Macrothink Institute™

International Journal of Linguistics
ISSN 1948-5425
2025, Vol. 17, No. 5

Writing Sign Languages: In Search of a Definition

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Received: July 9, 2025 Accepted: August 12, 2025 Published: August 24, 2025

doi:10.5296/ijl.v17i5.23111 URL: https://doi.org/10.5296/ijl.v17i5.23111

Abstract

This paper critically examines the historical and technological evolution of writing systems in relation to signed languages, situating this analysis within broader reflections on the cultural functions of writing, and its evolution. Beginning with an overview of writing as a symbolic and cognitive technology—from ancient pictographic and logographic scripts to alphabetic systems and digital text—the paper explores how these developments reflect the changing relationship of humanity with language, memory, and communication. Focusing on sign languages, the study traces the emergence of early transcription systems such as Stokoe's notation, which introduced *cherology* to describe the fundamental units of sign formation, and the later Hamburg Notation System (HamNoSys), which sought to represent non-manual components and achieve greater cross-linguistic applicability. The paper also assesses SignWriting, a visually intuitive system designed to capture the spatial and kinetic nature of signs, highlighting its pedagogical and cultural potential as well as its limitations. Finally, the paper analyzes the transformative impact of digital technologies and user-generated video content, which enable Deaf communities to record, archive, and share signed discourse directly. By framing signed video as an alternative form of writing, the study challenges alphabetic-centric definitions of literacy and underscores the multimodal richness of Deaf epistemologies. The paper concludes by arguing that both graphic transcription and video recording serve not only as tools for linguistic analysis and cultural transmission, but also as sites where broader questions of language, technology, and identity converge.

Keywords: Sign languages, Writing systems, Stokoe, HamNoSys, SignWriting, Multimodality

1. Introduction

As a visual-gestural language, sign language does not have a writing system to the level that spoken language has. Since the beginning of formal studies in sign language, this has been a problem for multiple reasons: noting its morphology for studying purposes (Stokoe, 1960; 2021), using a written form of sign language as a lever to develop greater writing-related cognitive skills (Pizzuto et al, 2000), and defining a literature for sign language that fully respects its modality (Brueggemann, 2004; Mertzani, 2022). The latter is particularly felt by the Deaf community, gathering around the need to re-define their identity around the use of sign language, rather than a disability (Kusters & De Meulder, 2013; Bauman, 2008; Lane et al, 2011). Thus, literacy is also mediated by signed texts and visual creations, and not only understanding, reading, and writing texts.

The opportunity for this evolution in the definition of literacy was provided by the birth and development of user-generated content web technologies, which has offered the opportunity for deaf signers to upload and share contents directly in sign language. Gradually, websites hosting signed videos created by deaf users multiplied, and grown in number and quality, to the point where, around 2010, signed video-contents begun to be considered as an alternative to pen-and-paper writing, for sign language. In the same time, researchers in sign language and deaf education were coming up with their own writing systems for sign language. Solutions such as HamNoSys and SignWriting, which will be introduced in the following paragraphs, became popular among researchers, and were tested for their efficacy as substitutes to writing for sign languages. Although these alternatives have been around for more than 10 years, to date there is no agreement on the topic. Several other attempts were provided from sign linguists and researchers, focusing on the creation of symbols representing the features of sign language and attempting to teach them to deaf people for their implementation. However, the Deaf community seem to prefer the use of videos to record their messages, to the point that the recently published companion volume to the Common European Framework of Reference for languages (CEFR) defines “writing”, for sign language, as the ability to create signed videos (CoE 2006; 2018).

This paper offers an insight into the discussion around this topic, offering a critical review of its evolution, starting from the definition of what a writing system is, and its applicability to signed languages. Drawing from the history of writing—from early pictographic and logographic systems to alphabetic scripts and digital writing—the paper explores how writing has served as a symbolic representation, a cognitive technology, and a tool for cultural transmission. Within this framework, the article examines the unique linguistic features of sign languages and the historical attempts to capture their visual-gestural modality through transcription systems. It discusses pioneering work such as Stokoe’s notation system, which first sought to describe the cherological parameters of signs, and how subsequent systems like HamNoSys expanded the scope to include non-manual features. The paper further analyzes more recent and visually intuitive approaches like SignWriting, assessing their accessibility, limitations, and potential as fully developed writing systems for sign languages.

Considering the role of writing as a "technology" for spoken languages, the analysis will continue by expanding its meaning to web technologies and the impact that they had on the representation of sign languages. The widespread adoption of online multimedia platforms and video recordings has led to a shift in the definition of 'writing', suggesting a new definition that includes opportunities for multimodal communication and online-specific codes. It argues that signed videos—by preserving the kinetic and spatial characteristics of sign languages—offer an alternative form of writing that challenges traditional definitions grounded in alphabetic literacy. Finally, the paper situates these developments within broader discussions on literacy, multimodality, and the evolving notion of what constitutes writing in contemporary digital and visual cultures. Through this analysis, the article aims to underline the cultural and epistemological significance of choosing between graphic transcription and digital recording as modes of sign language inscription, and to contribute to ongoing debates on language, technology, and representation in Deaf studies.

