ>, <h>, and <ḥ>, came to be utilized to represent vowel phonemes in later Punic. As Crellin meticulously delineates, there are two key variables to consider; namely, a) whether the guttural graphemes function as *matres lectionis*, carrying both consonantal and vocalic values, or as dedicated vowel graphemes and b) whether such vowel indicators denote the presence of a morpheme but not its phonological value, or both the presence of a vowel phoneme and its quality. It is, however, vital to note that because the phonographic stage never reaches the point where vowel representation is obligatory, there are no instances of alphabetic writing (i.e., obligatory notation of both consonants and vowels) with Punic characters. Nevertheless, Punic illustrates how a consonantal linear segmentary could potentially develop in the direction of an alphabet. Thus, it is of particular significance for the wider debate concerning the direction in which writing systems develop; something that has become controversial in recent decades following Daniels' (e.g. 1990; 2000) refuting of Gelb's (1963) assertion of

the principle of unidirectional development. Punic is also notable for the fact that, while there is orthographic development, from a synchronic perspective it is clear thatmorphographic and phonographic orthographies can co-exist, demonstrating that development is neither necessary nor universal.

The third paper is the first of the collection to consider a contemporary writing system. As aptly conveyed by its title, *More than an alphabet: Linguistic features of Korean and their influences on Hangul word recognition*, the third contribution by Hye K. Pae, Sungbong Bae and Kwangoh Yi focuses on the Korean Hangul writing system. As also suggested by its title, the central proposal of their paper is that Hangul functions as a *morphosyllabic alphabetic* writing system; a compound term that the authors claim best captures the orthographic, phonological and morphological characteristics of Hangul. In support of that assertion, their paper's two main sections describe the linguistic features of the Korean language and Hangul and present a selective review of psycholinguistic investigations into Hangul word recognition, respectively. Indeed, the structural organization of the paper essentially mirrors the conceptual construction of the proposed compound term. Starting from orthographic considerations, the foundation of Pae et al's argument is that Hangul conforms to the *alphabetic* principle to the extent that its graphs correspond to Korean phonemes. The term's second element is *syllabic*, reflecting the fact that component graphs are never written in isolation but combine to form syllable blocks (albeit with the inherent requirement to fill the consonant position of consonant-vowel (CV) orthographic structures with the null-sound *consonant* place-holder <ㅇ> for vowel-only syllables, such as <아> /ɑ/). The psycholinguistic evidence reviewed generally underscores the importance of sublexical processing, with a dominant role for syllable-based processing interacting with a propensity to segment CVC syllables into CV (body) and V (coda) units rather than C (onset) and VC (rime) units. Finally, the element of *morpho-* is proposed on the grounds that a considerable proportion of the Korean lexicon are Sino-Korean compounds, consisting phonologically of two syllables and morphologically of two morphemes. However, as the authors acknowledge, in comparison to the orthographic and phonological characteristics, empirical evidence is scarcer for the morphological aspect. Their paper also touches on the thorny issue of classifying the Hangul writing system according to the notion of orthographic depth (Frost, Katz & Bentin 1987). Although Hangul is, arguably, a shallow orthography based on one-to-one

correspondences between graphs and phonemes, it seems more appropriate to classify it as a deep orthography, because sound variations are common in Korean, due to various phonological phenomena such as assimilation and sound linking.

The focus on present writing systems continues in the fourth paper by Terry Joyce and Hisashi Masuda, entitled *On the notions of graphematic representation and orthography from the perspective of the Japanese writing system*, which examines two closely intertwined issues in seeking to elucidate the highly fungible, or interchangeable, nature of contemporary written Japanese. Drawing on discussions of the elusive trinity of terms—writing system, script and orthography—central to writing systems research, the first aspect is to reflect on the relevance of the notion of orthography, with its inherently prescriptive connotations of *correct writing*, for the overall Japanese writing system (JWS). While there are unquestionably orthographic conventions associated with the JWS's component scripts (as outlined within the paper), given that graphematic variation is a pervasive characteristic of the contemporary JWS (Joyce, Hodošček, & Nishina 2012), Joyce and Masuda argue that the notion of *graphematic representation* more aptly captures the considerable latitudes towards the graphematic solution space (Neef 2012; 2015). The paper's second concern is to espouse an inclusive notion of *intentionality*—on the assumption that, even when deliberately aiming to conform to standard conventions, written language is always motivated to some degree—as a framework for interpreting the highly fungible nature of graphematic representations within the JWS. Thus, envisaged as complementing the notion of conventionality, the authors present a tentative classification of the various factors of intentionality that also shape contemporary written Japanese. Acknowledging that their enterprise is not without challenges, in depending primarily on observational measures that often necessitate inferences and interpretations of underlying motivations, still, the authors draw on a wide range of examples from the linguistic landscape in constructing their coherent framework. The proposed framework classifies nine factors of intentionality under three main groups of message context, script sensibilities and creative representation. Under message context, the two factors are medium and audience; under script sensibilities, the four factors are kanji avoidance, nuance differentiation, author stylistics and script associations; and under creative representation, the three factors are word play, playful rubi (margin annotation) and graphic play. In addition to representing a more flexible approach to thinking about graphematic

