UNIVERSITY OF JYVÄSKYLÄ

TASK-INTEGRATED PAIR-READING: A STUDY OF FUNCTIONAL LITERACY IN A FOREIGN LANGUAGE

A Licentiate Thesis

by

Esko Johnson

Department of English 1997

ABSTRACT

Esko Johnson

TASK-INTEGRATED PAIR-READING: A STUDY OF FUNCTIONAL LITERACY IN A FOREIGN LANGUAGE

This study is a case study of functional reading (reading-to-do) in a foreign language. It explored the ways in which pairs of foreign language learners processed manual text in a "naturalistic," task-integrated setting, such installing a PC peripheral or setting the clock and timer of a video cassette recorder with the help of the manufacturer's manual. The aim of the study was to gain understanding about functional foreign-language reading, as constrained by task, situation and dyadic interaction. Fourteen sessions were audio and video recorded, and ten of these were analysed in detail. In each research session, the pair completed two tasks from a choice of several tasks. The combination of research techniques comprised protocol analysis of verbal and non-verbal interaction, questionnaires completed by the participants, and an individual interview of each participant after the reading session. A word that best describes the research findigs is variation. Session durations varied from 9 min. to 1 hr. 20 min., and the accumulation of long pauses could be anything from 5% to 52% of session interaction. Strategies of text access varied from step-by-step microprocessing to very casual top-down reading. Pair participation ranged from parallel individual sub-tasking to collaborative problem-solving and co-construction of textual meaning. Procedural and declarative knowledge, either instantiated individually or negotiated by the pair, had a crucial role for completing the task and accessing the manual text.

Keywords: foreign-language reading, functional literacy, pair-reading, task-integrated reading, interaction, collaboration

CONTENTS

ACKNOWLEDGEMENTS

This work has been a transition, a travel. It has been a transition from educational idealism, notions of development and of improvement to a wider understanding of language processing. For me the project has meant the kind of professional empowerment I went on seeking so long.

I would like to thank my supervisor Professor Kari Sajavaara and faculty at the English Department, University of Jyväskylä for their support, creative ideas and generous advice. Discussions with members of staff at other universities and research institutions were also very rewarding. I would like to thank Ari Huhta, Sanna Järvelä, Leena Kuure, Ian McLeod, Heikki Nyyssönen, Risto Pilto, Sauli Takala, and Helena Valtanen for help that was indispensable on my travel from research ideas to data acquisition, from data analysis to writing-up.

Anna-Liisa Leino (Department of Education, Univ. of Helsinki) authorised me to use the Finnish translation of Richard Rancourt's Knowledge Accessing Mode Inventory, for which I am grateful. For financial support I would like to thank the Finnish Cultural Fond (Suomen kulttuurirahasto) and the Foundation of Kokkola Institute of Technology (Kokkolan teknillisen oppilaitoksen kannatusyhdistys). Two companies, Keski-Pohjanmaan Röntgen and Keski-Pohjanmaan Datahuolto generously helped me by lending technical equipment for documentation.

Finally, I would like to thank my wife Seija and my daughters Nina, Mari, Katja, and Anne. Without their unending tolerance and support I could not have completed the study.

People learn to read, write, speak and listen *in certain ways* and they do this by serving *apprenticeships* in social settings where people characteristically read, write, speak and listen in these ways (Gee 1990:174).

INTRODUCTION

What is reading? When answering this question, reading research goes in trends and tides. Sometimes research tries to be "practical" and overlooks the ontological question, ie., fails to *ask what there is in the world of reading.* Modifying Carnap's ontological theory (as quoted by Niiniluoto 1990:21) we could distinguish between three types of objects:

(a) *Physical objects,* which always have a place, time, size, quality; as to reading research: a page of a book, an article; the layout, typography and length of text, etc.;

(b) *Psychological objects*: subject-dependent acts of consciousness such as observations, affects, thoughts, as well as unconscious acts (eg., automated skills). Reading research covers this category when looking into reading styles and strategies, learning from text, etc.;

(c) *Cultural-social objects*: historical and sociological phenomena such as customs and traditions that are time-dependent and culture-bound, but need not necessarily become actualised. For reading research, this category involves issues that relate, for example, to reading stance, negotiation of meaning, contextualised reading (situated reading), and the problems of literacy.

It seems that recent L2 reading research is biased towards "finding the answers" in psychological objects. The challenge of the present study will be looking for a balance, and covering, if necessary, both (a), (b), and (c) in the research design.

The text and the eye do not make reading, the road and the vehicle do not constitute travel. Reading takes a reader, a text, and a context. Much of

our every-day reading is, in fact, heavily contextualised. A good example of this would be when you install a new piece of home electronics, and try to follow the instructions of the manual you find in the package. Here the context of "real world" takes up a lot of your cognitive capacity, demanding this to serve the cognitive links and sub-processes that are required for a successful task-integrated reading, or briefly, reading-to-do. Obviously, some of us would tend to reduce reading-to-do down to problem-solving, not "real" reading, presuming that there is something called "pure" reading.

In needs analysis studies (eg. Väänänen 1992), engineers employed with manufacturing industries report that they read technical instructions and manuals in a foreign language on a day-to-day or weekly basis. To meet this need, institutions that provide technical education try to teach their students how to gain reading skills of this genre; at least, this has for decades been included in the EFL syllabi of the institutions. However, not very much is known about the context of "real-life" manual reading - how the language and the task are processed, and what factors come into play in the context.

The aim of this study is to investigate how Finnish engineering students access technical instructions, in a functional reading, or reading-to-do, situation, where they are required to act upon the authentic operating instructions they read. Another objective of this study is to find out about the crucial elements of such task-integrated reading events.

2. THEORETICAL BACKGROUND

2.1 Models of the reading process

There is an abundance of approaches to both L1 and L2 reading. Numerous theories of reading account for what takes place in the complex activity of reading. I will not try to cover all of these, but present a selection reading models, i.e. conceptualised representations of the theorised reading process that seem to offer some understanding of the kind of task-integrated reading at issue. Next, I will address some basic assumptions about task-integrated reading in L2. I will then present a number of related studies. Finally, I will discuss the requirements of a model for task-integrated pair-reading in EFL, in the light of these models and studies.

The domain of reading research, which intersects disciplines such as psychology, linguistics, and pedagogy, has no unified theory of reading (a master theory of reading). Instead, all reading theories seem to emphasise a special aspect of the reading process and, doing so, contribute to much confusion, rather than to an integrated understanding of reading (cf. Bernhardt 1991b:5-11). However, the lack of a unified theory is not to be understood as a weakness in reading research, or any other research domain. On the contrary, the gaps within and between various approaches are to be seen as a positive driving force that makes both research and practice evolve.

In their review of current reading models, Samuels and Kamil (1984) discuss the problems of model evaluation. Drawing on the past history of reading research, they find that each model is "a product of its time". The scholar who develops the model has only a limited knowledge base to exploit, and this knowledge is unavoidably influenced by "scientific philosophies and studies dominant in the historical context in which the model was developed". Another problem seems to be the fact that each researcher who describes the process of

reading is influenced by the information accumulated during experiments. The experimental information, in turn, is influenced by a number of interacting factors, which are often overlooked, namely, the age and skill of the subjects, the tasks which the subjects perform, the materials used, and the institutional context, etc.

More importantly, Samuels and Kamil (1984) also analyse the functions of a good reading model. They come upon three essential characteristics of a good model of the reading process: "(a) It can summarise the past, (b) it can help us to understand the present, and (c) it can predict the future." Models of the solar system showed the planet Earth as its centre, but scholars like Copernicus and, a century later, Galileo were able to destroy the old model that showed the centrality of the Earth in the solar system.

> Consequently it is important that we test our models in order to eliminate the invalid one and to retain the ones which deserve to be saved but may be in need of tuning. Thus, an absolutely critical characteristic of a good model is that it be precise enough to lead to testable hypotheses. It is only through the process of testing a model that we are able to determine its validity. (Samuels and Kamil 1984:192.)

Classifying models of the reading process is problematic. A straightforward way of classifying these approaches would be according to whether these want to postulate that (a) the text contains the meaning, (b) the writer has the meaning, (c) the reader has the meaning, or, (d) the meaning of the text is generated in interaction between the text and the reader(s). In line with these we would have *text-based*, *writer-based*, *reader-based*, and *interactive models* of reading; for a discussion of reading models, see eg. Leppänen (1993:49). As Samuels and Kamil (1984) point out, we should really look into questions of generalisability, but also keep in mind the framework of this study, ie. contextualised and situation-specific aspects of reading.

There is also the important question whether reading in L2 (second or foreign language), is crucially different form reading in L1, and therefore requires an L2 reading model. Theory in L2 literacy is very limited (see Bernhardt 1991a), and it is commonly thought that most L1 reading models are applicable in L2 reading. I will discuss the question of L2 reading theory in a later section.

In the following sections, I will look into Kenneth Goodman's model of reading, widely known for identifying reading as a psycholinguistic guessing game. Another commonly cited model within second/foreign language reading research, Kintsch and van Dijk's discourse processing model, will be presented after this (cf. Bernhardt 1991b:21-25). Next, I will see if Sadoski and Paivio's dual coding theory might bring us some insights on the non-linguistic elements in the reading process. Finally, I will discuss the representational (cognitive) aspects of reading.

2.1.1 Goodman´s "guessing game model": surface processing of discourse

Almost three decades ago Goodman presented his reader-based model, which is even today valued as a powerful tool for understanding what basically takes place during reading. The model is a striking antithesis of the then current notion of reading as a precise process that involved an "... exact, detailed, sequential perception and identification of letters, words, spelling patterns and large language units..." (Goodman 1967). After conducting studies of miscues in reading, Goodman concluded that reading is a selective process:

> Reading is a psycholinguistic guessing game. It involves an interaction between thought and language. Efficient reading does not result from precise perception and identification of all elements, but from skill in selecting the fewest, most productive cues necessary to produce guesses which are right the first time. The ability to anticipate that which has not been seen, of course, is vital in reading, just as the ability to anticipate what has not yet been heard is in vital in listening. (Goodman 1967.)

It is noteworthy that Goodman chooses to call reading a psycholinguistic process, stressing the non-sequential, selective and predictive/anticipatory properties of reading. With references to empirical studies of reading, Goodman emphasises that the reader draws on the sequential constraints and redundancy of written language.

Goodman presents a step-by-step model of reading. The steps describe the reading process, all the way from scanning to something he calls meaning assimilation. Goodman concludes with a statement that "throughout the process there is constant use of long- and short-term memory". The description emphasises the semantic cues, and the graphophonic and graphophonemic (letter-to-sound and letter-to-phoneme) links in reading (cf. Leppänen 1993:69-70, Pearson and Stephens 1994/1992:27-30). No contextual or situational links are discussed.

Some critical remarks are to be made here. Goodman does not offer direct empirical evidence to verify the model. However, excerpts of miscue protocol are presented, alongside with some descriptive discussion. Second, if it is assumed that the reader typically acts in a highly selective and non-sequential, or, heuristic, manner, it is doubtful that this could take place in as many as ten consecutive steps--a number of these also having optional sub-steps--without any links to a cognitive (control) mechanism or executive principle. Also, assuming that the reading steps are to constitute a processing cycle, where does the cycle start, what makes the cycle stop; where is the theoretical framework of the cycle? It could hardly be the self-regulating mechanics of a scanning eye that starts, directs and ends the hypothesised processing cycle. Finally, admitting that the steps do not "necessarily take place in the sequence presented," Goodman does not, however, propose any principle to explain possible skips or deviations from, and re-organisation of the steps. One would expect that Goodman´s reader, possessing a competence of psycholinguistic guesswork, would need to modify his or her processing steps, according to

personal, contextual, and situational constraints. In other words, the Goodman reading model fails to lead to testable hypotheses, and therefore does not fulfil Samuels and Kamil's requirement, discussed in the previous section.

Almost three decades later, assessing the impact of his "model and theory of reading", Goodman talks about a Copernican revolution. According to him, we have moved "away from a view of the reader as passive and the text as controlling the reader. The reader is now seen as an active user of language" (Goodman 1994:1094). The contention is, undoubtedly, in line with the great general impact of Goodman's model and its revisions especially on reading instruction. (Barnett 1989:19-20, Samuels and Kamil 1984:187).

Such a popular, straightforward model with its educational implications has also been a target of criticism. For a summary of the critique, see Dechant (1993:175-199).

Goodman's model of the reading process has been very influential on reading research in a second/foreign language (Bernhardt 1991b:22, Grabe 1991, Eskey 1988:93, Carrell 1988a:3). In her survey of L2 reading research literature, Bernhardt reports that Goodman´s psycholinguistic model, along with Smith's similar reader-based model, was the conceptual framework of most L2 reading from 1977 to 1988 (Bernhardt 1991b:22).

Bernhardt finds it remarkable that these two similar L1 reading models, in fact, were cited in as many as 66% of the L2 reading research articles she examined. She concludes that this dominance was "somewhat disturbing", as these were not the leading models of L1 reading research during the period, and suggests that there is "a lack of awareness and perception of the capabilities" of other models.

On the other hand, there are others like Carrell who see the Goodman model well-integrated into of the notion of "top-down processing" (Carrell 1988a:3).

As expected, Goodman's 1967 model has gone through modifications, which will not be discussed here in detail. His latest model, which he calls a "transactional sociopsycholinguistic model of reading" (Goodman 1994:1093-1130), seems to share the vague qualities as the 1967 model. What comes added is more pickles on the smorgasbord; Goodman draws heavily on the work of Halliday, Hasan, and Rosenblatt, and extends the model to include schema theory with cognitive strategies.

To sum up, Goodman´s still influential model of reading is a descriptive, and sketchy, account of what goes on during the reading process. The model helped reject the contemporary view of reading as a precise, sequential (left-to-right) decoding process; it helped create scope for alternative views. There is a linkage from Goodman´s popular model to the numerous L2 reading strategy studies conducted a decade or two later. The model's major weaknesses - the empirically unconfirmed and untested construct of the cycle of reading, and the way the model fails to explain facets of reading that go beyond processing mechanics - were obviously not seen as serious limitations at the time. After three decades of overemphasising one model over the others, we should consider what up-to-date reading research could offer for the study of reading in a foreign language (cf. Paran 1996).

2.2 Interactive models of reading

Models of the reading process commonly known as interactive comprise a variety of approaches. From the 1970s onwards, most reading research and pedagogy seems to find its theoretical framework in interactive models (Pearson and Stephen 1994/1992).

The term *interactive* can have multiple meanings. It can refer to the inter-action between the reader and the text, as the reader constructs a meaning of the

text, by utilising information that is available in the text and by drawing upon his or her prior world knowledge. A second interpretation of the term relates to the interaction of various hypothesised higher-level (non-automatic comprehension) and lower-level (automatic identification) skills of language processing. (Grabe 1991; cf. Leppänen 1993:85.)

2.2.1 Kintsch and van Dijk's discourse processing model

The roots of Kintsch and van Dijk's model (Kintsch and van Dijk 1978), with its subsequent revisions (van Dijk and Kintsch 1983, Kintsch 1988), are in text linguistics and schema theory of cognitive psychology. As all models that focus on knowledge structures of language processing, the model deals with comprehension. More specifically, Kintsch and van Dijk explain the generation of inferences, and describe what the reader remembers after reading. The following is a brief account of the Kintsch and van Dijk model; for a detailed model, the reader is advised to refer to Kintsch and van Dijk (1978), van Dijk and Kintsch (1983), and Kintsch (1988).

The Kintsch and van Dijk model starts from a given text, "a conceptual structure that represents the meaning of the text" and a characterisation of the reader "in terms of goals and purposes." The model does not deal with the lexical structure of the text, nor with sensory processing. The decoding of the conceptual surface structure takes place through the construction of a sequence of propositions, which is also known as a text base. (Kintsch 1987:8.)

Through several processing steps, which are both serial and parallel, the conceptual propositions of the text are transformed into increasingly abstract representation:

> The first level of processing. . . takes the list of input propositions and constructs from it a coherent whole. Thus, a text is no longer represented as a sequence of meaning elements. . . but as an interrelated, coherent structure. . . The propositions

> of one sentence are decoded and arranged in a coherent whole, and the same is done for the next sentence. (Kintsch 1987:8-9.)

Two sentences must, obviously, be linked, because the reader aims at understanding the text as connected discourse. Going from sentence to sentence, some of the information in the previous sentence must be retained in the reader's short-term memory, to enable the necessary integration of the new information with that derived from the old one. Here, a processing-capacity constraint steps in: since all processing takes some cognitive capacity, the reader has a limited capacity of short-term and long-term memory. Therefore, the reader can only hold over a limited amount of propositions. (Kintsch 1987.)

Figure 2.1 presents an outline of the three hierarchial levels of the model: The first level, comprising input propositions (a.k.a. microstructure), is shown at the bottom of the construct. On this first level, propositions are connected, through transformations called coherence rules - but only referentially - and doing so, they constitute the text base. Further, on the second level, the processed propositions are organised into units called facts, based on the world

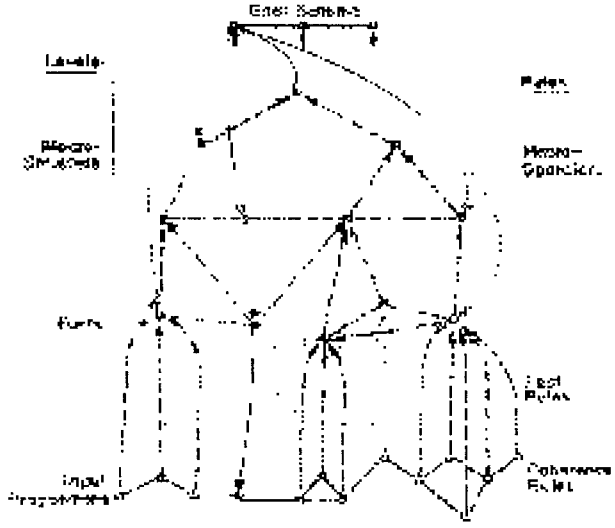


Figure 2.1. An outline of Kintsch's/Kintsch and van Dijk's model of discourse processing (Kintsch 1986). The model presents three levels of processing; textual information flow is bottom-up and top-down.

knowledge of the reader. Facts that meet with the expectations of the reader, and are thus relevant for the derivation of text meaning, constitute the basis of further processing. Other facts, the more irrelevant ones, are now left aside. The third level, the macrostructure of the text, forms a link between the goal schema and facts. (Kintsch 1987.)

> The macrostructure results from the operation of the macro-operators, which are a set of abstraction or summarization rules. Indeed, the macrostructure itself may have several levels--corresponding, say to along long abstract of the text and to ever more
> concise summarizations. Eventually, merely the title is left. (Kintsch 1986.)

The reader's goal schema, which embodies (personal) expectations and purposes of reading, determines "which of the fact units are relevant to his or her goals and purposes," and the macro-operators select the facts that are most relevant. This often leads to the construction of new propositions.

Figure 2.1 helps us understand how propositions lead to a "bottom-up" process, while schemata, or goals and purposes, contribute to text processing in a "top-down" way.

Typically, the text that is being processed may not produce a coherent memory representation, depending on the reader's goals or text-specific features. Here, the reader can either choose to go on, or go back in the text. If no explicit bridging information is found when backtracking the text, the reader may resort to inferencing. Inferences take up a variable amount of processing resources, depending on the availability of specific knowledge for the reader. (Kintsch 1987:9-10.)

Kintsch also discusses factors that contribute to readability. He claims that the traditional parameters of readability, sentence length and word frequency, are not very successful. To some degree, these measures seem to work, but if readers do not understand the words in the text - and therefore fail to derive an adequate semantic representation from the text - "all the higher order processes

will be impeded". Many reinstatement searches, frequent inferencing, and a limited memory capacity, while processing the text, contribute essentially to low readability. "Readability is not a property of a text, but a result of a reader-text interaction." (Kintsch 1987:10.)

In her review of the Kintsch & van Dijk model, Leppänen (1993:88-93) recognises some major limitations: the model has been used for only "schematically conventional texts", with the assumption that the text base is processed with no subjective or culturally constrained interpretation that could determine meaning derivation. Leppänen is also critical of the way in which the model addresses language in the process of comprehension, in ruling out the importance of surface structure variations: she suggests that Kintsch and van Dijk imply "that meaning is primarily the product of semantic operations, and only secondarily the product of language, of transformations of the surface level".

Leppänen (1993:88-89) concludes, nevertheless, that Kintsch and van Dijk's model is definitely "an opening in reading research": contrary to other approaches, it refuses to assume "that the ultimate goal and norm in reading is the authorial message encapsulated in the text which the reader must either discover or reconstruct." Instead, the model deposits that in the derivation of meaning there is a component interaction between the text and the reader.

> On the one hand, comprehension is constrained by the schematic structures suggested by, and information within, the text. On the other hand, it is directed be reader goals and inferences. This has the implication that there may be variation in the same way in which one and the same text is comprehended. In theory, Kintsch and van Dijk also note that the pragmatic, social and cultural context may affect comprehension. However, the role of context remains a marginal issue for them, so that comprehension appears in their model as primarily a decontextualized process taking place between the text and the reader's mind only. (Leppänen 1993:92.)

It is noteworthy that van Dijk and Kintsch acknowledge this discrepancy in their later work (van Dijk and Kintsch 1983:333-346, Kintsch 1988). They suggest that in discourse processing, in addition to a textbase, a situational model is created by the reader for mapping the textual representation onto a representation of the real world. They propose that the situation model is an integrated structure of episodic information, "collecting previous episodic information about some situation as well as instantiated general information from semantic memory" (van Dijk and Kintsch 1983:344). The arguments that van Dijk and Kintsch present for the hypothesising of a situational model include the following phenomena: reference, coreference, coherence; situational parameters; perspective of reading; individual differences in comprehension; the reordering of the elements of a text; problem solving, and learning.

However, an explicit formulation of the situational model is still to be seen; another job to be done is to fit the situational model into the overall framework of discourse comprehension. So Leppänen's criticism of the role of context as a marginal issue remains.

2.3 Paivio and Sadoski: dual-coding model of language processing

Dual-coding theory (Paivio and Begg 1981, Paivio 1987, Sadoski and Paivio 1994:538-601) is not specifically a theory of reading, but of cognition. It tries to explain linguistic cognition and non-linguistic (non-verbal) cognition and the relations, or connections, between these two. The model tries to combine both the linguistic and non-linguistic aspects of text processing, in the kind of contextualised text processing that the present thesis will look into. The model also challenges the common assumptions and frequently quoted reading studies inspired by schema-driven models.

According to dual-coding theory (Sadoski and Paivio 1994:538-601), language behaviour is mediated by two independent cognitive systems which are specialised for encoding, organising, transforming, storing, and retrieving information. One of these, the image system (nonverbal system), is specialised for handling information about non-linguistic objects and events; the other, the verbal system, is specialised for representing and handling linguistic information (see Figure 2.2).

On receiving verbal and nonverbal stimuli, our senses activate corresponding verbal and nonverbal mental representations - logogens and imagens, respectively. The perception of external linguistic and non-linguistic stimuli "is a relatively direct way that existing cognitive representations are called up or that new representations are added." The activation of representations in one code does not always involve activation in the other; one code can be active without the other, or both can be active in parallel way. This is called the *representational* dimension, or level, of processing.

The modality and size of the logogen and imagen elements may vary: a logogen might correspond to a phoneme, grapheme, word, or familiar phrase; an imagen might represent a natural object (or sound), a part of the object, or a familiar grouping of objects.

