Choosing how to write sign language: a sociolinguistic perspective

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Abstract

This article introduces the reader to the sociolinguistic issues surrounding the adoption of a writing system for sign languages. Initially, some background on sign language and Deaf culture is presented, followed by a discussion of several alternatives for writing sign languages and how these alternatives have been used and/or adopted. Sign languages in most parts of the world compete with spoken languages (languages that have established written traditions), resulting in diglossia. Though many scholars who work with the deaf community have tried to develop ways to write sign language(s), many Deaf do not feel the need for a writing system, either because they use video media or because they see writing as best done in the dominant language in their diglossic situation.

1. Introduction

Language, unaided by some form of technology, is subject to space and time (Gelb 1963: 3). An utterance has to be made in relative close proximity, and once the utterance is over, it is lost forever. Those who use and those who study sign language have leveraged technology to address these limitations in many creative ways, such as drawing, photos, video recording, and writing. Today, signing communities are presented with several choices of writing systems for their signed languages, but in most places they have not yet agreed on a particular system. This article will introduce some of the issues surrounding this topic.

The heart of sociolinguistics is the study and development of theories about language choice. Recently, Unseth has proposed that the theories developed for language choice may be equally applied to writing system choice (Unseth 2005). In this article, some of these theories will be applied to the choice of sign language writing systems. As noted above, the

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writing of sign languages is, for all practical purposes, in its infancy. Therefore, the academic community has the opportunity to observe not only the choice between writing systems but the factors that contribute or take away the desire to document one's language.

This article is in no way a definitive study of the uniqueness of Deaf culture,[1] nor is it a defense of the validity of sign languages as languages. Such studies are available for people who are interested (Sandler and Lillo-Martin 2006; Stokoe 1978). I will assume the posture of one who understands both to be facts.

Sign languages are the primary languages used by the Deaf for intra-group communication (Valli et al. 2005; Reagan 2006). These languages have very little in common with the dominant spoken language (DSL); in fact, one study suggests for an English speaker, American Sign Language (ASL) should be an FSI category 4, the hardest level of language to learn (Jacobs 1996: 186). Though the deaf are generally in constant contact with the DSL, they are rarely highly competent in reading and writing that language.

All moderately complex societies have writing (Coulmas 1998: 6), but there has been no writing system spontaneously created by the Deaf for documenting sign language. This does not mean there is a lack of writing systems for documenting sign language; in fact, many have been developed,[2] but few are in use, and only one seems to be growing in use among the Deaf.

2. Why not use the DSL?

For many readers, this will be the first exposure to the idea of writing systems for sign language. Therefore, a logical question is "Why don't the Deaf use the writing system of the DSL to write sign language? Each sign has a spoken word associated with it; just write that word down." In this case, the readers would not be reading or writing a sign language, they would be reading and writing a transliteration of a sign language.[3] It is also a fallacy that each sign has a single spoken word associated with it, just as every word in English does not have a one-to-one correspondence with Swahili words.

The writing systems most people are familiar with are visual representations of a spoken language.[4] These are linear representations of a largely linear medium: speech. The writing system of a signed language is a visual representation of a visual language.

In order to describe a sign language, a writing system must include the following: Handshape, Palm Orientation, Place of Articulation (which

includes point of contact, contact type [touch, brush, rub, grasp], and location), Movement (which includes direction, orientation, timing [simultaneous, sequential]), and Non-manuals (a description of eyebrows, mouth shape, head movement, shoulder placement, and body position) (Sutton 2002; Farnell 1996: 868). This is not an exhaustive list of what could be captured, but is a list of features that commonly carry a heavy functional load (Sandler and Lillo-Martin 2006).

When designing an orthography, prevailing wisdom says the adaptation of a current system is the most advisable option (Karan 2006: 65).[5] Writing systems for spoken languages are not designed to handle the kind of features exhibited in sign languages and would need to be distorted in order to accommodate them. As such, symbols of these glottographic systems would be reassigned to represent visual attributes. For example, in Stokoe Notation, when a sign's place of articulation is on the chin, a U is used. The symbol 5 is used when the handshape is a hand with all the fingers splayed. When 5 touches U, shown with a superscript X, the result is: $U5^{X}$, the Stokoe Notation for the ASL sign MOTHER.