representation, the notions of conventionality and intentionality factors that Joyce and Masuda advocate can potentially illuminate the human capacities for creativity that underlie all writing systems.

Following on from the papers on two historical (Linear B and Punic) and two contemporary (Hangul and JWS) writing systems, the final paper completes the special issue's temporal dimension in being a future-orientated case study of orthography development. In *Developing a unified orthography for Berawan: an endangered Bornean language*, Jey Lingam Burkhardt and Jürgen Martin Burkhardt tender a detailed account of their approach towards orthographic development. After briefly profiling the three small and linguistically endangered Berawan communities in the Malaysian State of Sarawak on Borneo Island that the authors have been collaborating with to develop the preliminary unified Berawan orthography, they establish the theoretical foundations of their project. More specifically, referencing both Smalley's (1959, 1965) well-known criteria for orthography development and Rempel's (1995) development stages, the authors advocate supplementing Smalley's five design criteria with two additional implementation criteria, which are all embodied within their stage framework of orthography development. As exemplified in their collaborations with the Berawan communities, the first implementation criterion is adequate testing, as it is vital for decisions about design options to be informed by objective measurements, and the second is the provision of sufficient time to learn the orthography being developed. Moreover, their proposed framework of four stages differentiates between an initial tentative orthography, intermediate stages of preliminary and working unified orthographies, and the final emergence of a standard unified orthography. This paper offers a fascinating perspective on the kinds of decisions that developing an orthography can entail; ones that can usually only be speculated about in the cases of pre-existing writing systems. Burkhardt and Burkhardt single out three decisions made in the transition to the preliminary unified orthography. The first relates to differentiating between the short [a] vowel as <â> and the long low vowel as <a>, which, in part, affords consistent ways of representing both short diphthongs and triphthongs to one community with a more complex vowel system. The second decision was to implement a grapheme distinction between the schwa [ə], as <e>, and the mid-front vowel [ɛ], as <é>, in order to avoid under-specification in the Berawan orthography. The third decision made was to insert the approximant <y> after <i> and <w> after <u> in vowel

clusters, which is beneficial in distinguishing between monosyllabic and disyllabic triphthongs.

3. Universal themes that transcend time

Consistent with AWLL11's theme of *Writing systems: Past, present (… and future?)*, the five papers of this special issue have been compiled primarily to represent a range of points along the temporal dimension. However, irrespective of their different temporal contexts, it is also abundantly clear that several universal themes transcend time. This final section seeks to briefly highlight two of them; namely, the pervasive nature of orthographic variation and enduring issues for writing systems research.

The pervasive nature of orthographic variation

Although the circumstances and extents undeniably differ across the five papers, the phenomenon of orthographic variation, from its sources to its desirability, has some degree relevance for each of the contributions. Both Sproat's (2000) notion of a writing system's *Orthographically Relevant Level* (ORL), as "the level of linguistic representation encoded orthographically by a particular writing system" (p. 14), and Neef's (2015) conceptualization of graphematics, as "the component of the writing system that captures the relation between letters and phonological units of the language system" (p. 713), are germane in this context. On the one hand, Sproat assumes that writing systems operate at a single ORL, while, on the other hand, consistent with Neef's focus on phonographic writing systems and as prevalent in some quarters of writing systems research (Share 2008), an ideal writing system is often assumed to entail a one-to-one mapping between graphemes and phonemes. Related to the representational inadequacies inherent in most writing systems, the phenomenon of orthographic variation also emerges from the tensions, experienced within most literate communities at one time or another, between balancing an adherence to the writing practices of previous generations and contemporary pressures for functionality and efficiency.

