An interactive video project for second language instruction is described. Using television news broadcasts, the educational software package can also be used for area or media studies. Prototypes have been developed for English and German instruction. The program is designed to support learner comprehension of authentic news broadcasts by encouraging learners to form hypotheses about the program and by activating situational, cultural knowledge (of format, content, or schemata) that may be otherwise unavailable to the second language learner. It exploited the predictability of the text format of news broadcasts. It provides two interconnected approaches to each news program, linear and structural, through which the user can proceed to gain comprehension of news items. The linear path gives a chronological view of the program, is topic- and theme-oriented, and allows for annotation and transcription. The structural view allows the user to select and mark the internal structure of the news item from either a schematic or a formatting perspective. Help facilities in the program that can be activated include dictionaries, background information, a databank of previously annotated material, and help specific to the program package. The software can be used for both linguistic and communicative exercises. (MSE)
TELEVISION NEWS, THE COMPUTER, AND FOREIGN LANGUAGE LEARNING

ULRIKE HANNA MEINHOF
TELEVISION NEWS, THE COMPUTER AND FOREIGN LANGUAGE LEARNING

Ulrike Hanna Meinhof

The last decade has seen an explosion of modern technology in the foreign language classroom. Television screens, video-recorders and an increasing number of micro-computers are for many teachers at schools and universities part of their every-day tools. However, much of this technology is not yet integrated into the curriculum, and its specific potential largely underused and underdeveloped. In foreign language teaching many of the activities engendered by modern technology support poorly or not at all the goals of achieving communicative competence (Hymes, 1972) in a foreign language, still considered to be the essence of foreign language teaching. Much of the potential of both technologies is left unrealized, because of some inherent limitations of both media as pedagogic tools. Taking television news (and, in the European context, specifically Satellite TV) as a paradigm case, the paper will introduce a new interactive video project, still undergoing development, which is building on the pedagogic potentials of video and computer technology whilst avoiding their pitfalls. The "Interactive News" project(1) will be presented as a novel way of introducing learner-centred and learner-directed computer software into the communicative, interculturally oriented foreign language classroom of the future.

TELEVISION NEWS

Television broadcasts, especially satellite TV, are an increasingly significant resource for bringing authentic foreign language material of tropical significance into the classroom. News broadcasts, in particular, offer access to contemporary sociocultural information in an attractive and inexpensive form. However, for a number of reasons, much of this material is often not used effectively.

DIFFICULTIES FOR THE LEARNER

Since learners lack the necessary background information, the items appear contextualized and confusing. At the same time, the visual images on the
screen do not necessarily further linguistic understanding: quite often they hinder the comprehension process by associating different events and schemata with the sound track. To learners struggling with difficult spoken discourse, the pictures can distract or mislead. (2)

DIFFICULTIES FOR THE TEACHER

Using TV broadcasts in the classroom causes additional problems for the teacher because of the time and effort required to select, annotate and recon-textualize the broadcast. TV programmes shown without proper preparation make comprehension difficult, programmes prepared in advance are soon out-of-date, and encourage a teacher-rather than a learner-centred approach.

In this paradoxical situation, computer technology has an outstanding contribution to make, which cannot be matched by any other resource or teaching support. Computers have a unique potential for storing and representing information in a variety of ways suitable to learner needs and selectable by learner choice. In interaction with television, which is a unique resource for up-to-date, culturally encoded, live material from the target culture in the target language, each technology can be used to its utmost advantage, and greatly enhance the learners’ language acquisition and engagement with the target culture. Such interaction can take the form of interactive video programmes.

In this paper I will introduce a prototype of an interactive Video project, still undergoing development, which is based on television news broadcasts. Other prototypes for lectures, science broadcasts and "soap operas" are planned.

News broadcasts were chosen as a starting point not only because of their importance for intercultural learning, but also because the news is more predictable in format and content than many other text forms. This is one of the reasons why comprehension of news stories by computers has received a great deal of attention from researchers in Artificial Intelligence (see for example the FRUMP system for understanding "sketchy scripts": de Jong, 1982; or Winston’s frame systems for specialist news stories such as "disaster events", Winston, 1984).