2. Writing as a Symbolic Representation

The history of writing spans over five millennia, marking one of humanity's most significant cognitive and cultural achievements. Writing began not as a system for representing speech, but as a visual and graphic means of communication, an encoded language with its own aesthetic, functional, and symbolic properties. The earliest known forms of writing emerged in Mesopotamia around 3200 BCE, when the Sumerians began using cuneiform writing, a system of wedge-shaped marks impressed into clay tablets using a reed stylus (Schmandt-Besserat, 1996). Initially developed for accounting and administrative purposes, cuneiform writing evolved into a sophisticated system capable of expressing complex ideas and narratives. Around the same time, in ancient Egypt, hieroglyphs — a blend of pictographic and phonetic symbols— emerged as another early form of writing, similarly steeped in both visual beauty and semiotic complexity (Allen, 2010). These scripts emphasized the graphic nature of writing, wherein symbols were not mere transcriptions of speech, but visual artifacts that encoded meaning through spatial arrangement, design, and conventional use.

As writing systems developed, the interplay between form and function became more nuanced. In China, writing emerged independently around 1200 BCE with oracle bone script, which later evolved into the complex logographic system of Chinese characters still in use today (Boltz, 1994). The Chinese script underscores writing as a graphic form with high aesthetic value, as calligraphy remains a respected art form. Unlike alphabetic systems, logographic writing requires the reader to engage directly with abstract visual patterns that represent ideas or words. As the development from pictographic to logographic writing continued, some symbols were used in a similar way if certain words had similar sounds, independent from their meanings (Yule, 2023). This process, also known as phonetization, initially came with the need to represent proper names in large cities, where the ability to differentiate one person from another – bearing the same name - would be limited by the dimensions of the city (Gelb, 1963). Examples of this phase are evident in the Aztec and Maya writings, where the phonetic principle is almost exclusively employed to express proper names.

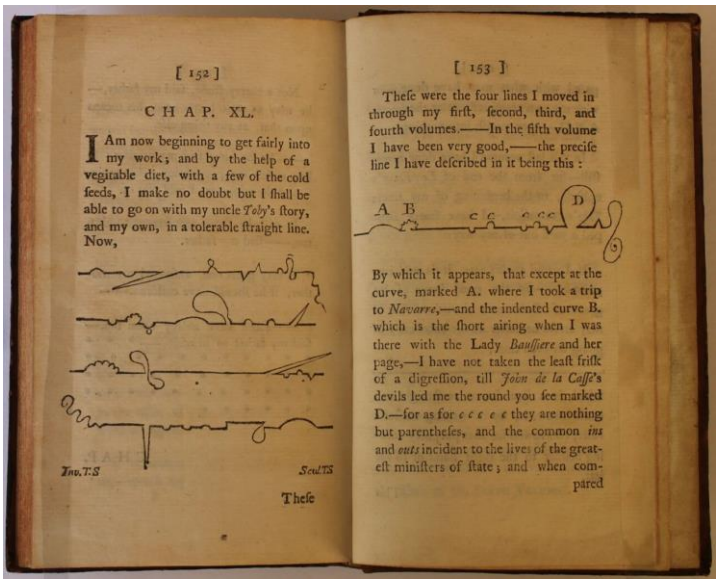
As Gelb explains: "Phonetization [...] arose from the need to express words and sounds which could not be adequately indicated by pictures or combinations of pictures. Its principle consists in associating words which are difficult to express in writing with signs which resemble these words in sound and are easy to draw." (Gelb, 1963, p.67). In some cases, the procedure involved also resulted in a full phonetic transfer, as in the case of the example reported by Falkenstein (1936) in Uruk inscriptions; in the second oldest stage of the writing, the sign for 'arrow' stands for both the Sumerian words 'ti', for "arrow", as for 'ti', "life". "Once introduced, the principle of phonetization spread rapidly. With it, entire new horizons were opened to the expression of all linguistic forms, no matter how abstract, by means of written symbols. The establishment of a full system of writing required conventionalization of forms and principles. Forms of signs had to be standardized so that everybody would draw the signs in approximately the same way. Correspondences of signs with definite words and meanings had to be established, and signs with definite syllabic values had to be chosen. [...] Conventionalization of the system of writing required not only the setting-up of the rules but also the actual learning of the forms and principles of writing." (Gelb, 1963, p.68)

3. Writing as a Technology for Speech and Cognition

A crucial moment in the process of conventionalization of the system of writing was the invention of the alphabet around 1800 BCE by the Semitic-speaking peoples in the Sinai region. The representation of basic speech sounds through the alphabet was a simplification that reduced the number of symbols required to represent it, instead of ideas or syllables (Daniels & Bright, 1996). The Greek adaptation of the Phoenician alphabet introduced the concept of vowel representation, which made written language more accurate in capturing speech and further democratized literacy. The Roman alphabet, derived from the Greek via Etruscan intermediaries, became the most widespread script in the Western world and remains dominant in the digital age. Despite the trend toward phonetic representation, the graphic dimension of writing continued to play a significant role, particularly in medieval illuminated manuscripts, in which text was as visual as a literary medium. Typography in the print era reinforced this visual function: the layout, typeface, and design choices all conveyed additional meaning and shaped reading practices (Bringhurst, 2012).