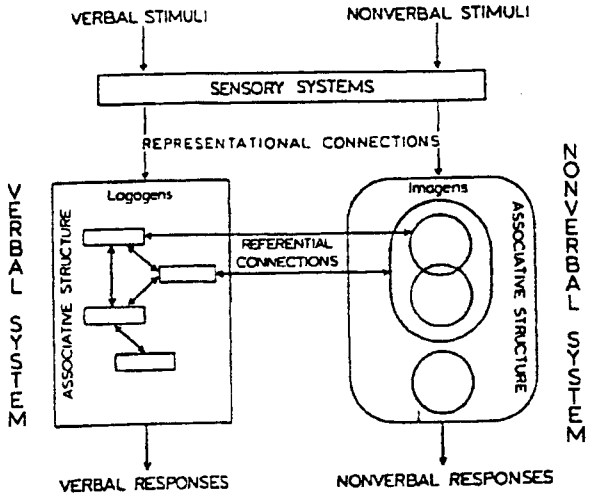


Figure 2.2. Dual-coding theory: Verbal and non-verbal representation systems. (Paivio 1986, Sadoski et al. 1991, and Sadoski and Paivio 1994)

Links between the verbal and nonverbal systems are via referential connections, which involve the activation of representations in one code by previously activated representations in the other code. This is called the *referential* dimension or level of processing. These reciprocal connections are generated as a result of increasingly complex experiences with objects and events and the language associated with them:

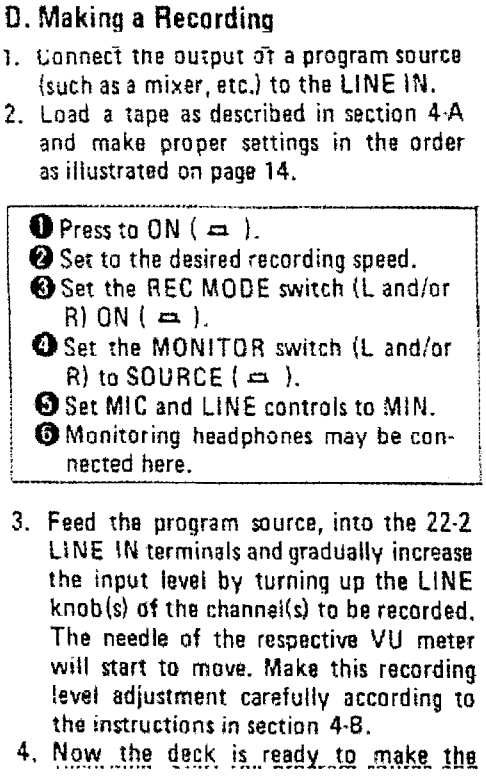
> We can label or describe our mental images in language, or language can stimulate mental images. For example, concrete language can easily evoke mental images, as in The diver plunged into the pool. Even abstract language (e.g., aquatics) might evoke such images, although they are typically less vivid or clearly experienced. Conversely, mental images of swimming pools might evoke the language typically used to refer to them, such as swimming pool, shallow end, deep end, and diving board . . . These connections are predictable and occur with probability, based on the life experiences of the individual and the linguistic and situational context. (Sadoski and Paivio 1994:586.)

Within the verbal and nonverbal systems, associative structures are created. The function of these associative structures is called the *associative* dimension or level of processing. Words or phrases are associated, as we experience and learn, with other words or phrases. But dual-coding theory also assumes that language can, via referential connections, evoke nonverbal images, and images can evoke verbal referents.

The three levels of processing, representational, referential and associative, include *external* and *internal variables* (Sadoski, Paivio and Goetz 1991, Paivio 1986). For instance, external contexts, situational constraints, and instructions interact with a person's existing symbolic systems, according to prior experience and individual differences. The theory also assumes that processing can be conscious or unconscious (automatic), and frequently involves the transformation and recoding of representations. However, Paivio's theory does not include any separate, abstracted structure, such as a schema, frame, or script; instead it assumes that processing consists of "the probabilistic activation of particular verbal/and or nonverbal mental representations by external stimuli or by previously activated representations" (Sadoski, Paivio and Goetz 1991).

As described above, the present study deals with task-integrated reading. Applying dual-coding theory to this context, consider the excerpt of a typical instruction text in Fig. 2.3, from the Owner's Manual of a tape deck, a.k.a. an open-reel tape recorder. How would I process this extract *in situ*[1]?

Presume that I am new to the task of making a recording. I have the manual, tape deck, and accessories, including the tape reel, on a table in front of me. I have a pretty good hunch of what to do, but I need to follow the instructions. Further, because of cognitive orientation, personal objectives and time constraint etc., I am determined to do the job as well as I can; I am not just playing around with the tape deck.



D. Making a Recording

1. Connect the output of a program source (such as a mixer, etc.) to the LINE IN.
2. Load a tape as described in section 4-A and make proper settings in the order as illustrated on page 14.

❶ Press to ON (▭).
❷ Set to the desired recording speed.
❸ Set the REC MODE switch (L and/or R) ON (▭).
❹ Set the MONITOR switch (L and/or R) to SOURCE (▭).
❺ Set MIC and LINE controls to MIN.
❻ Monitoring headphones may be connected here.

3. Feed the program source, into the 22-2 LINE IN terminals and gradually increase the input level by turning up the LINE knob(s) of the channel(s) to be recorded. The needle of the respective VU meter will start to move. Make this recording level adjustment carefully according to the instructions in section 4-B.
4. Now the deck is ready to make the

Figure 2.3. Extract from Owner's Manual. TASCAM TEAC Production Products, 13.

[1]This introspective demonstration is not intended to a valid account of comprehension processes. It is the belief of the present writer that especially the more automated comprehension processes (or microprocesses, as Kitsch and van Dijk would call them), may be impenetrable for non-experimental inquiry, irrespective of approaches used.

In a "reading-to-do" situation like this, it would seem fair to propose that because of short-term memory constraints, or non-automaticity, the text and the range of sub-tasks required are not processed in a serial, but parallel, fashion, with numerous onsets, interruptions and restarts of each of these sub-processes. Here, verbal and non-verbal representations of the text -- in Paivio and Sadoski's terms, the logogens and imagens -- can evolve and interact continuously. Evolving referential connections, eg. the mention of the **line-in** connection (the sound source hook-up) in ***"[1. Connect... to] the LINE IN."*** will help me proceed to create the recording. Having worked with cassette recorders extensively, I will at his point get additional support from the "knowledge-base" of my previous experience, both in the form of verbal and nonverbal connections.

However, the way I process the text and the task is not generic, but unique and personal. The way I read the text, understand the meaning of words, and make the recording is not exactly the way somebody else would do it. Obviously, if I repeated this after some time, I would not either read-and-do it in exactly the same way. On the second occasion, stored in my long-term memory, I would have mental representations of various kind, such as linguistic, visual, kinaesthetic, and tactile, to draw upon. These representations would involve both the text and the task. Nevertheless, the objective, mental "model", and outcome of the process of reading-and-doing would be more or less similar on the two occasions.

2.3.1 Research on mental imagery and dual-coding

In the following, I will briefly summarise findings from studies on mental imagery, an essential construct for dual-coding theory. It should be noted that imagery is not only confined to visual images, their representations and associations; other sensory modalities such as auditory, olfactory, tactile, and

kinaesthetic are also involved in mental imagery (Paivio 1981:114-115; cf. Atkinson, Atkinson, Smith, and Bem 1993:359-361).

Reviewing recent research on imagery and reading, Long Winograd, and Bridge (1989) reported that researchers have shown how subjects' comprehension of text is increased when readers get instruction or practice in forming mental images while reading. Imagery is more helpful in facilitating semantic than verbatim recall of text.

Research on the relation of imagery to comprehension has shown that imagery is involved in the organisation and storage of information, and it can help readers make inferences. Imagery studies show that less skilled readers are helped more than good readers by instruction on mental imagery, and that spontaneously, ie. without instruction, both good and poor readers can help comprehension by generating images.

Prior knowledge, assumed to be stored in the reader's long-term memory, comes play to with mental imagery in text processing. Imagery is connected with the perceptual, affective and experiental aspects of prior knowledge, as it affects the reader's response to and meaning construction of text. These responses seem to depend on the vividness of the reader's imagery, reader interest in the text, and on reading pleasure.

Mental imagery is related to the amount or level of image-cueing, concrete elements in text. Sadoski, Goetz, Fritz (1993) studied the comprehensibility, interestingness, familiarity, and memorability of concrete and abstract texts. Sentences and paragraphs of varying length, adapted from instructional textbooks, were used for delayed and immediate recall, and ratings by subjects consisting of university students. Results of the study showed that for sentences, "ecologically valid" concrete text was rated as more concrete, more interesting, and more comprehensible than (corresponding) abstract text, but not as more familiar. Results of immediate and delayed recall indicated that concrete information was better remembered than abstract information. Concreteness

was the best predictor and ratings of content familiarity a far weaker predictor of text comprehensibility.

2.4 The role of knowledge structures in comprehension processes

The assumption of explicit knowledge structures in comprehension has permeated L1 and L2 reading research conducted during the last two decades (e.g. Anderson 1994/1984:469; Barnett 1989:42). Abstract knowledge structures, also known as schemata, scripts, or story grammars, are seen as important constitutive elements of the comprehension process. In the following I will first look into main-stream schema theory, as presented by Anderson (1978, 1994/1984), Anderson and Pearson (1984), Carrell and Eisterhold (1983), and Eskey (1988). Next, certain aspects of schema theory will be discussed that have been criticized lately. Finally, I will give a few examples of schema-theoretic approaches in L2 reading research.

Not all models of reading comprehension (discourse processing) which posit knowledge structures go under the heading of schema theory. Recent contributions to theories incorporating knowledge structures include Gernsbacher's (1990) theory of structure building and Graesser's (1985) theory of knowledge-based inferences. However, these theories will not be discussed below.

A schema is assumed to provide much of the basis for comprehending, learning, and remembering the ideas in texts (Anderson 1994/1984:469-482). A reader comprehends a message when he is able to "bring to mind a schema that gives a good account of the objects and events described in the message." Comprehension is "a matter of activating or constructing a schema" that gives a coherent explanation of the objects and events mentioned in the text. Schema theory proposes that more than one interpretation of a text is possible; the schema that will be activated for a text depends upon the reader's cultural and

other background factors. This assumption is in "sharp contrast with the conventional view" that:

> Comprehension consists of aggregating the meanings of words to form the meanings of clauses, aggregating the meanings of clauses to form the meanings of sentences, aggregating the meanings of sentences to form the meanings of paragraphs, and so on... The meanings of the words cannot be "added up" to give the meaning of the whole. (Anderson 1994/1984:473.)

Note, however, that opting for a system with abstract knowledge structures is not the *only* approach for resolving the problem, if we want to question the "conventional view" of hierarchially-added meanings.

A great deal of attention in schema theory is given to introspective accounts on ways that concepts, objects, and events might be represented in schemata (Anderson and Pearson 1984:255-291). Oft-cited examples include a short text about ship christening (Anderson and Pearson 1984:260-261), and a rhetorically problematic and ambiguous passage describing the set-up of amplifier equipment for a serenade.[2] The latter text describes how the amplifier equipment is held up in the air - very unusually - by a bunch of balloons (Bransford, Stein, and Shelton 1984, also in Anderson 1994/1984:470-472); this is known as the story of "a modern-day Romeo".

The text sample of the modern-day Romeo can be read with the support of two kinds of drawings, which either match or do not match the textual account. In the Bransford experiment, the text was read by subjects with the two accompanying visuals. The results showed that subjects who were shown the right picture found the passage more comprehensible and were able to

---

[2]The original passage runs: "If the balloons popped the sound wouldn't be able to carry since everything would be too far away from the correct floor. A closed window would also prevent the sound from carrying, since most buildings tend to be well insulated. Since the whole operation depends a steady flow of electricity, a break in the middle of the wire would also cause problems. Of course, the fellow could shout, but the human voice is not loud enough to carry that far. An additional problem is that the string could break on the instrument. Then there could be no accompaniment to the message. It is clear that the best situation would involve less distance. With face to face contact, the least number of things could go wrong". (Bransford, Stein, and Shelton 1984).

remember a great deal of it, whereas subjects with the inappropriate picture rated the passage very difficult and were not able to remember much of it. The research findings, as Anderson reports, illustrated "what happens when a reader is completely unable to discover a schema that will fit a passage, and therefore, finds it entirely incomprehensible" (Anderson 1994/1984:472). Another, more common-sense explanation would be that with the right picture, reading was easier, because there was more information available, given in concrete picture format. The picture probably also offset some of the non-coherence of this text, ie. made it easier for the reader to decipher what the rhetorically peculiar passage was all about, and consequently, the reader could understand more and was able to recall more of the content. Access to both picture text enabled the use of two modes of comprehension processes (verbal and non-verbal), which according to dual-coding theory was likely to facilitate comprehension and recall in an additive way.

An important aspect of schema theory is the process by which the knowledge embodied in the schemata is activated. Anderson and Pearson (1984:260-264) propose that a schema of an object or an event is built in a componential way. Words mentioning any component of a schema have a certain probability of activating the schema as a whole. Some components of a schema are "particularly salient" and therefore have a high probability of bringing to mind the schema. When two or more schema components are mentioned, the sum total of the individual probabilities will make an aggregate probability of schema activation.

A central assumption is that schemata are constructed, reconstructed and modified on the basis of concepts and propositional data. So what might be the way that this takes place? Here schema theory has some trouble giving a valid explanation, especially one that could help avoid an imminent threat of circularity. Are concepts to be explained by further concepts, ad infinitum? Do we know how representations, defined by further representations, are anchored

in the real world where people read and write? If we fail to find an answer to this, we are faced with a paradox of meaning beyond words: "that an interpretation of a text is always just another text 'in other words,' in another language, or in some mental representation" (Gee 1992:13; cf. also Rayner 1989:305-306). If an adequate explanation cannot be presented, schema theory could hardly be more than a metaphor.

Further fundamental problems found in schema theory include the specificity dilemma of schemata. As Rayner (1989:305-307) points out, there is seems to be little that could provide evidence of the "size" of schemata, and there is not much that could usefully indicate what "grain" of schemata might be activated and used by the reader, at a particular moment.

In his critique of research on cognition and cognitive processes, Wenestam (1993) addresses this same specificity problem, from a methodological perspective. He briefly outlines a number of studies, which include some of the frequently cited schema-theoretic studies in reading comprehension. Typically in these studies, texts were first analysed for their propositional or idea-unit content, then administered to subjects, and finally compared to the reading outcome in terms of quantitative measures, eg. for number of units recalled correctly. In these studies, Wenestam notes, the researcher assumes that by using the methodology, s/he can study the cognitions and cognitive processes that explain the learning outcome. The researcher seems to take for granted that:

> What is perceived and learned by the subject is closely similar or identical to what the researcher perceives the learning material to be. However, I do not think that people in a strict and predictive way learn texts or stories the way the are intended to be learned or understood. On the contrary, there is empirical evidence that very clearly indicates that learning and comprehension of meaningful discourse may vary substantially between persons. (Wenestam 1993.)

The textual meaning changes between different readings; the reader is not the same person on the different reading occasions. Taking the author's or

experimenter's interpretation of the text as a point of departure introduces a "normative dimension that cannot be justified when the aim is to study cognitive processes." Wenestam argues that any attempt to introduce normative concepts for the text is of no value since the text means what it means to every reader. More valuable is to observe the differences in and qualitative variation of readers' interpretations, which are difficult to access using predetermined content categories. We should not accept that what is given is identical to what is processed in the text; each reader's way of understanding the text must be calibrated in terms of its qualitative characteristics. Such approaches, Wenestam adds, makes heavy claims on the researcher's competence as interpreter of the discourse.

Carver (1992b) draws attention to an issue somewhat related to Wenestam's critique. He refers to his extensive research (eg. Carver 1992a) on the variability of reading processes and goals, where he posits five reading processes, or reading gears, which comprise memorising, learning, rauding,[3] skimming, and scanning. Of these five processes, rauding is assumed to be the essential every-day reading mode, used by "most readers" and "most of the time"; Carver's findings indicate that college students usually "operate their rauding process" at a rate of ca. 300 words per minute. Evidence from several researchers shows that goals, component parts, outcomes, and reading rates associated with each of these five basic reading processes are quite different; also, the research results involving one of the five reading processes will not necessarily generalise to another.

Schema-driven reading research has produced theoretical claims about reading that should, in fact, be limited to a specific goal of reading, ie. reading

---

[3]The term rauding is a word derived from the words *reading* and *auding*. Carver defines reading as looking at words and determining their meaning, while auding means listening to words and determining their meaning. Rauding "focuses upon the fact that the comprehension processes underlying typical reading and auding are the same," is assumed to relate to "comprehension of the complete thoughts in the sentences of textual material," whether presented visually or auditorily. (Carver 1992a.)

to learn and memorise from text. Carver maintains that schema theory, unlike rauding theory, fails to cover every-day reading processes. He goes to point of claiming that:

> Effects of predictions activities, prior knowledge, and text type are trivial and can be safely disregarded whenever individuals operate their rauding processes, which covers most reading situations... There appears to be no direct evidence that these three schema theory variables have unique relevance to a normal or typical reading process, called rauding. (Carver 1992b.)

Kintsch (1994/1988:952-953) argues that schema-type structures are "too inflexible and cannot adapt to the demands imposed by the ever-changing context of the environment." He criticises the common notion that people understand because "they sort of know what is to come," ie. that understanding text, we process in a simple predicting top-down manner, and only stop to process the text bottom-up when our expectations are useless or wrong.

In his construction-integration model, Kintsch (1988/1994:951-995) posits that representations are built in a process where a text base is constructed from the linguistics input, combined with an integration phase in which this text base is integrated into a coherent whole. The construction-integration model incorporates an associative net with interconnections to enable the build-up of structures in the context of the task. In the framework of the associative net, structures are made in a connectionist manner, on the basis of a minimally organised knowledge system and the incoherent, potentially contradictory output generated, instead of precise inferences rules, by "sloppy" ones.

Sadoski, Paivio, and Goetz (1991) discuss a fundamental issue that they think is problematic for schema theory. They argue that schema theory suffers from a lack of a consistent definition. The epistemological question is, how conceptual or schematic knowledge can exist in the abstract, "isolated from any of the examples that gave rise to it". Sadoski, Paivio, and Goetz conclude that there is no universal agreement among philosophers and theorists whether

completely abstract schemata can exist or whether these constructs are "examples of reification."

A second point Sadoski, Paivio, and Goetz criticise is the "methodological demonstrations" and "mixed procedural peculiarities" of key studies from which schema theory has consolidated its empirical support. More precisely, the texts and methods used in the key studies yield effects that are difficult to replicate with other texts and variations. They suggest that results of schema-theoretical studies, used primarily to demonstrate the existence of schemata, are better explained by dual coding theory. For instance, they claim that readers, when processing the ambiguous text about the modern-day Romeo mentioned above, relied heavily on personal background and situational cues to interpret the text and form images.

To summarise: in reading research, there has been a central assumption that abstract knowledge structures, such as a schemata (or scripts), determine the way we comprehend and learn from written text. Critical remarks have been raised about the specificity and referential dilemma of schemata, and about potential methodological biases of schema-theoretic studies. Also, it seems unlikely that findings from schema-theoretic studies can be generalised to apply for "real-life" reading, or that they can enhance our understanding of how readers process text in a variety of everyday reading situations.

However, we obviously need a theory - or at least a working metaphor - to account for the kind of mental representations that come to play in language use such as reading. In the end, it is not of primary concern whether we label these representations as schemata, scripts, plans, or simply knowledge. Still, what is important is that we view the representations as individualised, flexible, and reader-constructed, enabling discourse processing in a meaningful way.

2.4.1 Schema-theoretic studies of reading in a foreign language

From early reading models to recent schema theoretic approaches, L2 reading research has attempted to find and follow paths set by contemporary research in L1 reading. These attempts have largely been geared to generating guidelines for L2 reading instruction. The bulk of L2 reading research being is rather limited, compared to massive basic and applied research in L1 reading (see Bernhardt 1989:23), and the practical results of this guideline-driven activity may strike as piecemeal or unconvincing.

Grabe (1991) made a survey of research in second/foreign language reading. He reported that the following were central issues in recent L2 reading research: prior/content/background knowledge; schema theory with implications such as pre- and post-reading activities, learner/strategy training; lower-level vs. top-level processing of text (bottom-up vs. top-down processing); thresholds of reading skills and L2 language proficiency; reading-writing connections; and L2 reading instruction.

Bernhardt (1991b:19-69) reviewed and created a database of empirical L2 reading research conducted in North America and Europe from 1974 to 1988. She developed nine categories for labelling the 352 studies she surveyed for her database: word recognition; background knowledge factors; text-structure analysis; oral-aural factors; syntactic features; cross-lingual processing strategies; metacognitive strategies; testing method; and instruction. Bernhardt noted that a majority of studies in the database were on L2 reading instruction -- reading achievement, instructional strategies, and materials. Bernhardt also pointed out that, for research and pedagogical purposes, it is difficult to make "legitimate comparisons" of L2 reading research because specifications of research variables in many of the studies were lacking or incomplete; "each study seems to be an N of 1 rather than a piece of a larger puzzle."

Recent studies of L2 reading typically have a schema-theoretic framework (eg. Barnett 1989:42, Bernhardt 1991b:29-38, Grabe 1991, Williams and Moran 1987). Carrell (1983) studied the effect of background knowledge both on L1 and L2 reading comprehension. She hypothesised three components or conditions of background knowledge: context (presence vs. absence of a title page and picture page preceding the text page); familiarity, and transparency (the presence vs. absence of concrete lexical items which provide textual cues) related to the content area. Carrell used four 120-190 word versions based on two texts titled "Washing Clothes" and "Modern-Day Romeo," the originals of which Bransford and Johnson had in their L1 reading study (Bransford and Johnson 1973). The subjects of the study were native speakers of speakers and ESL learners at two U.S. universities; the latter subject category consisted various ethnical backgrounds. Free written recall in English (a second language for the subjects of the study) was used to measure comprehension.

The results of Carrell's study indicated that unlike native speakers -- for whom all three components of background knowledge play a significant role in reading, comprehending, and recalling a text -- non-native readers showed "virtually no significant effects of background knowledge." Carrell found that native speakers used context in a top-down processing mode, to make predictions of what a text is going to be about. They also utilised textual elements, especially lexical clues, in a bottom-up processing mode to confirm predictions and to build up a mental representations of what a text was about from the information in the text. Native speakers were also "influenced by their prior knowledge of the text's content." Non-native speakers of English, Carrell concluded, did not read like native speakers. Neither advanced nor high-intermediate ESL readers seemed to used context or textual cues; they were not efficient top-down processors, as they made appropriate predictions based on context. Non-native readers were not efficient bottom-up processors, building

up a mental representation of the text based on the lexical information in the text.

Studying the reading of L2 French and Italian learners at an American university, Hammadou (1991) addressed the following research questions:

> (a) Do non-native readers comprehend familiar topics better than unfamiliar topics?
> (b) Does the difference between familiar and unfamiliar recall lessen for more proficient readers than for less proficient ones?
> (c) What are the qualitative differences in L2 readers' inferencing according to topic familiarity and language proficiency? (Hammadou 1991.)

For reading materials, Hammadou used authentic newspaper and magazine articles. The subjects' background knowledge, or familiarity of text, was estimated by a reporting procedure: they were given lists of topics to rank according to their prior knowledge of the topic. The subjects' recall of text content was assessed by free written L2 rendering of text, using a recall protocol (percentage of recalled text propositions). Inferencing was operationalised as recounted propositions "outside the narrow bounds of the original texts", and these recounts labelled as either logical or illogical inferences. L2 proficiency of participants, always a big snag in experimental research, was estimated according to enrolment in L2 classes (101 vs. 104 level).

The results of Hammadou's study showed that L2 readers did not comprehend familiar topics significantly better than unfamiliar ones. Second, the difference between recall of familiar and unfamiliar content did not lessen for the more proficient readers, ie., they "clearly comprehended more of every text than the novices." Third, the less proficient readers produced more inferences than the more proficient ones. There was no significant overall relationship between language proficiency, reported topic familiarity, and amount of inferences in recall.

For Hammadou, the results raised methodological speculations. Self-reported topic familiarity, the measure she used for assessing background

knowledge, could simply be inaccurate. This vagueness of measurement possibly worked against the hypothesised effect. Hammadou also concluded that the greater or lesser language proficiency "is not a simple question of quantity but rather reflects qualitative differences as well." (Hammadou 1991.)

This limitation -- the one-dimensional, "on/off" property of quantitative measures, both in the two studies cited above, and a number of other studies (eg. Carrell 1988b; cf. database in Bernhardt 1991b:29-35) - may severely undermine attempts to assess how prior knowledge relates to language comprehension. Bearing in mind the critical remarks by Wenestam, Kintsch, Sadoski, and Gee cited in the previous section, we may question whether the "effect-of-knowledge-on-comprehension" is a dependent-variable issue. The risk of producing not more than gross generalisations about the comprehension process is obvious, in case we fail to observe qualitative variation of readers' interpretations, which are hardly accessible in studies using predetermined content categories such as idea units. Also, the use of free recall in L2 as a measure for L2 text comprehension is not without problems. There could be a long way from the original L2 reading/decoding process to what is reconstructed and written down in L2.

One may speculate about what has made schema theory appealing for both reading research and reading instruction. It would seem that it has helped researchers and educators theorise about readers and reading, in domains and situations where diversity and variability abound - in a period of transition from old to new in reading research and instruction. Here it has probably been understood as capable of replacing strictly normative approaches and of bringing some order to an ensuing complexity (cf. Swaffar 1991:8). Second, schema theory has addressed key issues of reading research and instruction that relate to the text, its propositional content, and the outcome of reading, undoubtedly at the expense of more elaborated process and context-dependent questions. Finally, it has helped bring the reader to the forefront of research and

instruction, while still imposing a pre-established - de-contextualised and simplified - structure upon efforts to understand what goes on in reading (cf. Eskey 1988:93-99).

