COMTRANS: A MULTIMEDIA TOOL FOR SCIENTIFIC TRANSCRIPTION AND ANALYSIS OF COMMUNICATION

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ABSTRACT

In the process of communication analysis choosing the appropriate system for transcription is an important methodological preselection, because this choice will determine the selection of those elements which will be documented in the transcript and thus be available for analysis. To improve and simplify the reconstruction of the communicative event, we proceeded from the description of the methodological basis for interpretation of communication and developed ComTrans. A Communication Transcription System. ComTrans is a multimedia transcription software which not only allows the arrangement into a clear and easy form of what, how and when something is communicated directly onto the computer monitor whilst viewing the digitalized videotape on it. With the help of a repertoire of appropriate symbols and their operational definitions, it also supports various options of quantitative analysis tools. Through integrating an objective time line according to which all communicative elements (speech, gesture, gaze etc.) are arranged and connected, it is possible to locate these elements precise and to synchronize video frame and transcript. For the future, ComTrans can go a long way towards communication analysis. For practical and for theoretical reasons it may help to understand temporality and inner complexity of communicational processes which might also have a strong reflective impact on future communication theory itself.

1. SCIENTIFIC ANALYSIS OF FACE-TO-FACE COMMUNICATION AND THE PROBLEM OF TRANSCRIPTION.

The analysis of communicative interaction is the focus of interest of many different disciplines, not only in communication science, but also in psychology, sociology, linguistics, ethnography and even film analysis. They all examine communicative interaction in different ways, using different methods resulting from different aims. But whatever the scientific findings or perspectives, we have to proceed from the fact that communicative interaction is a *social event* between at least two persons acting in *time* and *space*, attempting to influence each other and to coordinate their actions by both verbal and non-verbal means. If we want to discover what happens between interactors, we will have to take into account more than just verbal elements and include such non-verbal phenomena as gaze, gesture, body orientation or paralinguistic phenomena–and within their respective contexts and associations. Just the study of such a whole communicative event with its complexity can yield substantial results but also leads to certain difficulties in the scientific analysis of communication.

For scientific analysis of communicative interaction, it is important to establish the data on which the analysis is based. Firstly, we have to fix the transitory process of communication we wish to examine by audio and/or videotaping. The second step is the notation of the recorded audio or video material into a *transcript*, i.e. creating a document of the examined communicative event. During this process of transcription it is important to be aware of the essential incompleteness of any empirical description (Waismann 1968: 42) as well as the fact that the more complex the recorded event, the more reduction is occurring. To summarize, we have to consider two stages of reduction of the original event: first, the selection and reduction caused by the method of recording and its perspectivity; second, the selection by the transcriptor during transcription. This leads us to the observation that "...there is not, and cannot be, a 'neutral' transcription system" (Psathas/Anderson 75). Nevertheless, it is important to point out that the aim of a transcription must be to achieve the best possible representation of the actual examined *communicative*

event–rather than the audio or video recording, which is only a document of the actual event (Ingenhoff 1998: 145; Ingenhoff/Schmitz 148 ff.)–and means attempting to exclude premature interpretations (as are found in other transcription systems of Kallmeyer (1988), Ehlich/Rehbein (1994), Henne/Rehbock (1979) etc.) and giving preference to descriptive presentation. Choosing the appropriate system for transcription is therefore an important methodological preselection, because the choice of system will determine the selection of elements to be documented in the transcript and which are then available for analysis. In conclusion, the choice of the transcription system is one of the most important steps in communication analysis and has a major impact on the results of such analysis.

However, it quickly becomes clear that the transcriptor has to cope with many difficulties in presenting the complexity of the communicative event on paper: the great variety of simultaneousness between the different elements and aspects of verbal or non-verbal behavior makes the precise determination of the individual parts of the event particularly complicated. Moreover, we have to find a way to describe complex non-verbal behavior without being interpretative or too descriptive in comparison with the transcription of words spoken simultaneously. Above all, we have to solve the problem of *time alignment* by noting actions that happen at the same time beneath one another, and actions that happen successively, side-by-side. In all, the transcript we require is therefore necessarily both complex and simple: it has to be composed of sequential and/or parallel, simple, easily identifiable, symbols which have to be clear in their markings of categories, while still preserving readability and ease of transcription (MacWhinney 5), and which allow the representation of the different aspects and complex dimensions of the communicative event.

Looking at current transcription systems, two main types are distinguishable: a) traditional transcription systems that are no more than conventions for describing certain communicative phenomena and therefore do not ease the problem of transcribing, and b) recently developed transcription systems as computer software programs. The transcription software developed in the last few years (for example, HIAT-DOS, syncWriter or TranScribe) primarily serve text processing and editing and simplifies the later correction of the transcript while preserving the score-styled presentation of synchronicity. Again, however, none of these programs solve the problem of presenting the objective duration of communicative actions and merely use parts (words, syllables) of utterances in the transcript as points of reference for the notation of start and end points for non-verbal actions. The development of *ComTrans* began here–by integrating the various features and functions discussed above in order to create the very first completely time line-based communication transcription and analysis program.

