

A Grapholinguistic Approach to Sign Languages

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By

Claudia Savina Bianchini

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The preface I would have liked

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¹ This is a blank page, because only Dominique Boutet, with whom I shared almost 12 years of work on SL graphic representation systems, could - in my eyes - have filled it. Unfortunately, he was unable to see the finished version of my book.

Premises

A. Origins and objectives of this book

In 2006, I defended my master's thesis in Information and Communication at the Università degli Studi di Perugia (Italy) under the supervision of Professor Margherita Castelli, psycholinguist. In this context, I compared various signs found in Italian Sign Language (LIS) dictionaries with gestures found in collections of emblems used in Italy (Bianchini, 2006). My aim was to study possible form similarities in gestures and signs conveying the same meaning, while trying to trace the presence of conceptual metaphors having influenced the signifying form of these signs and gestures. Invited to present my work at the seminar of the *Laboratorio di Lingua dei Segni* (now called *Language and communication across modalities* – LaCAM - the name I will use from now on) of the Institute of Science and Technology of Cognition (ISTC-CNR) in Rome – among the most renowned Italian research centers for Sign Languages (SL) studies – I was asked: "*How did you compare these signs and gestures? How can you measure the degree of resemblance or dissimilarity between them?*" In all naivety, I replied: "*con l'occhietmetro*" (literally "*by the eye-meter*"), a word I had just invented to say that I had simply compared visually the drawings of the signs and gestures in my collections.

The person who asked the question was dr Elena Antinoro Pizzuto, a researcher at LaCAM. At the end of the seminar, she came to tell me that the idea behind my thesis was a good one, but to validate my comparisons I should find a way of making them more objective, by describing signs and gestures with a transcription system applicable to both. The idea appealed to me, because that was what I had wanted to do in my dissertation, without however finding a way of transcribing signs and gestures: I had indeed tried the Stokoe Notation (SNot), but whereas for signs it was not precise enough, it was even too precise for gestures, not to mention the time these transcriptions required, the exigency of re-reading them and the difficulty of computer processing.

Since I was thinking of doing a PhD, Elena offered to help me to prepare a dossier and, shortly afterwards, I began my dissertation under international co-tutelage with the quadruple supervision of Elena at LaCAM

in Rome, Margherita Castelli at the Università degli Studi di Perugia, and Christian Cuxac and Dominique Boutet at the laboratory *Structure Formelles du Langage* (UMR7023-SFL) at the University of Paris 8. The aim was to take up the idea developed in my dissertation, but this time transcribing the signs with SignWriting (SW; Sutton, 1995), a SL writing system that Elena was testing with her Roman team.

Thus, I spent almost one year transcribing my dictionaries and collections of gestures, but as I progressed, it became clear that the issues that captured my interest had much more to do with the tool I was using to transcribe than with the data I was processing. One thing in particular intrigued me: the way in which, every time we reviewed my transcriptions with my colleague Tommaso Lucioli, a deaf signer and SW expert, he would start reasoning about why such and such a sign had such and such a form in the dictionary, about how he himself would have signed it in citational form, about how he would have used it in a sentence. These metalinguistic reflections emerged with even greater intensity when, together with the whole team, instead of talking about the signs present in dictionaries, we talked about stories written in LIS using SW. After some hesitation, I asked my supervisors to authorize a change of subject for my dissertation: I wanted to study SW, how it worked, its limits, and the reflections it constantly provoked in the LaCAM deaf researchers, who used it on a daily basis.

I carried out this dissertation between two countries and two laboratories: LaCAM in Rome, and UMR7023-SFL in Paris. These two institutions had different approaches to the problem of graphical representation of SL. In Rome, the emphasis was on practice, testing an existing system to verify its usefulness and limitations, and understanding its direct consequences on the language practice of deaf speakers and the scientific practices of linguists. In Paris, on the contrary, research was more theoretical, aiming to understand how deaf people felt about the existence of a graphic system for their language, and to formulate hypotheses about the characteristics that a "perfect" system should possess. For me, the two approaches, although dissimilar, were complementary, since they enabled me to see my subject from different and equally interesting angles.