To sum up: for proponents of schema theory, knowledge structures tend to go in integrated and abstracted packages, which are assumed to become activated in successful text comprehension. Adherents of other views see knowledge representations as more concrete, more varied and flexible stores of both verbal and non-verbal information. These are continuously re-structured representations that enable higher-level cognitive, social and affective processes in our everyday situations.

2.5 Approaches that see reading as non-generic processes

In addition to cognitive (internal) aspects of reading, the study of reading should also address external (social and situational) factors. In other words, the study of reading should cover the cultural-social objects of "what-there-is-in-reading" (cf. Section 2.1 above). An outlook of reading as more than a cognitive process assumes that the processing of text can only be studied within a unique context. But what is unique about the context? Bernhardt (1991b:9-17) presents some basic assumptions:

> (1) There are basically no generic or generalised readers or reading behaviours. Therefore, there are multiple "readers" within one person, depending on the context.
>
> (2) There are basically no generic or generalised texts. In other words, there are multiple "texts" within a text.
>
> (3) Seeking generalised principles of text processing is futile; eg. each data collection is an artefact of place and time.

The many-in-one aspect creates difficulties, which are typically circumvented in empirical reading research and theory. For instance, Kintsch and van

Dijk (1983:8-9) set out to "neglect the systematic representation of contextual information in discourse processing", in their extensive study of discourse processing strategies.

Rosenblatt's transactional theory of reading and writing (Rosenblatt 1994), designed for the study of literary interpretation, restates the problem of generalising about readers, reading, and texts. Rosenblatt disapproves of the common view of language as a self-contained system, "a set of arbitrary rules and conventions that is manipulated as a tool by speakers and writers". She emphasises the selective powers of the readers, but also relates reading to conversation, a face-to-face situation, where the human being is thought of as part of nature, constantly in transaction with an environment.

> Every reading act is an event, or transaction involving a particular reader and a particular pattern of signs, a text, and occurring at a particular time in a particular context. Instead of two fixed entities acting on one another, the reader and the text are two aspects of a total situation. The "meaning" does not reside ready-made "in" the text or "in" the reader but happens or comes into being during the transaction between reader and text. (Rosenblatt 1994.)

For the language user, language is a set of features of the public system that has been internalised through the user's experiences with words in life situations. Drawing upon the implications of this exchange, Rosenblatt finds a distinction between public and private meaning components in language. Public is the lexical, analytic, and abstracting component, and private embodies the experiential and affective element. Since every reading event, or written-text transaction, has both public and private aspects, the language user can choose a particular *stance*, ie., decide which aspect he/she brings into the centre of attention, and which he pushes to the fringes of consciousness. In simple terms, a stance reflects the reader's purpose in the transaction. (Rosenblatt 1994.)

Rosenblatt and Bernhardt are certainly not the only scholars who have voiced the need for integrating social and cognitive views on the study and instruction of reading. Ruddell and Unrau (1994:997-1035) present a meaning-

construction model, which, based on an interdisciplinary, or sociocognitive approach, integrates the reader, the text, and the teacher. It is an overview of the cognitive and social reality - the learning environment - where reading skills are acquired and exercised. The Ruddell and Unrau model, unlike most of the models discussed in the present thesis, offers a macro view crucially important for reading instruction. However, the full-blown the model, with its graphical maze of over twenty boxes and arrowhead lines - may best serve as a guideline for reading instruction, but might not provide an accountable framework for reading research.

In their model, Durrell and Unrau focus on the meaning-negotiation process as a central element. During negotiation for meanings, readers bring their own meanings to the interaction, teachers bring their understanding as well as understanding of the reading process, and members of the class interact with the text to shape - and reshape - meanings. Students and the teacher read much more than the written text. Basically, students and teacher read "several 'texts' - if we take 'texts' to mean events, situations, behavioural scripts, and other symbolic processes that require interpretation".

Bloome and Green (1984:412-415) also voice a need for bridging the psychological and sociolinguistic perspectives of reading research. They propose that these perspectives are primarily concerned with the individual reader and how that reader establishes a meaning for a text. The background knowledge and skills that the reader brings to interpreting a text, together with individual differences in the readers' knowledge and skills, constitute the *intra*personal context of reading. On the other hand, Bloome and Green suggest that the *inter*personal context of reading includes the organisation of reading events, "the interaction of participants involved in reading events, the influences that the interaction of participants had on the reading process, as well as how the reading process influenced the interaction of participants." The interpersonal context of reading is of primary concern in sociolinguistic perspectives of reading.

Connectionist views of the reading process include Kintsch's construction-integration model (Kintsch 1994/1988), which was briefly outlined in Section 2.2.4 above, and Gee's (1992) connectionist exploration. We will first look into Gee's view on the meaning of words, and then discuss his discourse-comprehension model in some detail.

Gee (1992:1-21) takes a position against the established view that words have meanings which go beyond words. He proposes that the structural elements in a text constitute cues, which in turn are used to produce "interpretative practices" connected with particular groups of people. Put another way, the meaning of words is not in the head, but in two elements: social practices and in what Gee calls Discourses - with capital "D":

> Discourses are composed of people, of objects (like books), and of characteristic ways of talking, acting, interacting, thinking, believing, and valuing, and sometimes characteristic ways of writing, reading, and/or interpreting (offering translations of oral and/or written texts) sensitive to the cues these texts present for interpretation to these practises). (Gee 1992:20)

In support of his anti-mentalist position, Gee gives several illustrative cases, but no explicit research findings. One such case is the way that college-age female students think of their close male-female relationships. The meaning of the word *jerk* - an approximation of a more or less non-acceptable male who is no good for dating - becomes consolidated for the individual female and her peer group, not through a look-up in a dictionary, nor through "knowing" or "thinking", but through socially mediated processes, as part of a social practice (which in turn is embedded in various ideologies)[4]. Literacy offers another example of interpretative practices that have their roots is social exchanges, first at home and later at school. Gee holds that literacy is acquired through a process

[4]Gee's (1990) discussion of meaning, Discourses, and ideologies seems to be related many core issues in ethnomethodology, such as that of intersubjectivity and indexality (eg. Garfinkel 1967).

of apprenticeship, and provides the literate person an access to secondary (ie. further) Discourses.

If meaning is in the Discourses of our everyday social context, not in the head, what representations of spoken and written texts do we have? To answer this question, Gee (1992:26-49) uses an uncomplicated connectionist approach which is based on a parallel distributed processing (PDP) model. The PDP model, with some roots in the classical learning theory, today provides a foundation for cognitive science, which seeks to establish theory for such cognitive processes as memory, learning, problem-solving, and natural language processing (eg. Atkinson, Atkinson, Smith, and Bem 1993:26).

A central idea in PDP is neuron-like units with multiple interconnections. Any unit can receive and send a signal with a varying degrees of strength, depending on how "excited" it is. Units and their connections can, for instance, be hypothesised operate in three layers: between input units (ie. the units receiving signals from sensors), intermediary connective units (which are hidden), and output units (ie. responses, reactions). As all units of consecutive layers have multiple connections of varying excitatory strengths, they thus form a network with interconnections. This network, Gee suggests, constitutes mental representations; in other words, it is the knowledge of words, concepts, and events, and it consists of "nothing more than a carefully orchestrated set of connection weights" between neuron-like units, organised into a network - "layers communicating to other layers". (Gee 1992:33.)

Obviously, if representations of words, concepts and events can be reduced to networks of neuron-level interconnections, such abstract knowledge packages as schemas or scripts are out of work:

> The connectionist model using network gets around [the difficulties of too rigid structures and implied defaults] in a natural and unforced way by not having explicit schemas represented at all. A network contains no representational object that is a schema. Rather, schemas emerge at the moment they are needed from the interaction of the units in the network all working in concert with one another. (Gee 1992:43)

In addition to Gee's explicitly linguistics-based nonmentalist approach, mention should be made of a recent development in cognitive psychology known as discursive psychology. Adherents of discursive psychology like Harré and Gillett (1994:69-70) argue strongly against the traditional view that human thought can be explained in terms of "formal syllogisms and inferences, and calculations of predetermined moves between propositions"; they aim to develop "cognitive" models that account for the dynamics of discursive practices, picturing cognitive systems that cover the complexity of real-world experience and are not bound by "rigid specifications of information."

To sum up: Although the external (social, situational, contextual) factors of reading may seems as complex, elusive and ill-defined, much of the great variability of reading lies in them. These factors should not be neglected in reading research, since they are bound to interact with internal (cognitive, psychological) factors, in a potentially complex way. There is an unresolved controversy between two views, one stating that in reading, a text constitutes a network of semantically bound abstractions - an "internal" world - and another view explicating that "external" factors are the ones that really matter.

If we require that reading theory and research help us meet the problems of real-world language use, or "internal-plus-external", the predominantly verbal abstractions of "internal-only" are not very helpful. It is noteworthy that there are many parallels to this in other domains of applied and general linguistics.

2.6 Functional literacy in L1 and L2

Reading at work often involves skills and competencies that learners are not equipped for by traditional literacy programmes at school. Hutson (1987:225-226) pointed out that content area reading skills that are today commonly taught in secondary schools include features that are helpful in working life, but the

tasks very frequently comprise activities involving read-and-remember-for-the-test. Hutson suggested that reading instruction at school which is geared towards academic literacy, ie. reading-to-learn. Curricular bias in reading instruction fails to cater for reading-to-do (see also Venezky 1990:4-6 and Mikulecky 1990:24-25). On the other hand, the traditional reading-to-learn skills are a most useful acquisition necessary for a wide range of learning contexts at school and at work alike, and in practice we would have to be cautious about contrasting the two literacies.

The term functional literacy has many definitions, from basic everyday reading and writing competency - the survival skills of the post-industrial society - to "job-relevant literacy, including but not always limited to basic literacy" (Hutson 1987:226). Functional literacy steps in, for example, when we operate the parking metre, fill in our tax schedule, or check tonight's TV programme. Fuzzy as the term might seem, it helps us understand the versatility of reading-and-writing skills and competencies required in various contexts.

Discussing aspects of functional literacy, Linnakylä (1988:14) proposed that functional literacy is a cultural and social concept that can be looked upon as a state of civilisation. On the reader level, functional literacy is a personal skill, and therefore requires continuous, life-long development. On the practical level, it is based on the control of reading strategies. Linnakylä concluded that functional literacy is a culturally, historically and socially determined skill, and a requirement imposed by the community. (Linnakylä 1988:13-15, 1991: 10-14.)

The functional literacy demands of working life can be very intensive. In a high-technology industry, for instance, employees were reported to spend a third to half of their work week on job-related reading materials (Hutson 1987: 227). Also, it is noteworthy that functional literacy demands do not cover only reading in L1. In her EFL needs analysis study, Väänänen (1992:107-121) reported that more than 70% of Finnish mechanical engineers (N=300) read

installation, operation, and maintenance instructions; handbooks, and brochures in English. For 45-60% of the mechanical engineers of the study, reading the above mentioned L2 text types was at least on a monthly basis; see Figure 2.4.

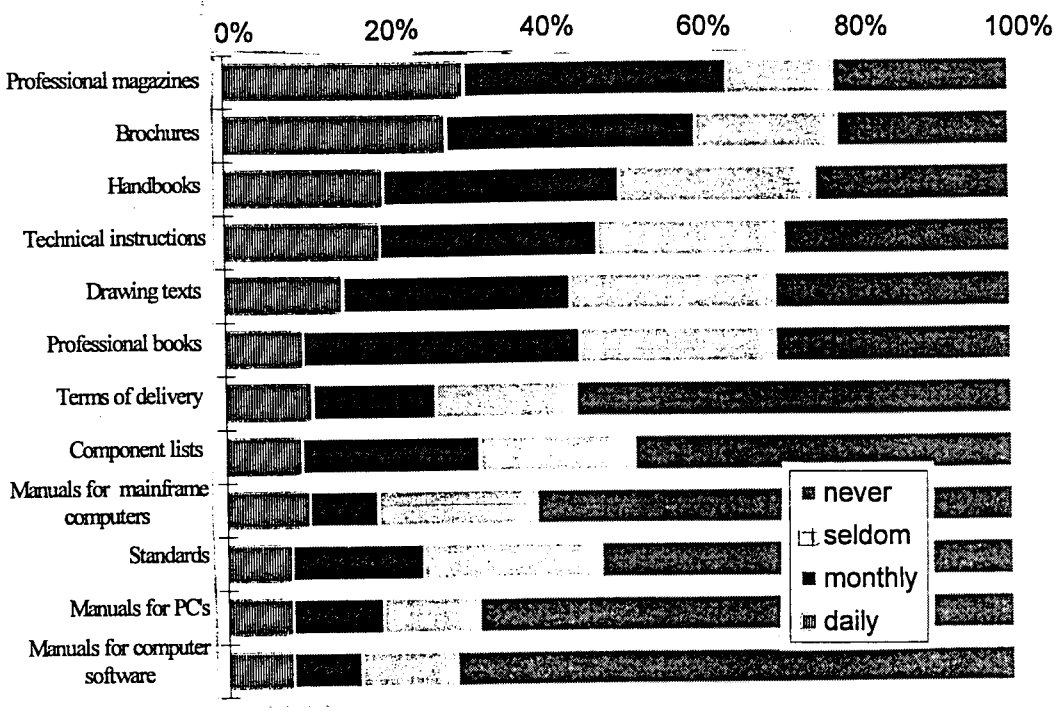


Figure 2.4 EFL (English as a foreign language) reading situations encountered by Finnish mechanical engineers at work. Adapted from Väänänen's needs analysis (Väänänen 1992:107-121).

Technical literacy (also known as technoliteracy), an obvious subcategory of functional literacy, is a range of skills required to learn and to use "high-concept density material (in print or in other visual modes) during training or performance for skilled, semiskilled or professional employment" (Hutson 1987:228). Applications of computerised communication, such as computer-mediated communication and hypertext (a modern format of interactive books, encyclopaedias, and online databases) clearly require a special type of technical literacy. Barnes (1994) reported that the non-linear features of hypertext may contribute to difficulties of information access, unless the reader learns how to "navigate and explore the text rather than follow a single path." Furthermore,

this hypertext exploration, or "blazing trails through information space" with multiple paths, takes intuition, and associative and critical selection skills that are not present in the linear, traditional reading process.

A useful notion is that the person exercising these skills and competencies is no longer just a reader, but a "user", a "manipulist" of text and its interface. The concept of user stresses the interactive aspect of information access and is particularly well-known in the world of the Internet and hypermedia.

There may be even more modes of information access that contribute to understanding technical literacy both as an instrumental, dynamic concept. This literacy may vary considerably depending on one's job description, task description, and the level of technological development and specific skills required at work and leisure.

Literacies are deeply integrated in many aspects of school work, leisure and working-life, and this makes them fuzzy, and helps them defy definition. For instance, it seems inadvertent to polarise academic, functional and technical literacy, or to place a lot of explanatory power in distinctions. Also, uses of various literacies overlap a great deal in practice. Recent developments in education technology certainly help to bring the three literacies closer. A higher education student in most industrialised countries is today trained to use computerised library systems for information retrieval; the student also uses CD-ROMs, and to an increasing extent, accesses interactive world-wide information networks, while completing core-study assignments, or when preparing seminar papers and the like. New educational concepts such as hypermedia learning (see Taylor 1994; Gill, Melchert, and Wright 1994; Hatakka 1994; Butler 1995), computer-mediated communications - CMC (Metz 1994), and open learning environment (see Tella 1994; Warschauer, Turbee, and Roberts 1995) prove the point -- these educational features were never the sideline of hi-tech industries; this kind of academic literacy is hardly second to workplace/functional literacy as to its complexity and productivity. How long it

will take until the now "elite" (Phillips 1994) reading-and-writing skills of the high-end educational environment are extended to the literacy programme of every school, remains to be seen. Judging from recent views by both policy-makers and technologists, this will not be very far in the future (see Reinhardt 1995; Linna 1995).

Delimiting the concept of technical literacy, Hutson (1987:228-29) suggested out that academic and technical literacy are not dichotomous but differ in the distribution of eight features: content, format, semantic structure of materials, task structure, mode of delivery, resources, problem formulation, and criterion. Some of these definition features - for instance, content ("unfamiliar though repetitious"), semantic structure of materials ("high density of unfamiliar concepts, with little redundancy") , and problem formulation ("the role of the... reader is often setting the problem, selecting, co-ordinating, and evaluating information..") - seem fairly diffuse. For instance, the reader of a modern poem will undoubtedly encounter a lot of unfamiliar content and little redundancy; this hard-access poem could take a considerable amount of reflection, even problem-solving, possibly a co-effort with another enthusiast, until its meaning is eventually revealed to the reader. Nevertheless, most of Hutson's definitions readily help to conceptualise technical literacy. It is useful to picture technical literacy as a set of multiple dimensions, not a clear-cut category of literacy. The salient dimensions of technical literacy should include the following dimensions, and we propose that technical literacy is biased on the first end of each dimension:

> (a) High level (vs. low level) of integration in narrowly defined tasks, ie. practical work.
>
> (b) High integration (vs. low integration) in occupational, domain-specific expertise.
>
> (c) High requirement (vs. low requirement) of media-specific access skills, such as computer-based document processing. In other words, compared to more conventional paper-based media, the person using these media has an additional cognitive role "user-reader".

> (d) High involvement (vs. low involvement) in interactive media. To successfully access and use interactive media such as hypertext or the Internet, the "user-reader" needs specific discourse-formatting strategies and related mental representations that are not acquired when using conventional reading media.

When validating instructional methods and media for second/foreign language reading, these dimensions of functional literacy, and their role in L2 literacy should be considered. It is noteworthy that recent methodology books and state-of-the-art articles on ESL reading (see Swaffar, Arens, and Byrnes 1991, Bernhardt 1991, Barnett 1990; Grabe 1991) fail to do so, possibly with the exception of ESP (English for Specific Purposes).

A more successful concept of reading instruction for work, leisure, or study could be achieved by looking at various literacies involved. This would start be acknowledging that literacies are integrated in domain-specific discourse practises, and generally, in what goes on in discourse communities. Another point of departure would be to realise that a particular type of literacy, such as functional (or technical) literacy, is more than the processed content or format involved. As Mikulecky points out, transfer of literacy skills can be "seriously limited, by differences in format, social support networks, and required background information, as one moves from context to context."

Needless to say, understanding various literacies would benefit from further theoretical and empirical study. And this research should go beyond the effort of needs analysis, more deeply into the expert-level discourse practises of the domain, if we presume that our approaches to L2 reading instruction are to be ecologically grounded. There is a wide range of rapidly evolving reading media - which in many instances are predominantly accessible in L2 only - and a multitude of special reading skills and competencies required in the domains.

2.7 Reading as an individual learning event

The eye and the text do not make reading; the vehicle and the road do not constitute travel. There is more than tools and materials in the two activities; both for reading and travel, only the constructive human mind with its past and present experience can make the difference. Therefore, studying task-integrated reading, we want to view it as an event of learning, engendered by personal goals, skills, and a social-contextual reality.

Reading, as an event of learning, (a) displays both a process and outcome of learning, and (b) exposes the reader-actor to a situation where differences of personality and cognition come into play. This two-dimensional perspective not only reinforces the non-generic view of reading which was discussed above (see Section 2.5 above) but also enables us to consider reading as a pedagogical issue.

Learning is an essential part of our every-day life, a "meta-tool" for dealing with the multitude of information in our environment. Rauste-von Wright and von Wright propose that human processing of information (reception, modification, and interpretation) is "a continuous and holistic process." This process can cause a change in our knowledge, views, skills, or emotions. When this change takes longer than a moment, we call it learning. (Rauste-von Wright and von Wright 1994:19.)

The mind, however alert or sharp, cannot process every piece of information, so there are bound to be bottle-necks, because of the limited processing capacity of the mind. Selective attention helps us cope with the multitude of signals all demanding to be heeded. The signals having strong physical features, and so being very different from other signals, eg. a flashing light etc., inevitably draw our attention. On the other hand, "internal" factors such as expectations and schemata (or knowledge representations), which we have acquired

through learning, help us focus our attention. Rauste-von Wright and von Wright suggest that attention is a resource that is limited but also very flexible. For instance, we can decide to focus on introspective reflection, or external messages from our environment. The more of our attention we decide to allocate on one particular focus, the less is left of this resource for other foci. (Rauste-von Wright and von Wright 1994:76-80).

2.7.1 Learning strategies and cognitive style

Reading is assumed to be an active, constructive process: The reader interprets the text - or creates a "summary of the text" - in line with personal goals, habits and strategies (Rauste-von Wright and von Wright 1994:20-22):

> The mass of information mediated by our senses is screened, classified, interpreted and modified in many ways. The codes - the products of these coding processes - get stored in our memory, while undergoing changes, while enriching or constraining the internalised representation of our social and physical world (von Wright, Vauras, and Reijonen 1979:4-16.)

We employ learning strategies as tools for working the perceived information. Learning strategies are assumed to be acquired schedules of action that we use for learning, in the context of the learning process. Learning strategies are not to be understood as personal styles nor categories of learning (Rauste-von Wright and von Wright 1994:21, 205), but as comparatively long-ranging and complex information-working processes, the results of which are reflected in the qualitative and quantitative features of our learning (von Wright, Vauras, and Reijonen 1979:6).

In the framework for the present study, reading strategies are understood as a sub-group of a reader's text-accessing processes, employed specifically for accessing reading media and for the meaning construction of the content in them. Evidently, as in the case of "general" learning strategies, there are many

ways of analysing reading strategies. A reading strategy is assumed to have an *intra*personal, not an *inter*personal dimension; put in other words, reading strategies are not hypothesised to constitute personal styles employed in reading activity.

It should be noted that the above "low-profile" definition is different from some of the views in recent L2 reading research, where reading strategies are assumed to have a very prominent role, especially in the context of reading instruction. On reading strategies and related pedagogy, see Barnett (1989:66-78), Block (1986), and Grabe (1991).

Linked to learning strategies is c*ognitive style*, which is reflected in the typical way an individual processes and stores information (von Wright, Vauras, and Reijonen 1979:25). Discussing cognitive style, Brown restates Ausubel's definition (Ausubel 1968:170, quoted in Brown 1987:85) "self-consistent and enduring individual differences in cognitive organisation and functioning", but points out that cognitive style is hardly just a cognitive matter, as it mediates between emotion and cognition.

> People's cognitive styles are determined by the way they internalise their total environment, and since that internalisation process is not strictly cognitive, we find that physical, affective, and cognitive domains merge in cognitive style... It would appear that individuals show general tendencies toward one style or another, but that differing contexts will evoke differing styles in one individual. Perhaps an "intelligent" and "successful" person is one who is "biocognitive" - one who can manipulate both ends of a cognitive style continuum. (Brown 1987: 85.)

The same concern about the not-only-cognitive element in cognitive style is expressed many other scholars; see eg. Leino and Leino (1989:7). Jonassen and Garbowski (1993) address issues of cognition and individual differences from a systematic persepctive. They attempt to control the conceptual ambiguity and introduce a hierarchial classification of interrelated constructs: mental abilities, cognitive controls, cognitive styles, learning styles and the links between personality types and learning. They assume that cognitive con-

trols derive from mental abilities and "influence and control an individual's perception of environmental stimuli" whereas cognitive styles, deriving from mental abilities and cognitive controls, "describe characteristic approaches of individuals of inquiring and organizing information." (Jonassen and Garbowski 1993:83-85, 173-175.)

Jonassen and Garbowski classify field dependence vs. field independence; impulsivity vs. reflectivity; and cognitive complexity vs. simplicity under cognitive controls. They put eg. visualiser vs. verbaliser, serialist vs. holist, analytical vs. relational, under cognitive style. (Jonassen and Garbowski 1993:83-247.)

Yet, there is another way of looking at how a person's cognitive processes are determined. This is the epistemological approach (eg. Lappalainen 1994:24-40), which looks into cognition from the perspective of how people access knowledge. Cunningham and Fitzgerald (1996) point out that epistemological underpinnings are important for reading research and researchers alike, because "reading itself is a way of knowing", epistemology is even more crucial for reading research and instruction than for most areas of education.

The epistemic style refers to the individual's typical ways of constructing knowledge and beliefs about the surrounding world. These ways are assumed to be deeply rooted in the individual's personality. How can we learn about people's epistemologies? One of the more widely known epistemological inventories, Rancourt's Knowledge Accessing Mode Inventory, KAMI, provides a paper and pen test for exploring this. The inventory is based upon a version of Royce and Powell's personality theory (Rancourt 1985, Lappalainen 1994:24-40). This theory posits that an individual's epistemological style is the product of the interplay of inborn and environmental factors during the formative years, and the style remains largely unchanged after the age of eighteen. Epistemological style is assumed to be a higher-level personality characteristics, and as permanent as personal values.