THE PROJECT: INTERACTIVE NEWS

Interactive Video programs in language learning have the potential to become an essential pedagogic tool if we give careful consideration to the question: "which technology is most suitable for which pedagogic task?" The Interac-
Interactive News (IN) project is being developed on the following premises:

- Television provides the textual resource, which can be selected, adapted, extracted in group work with or without the presence of the teacher.
- The computer provides the tool for interacting with the programmes in a highly flexible way which allows both, a whole range of guided paths through the system's sets of resources as well as open frames and slot-fillers within each chosen path for annotating and analysing the programmes.

The aim of Interactive News is the development of an educational software package applicable to:

- Foreign language teaching (prototypes are currently developed for English and German).
- Area Studies (socio-cultural information about a target culture).
- Media Studies, first and second language learning (news analysis).

1. THE RATIONALE OF INTERACTIVE NEWS

Interactive News differs from existing interactive video developments in three essential ways:

- IN supports video material recorded off-air by the teachers or learners themselves.
- IN is a cognitive support tool for the comprehension of these programmes.
- IN is a generic tool which allows the teacher/learner to build up their own data bank and materials.

1.1 Why Use Off-Air TV?

Interactive Video projects currently available or under development, with the exception of authoring programs, use a pre-fabricated, often purpose-built, video programme as their textual resource. This involves all the shortcomings of manufactured texts, which have been pointed out time and again in the applied linguistics literature (see for example Widdowson, 1979, 1983; Meinhof, 1983, 1985).

Those Interactive Video programs which make use of ordinary linear video cassettes tend to be linked to BBC computers, with their restricted memory.
space, which negatively affects the format and length of interaction which the programs allow the learners to make; in other words the majority of them use multiple choice or very short one-line utterances. (eg, AUTOTUTOR and TELSOFT).

The majority of IV programmes outside the school context use video discs rather than cassettes. These are restricted to pre-fabricated programmes by the nature of the technology itself, although developments of disc-players which can record their own disc are coming forward (WORM machines). Thus, the obvious advantage which disc players bring in the speed and accuracy with which the computer can locate the relevant slots on the programmes is outweighed in an educational context by their disadvantages: the impossibility of tapping material via aerial or satellite dishes and the costs of pressing a disc. There is clearly an enormous potential for interactive video programmes on discs for specific areas, where the information on the disc is of long term interest(3). But for a communicative approach to FLL, the need for learner interactions, the ability to intervene in the programme itself, and not just choose from given options and the exposure to many different and changing texts from the target culture is of paramount importance. These possibilities are secondary or non-existent in current disc-based systems, which would presuppose a need to use the same disc over and over again. Until video-disc players can be used in the same way as video cassette recorders and at a price which schools and universities can afford, IN will accept the relative slowness and inaccuracy of linear video. However, in contrast to authoring systems developed on BBC micro-computers which tend to be very restrictive in their format and not transparent in their programming language, IN provides a much more powerful and extremely flexible system, which teachers and learners can easily adjust and extend to their own needs. Bascó on the easily comprehended programming tool Hypercard for the Apple Macintosh, IN is a system for running and annotating linear videos, which exempts designers and users from having to learn a more difficult and less intuitive programming language such as BASIC.

1.2 Why do we Need a Cognitive Support Tool for Comprehending News Discourse?

IN supports the learner’s comprehension process by encouraging learners to form a hypothesis about the ensuing news programme. IN activates situational knowledge which native speakers possess, but which, in a foreign language and context is unavailable or lies dormant. It thus helps the foreign learner by encouraging and guiding the predictive strategies, which native speakers would employ naturally. Sociosemiotic and cognitive research into the way we comprehend natural discourse has focussed on the complex ways in which native speak-
ers anticipate the discourse they are confronted with. Halliday's description of how speakers activate different kinds of situational knowledge in order to "tune in" to the meanings about to be exchanged (Halliday, 1978: 189) correspond on a general level to the cognitive processes described by psycholinguists and discourse analysts such as van Dijk and Kintsch (1973) and cognitive constructs such as scripts, frames, schemata in Artificial Intelligence. (eg Schank and Abelson, 1977; de Jong, 1982; Winston, 1984). All these concepts attempt to capture the knowledge which native speakers activate in the process of comprehending discourse(4). To briefly give a brief example of such knowledge structures in relation to news broadcasts.