I defended my dissertation in 2012: entitled "*Metalinguistic analysis of the emergence of a Sign Language writing system: SignWriting and its*

application to Italian Sign Language (LIS)" (Bianchini, 2012a), it was dedicated to Elena's memory, who had died one year earlier.

That same year, when I arrived at the University of Poitiers - where I pursue my career as *maître de conférence* (MCF), i.e., tenured associate professor -, I was entrusted with a course on the history of writing systems and a course on SW for students in the degree program *Sciences du Langage - Langue des Signes Française (SDL-LSF)*. The question then arose of providing my students with a teaching support that could explain the general characteristics of the world writing systems, as well as show the specific problems linked to the SL graphic representation and illustrate the systems that had been developed up to that point. I wished I had a book to recommend to them, but there was none: so I contented myself with providing them with numerous bibliographical references, a home-made SW manual and around 400 slides for a 24-hour course... poor guys!

Moreover, Dominique Boutet invited me in 2012 to take part in meetings of the GestualScript team at the *École supérieure d'art et design (ESAD)* in Amiens, a group of linguists, typographers and graphic designers whose aim was, and still is, to develop Typannot, a graphic system for transcribing SL. I was immediately conquered by the opportunity of using my dissertation experience to move from the detailed study of an existing writing system to the creation of a completely new one. I saw it as a synthesis of the two approaches, one more practical and the other more theoretical, that I had worked with and studied at LaCAM and UMR7023-SFL.

A few years passed. In the meantime, my 400 slides had multiplied, and I continued to regret the absence of a book to recommend to my students. I began to think that maybe it was up to me to come up with a solution to this problem.

In 2015, a golden opportunity presented itself: expecting twins, I was keen to use 12 months of maternity leave to write it. Of course, I had largely underestimated fatigue and lack of time... In the few days after a quiet night (i.e., more than 4 hours of sleep), I started revising my dissertation, adding to it the elements acquired on Typannot, and modifying the manuscript with more mature reflections. Since Typannot is still an ongoing project, I found myself rewriting, adding, modifying, re-thinking. Returning to my position as MCF after a long parental leave, then COVID and other personal and

professional factors meant that the present work took 7 years to come to life. My only regret at having taken so long is that the person to whom I would have liked to entrust the preface, Dominique Boutet, is no longer with us. I leave a blank page in his honor: it is up to the reader to imagine what he would have written.

During my years of collaboration inside LaCAM, UMR7023-SFL and ESAD, I have had access to disparate ways of working and thinking about the SL graphic issues. In Rome and Paris, working on SW enabled me to understand that studying a writing system is not just about grasping how it works, but also considering the societal, pedagogical, political and other aspects encompassing the creation of a graphic system for a language without writing. In Amiens, I learned about *transdisciplinarity*: made up of typographers, graphic designers, computer scientists and linguists, the GestualScript team showed me that developing a graphic system requires drawing on the knowledge of the different disciplines working on the forms, tools, media and uses of writing. In fact, “calling on knowledge” does not mean setting up sporadic collaborations to solve this or that problem, but creating a team whose members, whatever their field of origin, acquire the theoretical and practical knowledge of other disciplines, so as to move forward as a united front.

Within these dynamics, however, I was often confronted with the need to define myself as a linguist to my peers: there are acquisitionists, phonologists, syntacticians, typologists, pedagogues... and me? I did not really fit into any of the major branches of linguistics and, apart from the very transversal branch of *Sign Language specialists*, it was difficult for me to identify a scientific community sharing my interests. In fact, my task is more to provide researchers with concrete tools to help them represent and investigate their data, rather than to try to solve myself a specific linguistic problem through the analysis of these data.

