

## Secondary Publication



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Date of secondary publication: 07.08.2025

Version of Record (Published Version), Article

Persistent identifier: urn:nbn:de:bvb:473-irb-109575x

#### Primary publication

Hartmann, Stefan; Nowak, Jessica; Szczepaniak, Renata (2021): The evolution of writing systems : Introduction to the special issue, in: Zeitschrift für Sprachwissenschaft : ZS, Berlin [u.a.]: de Gruyter, Vol. 40, Nr. 3, pp. 253–256, doi: 10.1515/zfs-2021-2048.

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## The evolution of writing systems

### Introduction to the special issue

<https://doi.org/10.1515/zfs-2021-2048>

Recent years have seen an increased interest in the investigation of graphemic systems both from a linguistic point of view and in a decidedly interdisciplinary perspective. Many different aspects have been addressed in the recent literature: the semiotic nature of writing systems (e. g. Morin et al. 2018), the emergence of writing systems in the real world as well as in laboratory settings (e. g. Garrod et al. 2010, Kelly et al. forthc.), neurocognitive processes determining the development of writing systems (e. g. Dehaene 2009), sociohistoric, cognitive, and cultural factors that influence diachronic changes in written language (e. g. Baddeley and Voeste 2012; Condorelli 2020), as well as the interface between writing, phonology and morphology (e. g. Fuhrhop and Schmidt 2014; Fuhrhop et al. 2017; Caro Reina and Engel 2020).

This special issue of *Zeitschrift für Sprachwissenschaft* brings together typological, empirical, and cross-linguistic studies investigating the diachronic development of writing systems. It is based on the workshop of the same title held at the annual conference of the *Deutsche Gesellschaft für Sprachwissenschaft* (DGfS, the Linguistic Society of Germany), March 4–6, 2020, in Hamburg. The aim of the present special issue is to shed new light on the dynamics of graphemic systems, taking into account the interaction of written language with different linguistic and social settings. Covering a broad range of writing systems in both European and non-European languages and at different diachronic stages, the contributions in this issue are situated within the central research fields of grapholinguistics:

- the typology of writing systems,
- linguistic, typographic, social and cultural factors in graphemic variation,
- punctuation, from a diachronic and cross-linguistic perspective,
- measuring graphemic variation.

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Any empirical study of graphemic variation and change requires a conceptual “toolkit” that allows for adequately characterizing and studying the individual components of written language, as well as to compare different writing systems. Consequently, recent years have seen extensive discussion of basic but still heavily debated concepts such as *grapheme* and *allograph* (see e. g. Meletis 2019; 2020). The paper by **Terry Joyce** and **Dimitrios Meletis** follows up on this line of research by addressing the question how an adequate typology of writing systems should look like. They argue that writing systems should be typologised according to their linguistic, processing and sociocultural fit, where the linguistic criterion deals with the question of how the writing system matches the structure of a given language. The concept of processing fit refers to the physiological and cognitive functions of writing systems, while the notion of sociocultural fit covers its communicative and social functions.

The next set of papers focusses on linguistic, typographic, social, and cultural factors of graphemic variation. Comparing different editions of one text, all of them printed in 1500, **Anja Voeste** shows how typographic aspects, text layout and line justification, influenced graphemic variation. On the one hand, the spelling variants, mostly abbreviations in the form of the tilde <~>, were an essential means of solving aesthetic and typographical problems. On the other hand, the typographical conditions opened a field of experimentation for spelling. The contribution by **Florian Busch** also deals with texts whose graphemic makeup is partly shaped by the affordances of their medium: Investigating variation in everyday digital communication, he investigates the metapragmatic status of standard orthography compared to deviant spellings in adolescents’ WhatsApp chats and school essays. He argues that in these texts, spelling variation can be seen as an important part of communicative practice and that spelling variants are often used to create a particular socio-indexical effect in context.

No less than three papers are dedicated to punctuation from diachronic and cross-linguistic perspectives. **Paul Rössler** investigates the shift from virgule </> to comma <,> in the German writing system of the 18th century and seeks to identify the reasons behind this astonishingly rapid change. He links the formal change from virgule to (fraktur) comma to the typographic variation between antika and fraktur fonts and argues that the antika comma used with non-native words in antika font paved the way for the replacement of the virgule by the fraktur comma in the remaining contexts (i. e. native words in fraktur font). In his analysis of so-called practicas from the 15th century (i. e. a historical text genre for astrological predictions), **Marko Neumann** investigates changes in the use of punctuation marks and capital letters as means of text segmentation. He shows that punctuation marks pertained to the system of text segmentation along with capital letters, pilcrows, line and paragraph breaks in editions before

1490, whereas these means of text structuring significantly converged thereafter, flanked by a clear shift from polyfunctional to monofunctional uses (e. g., capital letters and punctuation marks). **Javier Caro Reina** and **Işık Akar** follow the development of the apostrophe in Turkish since the introduction of the Latin alphabet in 1928. Based on a quantitative analysis of data from the newspaper *Cumhuriyet*, they uncover a complex refunctionalization of the apostrophe from a phonographic marker of glottal stops in Arabic loanwords to a morphographic marker of word boundaries in proper names, a development initially triggered by the foreignness of a name. The authors show that the extension of morphographic apostrophe usage is partially induced by animacy (in the case of native names) but also strongly connected to the prototypicality of proper names (i. e., it is restricted to personal and place names).

The measurement of graphemic variation is the topic of the final part of the special issue. Here, two different approaches concerning variation and change in large written corpora are proposed. Both take a quantitative-computational approach: **Stefanie Dipper**, **Ilka Lemke** and **Sandra Waldenberger** address graphophonemic and graphemic variation in the Reference Corpus of Middle High German. Based on automatically identified graphemic variants of a standardized word form, they derive replacement rules (based on a well-established measure, the Levenshtein edit distance), analyze their frequency and formulate allographic rules for their variation. In this way, they can determine characteristic differences between two texts and, thus, generate their “difference profile”. The authors argue that this method can be used to exhaustively evaluate and classify new collections of (historical) texts with a broad range of graphemic variation. Analyzing a different corpus, the German Text Archive with texts from 1600 to 1900, **Hanna Lüscho** conducts a quantitative study of graphemic variation to investigate the general trend towards less spelling variation in the corpus. Using the Damerau-Levenshtein measure of edit distance and combining it with the concept of entropy, she quantifies and ranks the degrees of variability that competing spelling variants show in the corpus.

Taken together, the eight contributions to this special issue add a number of key theoretical insights and methodological innovations to the flourishing field of grapholinguistics in general and the study of the dynamics of written language in particular. They cover a broad range of aspects from the conceptual basics and methodological challenges of studying written language, its variation and development to case studies on the interaction between writing and society as well as on the previously often neglected aspect of punctuation. In addition, they bridge the gap between graphem(at)ics and graphetics by taking material aspects such as typography and layout into account.

**Acknowledgment:** As guest editors, we would like to thank all authors for their valuable contributions to this special issue as well as the anonymous reviewers and the editorial board of *Zeitschrift für Sprachwissenschaft* for their support.

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