SYNCWRITER
INTEGRATING VIDEO INTO THE TRANSCRIPTION AND ANALYSIS OF SIGN LANGUAGE

Thomas Hanke and Siegmund Prillwitz

Introduction

Transcription is *the* accepted method for compiling a data basis for empirical language research. The problems connected with transcription are manifold; among them are:

- high expense in time
- comparability
- verifiability
- access to data for analysis purposes

In the field of sign language research, these problems become even more severe:

- The source material is video instead of audio, video quality often is poor in order to avoid irritating lighting conditions.
- In any case, a secondary language is required to transcribe sign language data because of the lack of a written form of sign language. The transcriber must be highly skilled in both the sign language and the secondary language.
- There are no well-established notation conventions comparable to either written oral languages or to phonetic alphabets for oral languages (e.g., IPA).
  - Notation systems require an extremely high effort in time: A survey on Sign Language Linguistics List in June 1994 resulted in quoted ratios anywhere from 1:10 to 1:120 (i.e. two hours transcription time needed for one minute of video), largely depending on the notation used. The lack of standards in notation systems and the variety of systems in use turn out to be a big obstacle for the validation as well as evaluation of transcribed data.[1]

> – Glosses, on the other hand, take less time to write, but they are considered to be coarse and to have a highly interpretative character. Furthermore, glosses mean a shift in language already to describe the form: The more detailed you want the glosses to be, the more linguistic instinct for the written oral language is required.[2]

This is the situation which made us decide to provide tool support for the transcription process by means of a computer program. The main goals have been:

- Direct integration of video

  Binding the video and the transcription together not only makes the final results much more transparent, but also facilitates the segmentation and transcription process. From the technical point of view, it accelerates the process and cuts down costs by avoiding all the hassle in working with a VCR (playing back and forth, back and forth, etc.).

  Moreover, video integration allows "partial work": If needed, you can concentrate on just a few aspects in your transcription – only those needed for your analysis. The direct link between the transcription document and the original video material provides a skeleton which allows you to always find the necessary context.

- Ease of correction

  As you all know, in conventional techniques (which include text processing on a computer) it may take hours just to apply a small change in an almost-ready transcription. Unfortunately, transcription work to a large degree consists of refining and revising. The computer, not the user, should take care of how to rearrange the transcription layout after applying changes.

- Full access to data

  The user should not be restricted to a necessarily limited set of analysis functions provided by the programmer, but s/he should rather be able to search for exmplex configurations, to automatically manipulate data, and to interact with other programs.

  The result of this effort is syncWRITER 2.[3]

---

1.   For a recent overview, see Miller (1994).
2.   A detailed discussion of advantages and disadvantages can be found in Johnston (1991).
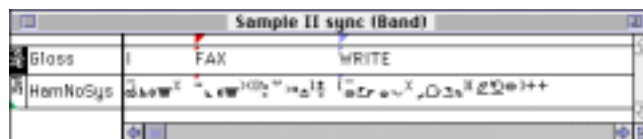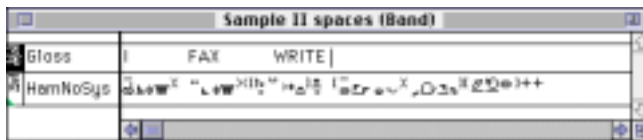
Editing with syncWRITER

The most important feature setting syncWRITER apart from ordinary text editors is to allow the user to define synchronicity between text parts. This synchronicity is from then on automatically maintained.

Comparable to music scores, there are several tracks where text can be entered. Segments in different tracks defined to occur at the same time are aligned to the same horizontal position. However, tracks are potentially endless in length: There is no paper width limit.
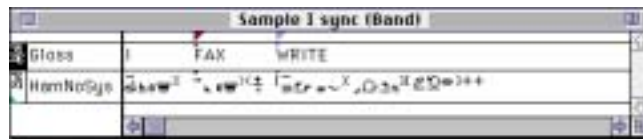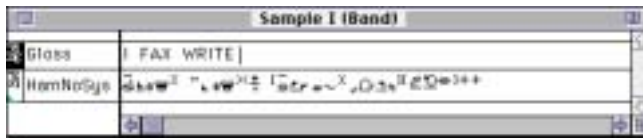
Figures 1 and 2:
Two tracks with three words each, before and after synchronisation.

Figures 3 and 4

3. syncWRITER is a joint project between the Center for German Sign Language and med-i-bit GmbH. The main author of syncWRITER is Eric Walter from med-i-bit GmbH.