In 2020, participation in the conference *"/gʁafematik/: grapholinguistics in the 21st century"* finally brought me into contact with the community of researchers who share my themes, and I thus found the field that best

corresponds to my job: grapholinguistics². This discipline is concerned with all aspects of written language: it can be theoretical, concerned with the relationship between orality and writing, with the definition of models for uniformly describing existing writing systems, and with the establishment of scriptural norms and conventions; it can also have an applicative dimension, looking at how theoretical knowledge about writing applies to real life, for example in relation to educational or psychological issues, literacy, language disorders and so on. As it touches on all facets of the graphic question, it is intrinsically dedicated to transdisciplinarity, since linguistics alone cannot answer all the issues related to writing. In this discipline, I find an answer to my need to approach the SL graphic question from a multitude of different angles, alternating theory and practice, as well as to my need to describe and compare existing solutions and propose new ones. The result of this multiplicity of approaches is what I describe in this book.

B. Dedication and thanks

I would like to thank all the people who have helped me to develop my ideas, to produce much of the material I have used to carry out my research and to bring this book to life: Elena Antinoro Pizzuto, Tommaso Lucioli, Alessio Di Renzo, Luca Lamano, Gabriele Gianfreda, Barbara Pennacchi, Giulia Petitta, Paolo Rossini and Virginia Volterra of LaCAM; Marilena De Marsico and Fabrizio Borgia of the Università Sapienza in Rome; Dominique Boutet, Patrick Doan, Claire Danet, Morgane Rébular, Léa Chevrefils, Adrien Contesse, Chloé Thomas, Timothée Goguely, Jean- François Dauphin and Mathieu Réguer of the GestualScript team at ESAD Amiens and Barbara Denis, director of the school; Margherita Castelli of the Università degli Studi di Perugia; Antonio Perri of the Università Sant'Orsola Benincasa in Naples; the members of the UMR7023 laboratory- SFL in Paris, and in particular Christian Cuxac and Brigitte Garcia, for their invaluable advice on my dissertation; my colleagues in the Department of Language Sciences at the

² My aim here is not to describe grapholinguistics in detail, but the curious reader can delve deeper into the subject by reading "*The nature of writing: A theory of grapholinguistics*" (Meletis, 2020), published in the "*Grapholinguistics and its applications*" collection, the same one that hosts the French edition of this book.

University of Poitiers and in the FoReLLIS laboratory at the MSHS of Poitiers, who have been hearing me talk about this book for 7 years and have not yet given up hope (I will not mention you individually, as I would need a whole page, but your trust is precious to me); the FoReLLIS Laboratory and ESAD, for their financial support for this publication; Yannis Haralambous, editor of the "*Grapholinguistics and its Applications*" collection, for accepting my proposal for a book and doing his utmost to ensure that these 7 years would not become 8; I am sure I am forgetting someone, and I beg your indulgence.

Finally, I could not have finished this book *so quickly* without the unwavering support of my family: my partner Marco, who has always believed in me, my children, who so tenderly distracted me from my writing by making me a champion of recycled cardboard constructions. But also Marco L. Bianchini and Isabelle Marbot, who reread every line of this book, one to give me the *old researcher's* advice on the scientific content and the other to eliminate as many typos and misprints as possible. Finally, Livia and PierLorenzo Bianchini, for the energy transmitted through our *fratellizia*.

This book is dedicated to the memory of Elena Antinoro Pizzuto († 2011) and Dominique Boutet († 2020). The former opened my eyes to the problems associated with the lack of an effective graphic representation system for SL and taught me to have "*la tigna*", i.e., the obstinacy to follow through on a reflection despite the difficulties; the latter taught me to implement a rigorous scientific approach and to surround myself with specialists from other disciplines in order to find innovative answers to the arising questions.

C. Warnings

This book is the fruit of nearly 15 years of research into SL graphical representation. The description of the writing systems for spoken languages, of part of the SL representation systems and, above all, of SW follows fairly closely the content of my dissertation (Bianchini, 2012a), but with important updates. Part of the description of SL representation systems and the presentation of Typannot, in its entirety, are original and derive from my work in collaboration with the GestualScript team at ESAD Amiens.

Although the result of a long series of collaborations, the contents of this book are the result of a personal reflection on the question of writing. The statements made in it are therefore solely my own, even when they relate results obtained as part of a team, since they are written from my personal point of view.