With the invention of the printing press by Johannes Gutenberg in the 15th century, writing entered a new epoch of mass reproducibility and standardization. Typography began to replace calligraphy as the dominant graphic form of writing, and written texts became more uniform and widely distributed (Ong, 1982). Yet even in this era of textual homogenization, graphic design remains essential. The arrangement of margins, the use of white space, and the hierarchy of headings all influenced how readers processed written content. Occasionally, authors would play with the elements of printed books, creating narratives through their adjustment. An example of this use can be found in *The life and opinions of Tristram Shandy, Gentleman*, by Laurence Sterne (1759-1767), which is a nine-volume work telling the works and life of the eponymous protagonist, in what appears to be a *Bildungsroman*. In this work, the narrative of Shandy's life proceeds in anything but a linear direction, getting lost in insights that distance themselves from the progress of the narrative and leaps forward or backward in the story, which is "told" through straight lines, spirals, and asterisks, each

representing something that cannot be translated in words. In the author's perception, the 'book' is understood as both a container for stories as well as a medium for telling them in a different and bold way. Figure 1, below, shows an example of the creative work done by Laurence Sterne in his manuscript:


[152]

CHAP. XL.

I Am now beginning to get fairly into my work; and by the help of a vegitable diet, with a few of the cold feeds, I make no doubt but I ſhall be able to go on with my uncle *Toby*'s ſtory, and my own, in a tolerable ſtraight line. Now,

Inv.T.S *Sculpt.S*

Theſe

[153]

Theſe were the four lines I moved in through my firſt, ſecond, third, and fourth volumes.——In the fifth volume I have been very good,——the preciſe line I have deſcribed in it being this :

A B c c c c c D

By which it appears, that except at the curve, marked A. where I took a trip to *Navarre*,—and the indented curve B. which is the ſhort airing when I was there with the Lady *Baufſiere* and her page,—I have not taken the leaſt friſk of a digreſſion, till *John de la Caſſe*'s devils led me the round you ſee marked D.—for as for *c c c c c* they are nothing but parentheſes, and the common *ins* and *outs* incident to the lives of the greateſt miniſters of ſtate; and when compared

Figure 1. Example of the creative use of visuals in the work by L.Sterne, courtesy of British Library website

Despite of the use of alphabetic characters, the work by Sterne also proves the existence of a tension between graphical and typographical writing that remains despite of the evolution of the available technologies for speech writing.

The pinnacle of the matter came with the modern digital writing, the nature of which reshaped how language is structured, processed, and interpreted. Digital writing encourages nonlinear structuring through hyperlinking, cut-and-paste features, and integrated multimodal elements such as images, audio, and interactive content, which are unattainable through handwriting or printing. These features do not merely augment text—they restructure rhetorical flow and reader navigation. Hypertext, for instance, enables writers to present multiple, simultaneous narratives or conceptual threads, fundamentally altering the temporality and cohesion of the text (Bolter, 2001). Additionally, the affordances of digital platforms allow writers to engage in constant revision, leading to a recursive and dynamic writing process that contrasts sharply with the linearity and permanence of handwriting. The psychological and communicative effects of this are relevant: in handwriting, writers often plan before inscription due to the high cost of erasure, promoting forethought and intentional structuring; in digital environments, writing tends to be more exploratory and provisional (Hayes & Berninger, 2010). From a cognitive perspective, this shift has been shown to influence syntactic complexity and lexical diversity, especially among developing writers, where digital texts often demonstrate less cohesion but greater fluency in idea generation (Beringer & Richards, 2002; Crystal, 2006; 2011). Thus, from a communicative standpoint, printed and handwritten texts bare their

authority, coming from the tradition of *scripta manent* (“what is written, remains”, Ong, 1982), while digital texts tend to be perceived as more ephemeral (McLuhan, 1964; Gourlay, 2023). The fluid and easily editable nature of digital text is a well-known topic. Scholars in this area often discuss the challenges of citing digital sources and the perception that digital content is less permanent or "solid" than a printed book.

4. Sign Language Features and First Forms of Transcription

As descripted this far, the history of writing tells the story of an advantage in shifting from a pictorial to a phonographic system, allowing a greater and more efficient representation of spoken languages. However, the return to more visual forms of writing, exploiting the multimodality of digital and online writing, show the limits of handwriting as an all-encompassing tool to represent human languages and experiences. This is also the case for sign language, following a history of its own. Sign languages and spoken languages share core linguistic features such as phonology, grammar, syntax, morphology, and the ability to express abstract concepts. Both are fully natural languages that emerge within communities and evolve over time. Like spoken languages, sign languages exhibit complex sentence structures and regional variation (Sandler & Lillo-Martin, 2006). They differ in modality: sign languages are visual-gestural, relying on space and body motion, while spoken languages are auditory-vocal. This leads to differences in how information is structured and processed—for instance, sign languages use spatial grammar and simultaneous constructions, which are rare in spoken languages (Sutton-Spence & Woll, 1999). Additionally, while most societies have standardized writing systems for spoken languages, sign languages typically lack widely adopted orthographies, as will be discussed in the following paragraphs.