The resulting system is very difficult to understand since prior understanding of alphabets would no longer apply. Kroeber (1958: 17) seemed to grasp the problem when he suggested that drawings accompany a sign language writing system, "as a check, and to correct ambiguities or awkwardness" that are inherent in such writing systems.

3. Systems of writing

Many writing systems have been developed by researchers for the purpose of studying sign language. The base assumption has been, "If the Sign Language is a code, it should be encodeable in notation, and decodable from notation" (Voegelin 1958: 74). Since Voegelin's call for a notation system for Plains Indian Sign Language, there have been several writing systems created for studying sign languages. Prior to that, drawings had been made to show what a sign may look like or how to position the hands for a particular word. There are no examples of prior efforts to establish a writing system for daily communication in sign language.

Two main categories of systems have been used for writing up to this point, those that are adapted systems and those that are influenced creation systems. Adapted systems use a type of linear alphabetic system, mostly using standard symbols from glottographic systems (usually alphabetic letters) to indicate discrete visual attributes. Those that are influenced creation systems use iconic or graphical representations to depict those same visual attributes, varying from line drawings to stylized sets of symbols.

In 1960 William Stokoe, Jr., published his monumental work on American Sign Language (revised in 1978). In order to describe signs, he created a writing system to discuss the handshape, movement and orientation, and location. His system contains two sets of symbols, one is a pure ASCII set, the other contains unique symbols created by Stokoe. The system was designed for ASL and is therefore limited to the phonetics of ASL.[6] Here is the ASCII version of Stokoe for the ASL sign I-DON'T-KNOW: PB^{bxf}. The Stokoe system has also been adapted for transcribing British Sign Language. Its use has been limited to academic writings, not used by the Deaf community.

An adapted system for writing Spanish Sign Language has been developed at the University of Alicante (S.E.A.). It uses alphabet letters to represent various movements and handshapes, e.g., ''Love'' is written as ''yn i (mi)''. By using this system, one of the developers believes, ''writing Spanish Sign Language becomes very easy'' (Herrero 2004: 41). At this point it is difficult to determine the level of acceptance this system has among the Deaf of Spain.

Another adapted system created for the purpose of transcribing sign language is SLIPA (http://tinyurl.com/32zljn). The SLIPA creator, David J. Peterson, intentionally limited himself to Unicode characters in order to be able to discuss constructed sign languages in e-mails and on the Internet at the phonetic level. The complexity of the system is a direct result of this requirement. SLIPA encodes the ASL sign TEACH as: $(ear[\square^{b(s)}]XY^{d})+(ear[\square^{b(s)}]XY^{d})$. As far as Peterson (p.c., 2007) knows, no one is using SLIPA as a means of daily communication, nor does he ever expect there to be.

Another way to write a sign language is to use the DSL to do a word-by-word translation; this system is commonly called Glossing. Each sign is glossed with words from the spoken language. Classifiers, movements, and non-manuals are documented using standard conventions. Glossing is in wide use among academics for the discussion of sign languages. As a methodology it is quickly understood if a person knows the DSL in which the signs are captured. It is also quick to write; though there are no formal standards, most follow basic conventions. For example:

(1)

	q	q
CL: 1 XI TELL-ME HOME+WORK DIFFICULT	YOU THINK+SAME YOU	

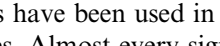
'The person over there told me the homework is hard. Do you agree?'

The main drawback is the reader cannot see what the signs themselves look like. It is also clear this system is a translation of a sign language

Figure 1. *Line drawing for Colombian Sign Language*

and not a record of the message in the language itself. There has been no development of sign language literature using this system, though as stated above, much academic writing uses this system.

According to Rosenberg (1999), some have proposed the use of Chinese characters to write ASL. The Chinese system being more meaning based, it is hoped that the characters could be used regardless of people's knowledge of the actual Chinese language. This idea has apparently not been seriously tested among any signing community.

HamNoSys was developed at the Institute of German Sign Language and Communication of the Deaf, University of Hamburg, as a transcription system to document sign languages on a phonetic level. It was made available to the public in 1989. Handshape, hand configuration, movement, and location are described using 200+ symbols. Many academic works have used HamNoSys as a system for describing sign language. The ASL sign PAPA looks like this:  in HamNoSys.

Line drawings have been used in a wide variety of publications related to sign languages. Almost every sign language dictionary and instruction book uses line drawings. Line drawings are purely pictographic representations of the signs themselves. The signs represented by the drawings may or may not be iconic.