1.2.1 Format knowledge

Native viewers as they switch on a TV news programme, have tacit knowledge about the format of the programme in question. English TV viewers bring specific expectations about Channel 4, ITV, or BBC 9 o'clock news, such as length and overall organisation of the programme. Channel 4 news at 7.00 pm lasts fifty minutes, but is interrupted by adverts; BBC 9 o'clock news lasts 25-30 uninterrupted minutes, if one includes regional news. Obligatory news items such as the weather forecast occur in different positions depending on the channel and whether they form part of regional or national news.

Most news broadcasts start with a preview of key items at the beginning of each programme and end with a summary, but the number and types of items vary. BBC 9 o'clock news previews five items, concentrating usually on the most important political news. ITV News at Ten is interrupted by an advert break and has therefore two previews at the beginning and end of part I. The opening preview tends to cover items from both parts, to arouse curiosity about the second part, and usually includes a human interest story. German SAT previews three items, often including one popular story.

Tacit knowledge of such news formats is not irrelevant. Choosing a particular channel arouses expectations about the format, which affects the native viewers' attention span, the anticipation of numbers of items, and of the length and depth devoted to each of the items.

1.2.2 Content knowledge

Communication, however monologic in form, is always a dialogic process, in the sense that an implied reader or listener is built into the encoding process (Volosinov, 1928/1973). News programmes, unless specifically designed for overseas consumption (eg BBC World Service on radio), are directed to viewers
of a specific culture. As was discussed in Part I of this paper, decisions as to what broadcasters can expect or take for granted as background knowledge are based on the assumed sociocultural knowledge of their assumed audience. Such assumptions affect every detail of news reporting and make the news hard to understand if the assumed shared background is non-existent.

1.2.3 Schematic knowledge

Each news item also triggers schematic knowledge, which guides the comprehension process. Van Dijk and Knitsch (1983) argue that discourse comprehension depends on the activation of different types of schematic knowledge. Hypothesis formation begins with the very first textual clue, but is constantly updated and adjusted as the text unfolds. Initial clues and signals in English and German television news are linguistic and/or pictorial: a spoken headline or title may be accompanied by a picture which symbolically or literally represents the news item, thus encouraging the activation of contextual and textual knowledge. However, these clues also depend on shared knowledge. Headlines (especially in the German Satellite news) are often colloquial in style and highly associative depending on the audience's ability to make inferences from a simultaneously given pictorial clue.

1.2.4 IN supplies various linear and structural views of news broadcasts which directly aim to support the cognitive processes of discourse comprehension for non-native speakers. (see section 2)

1.3 Why do We Need a Generic Tools?

In a communicative approach, the involvement of teachers and learners in building up their own resources is a vital factor. The idea that teachers could also be their own programmers was until recently dependent on the use of available "authoring languages" of a very restricted kind, unless teachers became computer fans willing to struggle with the difficulty of programming languages such as BASIC. This is no longer the case. "Hypertalk", the high-level programming language in which Hypercard is written, provides an easily accessible way of linking parts of texts with other parts of texts. Commands need to be no more than "go to card "x" plus the naming of the card, but more sophisticated commands in the network are equally easy to apply. The transparency of the system allows a totally different approach to the design of educational computer software. IN exploits the potential of Hypertalk by providing a network of interconnected templates, which allow the learners to explore different path through
various news programmes. But at the same time, learners are constantly adding to the program's resources. They can thus adjust the program entirely to their needs. IN is an incremental package which encourages the building up of resources over a numbers of years and generations of students. Therefore every part of the package is easily changeable, testable, adjustable, correctable. This also means that the amount of information available grows according to the specific needs of learners.

2. MODELLING THE NEWS WITH IN

IN exploits the fact that news broadcasts belong to a category of text more fixed in their structure than many other text forms. IN provides a computer model of those aspects of news broadcasts and news stories which are generally occurring, repetitive and therefore predictable. These aspects are written down on interconnected computer note-cards, leaving open the specific, the unsystematic, the particular and the unusual for learners to fill in themselves. Learners can choose various paths through the system which correspond to the TV news programme they have selected to watch. The mechanism for moving around within the package is pre-programmed links accessible through clicking so-called "buttons" with the computer mouse.

There are two interconnected views of each news programme covered by the package, each supported by a range of help facilities. The program encourages cross-referencing within and across the resources of each path and provides the facility for creating a combined view of the linear and structural representations of each news item.