The first to suggest a methodology for the annotation of sign language was also the first to suggest a methodology for its study: William Stokoe, in *Sign language structure: An outline of the visual communication systems of the American deaf* (1960). Faced with "a language that is virtually unknown", namely American Sign Language (ASL), Stokoe was the first to attempt the design of a rigorous methodology for its study, based on the ones already in use for spoken languages. The first step towards this goal was the definition of what could be considered the equivalent of ‘phonology’ for sign language, by isolating those recurring elements that appeared to be fundamental components of the language. The hands, their shape and movements, and their relation to the body were thus the first features to be described as minimum units of signs. Given the visual-gestural dimension of sign language, Stokoe also defined a new, self-standing discipline for the study of these features: *cherology*. Defined as "the structure, and its analysis, of the isolates or units of the phenomenological level of the sign language of the deaf", cherology is the analogous for sign language to phonology for spoken language (Stokoe, 1960: 43). In cherology, the minimum unit is the *chereme*, that is, the set of hand positions, configurations, or motions having the same functions in the language, and setting the base to the formation of signs (Stokoe, *idem*).

The difficulty in properly depicting the features of this language in pen and paper became immediately evident, not only for the three-dimensional nature of the language, but also for the need to represent hand shapes and their movements. To this end, Stokoe proposed a notation

system exploiting the signed equivalent to the spoken alphabet (*fingerspelling*, Figure 2), and signs for numbers, to provide a first level labelling system to cheremes. This was then combined with music-inspired symbols used to describe the movements, their pauses, and the spatial displacement of handshapes.

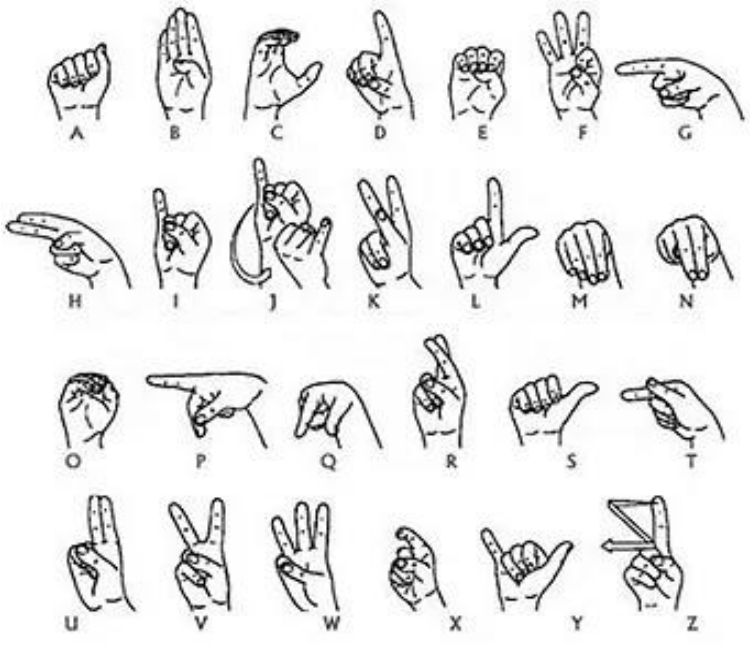


Figure 2. Fingerspelling, LIS

The accurate combination of letters, or *glosses*, and symbols was thus the first type of linguistic notation for sign language, known as the *Stokoe notation system* (SNS). This system allows linguists to keep a written record of the observed signs, and to decode their movements through a combination of symbols that are situated above, or next, to the alphabetic letter representing the basic shape of the hand. In the very first use of this system, the combination of typewriting and handwriting allowed adding symbols to the typed text, by hand. As an example, a segment from Stokoe's original essay is reproduced here (Figure 3). In the segment, Stokoe explains that the ASL sign for ‘show’ is performed holding the non-dominant hand in handshape B and the dominant hand pointing on it in handshape G, both hands moving forward at the same time (Figure 4). The segment clearly shows how, in a text produced entirely with the use of a typewriter, the annotations relating to the observed sign needed to be added by hand, at a subsequent stage to its drafting, as a regular typewriter would not support the required symbols.

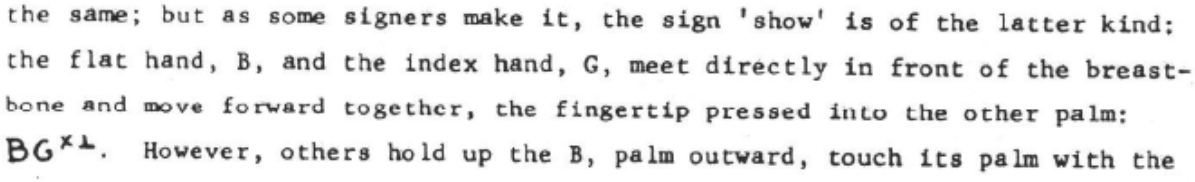

the same; but as some signers make it, the sign 'show' is of the latter kind:
the flat hand, B, and the index hand, G, meet directly in front of the breast-
bone and move forward together, the fingertip pressed into the other palm:
BG^{xL}. However, others hold up the B, palm outward, touch its palm with the