Furthermore, on the premise that once a discovery is published, it no longer belongs to the researcher who made it, but to the scientific community that will use it (or not), I have decided to adopt in this book (with the exception of this premise) the impersonal scientific style typical of Anglo-Saxon literature. I will refer to myself as Bianchini or as CSB (for Claudia Savina Bianchini).

Introduction

I. Introduction

Since prehistoric times, mankind has felt the need to fix information so that it could be recalled: religious beliefs, genealogy, chiefs' feats, etc. were kept alive in the collective memory thanks to oral tradition, but were also the subject of paintings that served as memory aids. With sedentarization and the development of agriculture, the need to preserve information (on tax collection, trade agreements, etc.) became greater. In order to guarantee inter-comprehension, stability of information and speed of recording, the drawn memory aids became increasingly conventional, until they were transformed into symbols; little by little, these symbols changed function, no longer encoding concrete information but the language of the scribe. Now transformed into characters, they also made it possible to represent abstract concepts and language characteristics that were difficult to describe with simple, conventional drawings. This was the birth of writing, the first human technology applied to language.

From this point on, the functions of writing multiplied, making it possible to encode commercial contracts, tax statements and the words of oracles, as well as historical accounts and legends, geopolitical agreements, agricultural practices, medical knowledge and more. Page after page, writing enabled humanity to store more knowledge than it could ever keep in its memory, and above all, it enabled it to organize this knowledge to draw new conclusions and advance society: thus were born philosophy and the sciences, including the sciences of language.

Writing soon ceases to be a mere linguistic representation and becomes an instrument for developing, justifying and preserving values and culture. In the case of peoples who write, the dissemination of culture that was ensured by oral tradition is now supported, and sometimes even replaced, by written tradition. But the cultural role of writing is not limited to the transmission of content: writing as such, through its forms and uses, is a constitutive element of the culture of writing peoples. It is not uncommon, e.g., in countries with highly nationalistic and assimilating policies, that demands of ethnic minorities for independence go with the creation or reevaluation of an independent form of writing, which clearly marks a break with the majority culture imposed by the central power.

Writing is therefore not simply an instrument for fixing language, it is an instrument that helps organize the flow of thought and speech, revolutionizing knowledge, culture, society, and language itself.

The minimum unit of any writing system is the *character*. Depending on the nature of the system under consideration, it may represent an expression, a word, a morpheme, a syllable, a phoneme, or even an articulatory feature. The nature of the linguistic information recorded in each character varies greatly from one writing system to another, influenced by the typology of the language and by the vagaries of contact between peoples who already had a script and those who were in the process of adopting one. For example, the Greeks created the first complete alphabet by adding vowels to the Phoenician *abjad*, as their language could not be satisfactorily notated using a consonant alphabet; but it is undeniable that, had the Greeks encountered the Chinese and not the Phoenicians, they would have developed a radically different writing system, both in terms of the nature of the system and its aesthetics.

Characters are also endowed with a concrete form, a graphic appearance, which is perceived by the reader (or even just the observer) as a form of writing. This form is influenced by the most disparate factors: the reasons for wanting to write (to decorate a building, to tell a myth, to record a business agreement) influence the care and time allocated to inscribing the characters and therefore also the complexity that those may display; the tools and supports used to inscribe the characters, as well as the gestural tradition that accompanies the manipulation of these tools, modify the form of the characters; the beliefs and mystical values associated with the characters can shape their forms and their uses; etc. Most of these influences are the result of chance: the shortage of papyrus led the Romans to write on parchment, forcing them to change their tools and, consequently, their writing gestures, which altered the characters shape.

Character shapes are not just aesthetic: they also determine how widely the system can be used. A system characterized by shapes that are simple to trace and easy to distinguish from one another is more likely to be learned by everyone; inversely, graphically complex characters, which require a

particular aptitude or skill and are difficult to differentiate, run the risk of confining the use of the writing system to an elite.