Rancourt's KAMI has three components - three ways of knowing or approaches to knowledge - which each add to an individual's profile. A person with a empirical style tends to utilise sensory data and to test his or her ideas about reality against the validity and stability of perceptions. Knowledge is typically acquired through concrete observations of the environment; natural science is taken as the basic model A predominantly empirical person is an active observer who bases his or her knowledge on an inductive approach.

The rational style again emphasises ideas and analytic skills which are constructed through reasoning and reflection. Conceptualisation is based on the logical comparison and analysis of observations, and mathematics is the is the basic model for this style. A person who has a distinctly rational profile relies on deductive reasoning, ie. resorts to logical, abstracted constructs to produce top-down implications; he or she will reject something as false if it is illogical.

The metaphorical style is based on symbolism or metaphors; fine arts is the basic model. Knowledge and ideas are acquired through processes that can be labelled as insightful, intuitive, analogical, and holistic. A person who has a predominantly metaphorical style is likely to be social, non-traditional, talkative and good at imagery.

2.8 Issues of L2 literacy

Theories about reading in a foreign language have traditionally been based on a wide range of insights from psychology. Since these cannot be but partial theories or general-level descriptive models, a master theory of L2 reading is lacking. Bernhardt's L2 initial, largely untested model stands as one of the attempts to theorise about reading in a foreign language.

Bernhardt studied the foreign-language reading development of French, German, and Spanish learners, on a long-term basis of four years; the study was

conducted at secondary and post-secondary schools. On the basis of her study, Bernhardt developed a multi-factor model of L2 reading. The model assumes that L2 text processing skills develop over time, and that errors can reveal development in understanding. (Bernhardt 1991a:40-41, 1991b:168-171). The model presupposes interactive, multidimensional dynamics of five L2 literacy elements (see Figure 2.5). In spite of its weaknesses, the model has a potential of integrating more piecemeal knowledge and partial theories of L reading.

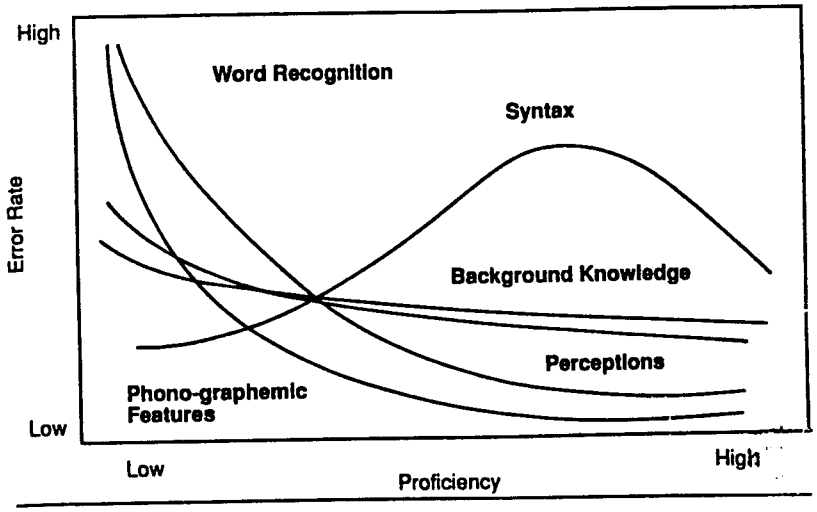


Figure 2.5. Bernhardt's L2 reading model: distribution of reading factors (Bernhardt 1991a:41 and Bernhardt 1991b:169)

The x-axis is labelled "proficiency", and is a continuum of developing skills in L2 reading. The central findings of the five L2 reading factors on error rate, over time spent in L2 instruction, are shown in the diagram:

> * The longer the exposure to instruction, the higher the rate of correct vocabulary use in terms of word recognition and lexical knowledge;
> * Intratextual perceptions and background knowledge also evolve exponentially, but the drop is less drastic;
> * Syntax errors increase with longer exposure to L2 instruction, then decrease gradually. (Bernhardt 1991b:169-170.)

As the model is sketchy, it needs further specification, and proper validation is obviously expected. Bernhardt admits that studies that show "subject

performance in all the facets of the theory, over time, must be conducted" (Bernhardt 1991b:171).

For such validation of Bernhardt's model, the following questions would need to be addressed. First, errors of reading outcome/process, as occurring on the five reading factors, are posited without definitions or operationalisation. (Whatever errors on various reading factors are, they obviously cannot live lives of their own, as they might be interacting, ie. have cross-effect links, which should be resolved empirically.) Second, we need to know much more about the "holistic scores" that were selected for the distribution theory (Bernhardt 1991a:40). Third, the model has an evident gap or bias caused by the exclusion of non-generic factors of L2 reading. As Bernhardt has elsewhere pointed out "there are basically no generic or generalised readers, or reading behaviors" (Bernhardt 1991b:10; see Section 2.5 above). Finally, as Bernhardt used nothing but the recall protocol approach in her study of L2 reading, some doubt may be expressed here, about a possible bias: what would be the impact of using other approaches for investigating L2 reading; do we have to refrain from using other L2 research instruments?

For the study of L2 reading, an important question is whether it would be safe to assume that reading in L2 is basically the same as reading in L1. To put it in another way, are L1 reading skills directly transferred to L2 reading? This question is certainly one that should not be answered categorically. That would be neglecting the cultural and social aspects of reading, as proposed in Section 2.1 (see also Bernhardt 1991b:32; Grabe 1991). Theoretical discussion and empirical research on L1 vs. L2 reading skills were reported by Alderson (1984), and surveyed by Bossers (1991). The central findings by Anderson and Bossers can be summarised as follows:

> (a) Reading in a foreign language is "both a language and a reading problem" (Alderson 1984).

(b) For L2 reading, there is a "threshold", or ceiling, of L2 competence (Bossers, 1991);

(c) L2 reading performance depends to greater extent on overall L2 proficiency than on L1 reading skill, although it has been shown that L1 reading skills do transfer to L2 reading (Bossers 1991; Barnett 1989:54).

Without going very deeply into issues of reading theory again, we might recall our discussion about the "many-in-one" perspective of reading, the versatility of literacy practises, and reading epistemology above. It is very likely that there would be unending problems, of both practical and theoretical kind, in proving these claims.

2.9 Explorations of reading in a context and a situation

Lorch, Lorch, and Klusewitz (1993) conducted a study on the *conditional knowledge of reading*. Distinguishing conditional knowledge from declarative and procedural knowledge, they proposed that conditional knowledge, or when and why to apply a given action - is essential in strategic reading behaviour. In the Lorch et al. study, U.S. college students constructed a typology of ten different reading situations, under two broader labels, "reading for school" and "reading by choice". Subjects of the study first generated a wide variety of reading situations, and in the second step, the reading situations were presented to a new sample of subjects. These students were asked to sort the reading situations with respect to how they perceived themselves as reading in each situation. Finally, a third group of subjects rated the reading situations according to their cognitive demands.

Research findings of the study showed that the students distinctly identified ten reading categories with respect to their cognitive demands. These had functional labels such as "exam preparation", "class preparation", "reading

to apply", "intellectually challenging reading" and "reading for stimulation". Interestingly, a comparison cognitive demands, "reading to apply" was rated as involving a slower reading speed, more testing and memorisation; a lot of rereading; attending to more details and important information than other categories of reading.

Kuure (1995) studied L2 text accessibility[5] by running reading tests, which integrated the use of computer software with reading the accompanying manual in English, and by post-reading interviews. The two participants of her study were students of English at a Finnish university department. Kuure pointed out that in real life readers often have widely different experiences of literacy, and exploring this variability, she used the concept of literacy history to describe the participants' experience in L1 and L2 reading.

After taking the test, the participants were asked to describe what they thought was important from the reader's point of view. They told that a particular text to a particular reader is not a result of from a failure in one single respect, but a combination of many factors. Also, reading purpose, which directs the reader to adopt the appropriate approach to the text, contributes to text accessibility in an important way; the reader's approach to text, however, can change during a particular reading situation. A good reader can access texts through strategic reading, by concentrating well, and adjusting reading speed and focus to the purpose of reading.

The participants told they had co-operated successfully in the task-integrated test, and had a good agreement about division of labour, but also reported that individual differences, such as variability as to previous experience and the level of background knowledge, may cause reader-pair mismatch and other interpersonal problems.

---

[5]Text accessibility according to Cook (1995:9) means "what makes texts easy or difficult to understand".

According to the participants, the accessibility of a text requires a logical text organisation. Any user steps to be taken should be presented in the manual so that they follow the natural order of things. As to other text properties, such as terminology and sentence structure, the participants said these relate to reader perspective and purpose of reading.

3. OBJECTIVES AND METHODOLOGY

The purpose of the present study is to investigate how Finnish engineering students access technical instructions in a reading-to-do situation where they are required to act upon authentic operating instructions that they read. Another objective of this study is to explore the crucial elements of such reading-to-do events, to reach, if possible, pedagogical applications.

3.1 Research questions

The study looks into the ways in which dyads of foreign language learners process manual text in a "naturalistic," task-integrated setting. In this particular setting the students are installing a PC peripheral or setting the clock and timer of a video cassette recorder, with the help of a manual. I propose that reading - especially in a task-integrated setting - is basically a non-generic process, driven by cognitive, situational, and social factors. Accordingly, the aim of the study is to gain understanding about functional L2 literacy, as constrained by task, situation, and dyadic interaction. The research questions of the study are:

(a) What is the role of individual and collaborative reading in the contextualised situation?
(b) How does the reader-pair process the manual text?
(c) What are the crucial elements of the task-integrated reading situation?
(d) Drawing upon the research findings of the study, what recommendations or suggestions can be made for functional literacy development in a foreign language?

Research in this domain is lacking, and accordingly the study is explorative in its approach. The following section will describe two pilot studies that helped

narrow down the approach. The subsequent section will address methodology adapted for the present study.

3.2 Pilot studies

Two pilot studies were conducted with two participant pairs at Kokkola Institute of Technology. Each participant pair was to carry out technical tasks, such as hardware installation or VCR timer setting.

The Pilot One (= P1) participants were first-year students of Automation and Instrumentation Technology at the Institute. They were male, 21-25 years of age, and when interviewed later, they reported that they were quite familiar with microcomputing; they both had a PC at home, but had never "opened the cover", as they said. Both participants had taken an introductory course in Microcomputing at the Institute. The Pilot Two (= P2) participants were recent graduates of the Institute, male, aged 28-30, and now co-owners of a small engineering company. Their four-year engineering programme had given them a theoretical and practical knowledge that was likely to cover the technicalities of the pilot tasks well.

After a warm-up activity, the pairs were to install a bus mouse, with a board and accompanying software, on a microcomputer, and to check if the mouse worked. In addition, the P2 participants were also given the task of setting the clock and timer of a video cassette recorder. The pairs were asked to freely discuss any reading detail and technicality they were to encounter.

The installation package contained a Logitech bus mouse, a bus board, brief instructions (Installation Guide), and a more detailed guide (Users Guide). No dictionaries or other reference books were provided; the reader-pair never asked for any. A screwdriver was made available. The participants studied the contents

of the package with instructions. They switched off the PC, removed its cover, and discussed how they should proceed. After this they installed the bus board in one of the free slots of the PC. The next step, configuring the mouse on the board, took most of the time and effort. After replacing the cover and switching on the mains, the participants installed two mouse drivers (the software required for the mouse). Finally, they tested the mouse and reviewed certain settings.

For the P1 participants, the installing of the bus board took more than 40 min., and for the P2 participants ca. 20 min. The second P2 task, ie. the setting of the clock and timer of a VCR, took ca. 22.5 min.

After the sessions, the participants were given questionnaires, and they were interviewed; during the interview parts of the video recording were shown to them to facilitate the interview. A word-recognition test of technical terms was also administered.

The P1 pair completed their task in the end, and their effort took more time than expected, whereas the P2 pair were much faster, more straightforward, and more professional in their operation. Although the first pair had a number of terminology problems - which they sought to solve through negotiation of meaning - their reading and the task itself proceeded without major difficulty. The high contextuality of this type of task usually makes the reading of the instructions fairly easy; readers often resort to guessing at the meaning of difficult words and technical concepts. Contrary to the intended step-by-step approach of the instructions, the first pair started from the wrong point, skipped a few, and later ran into difficulty, but nevertheless found their way out of the technical maze.

The second pair reported that the text was easy and they had no difficulty figuring out how to go about with the installation; their "reflective" discourse style, with fewer questions and answers about technicalities, proves the point. In

Extract 3.1, the P2 participants have just attached the board of the bus mouse on the computer and are now making the software configurations required for running the mouse. We can note how a high level of problem-solving, a reflective approach to reading, and many long pauses (lines 2, 6, 13) characterise the participant discussion in the sequence. (A rough transcript of the first P2 task, ie. installing the bus mouse, is given in Appendix 1.)

Extract 3.1

1 OP01: Missähän se on se?
2 (16)[1]
3 *(Takes the USER GUIDE and reads in it.)*
4 Kato kun se pitää saada sinne LPT2:een nyt kun se ladattiin...
5 OP02: Joo... OP01: Jos se vielä on LPT2.
6 (75)
7 *(OP01 reads the USER GUIDE, browsing, and OP02 reads the INSTALLATION*
8 *GUIDE. After reading under INSTALL THE SOFTWARE in the INSTALLATION*
9 *GUIDE for some time, OP02 points to a paragraph in the text, and interprets for*
10 *OP01.)*
11 OP02: Näyttää käyvän vaan DOSiin tuo INSTALL ja sitten Windowsiin
12 tuo WINSTALL. Mitä me tehään tuolle ny sitten?
13 (15)
14 OP01 *(Reads the paragraph shown by OP02, thinking for a while.)*
15 Otetaan se INSTALL...
16 OP02: INSTALL.

1 OP01: Where could it be?
2 (16)[1]
3 *(Takes the USER GUIDE and reads in it.)*
4 See, we ought to put it in LPT2, 'cause we just loaded in there...
5 OP02: Yeah.
6 OP01: If it still is in LPT2.
7 (75)
8 *(OP01 reads the USER GUIDE, browsing, and OP02 reads the INSTALLATION*
9 *GUIDE. After reading under INSTALL THE SOFTWARE in the INSTALLATION*
10 *GUIDE for some time, OP02 points to a paragraph in the text, and interprets for OP01.)*
11 OP02: Seems INSTALL is only for DOS, and Windows needs that WINSTALL.
12 I wonder what we should do now?
13 (15)
14 OP01: *(Reads the paragraph shown by OP02, thinking for a while.)*
15 Let's choose INSTALL...
16 OP02: INSTALL.

---

[1]A number in brackets denotes a pause longer than 4 sec., and "... " (without quotes) indicates a pause shorter than 4 sec.

Comparison of the participant discussions in the two P2 tasks shows that the first task generated 25 and 31 discussion turns, respectively, and the second task 55 and 48 turns. In other words, the first task, being more familiar, required little verbal exchange as compared with the second one. An analysis of the P1 and P2 data indicates that most of the reading strategies were co-operative or communicative strategies for negotiating technical details in the manual text.

The two pilot studies showed that a great deal of participant interaction, although mediated through discussion, was non-verbal in nature. Furthermore, the way in which the participants processed manual text was deeply integrated in the task itself. It was concluded on the basis of the pilot study that approaches commonly used in L1 or L2 reading research could not be readily adapted for such contextualised, task-integrated reading study. An important conclusion for the design of the present research setting was that more effort was required to develop a reliable, non-obtrusive method for audio and video documentation of participant interaction.

3.3 A componential research approach to task-and-reading

The present study is a *case study* which looks into the way in which five pairs of participants process task-and-reading situations. These situations involve the pairs in "naturalistic" real-world tasks combined with reading in L2. Both the situations and tasks with reading have a fundamental value for the research questions, and therefore the study resorts to a qualitative method described as componential approach (cf. Argyle, Furnham, and Graham 1981:31-32). The social and cognitive situation is thought of as a discrete, non-continuous whole, and the approach tries to determine the components and elements in the situation;

comparisons across situations can be sought, provided that successful parameters accounting for the phenomena are created.

The componential approach adopted is expected to enable a flexible use of a *combination of techniques*: a protocol for the analysis of conversation, written on the task session; questionnaires completed by the participants; and individual interviews of the participants. The componential approach converges with recent views which recommend that various elicitation techniques be combined in L1 and L2 reading research. Matsumoto (1993) suggests eg. collection of learner's mentalistic data from several sources and combination of introspective verbal-report methods with extrospective techniques. Combination of methods, generally known as triangulation, will provide "more accurate, valid data on learner's cognitive processes" as well as compensate for the problems built in each method (see also Silverman 1993:156-158). The concept of triangulation is borrowed from land surveying, and means "comparing two different views of the same thing: interview with observational data, open with closed questions or one researcher's analysis with another's" (Coolican 1994: 388).

The situations of this case study constitute *real-world contexts* of task-and-reading. It is expected that, with an adequate non-obtrusive, non-experimental approach, these contexts can be studied so that relevant data about social and cognitive processes are successfully gathered and analysed (see Nunan 1992: 52-58; Silverman 1993:8-29).

Below is a presentation of the data-gathering instruments used in the study with some methodological comments.

(a) *Video-recording of the task-and-reading session.* The session started with a warm-up activity. During this phase the participants were given more detailed instructions about the objective of the session and about what they were

expected to do. The audio and video recording equipment was also checked and adjusted during the warm-up. After the briefing and the selection of task (there were three to four tasks to choose from), the participants were given a very short instruction, first orally, and then in writing on the whiteboard. The instruction was, for instance: "Setting the VCR: Get acquainted with the device, and set the correct time. Set the timer to record a 60-minute programme today at 1800 to 1900, on local TV (channel one)." Note that the tasks did not, with the exception of some sub-task details, require advanced expertise in the technical domain. .

The sessions were kept as "naturalistic" as possible. The sessions took place in a classroom of a technical institute, outside of class hours. The person in charge of the session was the participants' English language teacher. He also conducted the individual interviews later. His role in the situation was closest to that of an *observer as participant*: "the observer role is uppermost and members of the group accept the observer in their midst as researcher" (Coolican 1994:103-104).

Designing a technical setting for documentation which ensures that everything essential is recorded on video and audio, with minimal obtrusion of participants' behaviour, requires experimenting and pilot studies. The participant positions and the set-up of audio and video recording equipment all contribute to the documentation perspective of the situational context. This perspective is then directly reflected upon the way in which the protocols of verbal and non-verbal interaction can be written. In the present study, the documentation perspective was accommodated to suit the explorative research questions - for taking both a "local look" at reading and a "global look" at the social-cognitive situation.

Figure 3.1 shows the initial participant positions and a rough placement of the equipment and materials. The participants were *first* asked to sit side by side,

and told that they could move at will. The technical equipment and reading materials were placed on the table in front of them.

Each participant had a "tie-tack" type microphone, which enabled separate audio tracks with high-quality, in other words, optimally codable recordings, for the two participants. The cameras were of the common off-the-shelf type (VHS and 8 mm video). Camera no. 1 was used to record a close-up view of the reading materials, from ca. 1 metre above, and camera no. 2 for a full-view picture from the left.

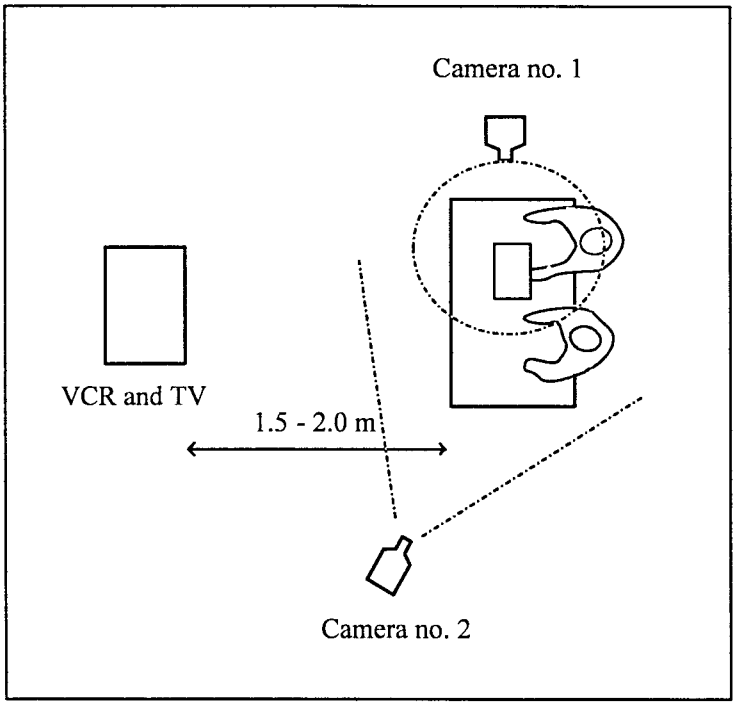


Figure 3.1. A bird's eye view of the camera set-up for the recording of the sessions. This set-up (with no camera operators) was used for the task where the participants set the clock and timer of a VCR. For the other tasks the set-up was slightly changed when necessary.

Both cameras were positioned on tripods; the pilot studies had shown that with a suitable set-up no camera men or other additional technical assistants were

required. This contributed to increased authenticity and non-obtrusiveness of the study sessions.

Protocols that covered the verbal and non-verbal data were written for discourse analysis.

(b) The *questionnaires* had two purposes. Firstly, the results of questionnaires were used for tuning up the following individual semi-structured interviews, conducted some hours after the task-and-reading sessions. Secondly, and more importantly, the data from all completed questionnaires were combined in the analysis of the task-and-reading sessions.

The participants were given two questionnaires: a shorter one (given only once during the session) that comprised general questions about reading in L1 and L2 (see Appendix 2), and a longer one specifically about reading during the session. The two questionnaires were adapted from reading studies by Hosenfeld, et al. (1981), Barnett (1995:198), and Valtanen (1994).

The second questionnaire covered the accessibility of the manual text, familiarity of topic, and the use of individual reading strategies (see Appendices 3 and 4). The second questionnaire was given twice, immediately after each task-and-reading was completed. The items in the second questionnaire dealing with reading strategies were of four main areas: monitoring and evaluating the reading process, heuristics and inferencing, use of domain knowledge, translating from L2 to L1.

In theory, it is possible that questionnaires that participants take may affect or modify successive participant behaviour during the *second* task-and-reading session. In this sense using questionnaires could be a problem for a study that attempts to look into "naturalistic" situational behaviour. However, drawing on the experience from the pilot studies, it seemed likely that a questionnaire with

(mostly) fixed-choice items would not seriously affect the interactive and cognitive outcome in a collaborative situation where the main cognitive focus is on task, not on reading.

The validity and reliability of non-standardised questionnaires in case studies might be considered problematic, as the ways of assessing and improving the parameters used are very limited. Apart from small-scale piloting and attempts to develop content validity, approaches such as calculations of reliability and quantitative item analysis are not possible (cf. Coolican 1994:135-158, Rust and Golombok 1989:143-171). However, it should also be borne in mind that data gathered using any instrument in a case study are case-specific, ie. of low generalisability. Therefore the issue of questionnaire validation is not seen as a methodological problem in this study.

(c) *A semi-structured interview after the session.* The interview, which partly drew upon the questionnaire data and a quick viewing of the video recording, covered three main topics: the task sequence, any text processing problems encountered, and pair co-operation. An instruction sheet for the semi-structured interview can be found in Appendix 5 (translation). For definitions of the semistructured interview, see eg. Nunan (1992:149-53) and Hirsjärvi and Hurme (1982).

The aim of the interview was to explore the participant's personal view of the session and to elicitate verbal accounts of any problems in the task-and-reading. A quick review of a full-scene recording was utilised, to enhance the participant's recall of each session. Since the task-and-reading session had lasted more that 1.5 hours, on an average, the interviewer ran the video tape in alternately fastforward or play mode, with occasional stops if required. During this video-stimulated recall, the participant described the session in brief outline.

He was encouraged to spot out particular processing difficulties, and to discuss them with the interviewer.

After the viewing, the participant was given a copy of the operating instructions and asked to indicate any parts that he remembered reading faster or more slowly than the rest of the text.[2] He was asked to mark his faster reading with "NOP" (fast), and slower reading with "HIT" (slow). He also leafed the operation instructions again, and underlined parts of the text, words or phrases, which he had found "hard", and indicated graphical features, such as layout or pictures, that he had found confusing to process. Next, he was asked whether he had found the operating instructions helpful or not and which parts of the instructions facilitated the task or created confusion. This procedure had a dual purpose: to elicitate a further verbal report about discourse processing and to provide complementary data for protocol analysis. It was assumed that the analysis of the protocol data would benefit from a comparison with this retrospective interview data. The final interview questions dealt with co-operation and personal chemistry between the pair of participants.

(c) A *word recognition test* after the reading task assessed the participant's control of technical vocabulary. The word recognition test included a collection ca. 35 words. These were selected from the parts of the manual that during the pilot studies were frequently found to create comprehension problems. (For the concept of word recognition test, see eg. Meara and Jones (1988). The instructions and words occurring in the recognition tests are listed Appendix 6.)