Figure 3. Transcription of the sign for *show* (Stokoe, 1960, p. 52)



Figure 4. SHOW

Source: http://www.lifeprint.com/asl101/pages-signs/s/show.htm

This combination of typewriting and handwriting can also be considered as the manifestation of a handwriting-first culture, where digital writing was not yet generalized and typewriting was the best technology available to most writers. Things will change 30 years later, with the development of personal computers and its diffusion among mass population, which also required the development of computer-based solutions for sign language notation, as for any other writing system. To this end, the first program to code SNS into a computer-readable language was the *Stokoe's font set*, developed in 1994 by Mark Mandel and based on characters from the American Standard Code for Information Interchange (ASCII; Mandel, 1994). The character set was later enriched with solutions that adapted to the evolution of new technologies, and the increasing number of supports for content sharing (A. Grieve-Smith, 2022).

5. Creating a Standard for Sign Language Notation With the Help of Technology

One of the limits of the SNS is that it strongly relies on fingerspelling and its alphabetic transcription. While this can be seen as a powerful simplification system, it limits its readability to only the people using that specific alphabet, who already possess skills in fingerspelling. It requires an accurate knowledge of the sign language being described, in order to mentally recreate the signs and understand the contents, which, in the beginning of sign language studies, was not often the case, especially through hearing researchers with no background in deafness. Out of the borders of a specific sign language, the interpretation of SNS becomes difficult without an adequate visual support, given the differences between the fingerspelling and signs from different country/signing communities. In cases like these,

similar glosses could refer to different handshapes, leading to misinterpretations. Not to mention sign languages referring to non-alphabetic writing, having a completely different system of reference. Thus, despite of the earliest use of this system, SNS is not the best candidate to create a standard for any sign language in the world (Hanke, 2004), and it's often used in combination with drawings depicting the essential features of the observed sign: its basic shape associated with arrows, or symbols for their movements, for example.

Figure 5 shows an example of this strategy, drawn from the first dictionary of Italian Sign Language (LIS) (Radutzky, 1992), for the sign CONOSCERE ("to know"). The signer is portrayed while performing the sign, and additional elements are added to inform about its movements: the initial and final position of the hands are highlighted with a darker or lighter line, and small arrows are placed on the fingers to inform about the direction of their movement from one position to the other. The face depicts the typical expression combined with the sign, the lips slightly protruding as if pronouncing a /ʊ/. At the top left of the image is the transcription of the sign using SNS, where '3' is the gloss standing for the handshape used by the dominant hand (Figure 5), and '>' above the number indicates the position of the handshape before the sign movement, that is "fingers open at forehead". The other symbols next to the number refer to the closing movement undergone by the handshape, its position and the place where the sign is performed.



Figure 5. CONOSCERE ('to know', in LIS)

Source: E. Radutzky, *Dizionario bilingue elementare della Lingua dei Segni Italiana,* 1992

Observing the image in Figure 5 and what is reported in the notation, other limits of SNS become evident: the facial expressions and lip movements are not reported, nor is the position of the head towards the approaching hand. In fact, the simbols reported right after the '3' depict the following, from left to right:

1. First movement, at the beginning of the sign: toward the left (<) and upwards (^)
2. Position: Forehead (⁀)

3. Following movements, at the forehead: handshape closing (#) and repeating the movement (•)

Thus, without the accompanying image and related symbols, there would be no way to access the non-manual components of this sign. As sign language emerged as a new field of linguistic studies, and its complexity became more and more evident, the transcription system devised by Stokoe was revised (Thoutenhoofd, 2003, for British Sign Language, BSL) or joined by others, responding to different research questions (Garcia & Sallandre, 2013).

Among these, the *Hamburg Sign Language Notation System (HamNoSys),* devised in 1987 by S. Prillwitz of the University of Hamburg, emerged as a valid alternative (Prillwitz, 1987; 1989). HamNoSys is a "phonetic" transcription system adding new symbols to Stokoe's original set, to describe facial expressions, lip movements and other non-manual components of signs. It also includes symbols for the description of sign languages other than ASL, to allow greater intelligibility in the international setting. Figure 6 shows an example of the application of this notation system for the sign HAMBURG in *Deutsche Gebärdensprache* (DGS – German Sign Language). As for SNS, the reading order is from left to right, and the set of symbols refer respectively to handshape, its orientation (towards or away from the signer), the sign location (the space or part of the body where it is performed), and the actions/movements performed by the signer while signing.