Writing is therefore a complex system, and its study requires an understanding of the language it represents, the cultural and social factors that influence its use, the graphic motifs that led to the formation of characters, the technologies (sometimes very ancient) used to inscribe writing on a support, and finally the cognitive, social and cultural implications of the presence of writing. Whatever the angle from which we approach the question, monodisciplinarity does not allow us to grasp all these dimensions. It is therefore necessary to call on the skills of the linguist, the anthologist, the sociologist, the historian, the designer and, nowadays, also the computer scientist and the engineer (and other experts as well) to grasp the multiple facets of the issue of writing.

Grapholinguistics is the branch of the Language Science that, although interested in the linguistic aspects of writing, sees writing as a topic worthy of a multidisciplinary approach. This relatively new discipline is equally interested in the content conveyed in written form, the intrinsic characteristics of writing systems, and the implications and applications of writing in society. This 360° approach to the question of writing is the basis for the present book on Sign Language (SL) writing.

SL are used by a large proportion of profoundly deaf people to communicate with each other and with hearing people who master these languages. There are over 140 SL in the world (Eberhard *et al.*, 2021), with a multitude of users; e.g., just in France, it is estimated that there are around 50,000 deaf signers (DREES, 2014), mainly employing French Sign Language (LSF).

SL are visuo-gestural languages: they are perceived by sight (not hearing) and produced by the signer's body. An uninformed observer might think that SL are "manual" languages, in which hand shapes and movements replace the sounds articulated through the mouth by speakers of vocal languages. But SL is produced by the signer's entire body: the hands certainly play an important role, but facial expressions and gaze play an equally crucial part, and the production of meaning also involves the

postures and movements of forearms, arms, shoulders, head, trunk, sometimes even of the pelvis and, more rarely, legs and feet. In SL, then, it is not the hands that do the talking³, but the whole body.

The SL visuo-gestural nature makes them typologically different from all the world spoken languages, and makes it impossible to adapt to SL any of the writing systems designed for a spoken language. Moreover, the multitude of articulators that produce meaning simultaneously can hardly be consigned to the monolinear space of a conventional writing line. These material difficulties are compounded by a lack of interest, and sometimes even reluctance, on the part of the deaf community to adopt or develop a SL writing system. Despite the fact that a number of different SL writing systems have emerged, there is currently no system that can be considered *THE* SL writing system.

The lack of an official SL writing system complicates any study requiring consideration of the signifying form of signs. To deal with this difficulty, some researchers have set up graphic representation systems, enabling them to transcribe SL for analysis.

The aim of this book is to introduce different graphic SL representation systems. Particular attention will be paid to systems that have been used or developed for linguistic research, which called for considering the signifying form of signs.

The systems are presented following a grapholinguistic approach, which gives equal importance to the nature of the characters, their form and their use. Thus, for each system, part of the proposed analysis focuses on its informational power, i.e., the characteristics of the signs it is able to represent. This power is matched to the research objectives for which the system was created and the theoretical frameworks of the researchers who developed it. Another aspect of the analysis relates more specifically to the graphic form of the characters making up the system, which influences the ability to read, write and learn it. Also shown is the spatial disposition with which the system attempts to account for the multitude of articulators that are activated during

³ In the 1980s, "*Mes mains ont la parole*" was the title of a segment on the children's program *Recré A2*, in which Marie-Thérèse L'Huillier, a deaf signer, told stories in LSF accessible to deaf young and - thanks to a voice over - to hearing people too.

the production of a sign. An additional section focuses on how signs represented by this system can be written and read. In this context, the instruments that accompany the graphic representation system are presented, enabling it to be used to conduct qualitative and quantitative research on SL corpora. Finally, on the rare occasions when a system has been used for something else than linguistic research, these other uses are indicated.

This book is the fruit of more than 10 years work by its author, Claudia S. Bianchini (CSB), on the question of graphical representation of SL. Over the years, she has worked in particular on SignWriting (a system for writing SL, which CSB studied as part of her dissertation) and Typannot (a system for transcribing SL, which she helped develop), both of which will have a place of honor in this book.

Concretely, in addition to the premises, this introduction (§ I) and the conclusion (§ IX), this work is made up of three main parts.