Children's books have been made with drawings of the signs of Signed Exact English (SEE II), with the English words under each picture. In this case it could be argued the signs are added to clarify the English words. In Colombia, a project to produce Bible passages in Colombian Sign Language chose to use line drawings to present the text (Figure 1). They were printed without glosses, though there are Spanish translations at the bottom of the pages. In this case, the drawings of the sign language are intended as the primary means of communication. In South Africa, a comic book using drawings of a South African sign language instead of speech bubbles has been prepared by the Gay and Lesbian Archive group

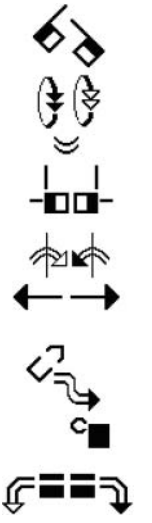


Figure 2. *Sample of SignWriting*

to inform the Deaf community about HIV/AIDS, sexual violence, and protection from sexual abuses (http://tinyurl.com/219hfm).

SignWriting (Figure 2) was initially invented in 1974 by Valerie Sutton to capture sign language from video in a Danish research project where precision was very important, so it resulted in rendering sign language with a high degree of adequacy (http://www.movementwriting.org/).[7] Efficiency is improved by the pictographic nature of the symbols, most of which are understood after a short training period.

Enkonduko al Plena Signuno is a transcription "system that was created specifically to encode the created sign language Signuno, which is, apparently, Signed Exact Esperanto (i.e., there's a sign for every morpheme, even if it makes no sense to encode it) ... this transcription system has a pictorial form and an ASCII form." However, the system "was designed *only* for Signuno, just as Stokoe Notation is only for ASL" (Peterson 2007).

It should be noted that many of these systems were not primarily intended to be a written form of sign language for the purpose of communicating in that language, but as an academic tool for describing signs of a language.[8] Sutton (2005) makes a clear distinction between what she calls a notation system and a writing system: notation systems are used to describe a language, whereas writing systems are used as a means of communication in a language. Within this classification, notation systems would include Peterson's SLIPA, HamNoSys, and the work of Lenseigne

et al. (2004), while Sutton's SignWriting and Spain's Alphabetic Writing System (Herrero 2004) are intended to be writing systems.

4. Factors affecting the acceptance and use of writing systems

As stated at the outset, at the heart of sociolinguistics is development of theories about language choice. Smalley, Haugen, and Garvin are three noted authors whose theories have contributed to our knowledge of language choice. Though none of these authors intended their theories to be applied to the study of writing sign languages, the validity of the insights gained by doing so helps establish their theories in unanticipated ways.

4.1. *Smalley's maxims*

Smalley's maxims focused on what he saw as the most important aspects related to the creation and acceptance of a new writing system.[9] The list is in order of importance as he determined it: (i) maximum motivation for the learner, (ii) maximum representation of speech, (iii) maximum ease of learning, (iv) maximum transfer, (v) maximum ease of reproduction (Smalley 1963: 34).

The decisions associated with the development of a writing system are rarely made based on linguistic reasoning alone. Often the sociolinguistic factors trump linguistic factors. The first maxim, learner motivation, is not related to the technical merits of a writing system, but to the attitude of the language community. For those interested in learning the systems, though, the technical complexities of many of the systems create a steep learning curve and thereby lower a learner's motivation. Maxims two and three will be covered in the discussion of Haugen's criteria for adoption.

By "maximum transfer" Smalley means when symbols of one system are learned, this knowledge can be transferred to another language. Using similar symbols with similar meaning can thus aid in the rapid acquisition of language of wider communication. Many of the sign language writing systems can be applied across all sign languages; therefore, skills developed in a system are transferable to all other sign languages represented in the same system. In this way they are fully transferable, since a given symbol will represent the exact same handshape or movement in all sign languages, even if the meanings are not all the same.

Maximum transfer is not always the case between systems. Symbols used in one system may or may not overlap those of another. For example, the British Sign Language Dictionary notation is derived from the

Stokoe system so their symbols carry the same meaning and one could transfer knowledge from one system to the other system. On the other hand, the same symbols may also be used in SLIPA or SignWriting and carry different meaning; what is learned in Stokoe's system will not transfer to these systems. Additionally, what the learner understands about symbols that happened to be used in a glottographic system may not transfer to another system. For example, the symbol # is found in Stokoe's system, SignWriting, and English, but the meaning is different in each system. In this case, transferability is not met.