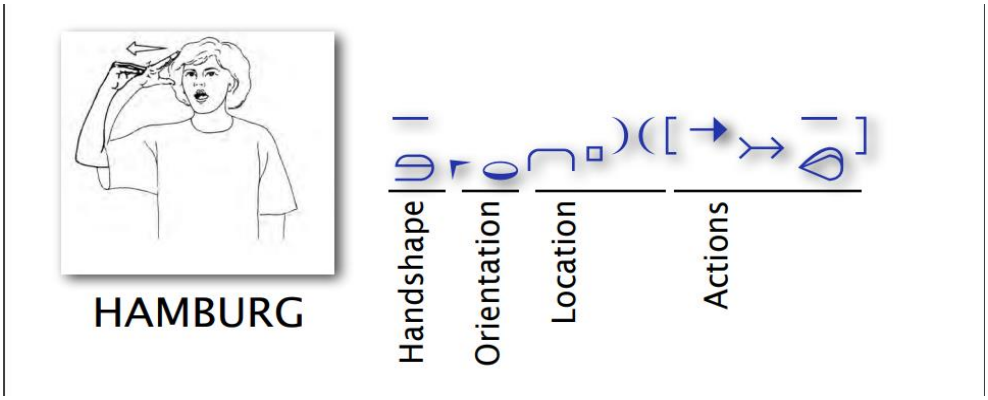


Figure 6. HAMBURG sign, DGS and HamNoSys notation

Fonte: T.Hanke, *HamNoSys – Hamburg Notation System for Sign Languages*, 2007

HamNoSys has an international calling and was born in a digitalized world. Its symbols were created as unicode characters, and are also used for programming signing avatars. However, its use for a quick and intuitive description of signs is not universally accepted: the transcription of a single sign takes up a lot of space and the problem of recognizing the basic handshape across different sign languages remains. It is a system that requires specific training, as writing in any specific language, and is not intuitive. Thus, academic papers on sign language still prefer to represent signs through simplified systems mixing visual/graphic with their notation.

6. Back to Visual: SignWriting

A notation system that has been particularly appreciated and used for its versatility is *SignWriting* (SW). Conceived by Valerie Sutton for dance in 1972, under the name of *Dancewriting*, it was then adapted to sign language at the request of the University of Copenhagen in 1974. The first use of this method in printing took place with the publication of the *SignWriter Newspaper*, written entirely in ASL through SW and published from 1981 to 1984 (Sutton, 1984). The use of this system for printing full texts representing contents in sign language motivated research on its use in linguistics, as well as in public domains. The idea that deaf people could benefit from learning and using SW is especially strong among researchers observing the difficulties experienced worldwide by many deaf people with understanding and using written texts (Pizzuto et al., 2000). Their studies claim that learning a writing system which is accessible for sign language users, intuitive, and with a short and consistent set of rules, can promote the development of cognitive abilities specific to writing, thus supporting spoken/written language literacy in the shape of an ability transfer. This idea, combined with the visual nature of SW, motivated further researches in this method of transcription. In 1986, *SignWriter Computer Program* was published by Richard Gleaves, providing a code to create digital texts in SW. Two years later, in 1988, the foundation of the *Deaf Action Committee for SignWriting* (DAC) by a group of ASL signers led by Lucinda O'Grady influenced the propagation of the method in the world (Sutton, 2004).

Written from top to bottom, left to right and in columns, SW uses symbols called *glyphs*, portraying both the manual and non-manual components of signs. The glyphs can be positioned in eight different ways and anywhere in space, to best depict the position and direction of hands movements while creating the sign. SW has visual rules that are easy to remember, and since it is related to the specific shapes of the language, rather than an alphabet, it is easy to use to represent any sign language in the world, making their interpretation easily intelligible among signers. Symbols indicating places, handshapes, and movements create the image of the sign. Figure 7 shows an example of SignWriting for the LIS equivalent of "washing (my) hair", extracted from the introductory manual by Di Renzo et al (2011).



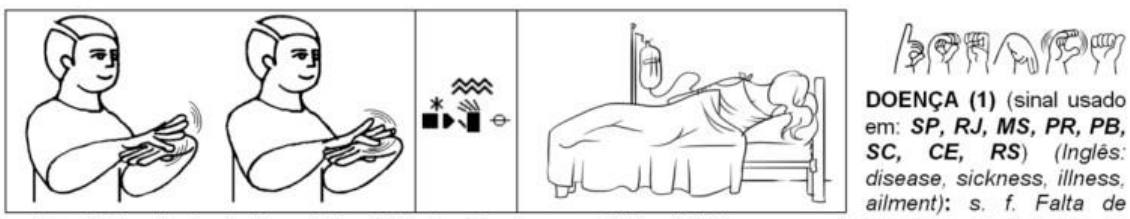
Lavarsi i capelli

Figure 7. Sign WASHING (MY) HAIR, LIS

In Italy, studies on SignWriting for LIS started by Elena Antinoro Pizzuto in 1998, when she asked Valerie Sutton and a group of Italian deaf people to transcribe the contents of a signed

video (Di Renzo et al, 2011). However, it was only in 2005 that actual research on this form of transcription developed, within the FIRB-VISEL project (2009-2012), and the publication of the aforementioned manual, intended for signing users. At the end of the project, a computer program for the transcription of LIS to SignWriting was also released under the name of *SignWriting improved fast transcriber (SWift)* (Bianchini et al, 2019b). The program allows the selection of glyphs to create a sign, and to save the result as an image, in a way that is also easy to integrate into digital writing without the need to install or shift between fonts in the same text, which is convenient for a wider circulation among non-specialized users and publishers.