The first part outlines the problem of graphical representation of languages, particularly of signed languages. Chapter § II traces the rising of different writing systems for vocal languages, and reviews the various typological approaches to writing systems. It presents the repercussions of the development of scripts, in particular on the birth of science, social structuring and the preservation of a community language, culture and memory. § III focuses on SL, explains the factors that make them difficult to script, and highlights the social, pedagogical and scientific factors that may justify the need for a script for SL. The chapter concludes with a critical presentation of the various systems developed to date for writing SL, both from the point of view of the systems informational power and their graphical characteristics.

The second part describes the research that has been carried out on and with SW, a SL writing system. Chapter § IV describes the system features and how it has been received by the deaf community and the researchers working on SL. This is followed by a presentation of how SW has been used within LaCAM, and of the research methodologies employed for gathering metalinguistic reflections from corpora written in SW. Section § V illustrates in more depth the structure of SW and the results of analyses carried out on exercises in composing and reading texts in SW by deaf

signers with a very good command of the system. In § VI, the reflections formulated by these same deaf people on the basis of reading texts in SW are gathered, showing how the use of the system improves metalinguistic awareness. In particular, SW enabled these speakers to understand the difference between writing a text and transcribing a signed production. Finally, in § VII, this part ends with suggestions for SW future development, particularly in terms of improving its pedagogical tools and facilitating SW integration into the Unicode standard. The issue of the IT tools required for the "modern" use of SW is also raised.

The last part presents the development of Typannot, a phonological transcription system for SL that is also adapted to co-verbal gestuality. § VIII presents the theoretical approaches and practical choices followed by GestualScript in developing Typannot. This is followed in § IX by an explanation of exactly how the system works, the solutions invented to ensure its legibility, and the IT tools developed to guarantee its inscriptability and queryability. The chapter ends with concrete examples of Typannot use in linguistic research.

Finally, § X concludes the book.

A. Terminology note

Before getting to the heart of the matter, a few words on terminology are needed. Terms such as "orality", "writing", "transcription", etc. can have different meanings and, in the absence of a clear definition, their use can lead to misunderstandings. It should be mentioned that the aim of this notice is not to impose a definition of these terms, nor to list their different meanings in the scientific literature, but just to explain the meaning given to them in this book.

A **graphic (representation) system** is a set of symbols, organized and conventional, which are traced (analogically or digitally) on a support using an instrument, and which convey information. The conventions governing the operation of these symbols relate to their form⁴, their arrangement in the graphic space, their relationship to each other, and also to the setting and

⁴ Or rather, the characteristics that distinguish one symbol from another.

situation in which the graphic system can and/or must be used. The information encoded by a graphic system may be linguistic (as in the case of the Latin alphabet or Mayan glyphs) or non-linguistic (as in the case of road signs, musical notes or chemical formulas); in the former case, the graphic system may be a writing system or a transcription system, depending on how it is used.

A **writing system** is a set of symbols, organized and conventional, which are traced on a support using an instrument and which represent one (or more) languages: in the case of writing, symbols are often called **graphemes** or **characters**, the latter being the term used in this book. Writing is used to convey the meaning rather than the form of language: for example, there are writing systems that give no information about how a written word should be pronounced. Writing systems (which may be historical or recent) are not only a means of representing language more or less faithfully, but they are also a reflection of the history, culture and society of the peoples who use them. For this reason, only those writing systems that have gained recognition (albeit sometimes limited) within the community of speakers of the language they represent will be referred to here. The use of a writing system influences the organization of the language itself, which the need arises to distinguish between **oral language** (preferably called **face-to-face language [FtF]** in this book⁵) and **written language**, as they can differ greatly from one another.

A writing system can be read by anyone who masters both the system and the language it represents, because **reading** implies understanding the information the system is used to convey. When knowledge of a writing system is not accompanied by an understanding of the meaning, it is a question of **deciphering**: for example, a French person can read a text in French, but his/her knowledge of the Latin alphabet will not enable him/her to read Swedish if he/she does not know this language. At most, he/she will be able to decipher the characters, provided he/she knows how to pronounce them. Depending on whether the aim of reading/decoding is to share the information content of a text with another person or to acquire it for oneself,

⁵ The preference for this term is dictated by the confusion that is often made between *oral* language (as opposed to written language) and *vocal* language (as opposed to sign language).

we may talk about **reading/decoding aloud** (or rather "**reading/decoding in high-signs**" in the case of Sign Languages) and **mental reading/decoding**.