Rancourt's Knowledge Access Mode Inventory (KAMI), a pen-and-paper questionnaire, was used to assess cognitive style. The word recognition test was given at the beginning, and KAMI at the end of the interview session.

---

[2] The rationale of slow vs. fast reading is based on R. Carver's rauding theory with "reading gears" (Carver 1992a).

To sum up: the data gathering for this task-integrated pair-reading resorted to the following sequence: (1) For *the participant pair* -- warm-up activity (5 - 10 min.), first task - a task that the pair was more familiar with; two questionnaires to complete; second task - a task that the pair was less familiar with; a questionnaire to fill in. (2) After a pause of some hours for each *participant separately* -- a semi-structured personal interview; a pen-and-paper test to assess cognitive style, ie. Rancourt's Knowledge Assessing Mode Inventory.

3.4 Participants of the study

The ten participants of the study were first and second year students of engineering at Kokkola Institute of Technology. The personal data about the participants of the main study and of one of the pilots is provided in Table 3.3. With the exception of participants OP07 and OP08, all participants had taken the Finnish matriculation. This normally requires the level of English (as a second language) equivalent to a post-intermediate or higher proficiency. Four participants had taken vocational (technical) education before entering the Institute.

§
Table 3.3 Personal data on participants of the main study and one of the pilots (in brackets).

Partic.	Programme	Year	Previous education
(OP01)	(Electr. eng.)	(Graduate)	(Matriculation examination)
(OP02)	(Electr. eng.)	(Graduate)	(Matriculation examination)
OP03	Mech. eng.	2nd	Matriculation exam.+ vocational educ.
OP04	Mech. eng.	2nd	Matriculation examination
OP05	Mech. eng.	2nd	Matriculation examination
OP06	Mech. eng.	2nd	Matriculation exam.+ vocational educ.
OP07	Electr. eng.	1st	Vocational education
OP08	Electr. eng.	1st	Vocational education
OP09	Electr. eng.	1st	Matriculation examination
OP10	Electr. eng.	1st	Matriculation examination
OP11	Electr. eng.	1st	Matriculation examination
OP12	Electr. eng.	1st	Matriculation examination

The participants were enrolled in four-year non-university higher education programmes internationally *(insinööri)* comparable with B. Eng. or B. Sc. (Engineering) at the university level. Six participants were students of electrical engineering, with specialisation in automation-and-instrumentation, and four were students of mechanical engineering. The graduates had completed all, the freshmen and sophomores part, of their English language requirement with good or excellent grades at the Institute.

The participants were male, 20 - 30 years of age, and all native speakers of Finnish. The pairs knew one another well, and were all in the same class. The participants were invited to volunteer for the study (outside class hours), in pairs assigned by the researcher. After the sessions were over, the participants received a small fee for their contribution.

4. DATA DESCRIPTION AND ANALYSIS

4.1 An overview of discourse data

In this study, fourteen task-integrated pair-reading sessions were audio and video recorded. Four of the sessions were allocated to piloting, and ten sessions in all remained for analysis. This section will give an overview of the protocol data. The later sections will introduce a framework for the analysis of the discourses and the main results of analysis.

As was described in Section 3.3 above, the pair at each session had a choice between three to five tasks. The participant data, tasks types with lengths, and other descriptive statistics are presented in Table 4.1. The pairs were asked to start with a task that they thought would be easier. In sessions 1 A, 2 A, 3 A, and 5 A, the first of the two sessions, the participating pairs chose the task of setting a VCR (video cassette recorder) clock and timer. One pair, OP09 and OP10, however, opted for the task of installing a bus mouse as their first task, and chose the setting of the VCR as their second task.

Table 4.1. Task-integrated reading sessions of the study: session tasks and participants.

Study sessions	**Task**	**Participants**	**Task duration**	**Task completed**
Session 1 A	Set VCR clock & timer	OP03 & OP04	23 min 8 s	yes
Session 1 B	Install bus mouse	OP03 & OP04	31 min 46 s	no
Session 2 A	Set VCR clock & timer	OP05 & OP06	9 min 32 s	yes
Session 2 B	Make recording	OP05 & OP06	23 min 30 s	yes
Session 3 A	Set VCR clock & timer	OP07 & OP08	14 min 18 s	yes
Session 3 B	Install CD-ROM drive	OP07 & OP08	48 min 10 s	no
Session 4 A	Install bus mouse	OP09 & OP10	35 min 5 s	yes
Session 4 B	Set VCR clock & timer	OP09 & OP10	11 min 15s	yes
Session 5 A	Set VCR	OP11 & OP12	19 min 11 s	yes
Session 5 B	Install bus mouse	OP11 & OP12	1 hr 20 min	yes

With the exception of Session 3B -- a prolonged, technically "impossible" installing of an internal CD-ROM drive on a PC - the recorded sessions were transcribed for verbal and non-verbal data. A more detailed analysis of the discussions was first conducted on the five sessions with the task of setting the clock and timer of a VCR. The transcripts of selected sessions are found in Appendices 7, 8, 9, 10,11, and 12.

4.2 The concepts and framework of analysis

Discourse analysis[1] was used for interpreting the recorded pair discussions of "naturalistic" task-integrated reading events. As mentioned above, the pairs were only instructed about the goal of the task, and all discussions were in L1. This design was to help understand the way in which the reader pairs process and interpret the manual text, ie. reveal for what functions they use language and non-verbal communication (cf. Brown and Yule 1983: 1-26, 222). More importantly, it was assumed that the use of these functions would convey two main aspects of the task-and-reading: situational interaction and cognitive transactions, ie. collaborative processing of the task and text.

For the analysis of these discourses, the concepts and conventions should be optimally tailored, in order to meet the requirement of the approach. As explained above, both verbal and nonverbal data were used as a source for these concepts and conventions.

The transcription symbols and conventions in this study are as follows:

(a) ... denotes a pause of less than 4 sec.
(b) (number) a pause of 4 sec. or more, eg. (8) indicates a pause of 8 sec.

---

[1]Interaction analysis (Nunan 1992:159-161) could be characterised as a middle-of-the road approach combining parts of discourse analysis (DA) and conversation analysis (CA). Used for the study of naturally occuring discussions, interaction analysis resorts to both linguistic and non-linguistic units of analysis, and shares the the same "broad, interpretative approach to the analysis of data" as CA.

The concept of interaction analysis may not be well-established, and there are domains and views where DA is understood as overlapping with CA. (eg. van Dijk 1990; Jokinen, Juhila, and Suoninen 1993:17-18). Consequently, in this study the term DA will be used in the broader sense, as a synomym for interaction analysis.

(c) Brackets *( )* are used to denote non-verbal behaviour, eg. *(laughs)*.
(d) Bold print is used for very marked stress.
(e) Two aligned brackets are used for coding simultaneous utterances, eg.

1 OP12: Tuosta, {pistetään}..
2 OP11: {Joo, teevee}ki on videokanavalla.

(f) Paralinguistic features are shown in brackets.
(g) Whenever possible, the manual text immediately preceding and following the words read aloud by the participants is given in square brackets. To improve the readability of the coded sections, the words read aloud are in bolded italics, eg.

1 OP10: Katotaanpas täältä. ***How to install for Windows***... [If]
2 ***you are using Windows*** [3, you must install the special
3 MouseWare driver and utilities that Logitech provides for
4 Windows.]

(h) A column on the right of the discussion is used for coding non-verbal behaviour.
(i) *(inaud.)* inaudible, cannot be coded.
(j) Punctuation: Ordinary punctuation is followed wherever possible, to facilitate the reading of the transcript.

In this study, a *turn* is seen as a building block of everyday discussions. It is defined as an utterance delimited by a change of turns (cf. Tiittula 1985:3-53). Extract 4.1 provides an example of such turn organisation. OP11 and OP12 are setting the timer of a VCR. They are reading the table of contents of the user guide, and have a problem figuring out what to do. Lines 1-2 constitute an example of a turn. OP11's utterance - in this case reading out a passage from the manual - ends when OP12 takes a turn by asking a question.

However, not every turn ends in a point where another speaker takes the floor. In the task-and-reading discourses of the present study, a pause of 4 seconds or more - which will be called a *long pause* - is taken as a turn delimiter. In other words, the long pause is presumed to be a transition relevance point, ie. "the spot that the participants recognize as the pontential end of a turn. . . where the a transition from one speaker to another becomes relevant" (Nofsinger 1991: 81).

In this discourse type the long pause often indicates drawn-out dyadic reflection on task-and-reading. The long pause is not a silence that must be resolved through allocation of turn, as in the case of conversations with three or more participants. An important potential function of the long pause is to draw and sustain the attention of the co-participant, who might be occupied in something else. Non-verbal communica-

tion, such as pointing with the finger, typically supports such a pause. Lines 5, 9, 16, 19 and 21 in Extract 4.1 will show this:

Extract 4.1

1	OP11: [Recording] ***TV Programmes... Timer***	*(OP12 leafs through manual[2],*
2	[Recording]...	*OP11 reads in T. of Contents, p. 1)*
3	OP12: Eikö se taimerilla tuu?	*(OP11 and OP12 browse at*
4	OP11: Joo. ***Quick Timer Recording*** - kumpi?	*Table of Contents)*
5	(5)	
6	Ajetaan kaheksantoista sivulle, katotaan...	
7	Yheksäntoista on vieressä...	*(OP11 turns to p. 18)*
8	OP12: Hmm...	
9	(9)	
10	No.. katotaan, mitä pitää tehä, ennenkö..	
11	OP11: Tsekata... Check, check... ***Programming for***	*(OP11 points at p. 18 and*
12	***timer*** [recording]	*reads aloud)*
13	OP12: Ens pitää lykätä kasetti sisälle ja sitten niin...	*(OP12 points at same p. and*
14	hm-hm... nuo läpyskät mikkä on tuola tuossa	*interprets text)*
15	on niin.. pitäs olla.. paikallaan. Sehän onki	
16	(4)	
17	kasetti, on tommonen uus.	
18	OP11: Joo.	*(OP11 points at same p.)*
19	(5)	
20	Ei kai siinä ny..	
21	(5)	
22	[Turn on the] ***TV set***	*(OP11 points at same p., reads*
23	***and set the video channel*** ... se on edelleen...	*and interprets text)*

1	OP11: [Recording] ***TV Programmes... Timer***	*(OP12 leafs through manual,*
2	[Recording]...	*OP11 reads in T. of Contents, p.1)*
3	OP12: We'll use the timer to get that, right?	*(OP11 and OP12 browse*
4	OP11: Yes. ***Quick Timer Recording*** - which one?	*Table of Contents)*
5	(5)	
6	Turn to page eighteen, and let's have a	
7	look... nineteen is next to that...	*(OP11 turns to p. 18)*
8	OP12: Uhmm..	
9	(9)	
10	Well.. let's see what we have to do, before...	
11	OP11: Check... *(comments in English:)* Check, check...	*(OP11 points at p. 18 and reads)*
12	(*reads:*) ***Programming for timer*** [recording]	
13	OP12: First you put the cassette in, and then...	*(OP12 points at p. 18 and*
14	uhm-uhm... those tabs, the ones in here,	*interprets text)*
15	I mean.. they should.. stay there. Well, this is	
16	(4)	
17	the cassette, it's a new one.	
18	OP11: Yes.	*(OP11 points at same p.)*
19	(5)	
20	I think that's all..	

---

[2]Extracts of the manual are found in Appendices 14-A and 14-C.

21	(5)		
22	[Turn on the] ***TV set***		*(OP11 points at same p., reads*
23	***and set the video channel*** ... it should be on...		*and interprets text)*

The long pauses in 5, 9, 16, 19 and 21, here spent on collaborative reading, provide an opportunity for turn-taking by either of the participants. It would therefore be inaccurate to regard these as pauses embedded in single turns.

Sometimes the discussants speak simultaneously. Any overlapping turns of the participants are taken as two turns in this study.

4.2.1 The discursive modes: reading-related vs. task-related turns

In a task-integrated pair-reading situation, the job of the reader-actor is to "get the job done" together with the pair. This activity involves both reading and practical work. In terms of the organisation of these interaction components, two main types of turns can be distinguished: *reading-related* and *task-related turns*. The category of reading-related turns covers explicit verbal interaction on the reading of the manual. The following interactive strategies are included in the reading-related turns: reading aloud; search and selection of manual text (with non-verbal activity such as pointing involved); translating, inferencing, and interpreting in practical terms (these often involve discussion of textual focus to establish a representation of meaning), and evaluating and monitoring the reading work. The reading strategies were partly adapted from the L2 reading studies by Hosenfeld et al. (1981), Block (1986) and Barnett (1989). The remainder of discourse turns are defined as task-related; a more elaborated approach to discourse sequences involving verbal interaction other than reading will discussed in later sections.

4.2.2 Participant interaction and the use of cognitive resources

There is a wide range of ways that a pair might collaborate in task-and-reading. As an ultimate case, we may picture a pair of "cognitive twins" who like to co-operate in close alignment. This pair would make sure they communicate effectively - using both verbal and non-verbal means - how they plan, execute, and check the minute details of co-processing. More importantly, however, the "cognitive twins" would share goals, orientation, expectations, knowledge (both declarative and procedural), and epistemological approach related to the task-and-reading. This approach is tentatively called *aligned integration of cognitive resources*.

At the other end of the same dimension, we could picture two very different persons who implicitly or explicitly agree to split the job and end up having separate but more or less *co-ordinated sub-tasks* for each. This is called *parallel integration of cognitive resources*.

Participants in task-and-reading are assumed to share a context and a task with a specified goal. Unlike other everyday encounters that may be regarded as more open-ended and unstructured, the task-and-reading situation does not seem to have many degrees of freedom. In other words, we may suppose that the situation does not require the participants to decide about a whole range of diverging approaches, nor communicate about and negotiate these supposedly few decisions. We might also think that just following the steps of an instruction is simple in practical terms.

However, after looking at Extract 4.1, we know that participants may communicate intensely about their collaborative task-and-reading. Regardless of the many default elements and givens in the situation, ie. knowledge and assumptions which A thinks B must share (Levinson 1983: 284-285, Brown and Yule 1983:153-154; 236), the interaction between A and B is crucial.

Theoretically, we can here distinguish between two main purposes of organising talk in the task-and-reading event: information, ie. mediation of "pure" facts, and the

mediation of interpersonal effect, ie. a request, a command, an order, etc., through language (see eg. Brown and Yule 1983: 231-233, Nofsinger 1991: 13-18 for speech acts). In practical terms, this division of purposes is vague and overlapping and can be difficult to carry out on real-life data. More importantly, however, it reminds us of a snag in the research context of task-and-reading. Although participant A may communicate to B about the interpretation of a particular passage in the manual, and this might strike us as a reflection of cognitive processes of reading, we would be misled to assume that reading processes are directly represented in communication.

In addition to this dilemma of fact vs. effect, there are other factors that may constrain the quality and quantity of collaborative interaction between A and B in the task-and-reading situation. The following list of possible factors is far from conclusive:

(a) Assumed and real inter-pair differences in situation-specific competencies, which may either impair or facilitate collaboration. For instance, participant A, finding out that B is much more competent, may choose to withdraw from active participation, and so take the role of an on-looker;

(b) As in all non-automatic operations, human capacity limitations that restrict cognitive action; short-term memory can only process a limited number of "chunks" at a time (eg. Anderson and Simon, 1983:13-15);

(c) Problems in inter-pair communication, the causes of which may vary from personal dislikes to differences in cognitive style; from conflicting perceptions about the situation to motivational problems.

In the following, two samples will be presented in which interaction about ongoing processes varies a great deal.

In Extract 4.2, OP11 and OP12 are setting the clock of a video cassette recorder (VCR). The User Manual of the VCR, which they are both concentrating on, provides the steps to be taken (an extract of the manual is found in Appendix UD-1-13). OP12 has the VCR remote control in his hand.

Extract 4.2

1	OP11: Tällä systeemillä laitetaan tuo...ässä,	*(OP11 and OP12 read;*
2	täsä selevitetään se.	*OP11 points at p. 13)*
3	OP12: Hm.. mutta eihän meiän nyt tuota tarvi tehä.	
4	OP11: Niin, ei kai se nyt oo...	
5	OP12: Että tuota ei tarvi tehä ollenkaan. Ko sais ens nyt	
6	ajan sinne.	
7	OP11: Niin, ei kai. (4)	*(OP11 and OP12 read)*
8	OP12: Määpäs painan uuestaan tuota CLOCK buttonia,	
9	jos se muuttus.	*(OP11 points at page)*
10	OP11: Muuttuuko se sitte? No, koitapa.	
11	OP12: Ei se muutu miksikään.	*(OP12 presses control button)*
12	OP11: Ei... ootas ny... Ei siinä kato... muuta ko laitetaan	*(OP11 points at page)*
13	tuolta tunnit ja minuutit. Sen näppäimistön avulla.	*(OP11 and OP12 read)*
14	OP12: Näppäimistön - tästä näin?	
15	OP11: Niin.	
16	(8)	
17	Nyt on ykkös-key..	
18	OP12: Kaheksan viistoista... nyt se on seittemäntoista	*(OP12 looks at his watch, then*
20	nelikyt-kuus.	*presses buttons to set time)*

1	OP11: This is the way you put the... S in,	*(OP11 and OP12 read;*
2	it says here.	*OP11 points at p. 13)*
3	OP12: Uhm.. but I don't think we have to do that now.	
4	OP11: That's right, I suppose it's not...	
5	OP12: I mean we don't have to do that at all. If we	
6	only got the correct time first.	
7	OP11: I suppose you're right. (4)	*(OP11 and OP12 read)*
8	OP12: I think I'll press that CLOCK button again,	
9	may be it'll change.	*(OP11 points at page)*
10	OP11: Will it change then? Go ahead.	
11	OP12: It won't change at all.	*(OP12 presses control button)*
12	OP11: No.. hold on... Well... all you need is key in the	*(OP11 points at page)*
13	hours and minutes, there. Using that key-pad.	*(OP11 and OP12 read)*
14	OP12: Key-pad - this one?	
15	OP11: Yes.	
16	(8)	
17	Now it's key number one..	
18	OP12: Eight fifteen... now it's seventeen	*(OP12 looks at his watch, then*
20	forty-six.	*presses buttons to set time)*

The interaction in Extract 4.2 seems to be aligned and fluid. OP11's textual interpretation in lines 1 and 2, on a co-processed point, is taken up and modified by OP12 in 3. A couple of turns later, another suggestion, this time by OP12 in 8, is duly checked and commented by OP11 in 10. A third example of uninterrupted alignment:

the long pause of 8 sec. in 16 is spent on co-processing of text and OP11's instruction "Now it's key number one" follows. The instruction is then taken up and put into effect by OP12.

In this sequence can be located some of the elements which Block (1992) found in her think-aloud study of reading comprehension. In Block's study, individual subjects were asked to read and think aloud while reading; they were to "say everything they understood and everything they were thinking as they read every sentence". Reporting the findings of her study, Block suggested that the process of comprehension had three phases: *evaluation*, ie. problem recognition and source identification; *action*, ie. strategic plan and attempt at solution; *checking*, ie. check and revision.

Lines 1-7 reflect evaluation, lines 8-10 reveal an action sequence, and lines 11-12 indicate checking. There is focus and co-ordination between the pair. Note that OP11, who in 1-2 suggests keying in the "S", for daylight saving time, has no difficulty revising his position in 4 and 7. OP12, again, recaps his previous (line 3) comment in 5, not because the comment was not fully understood or recognised by his pair, but probably because of capacity restrictions: he can only process one sub-task of reading-and-applying at a time.

As to explicit speech acts often cited in literature on discourse analysis (eg. Brown and Yule 1983:231-233), only one direct request for action (10), and one request for confirmation (14) can be identified. In other words, this extract shows a close interplay by OP11 and OP12 with no need to use the full force of discourse to regulate their work.

An example of a less fluid, less co-ordinated effort is to be found in Extract 4.3. Here OP05 and OP06 are processing the same sub-task as OP11 and OP12 above.

Extract 4.3[3]

1 (16)	*(OP05 checks remote control batteries)*
2 OP06: Pistiksää tuonne jo sen?	*(OP06 reads, points at p. 13)*
3 (4)	
4 OP05: Näkyykö tänne asti? ...	*(OP05 operates remote control, looks*
5 On se VCR:llä.	*at VCR panel, OP06 watches this)*
6 OP06: Mitä.. niin sää tuon nyt teit?	*(OP06 points at p. 13)*
7 [Note: If the VCR/TV..."TV" position, the]	
8 ***..clock.. clock cannot be set.***	
9 OP05: Hmm.	
10 OP06: [1.] ***Press the clock button***.	*(OP06 moves on in text., reads same p.,*
11 (20)	*points at same p.)*
12 OP05: *(Whistles)* Ootappa milles tää nyt meni...	*(OP05 reads same p., using remote control)*
13 OP06: Kokeilepa painaa ykköstä välillä *(inaud.)*	*(OP06 points at p. 13)*
14 OP05: Joo, joo. .. Se pitäs ottaa ensin..	*(OP05 presses remote control buttons)*
15 (6) Tosta ottaa noin.. Sitte...	
16 [Set the.. and minutes] ***using the key-pad***.	*(OP05 reads same p., inaud.)*
17 (12)	
18 Millä se menee tonne...	
19 OP06: [When setting the clock during...]	*(OP06 reads and points at p. 13)*
20 ***CANCEL***...	
21 {Ooksä tuolla?	
22 OP05: {Ootappa ny.	*(OP05 reads same page, OP06 reads briefly*
23 (22)	*then looks at TV screen)*
24 Tuossa se on...	*(OP05 presses Manual Tuning and*
25 viis... perjantai... siinä se on.	*Key-Pad buttons of remote control)*
26 OP06: Nyt se pitää...	*(OP05 and OP06 read same p.,*
27 (12)	*then OP05 operates remote control)*
28 Pitäskö siihen pistää *set*? ***Press the SET***	
28 [button to start the clock.]	
29 OP05: Niin, tai sehän on... valmis jo...	*(OP05 operates remote control)*
30 OP06: Ai jaa.	

1 (16)	*(OP05 checks remote control batteries)*
2 OP06: Did you put that right?	*(OP06 reads, points at p. 13)*
3 (4)	
4 OP05: Can one see it here?	*(OP05 operates remote control, looks*
5 Yes, it has the VCR on.	*at VCR panel, OP06 watches this)*
6 OP06: What... so you did that?	*(OP06 points at p. 13)*
7 [Note: If the VCR/TV...] ***..clock.. clock***	
8 ***cannot be set.***	
9 OP05: Uhm.	
10 OP06: ***Press the clock button***.	*(OP06 moves on in text., reads same p.,*
11 (20)	*points at same p.)*
12 OP05: *(Whistles)* Hold on, what did I do now...	*(OP05 reads same p., using remote control)*
13 OP06: Try pressing number one.	*(OP06 points at p. 13, button no. 1)*
14 OP05: Yes, yes... Must press that one first..	*(OP05 presses remote control buttons)*
15 (6) must press that one... So next...	
16 [Set the.. and minutes] ***using the key-pad***.	*(OP05 reads same p., inaud.)*

[3]An extract of the manual is to be found in Appendix 14-B.

17 (12)
18 How do I get that...
19 OP06: [When setting the clock during...].. *(OP06 reads and points at p. 13)*
20 **CANCEL..**
21 {Are you there now?
22 OP05: {Hold on. *(OP05 reads same page, OP06 reads briefly*
23 (22) *then looks at TV screen)*
24 It's there.. *(OP05 presses Manual Tuning and*
25 five... for Friday... there we go. *Key-Pad buttons of remote control)*
26 OP06: Now it must be.. *(OP05 and OP06 read same p.,*
27 (12) *then OP05 operates remote control)*
28 Don't you think you should press *set*?
29 ***Press the SET*** [button to start the clock.]
30 OP05: Yes, well it's.. done already.. *(OP05 operates remote control)*
31 OP06: Oh, I see.

The way in which OP05 treats OP06's questions in 2, 6, 21 and 28 indicates that OP06 is getting out of step with what is going on here (eg. in 6: "What... so you did that?" and in 21 "Are you there now?"). OP05's replies in 4 and 22 (especially in 22 "Hold on." without any attempt to help out OP06) and back-channelling in 9 show that OP05 is not helping his pair catch up. By the time the task is completed, OP06 says "Oh, I see." The several instances of drawn-out silent pauses for reading in 11, 17 and 23, 27 are not followed by attempts to negotiate text meaning, as is the case in most sessions of the present study. Without speculating about the causes of the out-of-step interaction in this extract, we can conclude that two talk-in-interaction sequences for the same sub-task can be very different.