Since its inception, researchers of at least 40 sign languages in the world have adopted SignWriting for sign language representation, and in deaf education (Flood, 2002; Stumpf, 2005; Caccamise & Sutton, 1982). Among these are American Sign Language (ASL), Nicaraguan Sign Language (ISN, *Idioma de Señas de Nicaragua*) and Brazilian Sign Language (LIBRAS, *Língua brasileira de sinais*). LIBRAS is one of the best represented sign languages, included into one of the largest and richest printed sign language dictionaries in circulation: the *Dicionário da Língua de Sinais do Brasil: a Libras em suas mãos*, edited by Fernando Cesar Capovilla and his collaborators. Published in several editions, the example in Figure 8 shows the sign for *doença* (Portuguese word for 'disease, sickness, illness, ailment'), as represented in the third edition of the aforementioned dictionary. The example shows the contemporary use of different representation systems as well as different languages. The sign is annotated graphically, in SignWriting, and with an image recalling its meaning; next to the sign, the transposition of its glosses is reported using fingerspelling, followed by the definition in Portuguese, and in English, for greater diffusion (Capovilla et al, 2017).



DOENÇA (1) (sinal usado em: ***SP, RJ, MS, PR, PB, SC, CE, RS***) *(Inglês: disease, sickness, illness, ailment)*: *s. f. Falta de saúde. Enfermidade. Indisposição. Moléstia. Processo mórbido definido e com sintomas característicos, que pode afetar o corpo todo, uma ou várias de suas partes. Ex.: A vacinação infantil imuniza o organismo contra várias doenças, e é muito importante que os pais se lembrem sempre de levar os seus filhos para a vacinação nas épocas apropriadas.* (Mão esquerda aberta, palma para baixo; mão direita aberta, palma para baixo, polegar tocando a palma esquerda e dedos direitos tocando o dorso da mão esquerda. Oscilar os dedos direitos sobre a mão esquerda.)

Figure 8. Sign for DOENÇA, “disease”, LIBRAS (Capovilla et al, 2017)

SignWriting has the advantage of being very accessible and transparent to sign language users, to a point where its introduction could have a similar effect for sign language writing as the invention of the alphabet had for writing. Its supporters see the opportunity to transcribe sign language for dissemination and study purposes, as well as the possibility of using it to provide the language with a writing system of its own. SignWriting allow sign language users to write their primary language visually rather than resorting to an oral-based written language like

English. As already mentioned, providing the language with a writing system of its own would empower the study and analysis of the specific features of sign language by deaf people, generating metalinguistic awareness and benefitting of all the positive outcomes coming from having and using a writing system (Bianchini et al, 2019a). SignWriting could be thus used not only to study the morphology of a sign, but also to convey news, stories, reports and traditions that could help in building a sense of literacy for sign language users. However, despite of the many supposed advantages coming from its adoption, SignWriting is not universally accepted nor used by the deaf community. Its use requires a minimum level of training, which is not always easy to find, or to attend. Printing it is space-consuming, and its use for storage, cultural transmission, and building a sort of "signed literacy" seems to be already covered by video recordings and their sharing.

7. Signs Recording as Handwriting

The diffusion, starting in 2004, of user-generated contents allowed by the technological advancement of the Internet, gradually opened a whole realm of new opportunities for deaf people, who finally saw the chance of creating personalized contents that could be shared immediately, without any filter. First by text, then by images and, finally, through videos, the user-generated, Web 2.0 Internet finally gave the deaf the opportunity to express themselves using the language(s) of their preference. Webpage interfaces were also customized to meet the needs of deaf eyes to focus on signed contents, sometimes far before the Web Content Accessibility Guidelines would provide directives to address them (De Monte, 2024; Roccaforte *et al.*, 2012). Figure 9 provides an example of what an early deaf-designed website would look like. The screenshot (taken back in 2013) comes from a very popular website for news and other content sharing in sign language, now offline; the dark background was designed to ease visual scrolling of contents and to increase the visibility of signed videos. Signed contents were very simple and mostly unplanned, backgrounds and image resolution was not always the best possible, but it proves a moment in sign language representation where deaf signers were testing new paradigms for the creation of signed contents in these newly available platforms.



Figure 9. Example of an early deaf-designed website

Comments to the signed contents, first added only in texts, could also be added as videos, literally creating signed discussions online that could be watched without moving from a page to the other. Although this solution was quickly abandoned, it set the base for a use of social media and social video streaming platforms (such as *Youtube*, *Vimeo*, *Instagram*) reflecting the need of signers to reach out and share their thoughts and opinions directly in sign language. There would often be dialogues around the contents expressed in the first video, followed by reflections on the language, or the deaf community itself. Contents would include discussions on faith and religious beliefs, or being deaf in a hearing world, often mediated by jokes and other forms or irony among the participants to the ongoing discussion. For researchers, the possibility to observe these contents, the way the multimodality of the platform would be exploited, and the linguistic choice done by the users, also contributed to a better understanding of the deaf community itself, and its complexity. Although specific linguistic studies on the structure of signed contents online are still rare, a growing set of research is proving the importance of the use of these platforms for deaf people to connect and build their sense of community (Guimar ães & Fernandes, 2018).