Like a writing system, a **transcription system**, also known as a **notation system**, is a set of organized, conventional characters traced on a support by means of an instrument and representing one (or more) languages. The aim of transcription, however, is to enable the representation of the signifying form of linguistic units, often for analysis purposes, so it is necessarily phonographic: to transcribe it is possible to use an existing writing system, in its original or adapted form (such as the International Phonetic Alphabet [IPA]), but also an *ex novo* system, invented expressly to represent the form of a linguistic unit. The degree of finesse with which a transcription/notation system describes this form depends on the graphic choices made when creating the system, and on the goal pursued by the person using it: it can represent much more but also much less information than the writing system normally used to code the language in question; a transcribed text containing insufficient information to reconstruct the meaning of the linguistic units it represents will therefore be deciphered and not read. The use of a transcription system serves to freeze the language as it is on a graphic support; the **transcribed oral language** (or **transcribed FtF language**) will therefore retain the characteristics of the oral language, while the **transcribed written language** (for example to represent phonographically a language whose usual form of writing is non-phonographic) will retain the characteristics of the written language.

Transcription/notation systems should not be confused with **annotation systems**, which are not graphic representation systems. These are systems of labels (often written using a writing system) used to specify the characteristics of an object: this object may be a linguistic unit, but not necessarily. It is thus possible to annotate the characteristics of a word (indicating its grammatical class, meaning, length, etc.), but also of a drawing (its colors, author, subject, etc.), a musical note (its instrument, timbre, length, etc.) or a flower (its variety, color, geographical area, etc.). The annotation must be linked to the object whose analysis it crystallizes, otherwise it becomes an empty label.

It will be explained later in this book that there are languages with a written tradition, and others - the majority - which have not developed any form of writing in the course of their history. The former are referred to as **written languages** and the latter as **purely oral languages** (or **purely FtF languages**). Almost all of the latter can be represented graphically by adapting an existing phonographic writing system: given the absence of any link between graphic representation and speakers' culture, this practice will be considered in this book as a form of transcription rather than writing.

The only languages that cannot be represented phonographically are **sign languages (SL)**, which must be distinguished from **vocal languages (VL)**, since the former use the visuo-gestural (or rather visual and bodily) channel, and the latter the audio-phonatory channel. The all the world SL are purely oral languages and, to date, there is no known system of graphic representation that would enable the creation of a writing system, or even a suitable transcription system: SL are therefore **languages difficult to script**. One of the aims of this book is to present ways of mending this non-inscriptability.

Finally, three terms - symbol, character and glyph - deserve special mention. A **symbol** is a unit of a graphic representation system: a musical note, a pictogram, a letter, and so on. When the information represented by these graphic systems is linguistic, the symbols are called characters or glyphs: for the Latin alphabet, it is more common to speak of characters while it is more likely to be glyphs for the Mayan script. However, the two terms are not really equivalent. A **character** is a unit of information in a writing (or transcription) system: it is an abstract unit. The Latin alphabet is based on 52 characters (26 uppercase and 26 lowercase), along with a long series of diacritic modifiers (accents, cedillas, dots, traits, ...), whose use varies from one language to another. But each of these characters can be written in infinitely different forms, depending on the writer's calligraphy or the font selected in the text-editing software. The concrete manifestation of characters, their design, is called a **glyph**. A glyph can represent a single character (like <A>) or it can be the union of several characters (like <Æ>). Although glyphs and characters are two sides of the same coin and should not be confused, the distinction between the two - although born with the

printing press - only became truly relevant with the advent of digital writing and, more specifically, the Unicode standard. In the old movable-type printing presses, if you wanted to write <Œ>, it was not enough to juxtapose an <O> and an <E>, you had to have a <Œ> character; on the old "basic" typewriters, writing <Œ> was simply impossible. Today, text editing software is able to take the abstract idea of the <O> and that of the <E> and, while maintaining the distinction between these two characters, bring up on screen a glyph <Œ>, which looks like a new character but is only a glyph⁶.