2.1 The Linear Path

The linear path, or as it is called in the package, the "programme overview", gives an on-line, chronological view of the particular news programme. Starting from the introductory sequences, it passes through the various sections of the programme to weather forecast and ending sequence. The linear view is topic and theme oriented, allowing annotations in the form of titles, unstructured notes and total transcripts of text. It includes transcript sheets for describing the film footage in chronological sequence.
The linear view as exemplified in figure 1 can fulfill a variety of functions:

- It gives a first sighting of the programme in a pre-set format. In our example an overview of ITV News at Ten;
- It allows learners to fill in the slots for headlines and other initial textual clues (e.g., ITV/headlines). This way they can familiarize themselves with the selection of items and the overall pattern of the broadcast and to make a record of the total sequence of news items;
- It allows learners to mark the beginning and end of items on the video to make the running of the video-tape controllable by the computer;
- It allows learners to transcribe items wholly or in part as sequences of text;
- It allows learners to transcribe items wholly or in part as sequences of film to encourage the separation of text and film for comprehension and analysis.
2.2 The Structural View

The structural view provides two main branches for selecting and marking the internal structure of each news item: a schematic view described as "pattern" in the package and a "format" view. Both together form a combined structural view of each news item.

Figure 2: The Structural View

2.2.1 The schematic view

The schematic view encourages the learner to think of specific news items as systematic patterns of discourse similar to what are commonly called "schemas", "frames" or "sketchy scripts". Learners are asked to choose from a given catalogue of news schemata, comprising patterns such as "strike", "natural disaster", "elections" and "terrorism". Many of these split into sub-categories. For instance election divides into "election campaign", "election results", "election aftermath"; or "natural disaster" divides into types of disaster such as "earthquake", "flood" etc, (see also Winston's "disaster event", Winston, 1984: 267). All schematic patterns lead to questions which are intended to capture the central information in the text. Figure 3 shows the questions in relation to the "strike"
pattern.

All the existing news schemata of IN and the questions related to them are under review and form the main focus for the ongoing research and evaluation of the package.

**Strike**

<table>
<thead>
<tr>
<th>Who is on strike?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Against whom is the strike directed?</td>
</tr>
<tr>
<td>Why is there a strike?</td>
</tr>
<tr>
<td>Are there effects for the general public?</td>
</tr>
<tr>
<td>What are the potential results?</td>
</tr>
</tbody>
</table>

![Diagram of the Strike Pattern]

**Figure 3: The Strike Pattern**

The function of the schematic view is

- to help gist comprehension of the news items by activating schematic knowledge;
- to direct learners to key points of the news items by asking them questions which elicitate essential information only;
- to allow insights into the variability of the amount of information provided by different news items in the same pattern for the different slots (see below);
- to allow the adding and adapting of news patterns according to new insights into the schemata themselves, or in response to different presentations in a particular news item.
2.2.2 The format view

The format view allows the learners to select the types of presentations used in a specific news item. These are limited in number and relatively invariable. Figure 4 shows the four main types of presentations.

The function of the format view is

- to allow a separation of the linguistic content of an item from its presentation in the studio or on the scene;
- to keep a record of the various formats employed in a news item for later analysis.

2.3 The Combined View

The combined view allows the learners to view each item as made up

- as a linear sequence of text accompanied by a sequence of pictures and
- as a structure of essential pieces of information presented in a particular format.
Together the information contained on the combined cards from the linear and from the structural view can be used for a complete analysis of the news item in question. An example of this is given in section 5 below.

3. FINDING HELP WITH IN

Help facilities of different types can be accessed at relevant parts of the program.

3.1 Dictionaries

Specific dictionary facilities are incorporated relating to different aspects of situational parameters. Some initial lexical items will be supplied with the package but the main emphasis will be on facilitating the building up of a learner- or classroom-specific resource. Like "spelling" facilities available in most word-processing software, dictionaries can be incremented every time a word or idiom occurs which learners or teachers would like to add to one of the dictionaries. More will be said about this under section 4. An important factor is the development of separate specific dictionaries: each dictionary is selective, in that it is organised according to thematic, schematic and other sub-categories. The vocabulary of, for example, the air traffic controller’s strike, would be accessed through different sub-dictionaries such as:

- a thematic dictionary for air-traffic
- a schematic dictionary for strike
- a format dictionary for speech acts (for example: interview-related speech acts).