To summarise: a quantitative analysis of the pair discussions shows considerable variation of session length, discourse types (discussion on reading vs. on task), and the allocation of pauses required for reading-with-task processes. Resorting to reading aloud from the manual and discussions on reading-and-task reflect the fact that the participant completing the task encounters problems which he cannot solve individu-

ally. Such overall parameters as distribution of turns[4] or pauses might, however, fail to shed light on the transactional and interpersonal dynamics of these processes.

Individual and collaborative work - planning, co-ordinating, executing, and monitoring of task-and-reading - is mediated through inter-pair communication. The interactive sequences in the examples above reflect considerable variations in collaboration, meaning negotiation, and "tuning in". The challenge of the analytic exploration into the interaction is to be sensitive enough to cover the essential variations.

4.3. Setting the clock and the timer of a VCR

This section will look into the ways in which the participants processed the task of setting the clock and timer of a VCR. Five of the six pairs chose this task as the first of the two tasks, with a choice of three to five task options. I will therefore first look into some of the major findings that this task produced.

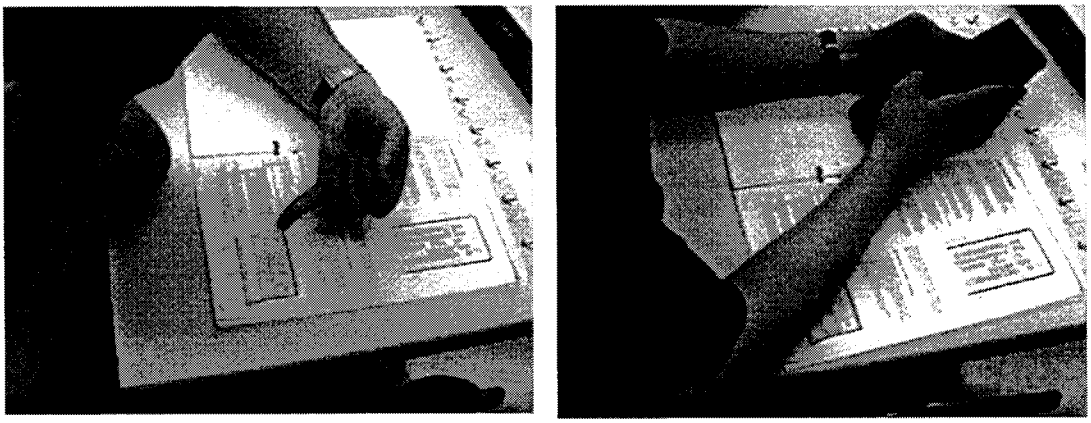


Figure 4.2. Participants at work, here setting the clock and timer of a VCR. - A slightly reduced Camera no. 1 view of a Session; for recording techniques, see Section 3.3 and Figure 3.1. The pictures used in this study were grabbed from the video tapes.

[4]Cf. Hiukka and Hiukka (1986), a quantitative study of dyadic interaction in CAI tasks, which focused on requests. The study did not show how pair interaction was organised, and in what way requests related to overall communication between the pair. It seems highly unlikely that frequencies of speech-acts, without consideration of speech-acts as constituents of discussion sequencies, can provide a valid account of interaction between the discussants.

As can be seen in Table 4.2, there was considerable variation in the task duration. In Session 2 A, the pair hardly spent more than nine minutes and a half on the task, whereas another pair, in Session 1 A, took nearly three times the time span. Table 4.2 also shows differences in the discourse volumes of the sessions. For instance, in the shortest session, Session 2 A, participant OP05 only read aloud three words from the manual text. He and his pair OP06 concentrated on solving the technicalities of setting the clock and timer. In their session, the accumulation of longer pauses, ie. those of more than three seconds, clearly exceeded the time spent on talking. Their discourse volume was 75 turns in all, and an average of ca. 8 turns per minute.

In Session 4B, on the other hand, we have a OP09 and OP10, who, spending a couple of minutes more, produced a discourse volume of more than 200 turns, an average of ca. 19 turns per minute. Correspondingly, this talk-intensive session has very few pauses of the longer type.

Table 4.2. Session data on the task of setting the VCR clock and timer: session durations, discussion volume (counted in turns), and accumulation of pauses of 4 sec. or more.

SESSION	Participant	Discussion turns by part.	Words read aloud in manual by part.	Accumul. of longer pauses (4 sec. or more)	Session duration
Session 1 A	OP03 &	86	9	52% (11 min 59 s)	23 min 8 s
	OP04	92	12	*	*
Session 2 A	OP05 &	42	4	53% (5 min 4 s)	9 min 32 s
	OP06	33	23	*	*
Session 3 A	OP07 &	71	75	53% (7 min 38 s)	14 min 18 s
	OP08	64	62	*	*
Session 4 B	OP09 &	105	3	5% (35 s)	11 min 15 s
	OP10	105	28	*	*
Session 5 A	OP11 &	178	85	41% (7 min 41 s)	19 min 11 s
	OP12	168	22	*	*
AVERAGE		*94.4*	*32.5*	*42.5% (6 min 35 s)*	*15 min 29 s*

The distribution of discourse turns, in proportion to task-related turns, is provided in Table 4.3. The accumulated lengths of reading-related sequences are also given in the table. We can note how pair discussions tended to split the turns more or less evenly between reading and task, with the exception of OP09 and OP10 in Session 4 B. Also, in spite of the great differences in task duration (9 min. 32 s. to 23 min. 8 s.) and accumulation of long pauses (35 s. to 11 min. 59 s.), all pairs took turns rather evenly. This is a rough indication of balanced inter-pair communication. However, in Session 2 A, the shortest session of all, OP05 took 42 turns and OP06 33 turns only.

Figure 4.3 compares the number of turns and reading-related turns, by each participant, relative to task duration. In other words, the number of the turns by the participant is divided by the duration of the session in seconds. The line in Fig. 4.3 indicates the accumulation of long pauses in proportion to task length.

Table 4.3. Setting the VCR clock and timer: reading-related sequences and discourse turn types by participant.

SESSION	**Participant**	**Discourse turns (all)**	**Reading- related turns, % (f)**	**Reading sequences (accumul., per pair)**
Session 1 A	OP03 &	86	50% (43)	70% (16 min 16 s)
	OP04	92	61% (56)	**
Session 2 A	OP05 &	42	38% (16)	62% (5 min 57 s)
	OP06	33	52% (17)	**
Session 3 A	OP07 &	71	54% (38)	47% (9 min 6 s)
	OP08	64	59% (38)	**
Session 4 B	OP09 &	105	17% (18)	5% (35 s)
	OP10	105	18% (19)	**
Session 5 A	OP11 &	178	52% (92)	76% (14 min 34 s)
	OP12	168	42% (71)	**
AVERAGE		*94.4*	*43.2% (40.8)*	*52.0% (9 min 17 s)*

On the basis of discourse parameters, the following sequence types emerge. The *pause-intensive type* includes (most of) Sessions 1 A, 2 A and 3 A. These have more than 50% of session time distributed on long pauses, and 38%-60% of discussion turns on reading.

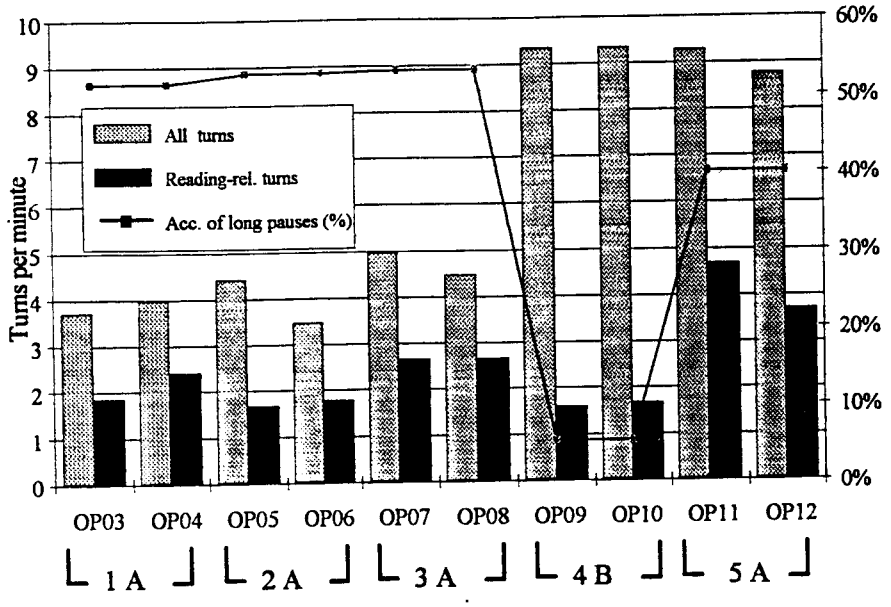


Figure 4.3. Discussion turns by participant and accumulation of long pauses, relative to task duration, in the five sessions with the task of setting the clock and timer of a VCR.

A major part of Session 4 B could be characterised as being of the *task-intensive type*, where the pair allow little time for long pauses. They mainly discuss the task, and talk about and read the manual text only in passing (18% and 19% of turns). Finally, in Session 5 A we have the *"read-and-apply-aloud" type*. Here the participants, who read aloud a large part of the manual text being processed, seem to concentrate much of their discussion on the text *and* the task, almost as intensely as the pair in the task-intensive type. Section 4.5 will present a more detailed analysis of three interaction patterns pause-intensive, task-intensive, and read-and-apply-aloud. For analysing the three interaction patterns, the data from interviews and questionnaires will be integrated. - The section below will compare interaction of the same pair in consecutive tasks: the "easy" task and the more "difficult" one.

4.4 "Second verse, same as first" - second task, the first rehearsed?

In the section above I looked into how the five participant pairs collaborated for setting the clock and timer of a VCR. I concluded that there was considerable variation between the sessions. In addition to the total length of the time spent on the task, this came out in such parameters as the number of turns, time spent on pauses, or words read aloud in the manual. There were also variations of the more qualitative type. For instance, it was seen how a pair took more collaborative effort on reading than others (working "bottom-up" on the text), while another pair spent more time on the application aspects of the task. Yet, a third pair collaborated in a way that seemed far from well-aligned, in the sense that a participant was clearly out of step and was left behind by his pair, who was more competent in the application work and reading alike.

What might characterise pair interaction and collaboration in the task that the participating pairs chose (or regarded) as the more difficult one? Is it "second verse, same as first", or can we here see, as a possible result of learning - or rehearsing if you may - participants adapting their approach towards shared cognition and collaboration? To answer the questions, I will narrow down the analysis: Instead of looking at all the five pairs, I will look at the collaborative interaction of three participating pairs, whose patterns of interaction on the VCR task show more contrast than that of the others.

Table 4.4 compares the proportion of interaction that the three pairs of readers spend on reading and the proportion of long pauses in Task One and Task Two. In Task Two, we can again note a high degree of variation between reader pairs as regards pausing (5-33%), reading sequences (24-46%), and reading-related turns (11-44%). This pattern certainly makes Task One similar to Task Two. However, it seems that practical work and problem-solving required in Task Two (ie. installing the bus mouse and making recording with an open-reel deck) take up more time than setting the VCR, and correspondingly, less time is left for reading. Setting the timer can be done conveniently with a number of key strokes; for instance, the VCR does not have any screws to untighten.

It can be concluded that with a technically more demanding task, such as installing the bus mouse or making a recording, the pairs obviously take more time to complete it, and more important, interact and discuss more, as well as give room for fewer pauses of the longer type (4 sec. or more).

Table 4.4. The first and second tasks: analysed sequences, sequences and turns that participants spent on reading, and accumulation of pauses 4 seconds or more.

Participants	**Task**	**Duration of analysed seq.**	**Acc. of long pauses in analysed seq.**	**Reading-rel. turns,% (f)**	**Accum. of seq. spent on reading**
OP05+OP06	1. Set the VCR	9 min 32 s	53% (5 min 4 s)	50%+61% (43+56)	5 min 57 s (62%)
OP05+OP06	2. Make recording	23 min 30 s	31% (7 min 4 s)	13%+11% (18+14)	7 min 13 s (31%)
OP009+OP10	1. Install mouse	29 min 25 s[5]	18% (6 min 24 s)	17%+16% (35+35)	6 min 44 s (23%)
OP009+OP10	2. Set the VCR	11 min 15 s	5% (35 s)	17%+18% (18+19)	2 min 39 s (24%)
OP011+OP012	1. Set the VCR	19 min 11 s	41% (7 min 41 s)	52%+42% (92+71)	14 min 34 s (76%)
OP011+OP012	2. Install mouse	31 min 00 s[6]	33% (10 min 19 s)	44%+33% (66+49)	14 min 13 s (46%)

For a deeper and more detailed analysis of the sequences where participants reading aloud hard-access parts of manual text explain and interpret words or whole sentences, it is necessary to make a distinction between *collaborative meaning construction* and the kind of verbalised text processing that merely gets communicated to the pair. Collaborative meaning construction - to use a shorter term, co-construction of meaning - refers to multi-phase exchange of turns for text-processing where participant A slows down reading speed, reads aloud a word or parts of the text, and draws the pair's attention; where typically, by pointing at the text, he suggests a verbal interpretation or literal translation of text, and also expects to receive uptake; further where participant B communicates to show s/he is paying attention, receives the interpreta-

[5]The task was completed in 36 min. 5 s.
[6]The task was completed in 1 hr. 20 min.

tion, and develops it further, or comments on it. To meet the criteria of co-construction of meaning, the sequence of turns is required to include focusing on the same textual point by both participants, (an attempt of) a verbal interpretation of the textual focus by either or both of the participants, and accountable feedback (comment) by the pair.

In Extract 4.4 OP11 initiates an exchange where he reads aloud (1-2). OP12 interprets after a short pause (3), and OP11 comments "yes" (4). Note that OP12's "We'll use the timer to get that, right?" is more likely intended for a practical representation of the textual focus at hand, rather than an interpretation of propositional content without task application.

Extract 4.4[7]

1 OP11: [Recording] ***TV Programmes... Timer***	*(OP12 leafs through manual,*
2 [Recording]...	*OP11 reads from T. of Contents, p. 1)*
3 OP12: Eikö se taimerilla tuu?	*(OP11 and OP12 browse at*
4 OP11: Joo.	*Table of Contents)*
1 OP11: [Recording] ***TV Programmes... Timer***	*(OP12 leafs through manual,*
2 [Recording]...	*OP11 reads from T. of Contents, p.1)*
3 OP12: We'll use the timer to get that, right?	*(OP11 and OP12 browse*
4 OP11: Yes.	*Table of Contents)*

The above sequence can be compared to what is found in Extract 4.5. In 2-3, OP05 checks if the VCR function is on, and OPO6 follows up to see what OP05 is doing (4). After a short pause, OP06 reads in the manual, but does not get an explicit response from OP05 (7), so he decides to read on; a pause of 20 sec. follows. Unlike Extract 5.4, this sequence has little action towards co-ordinated meaning construction, although the exchange of turns does indicate collaboration required for managing discussion.

Extract 4.5[8]

---

[7]An extract of the manual in Appendix 14-A.

1	(4)	
2	OP05: Näkyykö tänne asti? ...	*(OP05 operates remote control, looks*
3	On se VCR:llä.	*at VCR panel, OP06 watches this)*
4	OP06: Mitä.. niin sää tuon nyt teit?	*(OP06 points at p. 13)*
5	[Note: If the VCR/TV..."TV" position, the]	
6	***..clock.. clock cannot be set.***	
7	OP05: Hmm.	
8	OP06: [1.] ***Press the clock button.***	*(OP06 moves on in text., reads same p.,*
9	(20)	*points at same p.)*

1	(4)	
2	OP05: Can one see it here?	*(OP05 operates remote control, looks*
3	Yes, it has the VCR on.	*at VCR panel, OP06 watches this)*
4	OP06: What... so you did that?	*(OP06 points at p. 13)*
5	[Note: If the VCR/TV...] ***..clock.. clock***	
6	***cannot be set.***	
7	OP05: Uhm.	
8	OP06: ***Press the clock button.***	*(OP06 moves on in text., reads same p.,*
9	(20)	*points at same p.)*

The instances where meaning is co-constructed in the session protocols cover a varying amount of participant commitment and alignment, and cognitive processing depth. However, using the category helps us draw the line between this interaction category and turns used for search and selection, interpreting, etc., in ways that are not collaborative. Furthermore, a look at talk organisation over sequences will provide complementary data needed for more elaborated, more particular analyses of participant interaction.

With a default definition for co-construction of meaning, I will now proceed to use it for analysing collaborative reading in Task One and Task Two Sessions. Particularly, I am interested in sequences where the three pairs read for longer than 15 sec. in Sessions 2A and 2B; 4A and 4B, and 5A and 5B. I leave out sequences shorter than 15 sec. with the motivation that shorter sequences most often relate to searching, selecting, and localising, not to meaning construction. Tables 4.6, 4.7, and 4.8 provide quantitative data of the sequences, ie. instances of co-construction of meaning, manual

[8]An extract of the manual in Appendix 14-B.

text read aloud, and terminology explicitly negotiated for meaning by the three participant pairs. This quantitative data is summarised in Table 4.5.

Table 4.5. Meaning construction in major sequences of reading (15 sec. or more) in Sessions 2A, 2B, 4A, 4A, 4B, 5A, and 5B.

Session	Participants	Co-construction of meaning	Terms expl. negotiated	Text seq. read aloud[9]	Acc. of longer reading seq. (all reading seq.)	Turns by pair
2A	OP05+OP06	0	0	8	5 min 57 s (5 min 57 s)	16 + 17
2B	OP05+OP06	2	0	16	7 min. 19 s (7 min 13 s)	21 + 13
4A	OP09+OP10	5	0	10	6 min 33 s (6 min 44 s)	34 + 36
4B	OP09+OP10	5	0	5	2 min 19 s (2 min 39 s)	14 + 17
5A	OP11+OP12	20	3	33	13 min 13 s (14 min 34 s)	80 + 62
5B	OP11+OP12	17	5	41	13 min 58 s (14 min 13 s)	64 + 48

Comparison of the data on meaning construction (in Sessions 2A & 2B, 4A & 4B, and 5A & 5B) shows that OP05 and OP06 resort to co-construction of meaning only twice, in their second task. OP09 and OP10, working more collaboratively, use this tactic five times in the two tasks. While using nearly half or most of their session time on reading (76% in Task One, 46% in Task Two), it is most obvious that OP11 and OP12 should choose to co-construct very often: 20 and 17 instances of this tactic can be located, respectively. It is noteworthy that both OP05 and OP06 read out from the manual and produce a geat deal of reading-related exchanges with minimal co-construction of meaning. This seems to be another quantitative indication of non-alignment in participant interaction, which was discussed in more detail above when analysing Extracts 4.2 and 4.3 (see Section 4.2.2 above).

Only OP11 and OP12 explicitly negotiate the meaning of terminology in the manual text. In other words, they discuss individual terms, trying to find conceptual

[9]Note: Two or more parts/words of manual read aloud in the same sentence are counted as one text sequence; otherwise, parts/words of manual text read aloud recurrently by same participant or pair are counted as separate text sequences.

definitions for these. When working on the first task (setting the VCR clock and timer), OP11 and OP12 negotiate the meaning of *daylight saving time*, *is not lit,* and *SP* (= short play, alternate mode of *LP*), and in the second task they talk about the meaning of terms *bus board, cross out, jumper clip, run,* and *file.* The other pairs OP02 and OP04, OP05 and OP06 do not explicitly negotiate terms found in the manual text. Rather than trying to arrive at definitions, they read aloud individual words and interpret their meanings, typically with direct transfer to application.

Table 4.6. Major sequences of meaning construction in Sessions 2A and 2B, by OP05 and OP06. (Length of analysed sequences: Session 2A 9 min. 32 sec., and Session 2B 23 min. 30 sec.)

Sequence (Session)	**Protocol location**[10]	**Text seq. read aloud**[11]	**Co-construction of meaning**	**Terms expl. negotiated**	**Duration of sequence**	**Turns by OP05 + OP06**
1 (2A)	2A: 6-24	0	0	0	1 min. 0 s.	5 + 2
2 (2A)	2A: 29-58	5	0	0	3 min. 3 s.	5 + 8
3 (2A)	2A: 82-93	2	0	0	1 min. 9 s.	3 + 3
4 (2A)	2A: 121-133	1	0	0	45 s.	3 + 4
TOTAL	-	*8*	*0*	*0*	*5 min. 57 s.*	*16 + 17*
AVERAGE	-	*2.0*	*0*	*0*	*1 min. 29 s.*	*4.0 + 4.25*
1 (2B)	2B: 2-18	0	0	0	1 min. 14 s.	4 + 2
2 (2B)	2B: 48-76	8	1	0	2 min. 2 s.	7 + 4
3 (2B)	2B: 97-117	4	0	0	1 min. 29 s.	3 + 4
4 (2B)	2B: 182-188	2	0	0	55 s.	2 + 1
5 (2B)	2B: 216-220	0	0	0	23 s.	1 + 1
6 (2B)	2B: 318-322	0	0	0	45 s.	2 + 0
7 (2B)	2B: 329-334	2	1	0	31 s.	2 + 1
TOTAL	-	*16*	*2*	*0*	*7 min. 19 s.*	*21 + 13*
AVERAGE	-	*2.3*	*0.3*	*0*	*1 min. 3 s.*	*3.0 + 1.9*

[10]The codes below refer to session and line numbers.

[11]Note: Two or more parts/words of manual read aloud in the same sentence are counted as one text sequence; otherwise, parts/words of manual text read aloud recurrently by same participant or pair are counted as separate text sequences.

Table 4.7. Major sequences of meaning construction in Sessions 4A and 4B, by OP09 and OP10. (Analysed sequences: Session 4A 29 min. 25 sec., and Session 4B 11 min 15 sec.)

Sequence (Session)	**Protocol location**	**Text seq. read aloud**	**Co-construct-ion of meaning**	**Terms expl. negotiated**	**Duration of sequence**	**Turns by OP09 + OP10**
1 (4A)	4A: 300-310	0	1	0	56 s.	6 + 8
2 (4A)	4A: 391-401	0	2	0	31 s.	3 + 4
3 (4A)	4A: 447-464	2	1	0	1 min. 8 s.	6 + 3
4 (4A)	4A: 490-521	3	1	0	1 min. 41 s.	10 + 10
5 (4A)	4A: 532-550	2	0	0	1 min. 3 s.	5 +7
6 (4A)	4A: 561-574	3	0	0	52 s.	3 + 4
7 (4A)	4A: 596-599	0	0	0	22 s.	1 + 0
TOTAL	-	*10*	*5*	*0*	*6 min. 33 s.*	*34 + 36*
AVERAGE	-	*1.4*	*0.7*	*0*	*52 s.*	*4.8 + 5.1*
1 (4B)	4B: 37-57	3	2	0	52 s.	6 + 6
2 (4B)	4B: 152-162	0	1	0	25 s.	3 + 4
3 (4B)	4B: 245-250	0	0	0	17 s.	0 + 2
4 (4B)	4B: 254-262	0	2	0	17 s.	3 + 3
5 (4B)	4B: 271-278	2	0	0	28 s.	2 + 2
TOTAL	-	*5*	*5*	*0*	*2 min. 19 s.*	*14 + 17*
AVERAGE	-	*1.0*	*1.0*	*0*	*28 s.*	*2.8 + 3.4*

Table 4.8. Major sequences of meaning construction in Sessions 5A and 5B. (Analysed sequences: Session 5A 19 min. 11 sec., and Session 5B 31 min.)

Sequence (Session)	**Protocol location**	**Text seq. read aloud**	**Co-construct-ion of meaning**	**Terms expl. negotiated**	**Duration of sequence**	**Turns by OP11 + OP12**
1 (5A)	5A: 8-18	2	0	0	42 s.	5 + 4
2 (5A)	5A: 25-29	1	1	0	16 s.	2 + 1
3 (5A)	5A: 43-51	0	1	0	26 s.	3 + 4
4 (5A)	5A: 54-79	3	1	0	1 min. 8 s.	7 + 4
5 (5A)	5A: 83-115	3	1	1 (daylight s.t.)	1 min. 55 s.	11 + 9
6 (5A)	5A: 120-124	0	0	0	20 s.	2 + 1
8 (5A)	5A: 134-144	0	0	0	33 s.	3 + 3
9 (5A)	5A: 182-187	0	0	0	16 s.	2 + 1
10 (5A)	5A: 195-200	1	1	0	21 s.	2 + 1
11 (5A)	5A: 229-239	2	2	0	31 s.	3 + 4
12 (5A)	5A: 247-276	5	2	0	1 min. 24 s.	9 + 4
13 (5A)	5A: 280-299	3	2	1 (is not lit)	49 s.	8 + 7
14 (5A)	5A: 316-319	2	1	1 (SP)	19 s.	2 + 2
15 (5A)	5A: 329-343	4	1	0	45 s.	4 + 3
16 (5A)	5A: 403-411	3	1	0	15 s.	4 + 2
17 (5A)	5A: 415-426	2	1	0	21 s.	2 + 1
18 (5A)	5A: 437-453	1	2	0	55 s.	3 + 6
19 (5A)	5A: 458-485	1	3	0	1 min. 37 s.	8 + 6
TOTAL	-	*33*	*20*	*3*	*13 min. 13 s.*	*80 + 62*
AVERAGE	-	*1.8*	*1.1*	*0.2*	*44 s.*	*4.4 + 3.5*

Table 4.8. Major sequences of meaning construction in Sessions 5A and 5B. (Analysed sequences: Session 5A 19 min. 11 sec., and Session 5B 31 min.) (Cont.)