Figure 5

Figures 3 to 5: *In conventional techniques, you could achieve the same result by adding spaces (fig. 3), but that makes things difficult to change. If you change text (here the second word in the second track is refined), alignment gets lost (fig. 4). With synchronisation, on the other hand, alignment is automatically preserved (fig. 5).*

The number of tracks in a document is determined by the user and can be changed at any time. You are free to use text formatting options such as font, style, size, and color either to make things clearer or as part of your coding conventions.

Figure 6:
Multi-line transcription.

In the example shown[4] we use a three-line gloss transcription[5] as well as one line for notating the form of the signs, using HamNoSys – the Hamburg Notation System for Signs that has been in development at our institute over the past years.[6] You are completely free in what to use the tracks for. One might want to add tracks for translation into a given spoken language, comments, grammatical analysis, etc.

So far you have seen how syncWRITER enables you to set up

4.   This example is taken from the transcription of an interview that has been recorded in 1993 as part of a research project by Jens Heßmann. The interviewee is Matthias Mauersberger. We thank both for allowing us to use this material for demonstration purposes.
5.   We use the conventions from Prillwitz/Wudtke (1988/1990, 379).
6.   In addition to the definition of version 2 in Prillwitz et al. (1989, 46), a delta guide describing the changes in version 3 is in preparation, cf. Hanke.

multi-line transcriptions and how it helps in editing these structures. What now really makes syncWRITER a valuable tool in the sign language domain is the integration of digitized video into the document.

As you can add text (or picture) tracks, you can choose to add movie tracks to your document. Directly in the program you can open the movie in its own window and play it back, in full motion or frame-by-frame, forward and backward, single-step and pause, repeat it as often as needed – without doing any harm to your valuable video equipment.

For difficult-to-analyse passages, syncWRITER offers a loop function for just the segments in question to be viewed over and over again – possibly at reduced speed.[7] The next step then is to segment the video, usually into sentences or signs. This is done directly from the movie window while you are viewing the video. In the movie track, each segment is represented by a thumbnail which is automatically created in the segmentation process. Clicking on a thumbnail opens the play-back window showing only that specific segment.

Now, with the video segmented, you synchronize the thumbnails with transcription text as you enter it. Even with the video clips attached, synchronicity is maintained over all editing operations.

Figure 7:
A thumbnail and its movie window.

---

7.   syncWRITER uses QuickTime™ by Apple Computer, Inc.

Figure 8:
A transcription sample with text and video synchronized.

Output from syncWRITER

The endless tracks in the tape format discussed so far are handy for editing. When it comes to printing or if you want to integrate part of your transcription work into a paper, syncWRITER produces a score-like format, filling lines as far as possible. There are various layout options available, like where to put border lines, whether to suppress empty lines, whether to number blocks, etc.
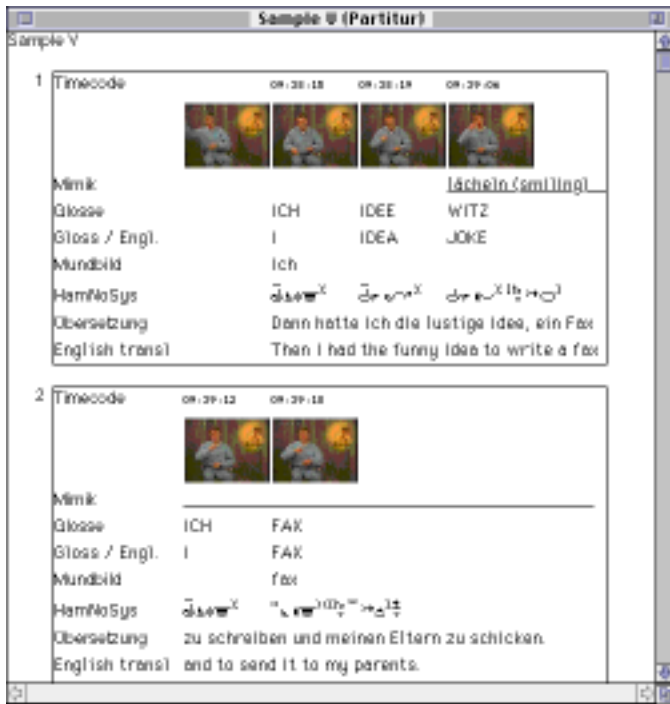
Figure 9:

The score format for printing etc., with borders around each block as well as block numbers.