In the writing and/or transcription systems presented throughout this book, only the Typannot system calls for a clear distinction between symbols, characters and glyphs. This is why these three terms - which will be used interchangeably in § II (on VL writing) and § III (on the graphic SL representation) - will be clearly differentiated in § VIII and § IX about Typannot. Since the author of this book was greatly influenced by her thoughts on Typannot when revising the parts of the book concerning her dissertation on SignWriting, this distinction between symbol, character and glyph will also be applied to § IV, § V, § VI and § VII. The rationale behind the distinction between glyph and characters in digital writing will be explored further in the chapters on Typannot.

B. Conventions applied

Wherever possible, the following conventions have been observed:

- characters and glyphs are enclosed in <...>. This is true for all characters (and their glyphs) describing VL, but in the case of SL representation systems, where the characters are quite distinct from VL characters, it has been decided to omit the <...> so as not to make the text unnecessarily

⁶ Theoretically, in the Unicode standard, there should be no characters such as <Œ>, since this -is the union of two characters; a ligatured glyph would therefore be sufficient to display this information on the screen. Unicode is, however, the result of the evolution of previous coding systems (such as ASCII), themselves heirs to typewriter keyboards. Faced with the need to guarantee the continuity of all texts produced before Unicode was defined, it was decided to incorporate historical ligatures such as <Œ> (<O><E>), <œ> (<o><e>), <Æ> (<A><E>), <æ> (<a><e>), <Ɔ> (<c><p>), <ɔb> (<d>), and so on. Writing with the help of software thus allows you to choose between typing the <O> and <E> characters one after the other, or inserting the <Œ> character directly; in either case, the <Œ> glyph will appear on the screen.

cumbersome; sometimes, especially in SL, it is the meaning of the character that is indicated (e.g., <right hand>) and not the character itself.

- pronunciation of words and sounds:
 - is indicated between '...' when written in the Latin alphabet (e.g., by using the original form of the word in the foreign language or its usual transliteration if the language is not normally written in Latin characters);
 - is indicated between /.../ when written in IPA.
- the translation of foreign words is indicated between "...".
- annotation labels are indicated between [...]; this also applies to "glosses" used in SL.

Since the realization of SL signs cannot, for obvious reasons, be represented by the Latin alphabet or by IPA, it is not possible to reproduce in the text the way the sign should be "read". This is why, for SL only:

- the translation of the signs is indicated between "...";
- translations of words in the form of "glosses" are always capitalized and enclosed in [...].

Part 1 - Writing(s)

II. Voice languages and writing

A. Writing

As a general rule, the term "writing" can be considered to have 4 main meanings: writing as the representation of language through a graphic system; writing as the set of characters making up this graphic system; writing as the process of elaborating a text; and finally, writing as the style or language used in a text or by an author.

Considering the first meaning, writing is the first form of human technology to be applied to language, giving rise to a new form of communication, which differs from oral communication in several ways (Fiorentino, 2007), summarized in Table 1, which compares oral communication, or FtF, and written communication. Following Bianchini (2012a), vocal languages (VL) expressing themselves only in face-to-face mode will be referred to as VL-FtF, and VL with both a FtF form and a written form will be referred to as VL-Written (see § I.A).

	oral communication (FtF)	written communication
basic communication code	phonic code (or visuo-gestural code in sign languages)	graphic code
production and reception units	mouth/ears (or hands/eyes in sign language communication)	hand/eyes (or hand/hand in the case of tactile writing such as Braille)
production tools	no particular instrument but the human body	tools for inscribing graphic code on a substrate
co-presence of interlocutors	co-obligatory spatiotemporal presence (and absence of physical obstacles to message propagation)	co-optional spatiotemporal presence
duration in time	the message cannot be sustained over time	the message can be sustained over time, if the medium is appropriate
link to context	production context communication	communication not linked to the production context

Table 1 - Criteria for differentiating between oral and written communication

Elaboration based on: Fiorentino, 2007:176