The sharing of symbols between the DSL writing system and sign language notation systems makes transferability between the two systems not only confusing, but impossible. As stated above, when one knows a spoken language's writing system, then tries to apply the knowledge gained from that experience to sign language writing, they quickly become confused. The same would be true in reverse. If one learns a sign language notation system, the knowledge gained will not transfer to a spoken language's writing system and may cause much confusion.

Maxim five, "ease of reproduction," has been lessened in importance in most areas where access to technology is readily available. In all other areas, though, this is still a concern. Unfortunately, few of the notation systems are easily reproduced without access to modern computer printing services, and even with access to computers, most systems are still difficult to write. Prominent exceptions are SLIPA, Spanish S.E.A., and the alphabetic mode of Enkonduko al Plena Signuno (for Esperanto), which were designed using only ASCII characters to facilitate their use on computers, but this causes a trade-off with ease of learning.

4.2. *Haugen's language adoption criteria*

In order for a language to be thought of as adoptable, Haugen (1971: 61–63) said it must be *efficient* — easy to learn and use, and it must be *adequate* — able to convey information with the desired degree of precision. Writing sign language, like all writing, is faced with the same trade-offs Haugen applied to language adoption, viz. efficiency and adequacy.

Notation systems are typically designed to document at the phonetic level; therefore, they convey every linguistic aspect of a sign language, making them very precise or "highly adequate" in Haugen's terms.[10] This high degree of precision, plus the desire to be reproducible with a standard computer keyboard, has led to some very complex systems.

Line drawings tend to be less than adequate in documenting complex signs or dialogue due to their limited ability to describe movement over

time. In spoken languages, sounds are not discreet units, but a series of changes over time. The same is also true about signs: they are not discreet units, but a series of changes over time. Imagine a film of a signed conversation; each sign will have multiple frames. To draw a specific sign, one would need to determine which frame best portrays the sign, then discard the others. Though line drawings tend to be easy to read, the under-differentiation renders them less than adequate. An additional drawback is that the efficiency of line drawings is dependent on the writer's artistic ability.

All writing systems of sign language have problems with efficiency as Haugen defines it. Notation systems are often based on glottographic symbols, which have had their meanings reassigned in order to represent visual articulations. Since sign language is not linear, the symbols are organized in a manner far different from spoken languages. For instance, in Stokoe notation, the symbols are ordered left to right and are read in the order of *Tab*, *Dez*, *Sig* (or location, handshape(s), movement and orientation). For a single sign, each part, *Tab*, *Dez*, or *Sig*, may have multiple symbols. The order in which the symbols are read may not be the same order in which the signs are perceived. In most spoken language writing systems, by contrast, the order in which the symbols appear correlate to the order in which they are perceived. When students try to use learning strategies acquired from other writing systems to construct and organize meaning with the new system, they find their previously gained knowledge is of little help. This leads to a high degree of confusion while learning the system. It must be remembered that these systems were never intended to be used as a means of daily communication, but as a research tool for highly trained linguists, a purpose for which they may be well suited.

Line drawings are easy to learn, as far as reading goes, but one must be an artist or very familiar with computer graphic software to draw them. The process is not as simple as imagining what a sign looks like then drawing it. Most often, photos or videos are taken of a person signing, then the frame that best depicts the sign is selected. The frame is then given to an artist to draw or rendered into a line drawing using software. As such, this is not a process most people are willing to do for daily writing.

4.3. *Garvin's functions of languages*

The choice of a language is surrounded with an inevitable set of consequences. As Garvin (1973: 27–31) points out, a language can serve to

unify or separate people groups. It can enable or prevent a people from participating in a wider community. Choice of language can also foster pride within a people. These same functions are apparent in the choice of sign language writing systems.

Notation systems are used mainly, if not exclusively, by researchers for the purpose of research and publication. There are no groups of Deaf who use a notation system as means of communication in a written format. Notation systems are used to describe sign languages, but have not been used in any significant way to actually express language.

There have been no large groups of Deaf who have rallied around, or adopted, a notation system as cultural marker. However, there are groups of Deaf who have taken the time to learn and use SignWriting, not as a primary means of communication, but as a way of accurately recording sign language in a system that preserves a record of much of the language. Several of the individuals who use SignWriting see it as a mark of distinction, something they can use and understand that is different from the writing systems of spoken language.