Sequence (Session)	**Protocol location**	**Text seq. read aloud**	**Co-construction of meaning**	**Terms expl. negotiated**	**Duration of sequence**	**Turns by OP11 + OP12**
2 (5B)	5B:77-135	10	3	2 (cross out; jumper clip)	3 min. 32 s.	14 + 13
3 (5B)	5B:147-155	0	1	0	28 s.	3 + 3
4 (5B)	5B:234-238	0	1	0	26 s.	2 + 1
5 (5B)	5B:265-269	2	1	0	17 s.	2 + 1
6 (5B)	5B:285-287	0	0	0	15 s.	1 + 1
7 (5B)	5B:299-326	4	1	0	2 min. 15 s.	8 + 6
8 (5B)	5B:337-360	7	1	0	1 min. 34 s.	5 + 4
9 (5B)	5B:382-392	4	2	2 (run; file)	51 s.	4 + 2
10 (5B)	5B:407-424	3	1	0	1 min. 2 s.	6 + 4
TOTAL		*41*	*17*	*5*	*13 min. 58 s.*	*64 + 48*
AVERAGE		*4.1*	*1.7*	*0.5*	*1 min. 24 s.*	*6.4 + 4.8*

A look at quantitative data on interactive discourse processing in Task One and Task Two, indicates that in Task One ("easy") and Task Two ("more difficult") the participant pairs use basically the same approaches for joint reading, and for collaborative action as indicated by the parameters for co-construction of meaning, negotiation of meaning for terminology, and text sequences read aloud in the manual. Yet great variability is shown in the approaches adopted by different pairs.

The phases of co-construction. In Section 4.2.3 I juxtaposed an interaction pattern of Session 5A to Block's finding (Block 1992) that she made in her think-aloud study. Block posited that the think-aloud process of comprehension, in solo-reading, typically takes place in three phases of evaluation, action, and checking. Co-construction of meaning, as suggested in the present study, comprises focusing, interpretation and feedback. It can now be concluded, with more evidence, that Block's three-phase cycle compares well with co-construction in pair-reading interaction. However, it is unlikely that this cyclic similarity could in a valid way imply the existence of a uniform, high-level cognitive process underlying the two cycles of think-aloud (in solo-reading) and verbal interaction (in pair-reading). It would rather seem that the two cycles reflect *similar interpretative and problem-solution practices* (cf. Gee 1992:1-21; see Section

2.3 above) that readers skilfully resort to for meaning construction. This conclusion is supported by the fact that discursive exchanges in sequences on reading and on the task itself tend to follow the same pattern, as shown in Extracts 4.1, 4.2, and 4.3.

Another way to interpret this cyclic resemblance is to view it from the wider perspective of cognitive processes. Research findings on expertise (eg. Ericsson and Smith 1991; Glaser and Farr 1988) show that novices in various specialist domains often use different approaches for problem-solving than experts. Reviewing several key studies on expertise, Ericsson and Smith (1991:20) summarised that expert performers tend to use a solution method as part of their comprehension of the task, whereas less experienced subjects have to construct a representation of the task deliberately and generate a step-by-step method. For instance, medical experts produce their diagnoses by studying the symptoms (forward reasoning), whereas less experienced medical students usually check the correctness of a diagnosis by inspecting relevant symptoms (backward reasoning).

The two alternate approaches of forward reasoning (solution method) vs. backward reasoning (step-by-step method) seem to be reflected on discoursal-interactive processing. In Sessions 5A and 5B, participants OP11 and OP12 follow the steps given by the manual closely in a bottom-up fashion, which in turn makes their progress very slow especially in Task Two. Also non-experts in computer hardware installation, OP09 and OP10 follow a novice technique, but of a different kind: they work backwards, ie. choose to solve the problem in a categorical way, and do not consider the wider constraints (environment) of problem-solving. This induces a high risk of causing damage to both the computer and the installed peripheral equipment, which the participants duly recognise. An example of how they agree to follow this heuristic approach will be given in Section 4.8 below.

Figure 4.4. Roles of collaboration are important both in practical work and manual reading. A participant pair meet the challenge of installing a PC board, as first-timers.

4.5 Patterns of pair interaction and collaboration in task-integrated reading

Pair collaboration in task-and-reading requires interaction. Implicitly or explicitly, the pair tends to develop joint plans with strategies, execute them, and stepwise or after completing the task, check the outcome. The findings of this study have so shown that the pairs were far from "cognitive twins," the kind of pair that would co-operate in close alignment without little need for discussions. On the other hand, none of the pairs seem to split the whole job, ending up in separate, parallel sub-tasks.

What is the role of the participant in each of the session as to reading and task completion? Does the participant contribute in a parallel or a collaborative fashion? Is reading and practical work done on equal terms? On the basis of available data, a researcher interpretation was sought to these question.

To assess these roles, the video recordings were viewed several times, with special focus on non-verbal action and exchanges. A summary of the researcher's interpretation, based on the video recordings and protocol data, is presented in Table 4.9; post-session interview data will be summarised later in this section.

Table 4.9 Researcher's interpretation of participant's role in collaboration.

Task One	Task Two
OP05: Had a dominating role in reading and practical work.	OP05: Had a dominating role in reading and practical work
OP06: Had a secondary role in reading and practical work. Sought focal points in manual text. Was out of step.	OP06: Collaborated in reading. Did practical work mainly as instructed by his pair.
OP09: Collaborated effectively in reading and practical work. Took fewer turns in practical work.	OP09: Collaborated in reading and practical work. Took fewer turns to operate RCU (= remote control unit).
OP10: Collaborated effectively in reading and practical work. Took some more turns in practical work.	OP10: Collaborated in reading and practical work. Took some more turns to operate RCU.
OP11: Collaborated effectively in reading and practical work. Took (fewer) turns to operate RCU. Was slightly more active in reading.	OP11: Collaborated effectively in reading and practical work. Was less active in practical work, slightly more active in reading than his pair.
OP12: Collaborated effectively in reading and practical work. Took some more turns to operate RCU. Became more active in reading towards end of task.	OP12: Collaborated effectively in reading and practical work. Did more practical work and was less active in reading than his pair.

A look at the summary shows that one of the three pairs, OP05 and OP06, read and work more individually, one taking the lead and dominating both in reading and practical work, while the other was more or less in a position to merely watch and follow. This role, however, changed somewhat to include more collaborative reading in Task Two. With this exception in the data, pair collaboration by OP09, OP10, OP11 and OP12 was on equal terms, and with slight specialisation of role, either for reading or practical work. It is noteworthy that the collaborative role, once taken in Task One, continued to be adopted in Task Two.

Collaborative activity is also reflected in the way in which the individual participant access the manual. Tables 4.12 and 4.13 give an listing of manual words read aloud during the session by each participant. For comparison of access problems, the words underlined by the same participant during post-session interviews are cross-

tabulated. An additional column shows the percentage of words assessed as unfamiliar by the participant in the two word-recocgnition tests. (These tests were administered after the sessions.)

The text picked out from the manual and read aloud for the pair mostly covers content words with a high level of contextuality and an immediate connection to the real world. Examples of words read aloud in the VCR manual are: *clock, button, video channel*, and [to] *record.* Function words are generally not read out at all, as the collaborating reader is very skillful in leaving them out in the sentence s/he chooses to bring up for discussion. Most of the manual terms whose the meanings are collaboratively constructed are content words and almost exclusively nouns or verbs.

Tables 4.12 and 4.13 show how collaborative action in Sessions 5A and 5B (with participants OP11 and OP12) is heavily focused on collaborative micro-processing. For instance, in Session 5B, OP11 repeats several words from the text - *if you have; Program Manager; File Manager* - which are key terms to the points that create access problems. Judging by this measure, the difference of micropocessing between Sessions 2A, 2B, 4A and 4B is less prominent.

As might be expected, the pair who had a less prominent role in collaborative reading and who consquently did not encounter and process as much of the text as hip pair underlined more in the manual text. This pair also indicated a higher proportion of the words as unfamiliar.

Table 4.12. Manual words read aloud (during task-integrated reading session), words underlined (in post-reading interview), and per cent words assessed as unfamiliar by participant. - Task One.

Sess. & Part.	Words read aloud in manual. Number of lexical items in brackets. Words read aloud on the screen or controls are not included here.	Manual words underlined during post-session interview (number of lexical items/underlined extracts in brackets)	Unfamil. words in Test One
2 A: OP05	(4) using the key-pad; disappear	(0) --	24%
2 A: OP06	(23) clock cannot be set; press the clock button; CANCEL; press the SET; press SET; timer recording; the Programme & Clock screen will disappear	(37/3) erasure prevention tab intact; the EXT indicator is not lit; the blinking segment on the Programme & Clock screen indicates the item ready for data entry; defeat tab has been removed, cover the cavity with adhesive tape	36%
4 A: OP09	(15) jumper; how to install for DOS; install for DOS; install mouse driver and utilities; Windows	(1/1) Launch	20%
4 A: OP10	(35) user's guide; install; bus board; install for DOS; before you leave the main installation menu we recommend that you select Run Tutorial from the main menu; how to install for Windows; you are using Windows	(0) --	11%
5 A: OP11	(85) the VCR channels; when setting the clock; daylight saving time period; Daylight Saving time; correcting clock data; MANUAL TUNING; SET button; has been corrected; TV Programmes; timer; Quick Timer Recording; check; programming for timer; TV set and set the video channel; is not lit; is not lit; EXT; long play; VCR; PROG; programming for timer recording; programme number; the date using the key-pad: channel; want to record; ready... PROG button... memorize... timer recording; now been programmed... VCR to... stand-by; to set the VCR; memorized timer	(40/1) When setting the clock during the daylight saving time period, press the BAND/CANCEL S/W button, and make sure the "S" for Daylight time appears on the display. The clock will then keep time according to the daylight saving time.	0%

Table 4.12. Manual words read aloud (during task-integrated reading session), words underlined (in post-reading interview), and per cent words assessed as unfamiliar by participant. - Task One. (Cont.)

Sess. & Part.	Words read aloud in manual. Number of lexical items in brackets. Words read aloud on the screen or controls are not included here.	Manual words underlined during post-session interview (number of lexical items/underlined extracts in brackets)	Unfamil. words in Test One
5 A: OP12	(22) setting the clock; VCR/TV; on the TV screen; BAND/CANCEL S/W; BAND; clock button; EXT indicator; SP; MANUAL TUNING; PROGram button; timer button	(61/18) daylight saving time period; *Daylight Saving time*; <--- or --->; repeatedly; daylight saving time; signify; can be preset to carry out unattended recording of television broadcasts at a; is done by entering; erasure prevention tab intact; duration; lit; blinking segment; keypad; will be assigned; unless the start time is set to a time before the present time; defeat tab; cover the cavity; accordance with.	11%

Table 4.13. Manual words read aloud (during task-integrated reading session), words underlined (in post-reading interview), and per cent words assessed as unfamiliar by participant. - Task Two.

Sess. & Part.	Words read aloud in manual. Number of lexical items in brackets. Words read aloud on the screen or controls are not included here.	Manual words underlined during post-session interview (number of lexical items/underlined extracts in brackets)	Unfamil. words in Test Two
2B: OP05	OP05: (38) speed; REC MODE; Left or Right; monitor; controls; REC MODE; controls to; Line In; VU... will start to move. 3. Feed the programme source into... gradually increase... up the LINE knob(s); deck; making a recording; Source Monitor Switch	OP05: (65/2) Feed the programme source, into the 22-2 LINE IN terminals and gradually increase the input level by turning up the LINE knob(s) of the channel(s) to be recorded; Monitor the recording being made, either via headphones or via playback equipment connected to the OUTPUT terminals of the 22-2. Check that there is no degradation in the signal quality by switching the MONITOR switch(es) between SOURCE (=) and TAPE ( )	28%
2B: OP06	OP06: (26) to MIN; now the deck is ready to make the recording... programme source and press the RECORD; start the programme; start programme source; *source*; source; tape	OP06: (0) --	44%
4B: OP09	OP09: (3) setting; recording; timer	OP09: (3/1) Daylight Saving Time	6%

Table 4.13. Manual words read aloud (during task-integrated reading session), words underlined (in post-reading interview), and per cent words assessed as unfamiliar by participant. - Task Two. (Cont.)

Sess. & Part.	Words read aloud in manual. Number of lexical items in brackets. Words read aloud on the screen or controls are not included here.	Manual words underlined during post-session interview (number of lexical items/underlined extracts in brackets)	Unfamil. words in Test Two
4B: OP10	OP10: (26) setting the clock and the VCR channels. Setting the clock; set; MANUAL TUNING button until... Press... SET... data has been corrected; timer recording; playback; visual search	OP10: (0) --	3%
5B: OP11	OP11: (104) mouse to a "port"; bus board; bus board; IRQ addressing; labeled 2; IRQ; cross out the pin-settings in this... can NOT use; if you have; cross out the pin-settings... can NOT use; if you have; cross out... pin-setting; IBM AT, IBM PS/2; use any pin-set number; cross out; in this table that your system can NOT use; if you have cross out pin-set; if you have; how to install for DOS; cannot install; floppy disk; file menu; Program Manager; Program Manager; from the File menu... Windows Program Manager; Program Manager; File Manager; Program Manager; Program Manager; File; Winstall; MouseWare; User's Guide; DOS mouse driver	OP11: (26/2) Cross out the pin settings in this table that your system can NOT use; Use any pin set number not crossed out in the above table.	9%
5B: OP12	OP12: (25) bus board; COM2; IBM; any pin-set; jumper clip; use any pin-set number not; mouse; computer cables; if you... using; Program Manager; Run; Run; File; Winstall	OP12: (59/18) thumbscrews; six receptor holes; registration card; Bus Mouse; bus mouse; configure; electrostatic substances such as polystyrene plastic; IRQ block; pin-sets labeled 2; pin-set 3; jumper pins; Cross out the pin settings in this table that your system can NOT use; Cross out; jumper clip; seated the gold-striped bottom edge of the bus board into the expansion slot; working copies; MouseWare driver; dialog box.	31%

After an analysis in more detail of the partipant collaboration and intercation of three pairs in task-integrated reading, it is time to attempt a synthesis. The three pairs each show a distinctly different pattern of collaboration and interaction. How can we summarise these approaches to task-and-reading?

Type A Interaction. A major part of Sessions 5 A and 5B constitutes interaction that is characterised by close collaborative alignment. Lacking background information, and seeking to construct it from the manual, OP11 and OP12 utilise the textual resource most extensively, making frequent attempts to negotiate and to co-construct meanings of key terms. Since their practical work also requires collaboration, the pair resort to discussions of both the text and the task. Figure 4.5 visualises the dynamics of this process.

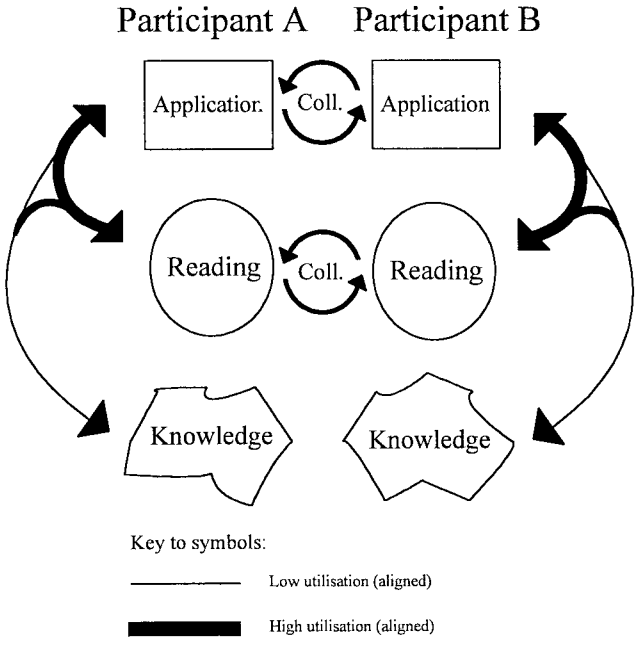


Figure 4.5. Type A Interaction in task-integrated reading (Participants OP11 and OP12). Arrow-head lines indicate discursive alignment of *knowledge*, *reading* and *collaboration*, with an emphasis on reading for application. Collaboration on reading and on application is indicated by arrow-head arcs in the middle.

Type B Interaction. Sessions 4 A and 4B are mostly characterised by collaborative exchanges on the task - and beyond it. In fact, OP09 and OP10 accomplish more sub-goals of their Tasks One and Two than the other pairs do. In Tasks One and Two, they spend about a quarter of their time on reading-related discussions. It is characteristic of OP09 and OP10's approach that they mainly discuss the task, allow

little time for long pauses (of reading and problem-solving), and read specific parts of the manual text as if only in passing.

OP09 and OP10 resort to co-construction of meaning and negotiation of technical terms minimally in Tasks One and Two. This orientation to manual reading looks very staightforward, although OP09 does make a few suggestions to read more in the manual. Their interaction indicates close alignment of cognitive resources: Figure 4.6 shows the dynamics of this process.

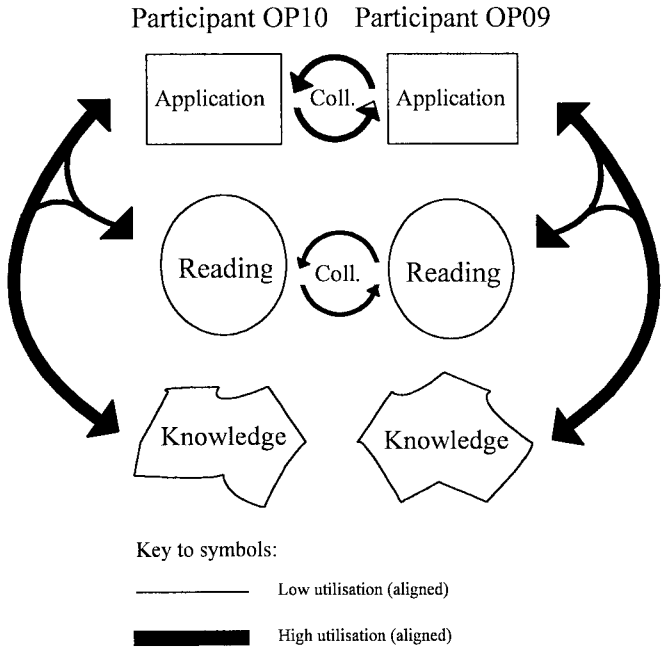


Figure 4.6. Type B interaction in task-integrated reading. Arrow-head lines indicate alignment of *knowledge* and *reading*, with an emphasis on knowledge for application. Collaboration on reading and on application is indicated by arrow-head arcs in the middle

---

Type C Interaction. Most of Session 2 A and parts of Session 2B incorporate interaction that is characterised by non-aligned, parallel use of cognitive resources. Especially when completing Task One, OP06 seems to have less background and procedural information than OP05 and accordingly tries to initiate reading-related

exchanges, in order to construct knowledge from the manual. In Task One, OP05 prefers reading top-down; he does not want to make unncessary stops to co-construct and negotiate meaning, ie. he uses the textual resource in a different way. (In Task Two practical work requires more collaboration, and the pair resort to discussions of both the text and the task; this makes parts of Session 2B less categorical.) Figure 4.7 shows the dynamics of this process.

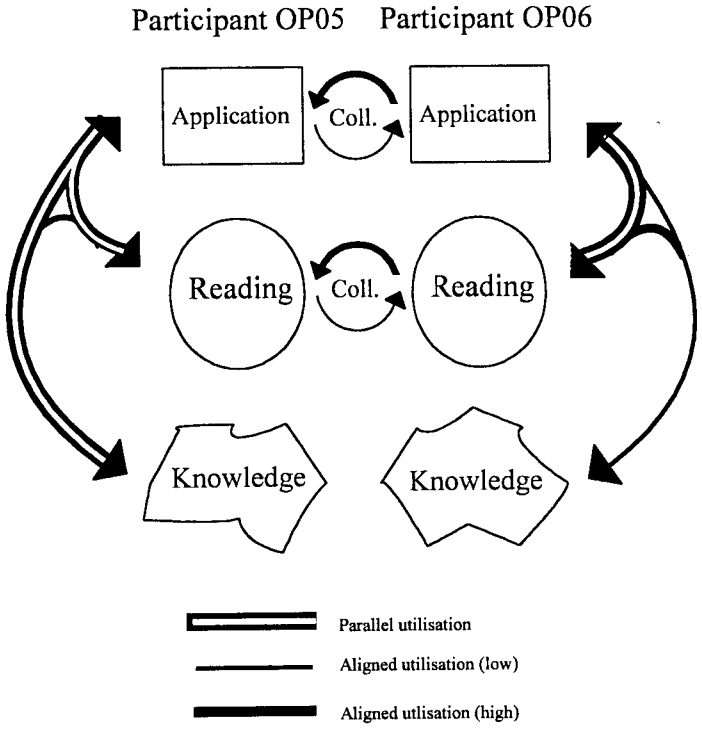


Figure 4.7. Type C Interaction in task-integrated reading. Arrow-head lines indicate non-alignment and parallel use of *knowledge* and *reading*. Note Participant OP06's frequent moves to initiate discussion of reading and of application, indicated by bolder arrow-head arcs in the middle.

When the three interaction patterns are compared, is Type C Interaction unsatisfactory, problematic, or even dysfunctional? From the point of view of talk organisation, moves (eg. requests) that do not lead to expected response are hardly unexceptional in everday conversation. For the goal-oriented OP05 completion of the task seems to be more important than keeping OP06 informed about what is going on

and answering the pair's queries; the parallel approach that OP05 prefers in fact leads to a quick result. In the post-session interview, neither OP05 nor OP06 mentioned anything that indicated they were unsatisfied with pair interaction as such.

From a pedagogical point of view, the parallel approach may strike as problematic, with its low level of synergy and limited diffusion of knowledge between the partners in the pair. Instructional approaches such as co-operative/collaborative learning may help modify this kind of learner-pair behaviour (see eg. Cooper, McKinney, and Robinson 1991 for definition and bibliography).

4.6 Reading tactics and strategies

How should manual text be read in a task-integrated situation? The question was asked twice: after each of the two consecutive sessions. Participant answers to this open-ended question are shown in Table 4.14. The response items are slightly modified (whenever two answer types overlap), and arranged according to areas of reading tactics.

The participants' responses seem to fall into five main categories. The first of these, *tactics for monitoring the reading process* in 1.1-1.7, where the need to carefully read (and proceed with the task) is focal, was mentioned by all participants except OP09 and OP10. The tactic comes to close terms with the "gears" of rauding theory. As Carver points out (Carver 1992a; see Section 2.4 above), observing the variability of reading processes and goals is essential for reading skills, these readers indeed had to slow down and process the text in a more gradual mode than OP09 and OP10 were able to do.

The second group of responses (2.1 and 2.2) relates to the *conditions for text use.* The response category also seems to ring a bell for the reading gears; in other words, the reader-actor who is well acquainted with the discourse and real-world task can gear his/her reading process to rauding, browsing, or even scanning.

Table 4.14. Participants' written answers to the question "How should one read manual text, in a situation like this?" given immediately after the two sessions. Answers are arranged here according to areas of reading tactics. (Abbreviations: T1 = response after Task One, T2 = response after Task Two.)

Code	Tactic for reading manual text	Participant /Task
1.1	Carefully and in an orderly/systematic manner.	OP03/T1, -/T2,OP11/T2, OP12/T1, -/T2
1.2	Read and proceed in the recommended order.	OP07/T2
1.3	Read carefully, from beginning to end.	OP04/T2
1.4	Proceed carefully, look at the pictures.	OP06/T1, -/T2
1.5	Carefully, translating word by word.	OP05/T2
1.6	To read carefully is important, because you want to make sure that you complete the task as instructed.	OP08/T2, OP11/T1
1.7	If you fail, go through once again step by step.	OP12/T2
2.1	Depends on how your experienced you are; if you do not know much, read carefully.	OP09/T2
2.2	Use the manual text as a support (for settings) and as a resource for knowledge.	OP10/T1, -/T2
3.1	First, read through the entire text.	OP09/T1
3.2	Read the introduction.	OP07/T1, OP07/T2
3.3	Look for and read what you need to find following the out headings.	OP07/T1, -/T2
3.4	Have a problem (a "question") in mind, when you read.	OP12/T1
4.1	Do not worry if you do not understand everything.	OP04/T1
4.2	Read the text so that you understand it.	OP07/T1
4.3	Read the essential; do not get stuck on every word you do not know.	OP08/T1
4.4	Look up unfamiliar words in the dictionary.	OP03/T1
5.1	You should get some knowledge about computer technology.	OP04/T2
5.2	Get some basic knowledge of the topic.	OP10/T1
5.3	You should also make use of the PC manual [not only the installation manual]	OP03/T2

The third group (3.1-3.4) deals with *executive processes*, ie. tactics for making text-processing choices, among various procedural options available for the reader. The fourth group (4.1-4.5) concerns *heuristics and inferencing*.