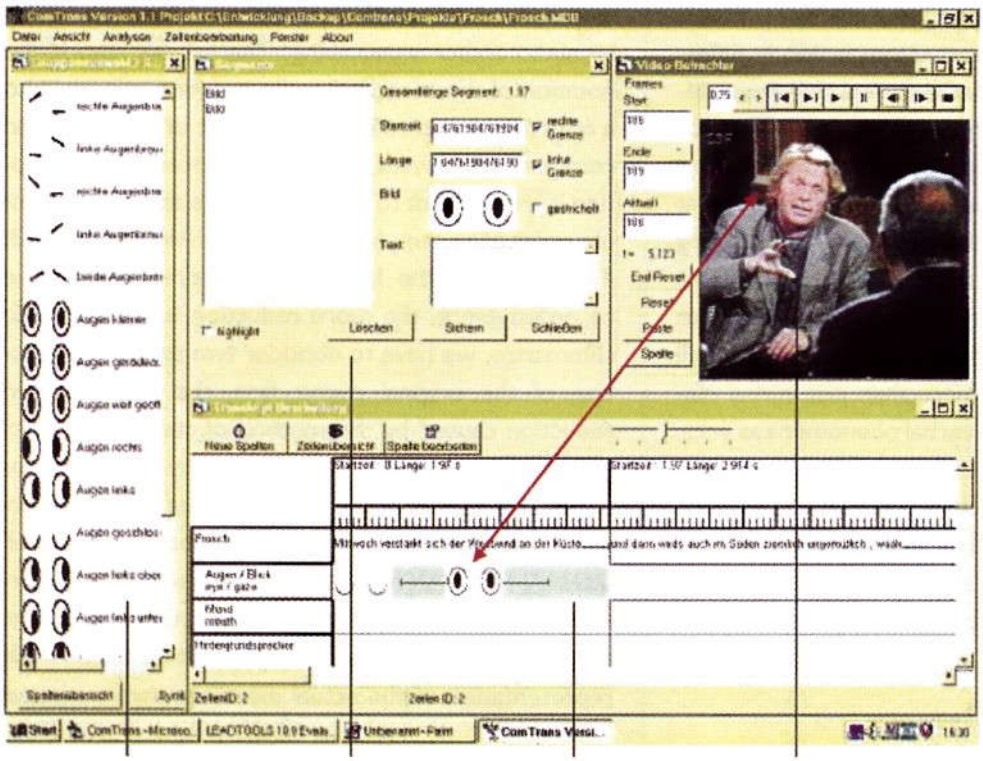

Figure 1: Overview *ComTrans:* Video Viewer, Transcript, Groupselection, Segments

2. THE COMPONENTS AND STRUCTURE OF *COMTRANS.*

ComTrans is multimedia transcription software designed not only for *presenting* and *transcribing* the elements of a communicative event, but also for *locating* communicative elements on the time line by the possibility of frame-by-frame analysis of the digitized videotape. Moreover, many *analyzing tools* are already integrated to facilitate quantitative analysis of speech time, overlaps, occurrences of gestures etc. To give a short impression of the various components and structure of *ComTrans*, we will take a look on it from the process of creating a transcript:

2.1. THE VIDEO VIEWER AND THE CONNECTION TO THE TRANSCRIPT.

At the beginning of a communication research project all important, additional information (such as transcriptor, date, situation description, etc.) is registered in the dialog field "Project Data" and, if available, a video file is interlinked with the project. The integrated video viewer now permits the viewing of and listening to MPEG-1 and AVI-video sequences.

Subsequently, the structure main lines and sub-lines of the transcript is established via the dialog "Line Overview". Here, main lines represent for example the speaker lines, while sub-lines represent the category groups of transcription and analysis allocated to them. Within *ComTrans*, a symbol group (e.g. arm movement) is associated with each of these category groups (e.g. body orientation or gesture), and can then be worked on individually and extended (i.e. group selection).

The frames of the analyzed video sequence are directly connected with the appropriate segment in the transcript by an objective time line, which guarantees a synchronization of video frame and transcript. Depending on the amount of detail to be transcribed per time-unit, it is possible to spread or shrink the segments of the time line. The time line automatically adjusts itself to the type of video analyzed. (i.e. 25 marks representing 25 pictures per second) or can be set manually in case of audio analysis.

In this way it is possible to *both view and transcribe the digitized video simultaneously*, by means of the integrated video viewer and the transcribing of the examined sequence in the "transcript" window beneath it.

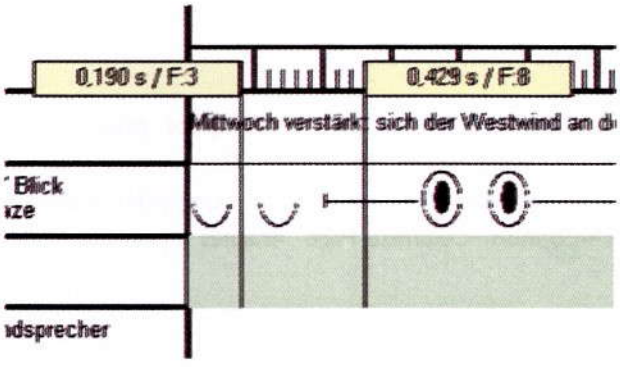

Figure 2. - Time Alignment during Transcribing

2.2 THE CONSTRUCTION OF A TRANSCRIPT DURING THE TRANSCRIPTION PROCESS.

The transcript itself is presented in a table that orients its columns along the above-mentioned time line, i.e. the time code of the analyzed video–representing minutes, seconds and frames–whereby the time structure of the communicative event can be visualized.