What begun as dedicated websites that were mostly targeted to a community of signers, the introduction of photo/video-based social media such as *Instagram* or *TikTok*, favored the transition to these platforms, for more individual-based content. Where video-threads would be more topic-based in the first websites and platforms dedicated to deaf users, they are now mostly individual-based, given most signed-content creators would publish their videos on their own digital page. As for other online content creators, reference to videos provided by other signers is often mentioned at the beginning of the video, followed by the content

generated by the user. Although this makes it confusing to follow the stream of thoughts and discussions around a specific topic, it does prove the vitality of this technology for communication in sign language, and its interest in creating a signed narrative like it has never been possible before. In contrast to the videos used in the first phase of online sharing, modern signed contents show bold signers, lighting and image-framing that have been carefully chosen, and contents that have been carefully planned before clicking on the "record" button. Signing and broadcasting styles follow the standard trend of the hosting platform, proving competence in mastering the available technology.

In videos, all of the specific features of the language are visible and co-exist, in a way that can be compared to the emotional and personal nature of handwriting. With modern technologies, signers can easily record, view and eventually re-record themselves signing, planning contents according to the target viewer(s), in a way that resembles the writing and revising processes of handwriting a spoken language. Just as any smooth and slightly absorbing surface became the ideal surface for writing, video recording technologies and social media turned out to be the ideal support for sign language transmission, offering an affordance to record, transmit and store signed communication like never before. Thus, it is not a surprise that a reference tool for language education such as the Common European Framework of Reference for languages (CEFR) has added video recordings as the standard medium to document and assess sign language production and interaction, replacing written or audio recordings typically used for spoken languages (CoE, 2020). These video recordings serve as a functional equivalent to writing, allowing signers to build a form of literacy, and reflect on their own language as never before.

8. Conclusive Remarks

Writing is commonly defined as a system of graphic marks representing the units of a specific language, allowing for the communication of thoughts and ideas across time and space, independent of face-to-face interaction. In the history of sign language writing, only SignWriting fits this definition, as it accounts for representing the units of the language, in a way that is independent of face-to-face interaction and, as proved by the use in the SignWriter newspaper, allow for the communication of thoughts and ideas across time and space. However, despite of all best attempts to improve the adoption of this system among signers and the proved efficacy in promoting literacy in deaf and hard of hearing students, its use remains restricted to limited, specialised contexts. Out of the classroom, deaf people tend to blend the use of sign language with (spoken language) writing, and to rely on video recording for communication, storage of information and the creation of contents that are meaningful to the signing deaf community.

When comparing the properties of (hand and digital) writing to online videos in sign language, the latter seem to offer a compelling counterpoint—and, in some respects, a parallel—to the established properties of written language. Like writing, signed videos provide permanence and visual persistence, allowing contents to be paused, replayed, and studied over time, fulfilling a key archival function. While pausing, the units of the language remain visible and readable, as they are while playing. These videos, though temporally bound like speech, gain a

form of decontextualization by being recorded and shared across contexts and audiences, in ways that are similar to written texts. Further investigation are needed to understand the way in which recorded videos shape signed production, as writing does with speaking.

Unlike other forms for sign notation or transcription, signed videos remove the cognitive barrier of orthographic training, offering deaf signers a way to compose, store, and circulate complex ideas without translating them into a written language, which is known to often represent a barrier to the transmission of emotional and/or contextual information. This visual-kinetic modality democratize linguistic production, and subverts the notion that literacy must be alphabetic, reaffirming that language can be composed and preserved in embodied forms that are equally valid for cultural, educational, and intellectual engagement (Mertzani, 2022). This is significant because traditional alphabetic systems often inadequately capture the spatial and gestural complexity of signed languages. This perspective opens an interesting reflection of what new, multimodal technologies are offering in terms of defining the meaning of 'writing' in a digital world. If, following Ong (1986), it did "technologize the world", then digital writing and the return of a more human-friendly, multimodal and multilingual use of language might be the next step in the cognitive and cultural evolution of human languages

In privileging signed videos as a primary literacy form, Deaf communities assert autonomy over their language and literacy practices. This recognition moves beyond the deficit model that has historically framed Deaf people as lacking literacy and instead celebrates the multimodal richness of Deaf epistemologies. The rise of smartphones and user-friendly video editing tools has further democratized this form of writing, allowing for spontaneous expression, widespread sharing, and the development of new genres unique to signed discourse. At the theoretical level, treating video as writing requires rethinking semiotic hierarchies and embracing a broader definition of literacy—one that includes kinetic, visual, and embodied modalities as legitimate, structured, and enduring systems of inscription. Just as the printed word revolutionized knowledge transmission in spoken language cultures, "video writing" opens new pathways for linguistic creativity, historical continuity, and educational equity in signed language communities.

Acknowledgments

Special thanks go to Elena Radutzky and Edizioni Kappa for allowing the publication of the sign for CONOSCERE, in Figure 5. Similarly, I wish to thank ASL University for their permission to use the picture for SHOW, in Figure 4.

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