3.2 Background Information

Background information about location, theme, or participants will be accessible from various points in the program. Just as the dictionaries in the package are an incremental facility with a fixed structure but with little more than just a basic initial content, the background facilities come as patterns to be filled and expanded by the learners themselves. Some information sheets will be supplied with the software. In the case of the German news, this will comprise for example, a map of German speaking countries and some basic sociocultural information such as names of heads of state and of political parties. But the majority of the information in the background facility is to be build up by the
users themselves, exploiting the Hypercard's facilities for adding new cards, stacks or folders to the package.

3.3 A Data Bank of Previous Cards

Equally accessible from different points in the package will be catalogues and records of previously annotated material. Depending on resources, cards can be stored on computer disc alone or can be supplemented by a video-library of the annotated programmes. Key broadcasts can thus be re-shown and re-analyzed. At the very minimum, though, the annotated combined card on each item should be kept as part of the data-bank for future reference.

3.4 Information about the Organisation of IN, and an Explanation of Icons and Meta-Language Employed

Information about the organisation of the package and its metalanguage is not only intended to make the learners' path through the system easy and help them to relocate themselves should they get lost in "hyperspace". It is also essential for making its structure transparent and adjustable by users to their needs. Giving access to the metalanguage is in addition valuable sociosemiotic information about a metalanguage for analysing news. Help cards such as "help: location" will explain that news representation is dependent on the relative closeness or distance of the place of occurrence to encourage the learners to reflect and comment on such effects. Figure 5 shows the card which explains the purpose behind the "format view" of the news item.
4. ANNOTATING THE NEWS WITH IN

4.1 Filling in Slots

IN provides different types of fixed slots for annotation by the learners. Depending on the place in the package, these slots vary in size and in kind. They comprise for example:

- Small fields for filling in headlines and topic markers.
- Scrolling fields for taking down notes or for answering pattern questions.
- Fields for transcribing larger chunks of text or describing the film footage.
- Split cards for juxtaposing different views.
- Various fixed format cards for dictionaries and other help facilities.

All of these are cross-referenced to allow free movement between each level of transcription, extraction, or analysis.

4.2 Indexing and Marking of Text

IN enables the learners to copy any part of the text onto worksheets for further practice (see Section 6 below). Learners can for example:

- index and mark key sequences for closer thematic analysis
- index and mark key structures for closer linguistic analysis, dictionaries and open worksheets
- index and mark key words for dictionaries and open worksheets.

5. ANALYZING THE NEWS WITH IN

By juxtaposition and contrastive arrangement, news items are not only much easier to comprehend, they are also much easier to analyze.

5.1 Juxtaposition of Internal Structures of News Event

Annotated key items appear side by side according to different categorizations. Combined cards, juxtaposing the information from structural and linear paths, allow insights into the way news items are represented as semiotically encoded communication. Although such insights could be arrived at by other
means, they are particularly easy to obtain through the combined cards of IN, which is essential, if analysis is to be conducted in a foreign language. By keeping separate records of the different views of a news item (theme, location, central information, visual presentation and format) their different contributions to the fully encoded news item can be separated out and analyzed. For example, the combined card for the news item "strike by Spanish air traffic controllers" shows the relationship between actors in text and actors in film sequences as follows:

Actors in text: The Spanish air traffic controllers on strike.
Actors in corresponding film sequence: The suffering passengers at Gatwick airport = affected public.
Format: Voice over by newsreader.

This particular strike item was clearly represented through the eyes of the passengers (those affected by the strike), rather than through the eyes of the striking controllers (those who are on strike). This effect is further strengthened by the almost total blank in the pattern question: "Why is there a strike?" That this is not the only way strikes are represented on British news, becomes clear when we compare these results with those of 5.2.

5.2 Juxtaposition of Current and Previous Broadcast

The analysis made possible from combined cards is particularly useful if compared with the results from other news items which belong to the same schematic pattern but to a different geographical or political location.

Within the strike schema, the comparison between the Spanish air traffic controllers' strike and a subsequent strike of Polish steel workers produced the following alternative presentation:

Actors of text: The Polish steel workers on strike.
Actors in corresponding film sequence: Polish steel workers outside the factory gate.
Format: Voice over by newsreader.

This time, the strike is clearly represented through the eyes of the striking workers. The empathy with the strikers is further strengthened by the entries to the pattern question: "Why is there a strike?". Whereas the reasons for the air traffic controllers' strike remain largely obscured behind the reporting of the effect of the strike, here the same question produces a plethora of information about poor living conditions, inflation etc.
It thus becomes obvious to learners

- that the news presentation favoured the cause of the steel workers in Poland, but not those of Spanish air traffic controllers and
- how such an inclination was achieved by the interaction of linguistic, visual and structural means.