The duration of a segment (which may consist of a symbol, a text, or of a video frame copied into it) is determined at the time of inserting the segment into the cell. The graphical representation may well differ from the corresponding time unit, but without losing important data for later analysis, as all data for time positioning of the individual segments is saved in tables in the respective project database.

Moreover, a simple system of symbols has been developed, combining the advantages of easy readability and clarity, in particular for the presentation of non-verbal activities. Within the dialog field "Group selection," these symbols may easily be selected and directly inserted by mouse click into the accurate location in the transcript.

2.3 POSSIBILITIES FOR BESPOKE SYMBOLS IN *COMTRANS.*

The symbols already available in *ComTrans* are represented by Windows-Bitmaps. Each symbol has a description and a graphic representation that are downloaded automatically from the symbol manager when the program is run. *ComTrans* divides the symbols into category groups such as "body positioning", "arm movements", etc.

If required, new symbols or icons, or even new category groups, can easily be created individually and then integrated into *ComTrans*, making the system highly flexible for users.

2.4 THE ANALYSIS INSTRUMENTS INTEGRATED IN *COMTRANS.*

All of the symbols used or created in *ComTrans* can be automatically analyzed by an integrated quantitative analyzing tool, which for example can count groups of symbols per column or show how often, where, when and by whom a communicative element was used. The analyzing tool is also able to calculate how long each speaker has spoken or has used non-verbal activities in total in comparison with the other speakers.

The speaking times are then sorted by speakers, for instance, and the individual times of the text pieces added, and thus grouped together into "cumulative speaking times". Also, speech overlaps between different speakers can be found and summarized by speaker.

2.5 THE PRINT EDITOR.

ComTrans offers the possibility of printing out the transcript using WYSIWYG. The printout may be checked before the actual print using print preview. The option "Optimize Page" enables a printout to be adapted to the selected page, and optimizes the printout. The printout may also be reduced manually and adapted to different formats and settings (e.g. portrait or landscape format).

2.6 CUSTOMIZING VIA CTEOM (*COMTRANS* EXTENSIBLE OBJECT MODEL).

Because of the integration of a plug-in-interface and ActiveX components, *ComTrans* is already modularly extensible (for instance with additional analysis modules). By using this interface, additional programs can be plugged into *ComTrans*. Plug-ins can be created in every COM (Component Object Model, e.g. Visual Basic, C++) capable language. Moreover, *ComTrans* has a multi-user-capability with a central database system, allowing several users access to their projects at the same time. By COM-API, all of the data can also be used in other programs.

2.7 CORPUS ADMINISTRATION.

ComTrans comprises a corpus administration that not only operates on the level of individual files, but is also accessible in accordance with the specific research targets. Corpora, consisting of different or all data files, may thus be identified and grouped together not only by file names, but also by defined attributes entered

in the "Project Data" field. It is planned to extend this option to a full text search of the produced transcript, to enable a corpus of all available transcripts to be easily assembled, in which questions or certain wordings etc. occur.

3. OUTLOOK.

Though work is still in progress, *ComTrans* hadn't been possible without Kristof Berger, Stefan Schulz, Thomas Barth (computer specialists) and Friederike Rave (communication designer) who all deserve many thanks for all their support and help. Next steps in further development will be the enabling of a precise assignment of verbal communication to segments on the time line by integrating an oscillograph for the visual representation of accoustic phenomena, and above all the preparation of a high-end version with MS SQL-Server. Although *ComTrans* was devised for transcription and analysis in communication science, the software has been designed to be so flexible as to be compatible with known transcription systems and thus applicable in the most diverse disciplines and for a wide variety of purposes.

At the very least, the use of *ComTrans* should contribute to a better understanding of the temporality and complexity of the innermost workings of communicative process, and thereby exert some influence on the theory of communication.

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Gestures.

Meaning and Use

EDITED BY: Monica Rector | Isabella Poggi | Nadine Trigo

EDIÇÕES UNIVERSIDADE FERNANDO PESSOA

FUNDAÇÃO FERNANDO PESSOA

Title: **Gestures. Meaning and use**
(Proceedings)

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Editors:
Monica Rector; Isabella Poggi; Nadine Trigo

Cover [image]:
Francisco Gerardo Toledo Ramirez

Edições Universidade Fernando Pessoa
Praça 9 de Abril, 349
4249-004 Porto
www.ufp.pt

Pre-Printing:
Labgráfico – UFP

Offset Printing:
Oficina Gráfica da Universidade Fernando Pessoa

Bound:
Gráficos Reunidos – Porto

Depósito Legal: 192 630/03
ISBN: 972-8184-95-6

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