An interesting point to note is that, traditionally, among the Deaf in America, those highly skilled in English have been shunned by the wider Deaf community. As such, to become skilled in written English would be to deny ones Deafness. As such, English skills are seen as a separating factor, while strong ASL skills are seen as a unifying factor. This attitude seems to have carried over into the choice of writing. For one to write English, one would deny their Deafness. In order to maintain Deafness, one could not write because there were no writing systems available to document sign language. Being an Oral culture,[11] this did not appear to be a problem for the Deaf in America.

5. Acceptance and use of sign language writing systems

The corpus of written literature in sign language (as opposed to literature *about* sign languages), though growing, is still quite small, and very new. The lack of a grand tradition demonstrates (and contributes to) the low priority the writing of sign language has had among the Deaf.

Even though the language choice for daily intragroup communication is a sign language, literacy is, except in rare cases, only available in the DSL. As such, all reading and writing must be done in a language that is not the language of daily intragroup communication. Though as Coulmas (2005: 206) points out, through most of human history the language of daily communication and the language of literacy have not been the same, this is not an ideal situation. The degree in which Deaf persons

want to express themselves in writing is directly related to the degree of fluency in the DSL they require. Those who have wanted to fully express themselves in writing, up to this point, had to study in order to become skilled in a foreign language (that is, the DSL), then use that language's system.

Today there are several writing systems available to the Deaf, but, as has been shown, most are not suitable to meet the needs of daily writing. The one system that presents itself as a viable option is SignWriting.

SignWriting gives the user the degree of precision needed to fully convey the intended meaning. As such, it is well suited to capturing the subtleties of signed languages in ways the DSL cannot. This makes it ideal for writing the richness of sign language, as can be attested to by the growing corpus of sign language literature, lexicons, Bibles, children stories, and newspapers. This has, in turn, created a domain that has not existed before: sign language literature.

The act of writing using the SignWriting system is, currently, difficult and time consuming. Standards for writing are derived from the work of previous authors; therefore, when a writing system is new there are few standards available to help guide authors (Coulmas 1987: 121). Early work takes a considerable amount of time, which, ideally, decreases with the lessons learned in each successive publication.[12] Other factors include difficulty in using modern technology (though this is steadily improving as new software is being developed) and a lack of well-documented handwriting standards.[13] These difficulties make SignWriting inefficient for daily written communication needs. Therefore, the DSL remains the choice in that domain.

The SignWriting system is flexible enough to represent all sign languages tried thus far. Currently, there are writing projects using SignWriting for more than forty different sign languages (Valerie Sutton p.c., 2006). SignWriting is the only sign language writing system that has been officially adopted by a national government, being so chosen in Denmark. It has also been chosen for use in the two-volume Brazilian Sign Language Dictionary published by the University of Sao Paulo in 2001. Schools in several countries are currently using SignWriting on a daily basis.

SignWriting seminars have been held internationally and have resulted in many groups being established for the promotion of writing the local sign language using the SignWriting system, including Brazil, Japan, and Saudi Arabia. These groups document the literature of their languages with SignWriting, as well as enhance their languages through the creation of lexicons, dictionaries, sign language versions of popular children's tales, Bible passages, and other signed literature. Though the sign languages of

each of these countries are different, the writing system is the same, making multilingual literacy much more feasible.

There is a SignWriting forum on the Internet, frequented by people from many parts of the world, for the purpose of discussing how a sign should be represented in SignWriting. The sign under discussion could be from an Ethiopian, South Korean, or Brazilian sign language. Often a person refers to a photo, video, line drawing, or a written description of a sign and the group will offer suggestions as to how that sign should be written.

It is likely that the most common way to represent sign languages in publication has been line drawings. This seems mainly due to the innate adequacy and efficiency for representing individual signs with low levels of complexity. Line drawings, therefore lend themselves quite well to introductory dictionaries and teaching materials, which is where they have been in heavy use. But due to the difficulty in producing line drawings and its inadequate representation of dialogue, line drawings have not been used as a means of daily communication among the Deaf.