As already noted, the central focus of Judson's contribution is to examine the extensive synchronic orthographic variation attested in Linear B for insights into the development of that writing system. Viewed from the opposite perspective, however, the paper is equally

informative about the phenomenon of orthographic variation. Firstly, although the ORL of the Linear B signs discussed is the syllable, most of the orthographic variations involve alternative approaches to representing the additional consonants of Mycenaean Greek's closed syllables and consonant clusters. Significantly, the conventions for using the core signs were not wholly replaced by the creation of extra signs, despite their potential to reduce ambiguity or represent morphological information (such as plural *ra₃*). Secondly, given that individual hands were evidently not compelled to curb the significant levels of variation, even within their own writings, from a functional perspective, the writing system was manifestly sufficiently well suited for the administrative purposes for which it was primarily employed. Thus, the Linear B Greek evidence provides an interesting counterpoint to modern perspectives on orthographic design, where regularity and uniformity are prioritized as ideals.

In the Punic material discussed by Crellin, orthographic variation is also a key characteristic not only at the level of individual inscriptions by also across time and space. While West Semitic writing systems are usually classified as abjads (Daniels 1990), or consonantal linear segmentaries (Gnanadesikan 2017)—writing systems that in principle denote only consonants—Crellin traces for Punic a development trajectory from morphographic stages, where morphological information is privileged over phonological to a later phonographic stage that is more fundamentally orientated towards signifying phonological information. From the perspective of orthographic variation, the fact that texts written in the Neopunic script are attested with both morphographic and phonographic orthographies stands as clear testimony of how alternative orthographic principles can co-exist as the tensions between convention and innovation play out.

Although not explicitly acknowledged by Pae et al in their contribution, it is also worth noting that the promulgation of Hangul in 1446 did not immediately usurp the use of Hanja (Chinese characters), for, as King (1996) points out, Chinese writing and later a form of Sino-Korean mixed script continued into the twentieth century. While Hanja representations have not been completely expunged from Korean culture, certainly the potential for Hanja-Hangul orthographic variations, even if not totally extinct, is now quite dormant, for, as Pae et al observe, the current policy of the Korean government is to limit Hanja instruction within public schools. However, one could argue, with some justification, that the influences of such orthographic practices underlie the various forms

of sound variation that Pae et al discuss. As the authors note, the spelling conventions of contemporary Korean are morpheme-based, and, thus, while preserving the morphological transparency of content words, it is at the expense of reduced phonological transparency. A situation that effectively renders the inherently shallow one-to-one grapheme-to-phoneme correspondences of Hangul to function as a deeper orthography.

The notion of orthographic, or graphematic, variation is also at the very heart of Joyce and Masuda's paper on contemporary written Japanese. Although their paper does not explicitly reference Sproat (2000), a key characteristic of the JWS's component scripts is that they function at different ORLs—kanji at the morphographic level, the two kana script of hiragana and katakana at the syllabographic level, and the rōmaji alphabet at the phonemic level. Drawing instead on Neef's (2015) *Modular Theory of Writing Systems*, Joyce and Masuda seek to highlight how the JWS's multiple scripts yield a vastly expanded notion of the graphematic solution space, which, in turn, makes graphematic variation an integral feature of contemporary written Japanese. In addition to also challenging the necessity or desirability of prescribing a single *correct* orthographic representation, their paper also underscores the tension between adhering to orthographic conventions and innovative forms of written language.

As echoed in Burkhardt and Burkhardt's paper, approaches to orthography development generally hold the phoneme to be the optimal ORL and ideally strive to realize one-to-one relationships between phonemes and graphemes. As practitioners actively engaged in orthography design, however, the authors are also keenly aware of the issues of both the under- and over-differentiation that exist within Malay orthography. Given that *maximum transfer*—in the Berawan context, referring to the extent to which literacy for the developing orthography can aid learning to read Malay, the region's majority language—is one of the project's design criterion, such factors have inevitably shaped some of the design decisions already implemented, such as distinguishing the short [a] vowel as <â> from the long low vowel as <a>. However, to the extent that this particular decision was also motivated to provide one of the three Berawan lects with consistent ways of representing both short diphthongs and triphthongs, which are not present in the other two lects, arguably, the orthography is already incorporating the seeds for orthographic variation from its very inception.