If you happen to detect a problem in your transcription while viewing the score: Simply click onto that particular point, and you are back in the tape format at just the position in question.

Data Analysis with syncWRITER

In many cases, transcriptions are considered more a data grave than a valuable data source. syncWRITER has been designed to allow full access to the interlinear structure from within the program or even from other programs.

One example is a search agent that shows the next two-handed sign in the document. The interesting point about this is that syncWRITER does not know anything about neither signs in general nor two-handed

signs in particular. Instead, the search agent[8] looks through the HamNoSys tracks (considering HamNoSys to be a standard font). If you are familiar with HamNoSys you probably know that in order to find two-handed signs you cannot simply look for a certain character, but you have to look for a couple of different patterns.

In the same way you can construct search agents as complex as "What is the average length of wh-questions in this sign language text?", "Find the next one-handed sign that took more than 1.5 seconds to produce!" or "Find signs with circle movements and the mouth pattern 'open mouth, teeth revealed', but only if they occur in questions!"

Commanding other Programs and Devices from within syncWRITER

With the same scripting mechanism used to command syncWRITER for analysis purposes, syncWRITER can control other programs to do any job, to work on data provided or to provide data. E.g. you might want to build up a database of signs with their associated mouth patterns. You could easily do this with the combination of syncWRITER and a popular database program. Another interesting example is to attach buttons to the syncWRITER documents (in a fourth type of track, the "script track") to command the VCR just to play a single sign, i. e. to fast-forward (or rewind) to the starting position, then to play the time required for the sign, and to stop finally. This allows you to digitize video material in lower resolution because then it is easy to precisely consult the analog video if in doubt about some details.[9]

Status and Perspectives

While version 1 of syncWRITER, released in 1990, featuring text-only synchronisation, turned out to be a highly valuable tool for "transcription professionals"[10], it did not attract others to (re-) consider working with transcriptions.[11] That has changed with the integration of video. Since the first beta version of the program became available, we have already taught two classes "Introduction to Transcription Techniques" by using syncWRITER instead of paper & pencil.

Students learn to carry out transcriptions on their own or as members of a team, following notational conventions agreed upon beforehand.

---

8. A scripting language program.
9. You need a VCR with a serial interface to achieve this solution.
10. cf. Rehbein et al. (1993, 135)
11. For a discussion of version 1 cf. Papaspyrou/Zienert (1991).

They all experience the typical pitfalls both in technical aspects and in transcription methodology. Using syncWRITER leaves time to get (relatively short) transcriptions ready and to work with them, better motivating students because they experience what can be done with the results of their expenditures both in time and work.

These introductory courses are the basis for study papers in phase II seminars, where students produce transcriptions for their analysis approaches. Of course, technical support is provided for video digitization as well as for the construction of complex search agents.

For international cooperation in research, we hope to provide a common basis to work with and to build upon which is flexible enough to meet any special requirements or preferences.

References

Hanke, T./Meyenn, A.v./Zienert, R. (forthcoming): HamNoSys Version 3. Zentrum für Deutsche Gebärdensprache. Arbeitspapiere.

Johnston, T. (1991): Transcription and glossing of sign language texts: Examples from AUSLAN (Australian Sign Language). *International Journal of Sign Linguistics* 1, 3-28.

Miller, C. (1994): A note on notation. *Signpost* 3, 191-202.

Papaspyrou, C./Zienert, H. (1991): The syncWRITER Computer Programme. In: Prillwitz, S./Vollhaber, T. (eds.): *Sign language research and application*. Proceedings of the International Congress on Sign Language Research and Application, March 23-25, 1990 in Hamburg, 275-294. Hamburg: Signum.

Prillwitz, S./Leven, R./Zienert, H./Hanke, T./Henning, J. (1989): *HamNoSys. Version 2.0;* Hamburg Notation System for Sign Languages. An introductory guide. Hamburg: Signum.

Prillwitz, S./Wudtke, H. (1988/1990): *Gebärden in der vorschulischen Erziehung gehörloser Kinder.* Zehn Fallstudien zur kommunikativ-sprachlichen Entwicklung gehörloser Kinder bis zum Einschulungsalter. Hamburg: Verlag hörgeschädigte kinder/Signum.

Rehbein, J./Grießhaber, W. /Löning, P./Hartung, M. /Bührig, K. (1993): Manual für das computergestützte Transkribieren mit dem Programm SyncWRITER nach dem Verfahren der Halbinterpretativen Arbeitstranskription (HIAT). Unpublished manuscript.