In many areas of the world, the signing community is depending more and more on video communication via the Internet. Video Web logs (vblogs) are becoming an important way for signers to communicate and share their ideas. As access to this technology becomes more and more available, the desire to create a writing system may dwindle. One of the more common responses encountered when asking the Deaf about writing sign language is "Why bother when I can use video?"

6. Conclusions

Until recently, the Deaf have not developed a corpus of sign language writing. All writing had been in the system used by the DSL, with no attempt to capture sign language literature. Though this may be attributed to many historical factors, both social and linguistic, a key factor has been the lack of an adequate writing system. With the increased sophistication of the Deaf community, new writing systems have developed. Recently, many Deaf have begun to adopt SignWriting as a way to document sign languages. SignWriting fulfills many of Smalley's maxims and meets Haugen's notions of an efficient and adequate system. Further, as Garvin points out, languages often serve as a unifying force, and SignWriting is in a position to be used as leverage in the Deafhood movement that is arising (Ladd 2003).

Additionally, due to the current difficulties of writing with SignWriting, a diglossic situation has arisen in which daily writing is accomplished via

the DSL writing system, while a body of sign language literature is produced in SignWriting. However, in many countries SignWriting is being used by a small (but growing) segment of the Deaf population on a regular basis.

Finally, the sentiment of "Why bother?" is one of the most commonly held arguments from the Deaf against writing sign language. Before a community is willing to discuss a writing system, they must answer the question "Why bother?" For many in the Deaf community, this question has not been adequately answered. As such, there is not a wide-spread felt need for writing. As a result, there is very little competition between the sign language writing systems. Therefore they choose no script for writing their sign language. As far as most Deaf are concerned, they are not stakeholders in these endeavors.

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Notes

1. In this article, "deaf" refers to audiological deafness and "Deaf" (with uppercase D), to people who are associated with a culture group (not to a medical condition) who may or may not be deaf in an audiological sense.
2. On the SignWriting online forum, Sutton mentions 50–100 different systems. See http://listserv.linguistlist.org/cgi-bin/wa?A2=ind0503A&L=SW-L&P=R12135&D=1&H=0&I=-3&O=T&T=1 (accessed 8 January 2007).
3. There are systems called glossings that follow a similar idea; these will be discussed below.
4. In the case of Braille, the visual component is modified with a tactile component.
5. In all fairness to Karan, her paper was focused on the needs of spoken languages and did not take into consideration the unique challenges sign languages present.
6. It will seem odd to some to speak of the "phonetics" of a sign language, but this is established usage (e.g., Tyrone 2002), referring to the way the parts of the body are used to form signs.
7. Sutton derived SignWriting from her earlier DanceWriting system, created in 1972.
8. Stokoe's system is an exception. "The system of transcription presented here as a tool for analysis may recommend itself to the deaf or hearing user of the language as a way of recording for various purposes this hitherto unwritten language" (Stokoe 1978: 1).
9. In this context, no effort is made to distinguish between the various uses of "writing system," such as "script" or "orthography."
10. Stokoe's system is not as robust as later systems. He limited himself to the study of the handshape, position, and motion of American Sign Language, and as such, only developed a notation system for those aspects. Since that time, other aspects of the language have proven to be of vital importance (Stokoe 1978: 38; Martin 2000: 18).
11. Oral is an awkward term, being based on spoken language biases, though its usage, as applied to the study of "Orality" and "Oral Culture" applies here. Ong's (2002) assertion that sign languages are a substitution for speech — though I would argue they *are*

speech using a visual medium — effectively places Deaf cultures into the same category as other cultures without a tradition of literature. A further unfortunate aspect to the term "orality" is it is also the label for political/educational/social movements that reject sign language, prohibit its use, and force voicing as a means of communication. These are movements which nearly all Deaf have been exposed to and which are often sources of great resentment.

12. One step in this evolution was the direction of writing. Early SignWriting was left to right, top to bottom, following the practice of English. Due to the nature of sign languages, body position on a vertical axis can carry a heavy functional load. In order to show this more accurately, SignWriting is now written in vertical columns, top to bottom, left to right, as seen in Figure 2. Also, as of the date of this paper, the 2004 Sutton's SignSpelling Guidelines is being revised (www.signwriting.org/archive/docs2/sw0145-SignSpelling-2004.pdf).
13. At the time of writing, a new course in SignWriting Handwriting appeared on the official SignWriting Web page, http://www.signwriting.org/lessons/cursive/handwriting/.

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