Enduring issues for writing systems research

While immediately acknowledging that the degree of direct engagement varies across the papers, all five papers also grapple, either implicitly or explicitly, with issues of definition and typology that are of universal and timeless significance for writing systems research.[1] Naturally, the key terms that most warrant precise and careful definition are the closely interconnected set of terms *script*, *writing system* and *orthography*. Of these, the term script is used the more consistently across the collection and generally in line with Coulmas' (1996: 1380) definition; "the actual shapes by which a writing system is visually instantiated". In contrast, greater disparity is visible in the definitions of both writing systems and orthography. On the one hand, the interpretations of writing system range from the abstract unit-sign mapping to more inclusive senses of visually representing a specific language. On the other hand, those of orthography hang on whether it is being regarded as essentially synonymous with writing system, on whether it refers primarily to the principles or rules by which script elements are concatenated, and on the prescriptive status of such rules. Not surprisingly, the issues of typology are also intimately concerned with the coherency and precision of the taxonomical categories that are employed in differentiating between related phenomena—whether in terms of writing system or orthography—that are, in turn, highly dependent on how the sign to linguistic unit relationships are perceived and interpreted.

The enduring significance of these issues for writing systems research is patent from both the historically orientated papers. From Judson's discussion of Linear B, while it is clear that the individual hands behind the Mycenaean Greek texts must have been highly trained, it is also equally evident that they lacked a standardized orthography that prescribed the use of all signs in all circumstances. The co-existence of alternative orthographic conventions would thus appear to have much in common with the concept of alternative graphematic representations advocated by Joyce and Masuda. The co-existence of alternative orthographies is also a key aspect of the developmental trajectory that Crellin delineates within the historical Punic inscriptions. However, in contrast to Judson's synchronic perspective but consistent with his diachronic focus, Crellin is intimately concerned with appropriately locating the Punic orthographies within a typology of writing

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[1] At this juncture, it is expedient to mention that our policy, as guest editors, has been to refrain from imposing any theoretical perspectives on the individual authors.

systems, with particular reference to how that can inform our thinking about the distinctions between alphabets, abjads and segmentaries (Daniels 1996; Gnanadesikan 2017).

These enduring issues are also plainly manifest in the special issue's other papers. As noted earlier, Pae et al argue that the term of *morphosyllabic alphabetic* writing system most aptly captures the orthographic, phonological and morphological characteristics of Korean Hangul. To the extent that typologies are predominantly analytical in approach, their reasoning, which is essentially holistic in nature, appears to adopt a rather more inclusive attitude towards the ORL of Hangul. Joyce and Masuda's paper also tenders some suggestions about the connections between writing and the language system. More specifically, they argue that, as the regulatory connotations of orthography are not reconcilable with the fungible nature of the JWS as a whole, the term graphematic representation is more suitable in the context of the JWS where written variation is the norm. Needless to say, the pervasive nature of graphematic variations in the JWS stems directly from the fact that it is a mixed writing system comprised of multiple scripts that function at different ORLs. Finally, Burkhardt and Burkhardt's exposition of their collaborative project to develop the preliminary unified Berawan orthography with three Berawan communities elucidates some important aspects of orthography development. In particular, their proposed framework of four stages of orthography development neatly emphasizes the importance of testing and consensus building in the construction of functional conventions of usage. While proposed primarily as a framework for designing orthographies, it is no coincidence that the way that orthographies develop through a series of stages is also abundantly evident in the two papers that consider historical writing systems.

During our time as guest editors, we have monitored the development of these contributions from their initial presentations at the AWLL11 workshop through multiple revisions, including blind external reviews, to their eventual inclusion as valuable contributions to this special issue collection. We would like to express our sincere appreciation to everyone involved at various stages along the way. Firstly, to all the participants of AWLL11 workshop for providing initial reactions to all the workshop presentations, which undoubtedly helped to shape the subsequent submissions. Secondly,

to all the participants who submitted full papers for consideration; we are sorry that not all could be included. Thirdly, to all the external reviewers for providing constructive comments that unquestionably helped to greatly benefit all subsequent revisions. Fourthly, to Dorit Ravid, *Written Language and Literacy*'s (WLL) general editor, for her guidance, support and patience throughout. Fifthly, to John Benjamins, WLL's publishers, for their long-standing support to the AWLL in graciously maintaining the tradition of featuring selected workshop papers as regular special issues. Finally, we would especially thank all the authors for their dedication and commitment in working with us throughout the editing process. We sincerely hope that the papers of this special issue will contribute to highlighting some of the commonalities of all writing systems, whether past, present or future.

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