5.3 Juxtaposition of Different Representations of the Same News Item

If students have access to different news programmes, IN also enables a contrastive analysis of how the same piece of news can be presented in a variety of different ways. In a recent analysis of an item about Afghanistan, students discovered for themselves how we draw inferences from a combination of picture and text, even though neither makes its meaning explicit. Both news programmes, BBC 1 and the German Sat 1, showed the identical footage but accompanied the pictures with different text.

The pictures from Kabul first showed a water-carrier followed by a picture of a cyclist carrying a canister on the rack of his bike. The German news accompanied these pictures with a text about the food shortage in Kabul, stressing the threatening collapse of the city. The English news spoke of a petrol shortage. It became clear that the viewers of the German news saw the canister as containing water, thus adding to the sense of despair which the local population was said to feel. Viewers of the English news, however, put petrol into the canister. An unfortunate shortage, but not of the same distressing nature. Of course, neither of these interpretations were verifiable, nor were they particularly relevant to the situation described. But the emotional appeal of the news item was significantly influenced by correlations such as these.

Such conscious insights in the construction of news programmes and their usually unconscious effect on viewers are an important educational achievement in our native language and native culture. Developments in mother tongue and literacy teaching are increasingly taking account of the needs of native speakers to learn how to decode socially encoded meanings and not just to decipher graphic symbols. To be able to conduct such analysis even in a foreign language and across cultures is therefore a highly significant contribution to a general learning process about media communication and a vital pre-requisite for coping intelligently with the global expansion of satellite TV.
6. PRACTICING THE NEWS WITH IN

6.1. Linguistic Exercises

Because IN enables learners and teachers to mark, index and copy any number of lexical items appearing anywhere in the package, the construction of follow-up activities using the same or similar items in a different context becomes very easy. IN will include a variety of worksheet templates with pre-set structures for different kinds of exercises which can be filled with the linguistic items from the annotated programmes. Some of these follow-up activities will be similar to the kind of exercises developed on conventional CALL programs, ie cloze exercises, reformulations, true/false questions etc. But because the words and structures relate to the original TV news item, they are much more contextualized than would normally be the case.

6.2 Communicative Exercises

Since IN provides linear and structural views of existing news programmes, these templates can be used by learners to rewrite, invent and produce a news programme. Such projects are ideal for group work because of the many different tasks engendered by the work. The following are only a selection of many possible types of project work on the basis of IN:

- Re-writing a broadcast so that its emphasis and perspective changes would, for example, imply a change in the amount of information given as an answer to pattern questions or a change in the format.
- Inventing a news programme would simply require the filling of the existing slots with imagined events.
- Producing a news broadcast (with or without a video-camera) could entail the composition of a full linear text by the group, together with directions about format and film footage. Such composition is made easy by the transcript sheets which align the text with its mode of presentation. But the linear text could equally well be produced spontaneously, on the basis of the structural cards alone. The different roles which learners could play as news presenters, interviewers, interviewees stimulate a whole range of communicative interactions.
SUMMARY

Interactive News is a new support facility currently being developed on the basis of Hypercard on an Apple Macintosh SE. It combines the facilities of a cognitive support tool for comprehending off-air TV news programmes with a system for annotating these programmes and for building up a resource bank of linguistic and cultural data. It comprises prototypes of linear and structural views for a range of existing news broadcasts, a set of help facilities and a network for generating further facilities by the users themselves. Working with IN will replace passive viewing with an active, problem-solving approach to the comprehension of television news.

FOOTNOTES

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2 The relationship between the pictures and the text of news broadcasts is very complex and cannot be discussed here. But see Meinhof, forthcoming, "Double-talk in news broadcasts: a cross-cultural comparison of pictures and texts in television news".

3 For example, visual reference libraries, views of the human body for medical research, environmental studies etc. See, for example, the "University of London Video-Disc Library of Anatomy" developed by the Audiovisual Centre of the University of London (Clark, 1987).

4 See also patterns of interaction ("formats") between small children and parents which enable early language learning (Bruner, 1983) and their application in Ward's programs. (Ward, 1988).

5 The group of students referred to are undergraduates at Sussex University with either an O- or an A-level knowledge of German.

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