Matching responses, respondents and protocol data, it seems that this simple open-ended question induced the kind of tactic that had been activated and dominated in the participants' reading performance before answering; it is most likely that there is a chronological connection, ie. naming a particular tactic is not primarily a result of the reading circumstances or competence as such. For instance, after completing Task Two with difficulties of problem-solving and many re-readings, OP12 wrote "If you fail, go through once again step by step". No doubt many more tactics could have been covered if elicitated by techniques that suggest thematic points, or give a list of items to choose from.

A second conclusion: participant's views on good reader tactics are first and foremost situated. A good practice in task-integrated reading, like any other high-level activity, is complex because it depends on the context, is configured and modified to suit it. Therefore the outcome of the activity is hardly achieved by possessing performance or skills as such, but their application.

Appendix 15 shows the questionnaire data on reading strategies. The data were primarily used for fine-tuning of the individual post-session interviews.

4.7 Main results of the participant interview

The participant interview dealt with three main topics: the task sequence, text processing problems encountered during the sessions, and pair co-operation. The aim of the interview[12] was to explore the participant's personal view of the session and any problems in the task-and-reading. At the interview, a quick look at the video recording of the two sessions enhanced the participant's recall; the task-and-reading sessions covered more than 1.5 hours, so the interviewer had to run the video tape in both the fastforward and the play mode. The participant described the session briefly, and was

[12] An instruction sheet for the semi-structured interview is found in Appendix 5 (translation).

encouraged to locate particular difficulties and to discuss them with the interviewer. He was asked to indicate the parts that he remembered reading faster or more slowly than the rest of the text and underline the parts of the text which he had found hard to understand. Furthermore, he was asked if he had found the operating instructions helpful or not and which parts of the instructions facilitated the task or created confusion. Questions about co-operation concluded the participant interview.

In Section 5.5 above, I discussed the parts of text that were underlined by the interviewees (see the third column in Tables 4.12 and 4.13). As was noted, the pair who had been more in charge of practical work and less in charge of manual reading underlined more during the interview.

The results of the interview are summarised in Appendix 13. under five headings: division of tasks; interaction and collaboration; access of manual text; evaluation of participant's own and his pair's contribution; previous experience and knowledge of related tasks. Instead of comparing the data of the ten interviewees in detail I will here discuss findings that relate to reading, interaction, and collaboration.

Most participants said that pair collaboration was positive and helpful. Collaboration made both reading and practical problem-solving faster and more fun. They assumed they would have read in a more careful manner and in more detail and advanced with the task more carefully if they had worked alone. In this sense, pair-work enabled faster progress while also provided safeguard against mistakes (OP04, OP05, OP07).

The interviewees recognised the various roles they had, as to division of labour (reading vs. practical work). It seems that the participants were generally happy with the role allocation between the pair. If there was any disagreement (OP05), it was on practical issues - reading and problem-solving - not on collaboration, and it was mostly resolved by negotiation.

The participants also produced a wide range of evaluations about their own and their pair's contribution. It is noteworthy that many participants at the session formed

an opinion about their pair's previous experience and level of knowledge, and were willing to share this, although they were not explicitly asked to do so at the interview. However, this evaluation of the pair's contribution was only based on implications and inferencing, as the protocols do not show cases where the two participants could have discussed these issues explicitly; it is likely that the risk of threatening the pair's face prevented this. In any case, being involved in collaborative interaction generally offers opportunities to both assess and monitor the skills and comptencies of the pair.

4.8 The knowledge-accessing mode and reading strategies

This study does not attempt to seek connections between the knowledge-accessing modes (KAMI) and patterns of behaviour occurring in task-integrated reading. This would be the business of a quantitative inquiry with cohorts of subjects. Instead, I will use knowledge-accessing profiles to produce additional interpretations concerning differences in pair collaboration and interaction. The KAMI data on the participants of this study are given in Table 4.15.

Rancourt's (1985) and Lappalainen's (1995:162) research findings show that students aiming at, or enrolled, in the study of science and technology typically have an empirical-rational orientation. This seems to be in line with the average profile in the present study, as the group of ten participants comprises six persons with either a dominatingly empirical profile and two with a balanced empirical-and-metaphorical profile. For half of the students, the metaphorical component - which is very typical of students of arts and language - covers less than 25 %.

A person with a distinctly empirical style is inclined to using sensory data and an inductive approach for knowledge construction. A person with a rational style, on the other hand, is likely to prefer a deductive-reflective approach in reading and problem--solving (cf. Lappalainen 1995:24-34). Accordingly, one may speculate that the "empirical" participant OP10 finds it more helpful to try out various options of the

task, and does not like to read as much as his pair OP09; the latter has a pronouncedly rational KAMI profile. Their difference in knowledge-accessing mode probably reflects an *epistemological distance in collaboration* between the participants, which is indicated by a more pronounced need for discussions and negotiations about the practical approach for solving the task and for reading.

Table 4.15. Participants' profiles of KAMI (Knowledge-Access Mode Inventory)

Participant	**Metaphorical**	**Rational**	**Empirical**
OP03	29%	27%	44%
OP04	28%	30%	42%
OP05	27%	37%	37%
OP06	13%	46%	41%
OP07	24%	34%	41%
OP08	22%	38%	40%
OP09	16%	42%	42%
OP10	29%	26%	46%
OP11	23%	43%	33%
OP12	33%	29%	38%
Average	*24%*	*35%*	*40%*

Comparison of the interview data by OP09 and OP10 (see Appendix 13), shows how OP09 says that working alone he would have read the manual more carefully, while OP10 reports that when working in a pair, responsibility is shared; you do not have to think as carefully about what you are doing, because your pair is watching you. This assumption is again supported by the questionnaire data (Table 4.14 above), where OP10 writes "Use the manual text as a support for settings and as a resource for knowledge" answering the question "How should one read manual text, in a situation like this?" In other words, we can note a consistent pattern for the preference of

induction (ie. working with inferences based on both here-and-now and previous knowledge) over deduction (ie. working with support from manual instructions). OP10's general-level preference for the inductive approach is also seen in his reluctance to discuss textual details in the instructions at the interview. As to the sequential level, I refer to the analysis of Extract 4.6 in Section 4.9 below.

A distance in epistemology may also undermine the foundations of collaboration between OP05 (empirical-rational) and OP06 (rational). For this pair, the difference of acquired procedural and declarative knowledge is more prominent, and following the text is the only way for OP06 to bridge the knowledge gap between him and OP05. Since the rational-deductive approach is closely linked with a preference for following principles (instructions) in the manual text, OP05's inclination towards trying out options and following the instructions less carefully creates a disadvantge for OP06 and may also be one of the reasons why OP05 opts for the parallel approach in pair collaboration.

To sum up: in cognitive operations such as reading, it is likely that a person prefers to choose an approach which best suits his or her acquired, individual cognitive style. This preference is reflected in a construct known as epistemological orientation. For instance, a person with a dominantly rational style is likely to prefer a deductive, step-by-step approach. A dominantly empirical person again will prefer heuristic discovery and will probably not be at ease following the step-by-step instructions of a manual.

4.9 A problem of text access in task-and-reading

The reader-actors of this study, depending on their level of expertise, each need different properties of manual text. The principle of *ordo naturalis* (ie. following the natural order of things, in a step-by-step fashion, as instructed by the manual) helps the novice who has little experience and knowledge to support him. The "novice", or rather, the

one who chooses an approach typical of a novice, resorts to collaborative microprocessing of text and task, together with his pair. For example, in Session 5 A participants OP11 and OP12 work seamlessly together, building a cognitive staircase that slowly but surely takes them over the barriers to the goal.

The expert, ie. the one who is (or thinks he is) in a position to adopt an approach typical of a resourceful person, does not hesitate to skip the steps. A quick glance at the pictures and text typically confirms that he is either on the right track or needs to slow down for some checks.

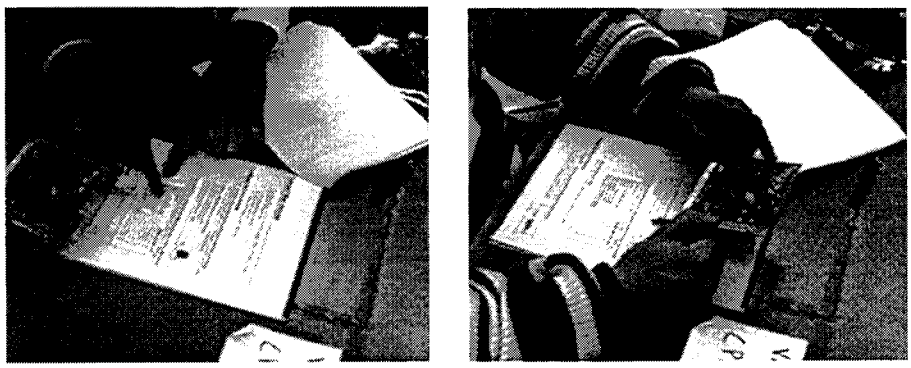


Figure 4.8. Setting the IRQ. To make sense of the instructions for setting the IRQ created great problems for all participant pairs, except a pair of recent engineering graduates in one of the the pilot studies.

There are, however, a number of cases where the text fails to serve the needs of reader-actors. In the following, OP09 and OP10 set the IRQ[13] of a computer mouse,

[13]The peripheral device (such as a modem or a mouse) connected to a computer communicates with the central processing unit (CPU) of the computer. This takes place by means of IRQ's, or Interrupt ReQuest. IRQs are signals that a previous request has been attended to, data has arrived that needs to be interpreted, or an error has been detected. When the CPU gets an interrupt, it stops what it is doing to handle the necessary task. Interrupts are sent over one of the many IRQ wires, and if two peripherals are set to use the same IRQ, and do so at the same time, a conflict (a short) is produced. While this most likely will have no effect, it has a chance of damaging the peripheral device or the motherboard of the computer. (Technical Reference Infobase 1995.)

If a peripheral device is assigned to the same IRQs as other devices, it must use an another IRQ. Interface cards accompanying the peripheral device usually has a simple mechanical switch for changing the IRQ configuration, which will enable a solution to potential IRQ conflicts.

part of the second task in most of the sessions. The Logitech Mouse documentation does not provide the basic background information necessary for making sense of the IRQ settings. Accordingly, attempts to resolve the setting of the IRQ merely yield reflected guesses (see Appendix 9). Success by OP09 and OP10 in Session 4 A is hardly more than pure luck, as is shown in Extract 4.6.

Extract 4.6

1	OP10: Laitetaan nää ruuvimeisselit tonne toiselle	
2	pöyälle pois tieltä.	*(OP10 moves the screwdrivers.)*
3	OP09: Oliko tässä jotain, katopa, hei.	*(OP09 draws OP10's attention)*
3	(10)	*(OP09 and OP10 read)*
5	OP10: Hiiren yhdistä{minen..	
6	OP09: {Tämä.	*(OP09 points at IRQ block)*
7	Mikä tämä on? Jumperi. (4)	*(OP09 and OP10 read)*
8	OP10: ***Bus board***... *(inaud)*.. {Eikö tos}sa oo.. mitä..	
9	OP09: {Pitikö se}...	
10	pitikö tuolta jotain tollastaki ettiä sisältä?	*(OP09 re-points IRQ block)*
11	OP10: Oiskohan se sitte ollu siinä.. piirikortista?	*(OP09 turns to p. 6)*
12	Sehän riippuu kato, että minkälainen laite on.	*(OP09 & OP10 turn back to p.5)*
13	OP09: Kokeillaan, jos se toimii {ilman..	*(OP10 points at IRQ block, p.5)*
14	OP10: {IBM	
15	AT, se on sitte kakkosessa.	
16	OP09: Mutta se on IBM AT, {tää, tää on	*(OP10 points at IRQ block, p.5)*
17	OP10: {Niin joo..	
18	OP10: ..Unisys.	
19	OP09: ..on kopio. Voi olla, että se toppii, valittaa.	
20	Kokeillaan, toimiikse.	*(OP09 closes the manual)*

	(Four turns omitted here)	

21	OP10: Kyllä se sitte rupee käryämään,	*(OP10 starts up the computer.)*
22	jos ei se lähe käyntiin.	
23	OP09: Ei se kärähä. Se on suunniteltu niin. (4)	
24	OP10: Saajaanpahan valo- ja ääniefektejä.	
25	OP09: *(Laughter)* (5)	
26	OP10: CD-ROM, se on ihan kiva kanssa.	
27	OP09: Se on vaan paha, jos sieltä on jääny joku laittamatta.	
28	OP10: Mitä? (8) Mikä on jääny laittamatta?	*(OP09 & OP10 watch PC start.)*
29	OP09: Tämä, mikä tää ny on? Tätä hyppyä	*(OP09 turns back to p. 5, points at*
30	(8)	*IRQ block, OP09 and OP10 read)*
31	OP10: Ei, se on tuota niin... se vaan lyyään...	
32	OP09: ***How to install for DOS..***	*(OP09 turns to p. 6, reads at p. 7.)*

Browsing user documentation of peripheral equipment will show that the non-expert perspective is rarely and unsystematically taken into account. For instance, the Logitech Bus Mouse does not provide the basic background information necessary for making sense of the IRQ settings, whereas other less demanding issues are explained in detail.

33 OP10: Kato ko se on tuota niin.. Se saattaa olla *(OP09 turns to p. 6 and 7)*
34 tuo tossa että... näytäpä mitä siinä lukee. *(OP10 backs to p. 5, points at IRQ)*
35 OP09: Hm-m [Hi Level Inton.] *(PC boot-up is completed)*
36 (6) Kyllä se käynnisty.
37 OP10: Joo.
38 OP09: No-ni.

****

1 OP10: Let's move these screwdrivers, *(OP10 moves the screwdrivers.)*
2 out of the way.
3 OP09: I wonder if there was something, take a look. *(OP09 draws OP10's attention)*
4 (10) *(OP09 and OP10 read)*
5 OP10: Connecting {the mouse..
6 OP09: {This. *(OP09 points at IRQ block)*
7 What's this? A jumper? (4)
8 OP10: ***Bus board***... *(inaud.)*.. {I thought} this was.. what..
9 OP09: {Do you think}.. we should
10 ...we should look for something like that, inside? *(OP09 re-points at IRQ block)*
11 OP10: Do you think it could have been in the...board? *(OP09 turns to p. 6)*
12 It depends on what kind of machine you have *(OP09 & OP10 turn back to p.5)*
13 OP09: Let's find out if it works {without... *(OP10 points at IRQ block, p.5)*
14 OP10: {IBM
15 AT, it's in number two.
16 OP09: But that's IBM AT, {this, this one is.. *(OP10 points at IRQ block, p.5)*
17 OP10: {Oh, that's right...
18 OP10: ..Unisys.
19 OP09: ..is a clone. Maybe it will stop, or complain.
20 Let's try if it works. *(OP09 closes the manual)*

(Four turns omitted here.)
---
21 OP10: There's gonna be some smoke coming out of it, *(OP10 starts up the computer.)*
22 in case it won't start.
23 OP09: It won't blow up. It's been designed that way. (4)
24 OP10: We'll get some nice light and sound effects.
25 OP09: *(Laughter)* (5)
26 OP10: CD-ROM, that's a nice thing to have.
27 OP09: I mean it's too bad if we left out something.
28 OP10: What? (8) What do you think we left out? *(OP09 & OP10 watch PC start.)*
29 OP09: This one, what do you call it? This jump here *(OP09 turns back to p. 5, points at*
30 (8) *IRQ block; OP09 and OP10 read)*
31 OP10: No, it is, you know.. you just put it...
32 OP09: ***How to install for DOS***... *(OP09 turns to p. 6, reads at p. 7.)*
33 OP10: Well you see it's like this.. Maybe it's *(OP09 turns to p. 6 and 7)*
34 this one here...let me see what it says. *(OP10 backs to p. 5, points at IRQ)*
35 OP09: Hm-m [Hi Level Inton.] *(Computer boot-up is completed)*
36 (6) Well it did boot up all right.
37 OP10: Okay.
38 OP09: Right.

An analysis of Extract 4.6 portrays OP09 as slightly more inclined to microprocessing, ie. reading the text, and finding coherence in it, whereas OP10 prefers to get on with the task, without resorting to manual support. In fact, OP09 produces several requests to read in the guide (3, 6-7, 9-10) and one implicit move to check the equipment (27). Moreover, he also suggests trial and error (13; 19-20). Participant OP10, who has just switched on the computer, seems to be equally aware of the possibility that something might have gone wrong. However, he cannot or does not want to offer any explanation about the mysterious IRQ (31, 33).

Anxiety about the risk gets channelled out through jokes that OP09 and OP10 share (21-22, 24, 25). Note that OP09 and OP10, unlike other pairs who chose the same task, do not mention or read aloud the non-accessible abbreviation IRQ. When interviewed individually after the session, both OP09 and OP10 reported that they did not know what the IRQ was, and did not wish to discuss it further with the interviewer.

5. DISCUSSION AND CONCLUSIONS

The present study looks into functional L2 literacy from the perspective of a situational context. The study aims at increased understanding of functional L2 literacy as constrained by task, situation, and dyadic interaction. The research questions of the study were: What is the role of individual and collaborative reading in a certain situation? How does the reader-pair process the text in a manual? What are the crucial elements of a task-integrated reading situation? Reader pairs participating in task-integrated reading sessions collaborated to solve practical problems such as setting the clock and timer of a VCR or installing a PC peripheral while making use of a manual text. In each research session, the pair completed two tasks from a choice of three to five. Ten sessions were audio and video recorded and analysed for participant interaction. The research data was obtained by using a combination of techniques, viz. a protocol for the analysis of dyadic verbal and non-verbal interaction, two questionnaires completed by the participants, and interviews with the participants after the session.

Methodologically, the study is qualitative and inductive and explores processes of reading in contextualised, ie. "naturalistic," reading situations, as opposed to experimental approaches with explicit hypotheses and preconceived variables. Accordingly, the findings of this study should be understood within the framework of a case study which, by studying processes of "naturalistic" reading, shows its full potential by generating hypotheses rather than testing them (cf. Seliger and Shohamy 1989:22-41) .

Reading research and instructional approaches to reading development have traditionally been geared towards academic literacy (reading-to-learn), mostly with a product-oriented perspective (see eg. Bernhardt 1991b:23-69). Functional literacy has achieved less attention. In what follows I will there-

forediscuss the findings of the present study with an aim of generating implications which emphasise the conceptual differences between the two literacies. I will also compare some of the more widely established instructional tenets within the two literacies. Next, I will evaluate the research approach with a critical eye. In the final section I will present suggestions for further research.

5.1 Collaborative reading in a task-related context

A word which best describes the research findings of this study is variation. The session durations varied from 9 min. to 1 hr. 20 min. The accumulation of long pauses (4 sec. or more) could be anything from 5% to 52% of the session interaction, and the percentage of sessions time used for reading ranged from 7% to 76%. The strategy of manual text access varied from step-by-step microprocessing to very casual top-down reading. Pair participation ranged from parallel (individual) sub-tasking to aligned (joint) problem-solving and collaborative construction of textual meaning.

The results of the present study indicate that procedural, metacognitive, and content-specific knowledge - either instantiated individually or negotiated by the pair - has a crucial role for completing the task and for accessing the manual text successfully. Depending on individual orientation and the approach negotiated between the pair, the lack of various types of knowledge could be offset by joint reading, problem-solving, and heuristics - in other words, an aligned use of cognitive resources. This in turn contributes to resolving a major part of the participant's perceived cognitive uncertainty.

However, if it happens that the intra-pair gap of cognitive resources is too wide and the difference in personal orientation is overpowering, the individual is likely to prefer a parallel use of cognitive resources. This again may

involve sub-tasking with low-level synergy and limited diffusion of knowledge between the pair.

Functional reading is mostly contextualised for a practical task. The task has a high priority, and it takes up much more of the reader-actor's resources than the text. The term *necessary text* or *utility text* denotes this to the point (Cook 1955:15). Cook (1995:15) defines a necessary text as one that has got to be read for a purpose, is primarily concerned with information, is fairly constrained by genre conventions, has a practical observable outcome, and whose sender is a specialist. The definition is "fuzzy" and would probably create problems if really tested for text data of various genres. However, the text examples which Cook discusses are mostly from operating instructions.

The interplay of the real-world task and related reading - which seems to constitute the basis of functions in functional literacy - is best put into the format of a meta-orientation: *if you experience uncertainty about the function(s) you need to solve, seek information to resolve that uncertainty; next, work on the information to construct knowledge for the function(s)*. Note that the meta-orientation is (a) metacognitive, ie. deals with self-monitoring and (b) conditional, it ie. explicates that information search and construction of knowledge are optional; and (c) it assumes that information search and construction of knowledge for the function are interconnected.

As to the construction of knowledge, collaboration or individual problem-solving towards achieving the goal is often a more attractive choice than reading the utility text, and in particular more appealing than reading alone. This may also seem a paradox: what the reader decides not to read, or fails to read, is at least as relevant in functional literacy (reading-to-do) as what s/he does read in the text, while in reading-to-learn situations, the reader will choose to proceed in a principled and more unified way. A number of considerations support this argument:

Because of the high priority of getting the practical work/task done, the reader-actor will tend to concentrate on the application. Every-day experience tells us that some reader-actors neglect the text whenever possible. Unlike in reading-to-learn, the reader in a functional reading situation will not in the first place need to memorise the content of the text itself but will work towards generating a "what-to-do-next" representation of the task. The manual writer observes the low priority of the text over the task, and usually follows the principle of linearity of experience. As a text design strategy this is known experiental iconism (Enkvist 1981). By definition, experiental iconism occurs when the linear relations in a text stand for temporal, causal, spatial, or social relations in the world which the text describes.

Secondly, the reader-actor encounters the contextual situation as a novice, an expert, or something between these two extremes. The expert in the domain is likely to use the textual resource as a global check-list and will hardly access the text to its full potential. The novice again will often adopt a local-level approach, to get the knowledge required for the practical application, to follow the instructions in a more step-by-step procedural way, and to settle problems of an affective kind that arise from the new challenge. Utility texts (necessary texts), however, seldom "teach" things by providing a deeper understanding of the principles and background of the practical work/task, and are therefore likely to leave many novices in trouble. As a good example of this, we saw in this study how the user was instructed to set the IRQ block in the manual.

Research on expertise in various domains shows that novices use approaches for problem-solving that are different from those used by experts. A general conclusion is that expert performers tend to use a solution method as part of their comprehension of the task, while less experienced subjects have to construct a representation of the task deliberately and generate a step-by-

step method. Experts in the domain of medicine produce diagnoses by studying the symptoms (forward reasoning), whereas less experienced medical students usually check the correctness of a diagnosis by inspecting relevant symptoms (backward reasoning). In this study, the two approaches seem to be reflected on the level of the discoursal/interactive process. A pair of participants with limited procedural and declarative knowledge follow closely the steps of the manual, in a bottom-up fashion, which makes their progress especially slow. Yet another pair of non-experts in this study assume another type novice technique: they work backwards, ie. solve the problem in a categorical way, without carefully considering the wider constraints of problem-solving. This in turn increases the risk of causing damage to equipment, which the participants, however, duly recognise and even worry about.

In joint task-and-reading we can trace an interesting aspect of metacognition: besides self-monitoring, the participant seems to engage in concurrent monitoring of his pair's task-and-reading. This can vary from very subtle and intensive collaboration (eg. in co-construction of meaning) to concurrent observation, occasional questions, or explicit requests for information.

5.2 Elements of functional reading in a foreign language

To define functional literacy, a list of features can be presented to cover the whole patchwork of different situations and contexts. These features are usually modified to match special skills and competencies such as the procedural knowledge required when accessing hypermedia or seeking information on the Internet. Yet another, perhaps a more common and broader, definition emphasises basic everyday reading and writing competency

- the survival skills of post-industrial society, ie. basic literacy without the frills. The fuzzy term of functional literacy helps us understand the versatility of reading-and-writing skills and competencies required in various situational contexts.

Functional literacy and its role in target L2 literacy should be given some consideration when validating instructional methods and media in language education, A successful framework of reading instruction for work, leisure, or a specialist domain could be achieved by looking at various literacies involved. A recommendable approach would start by identifying literacies that are integrated in domain-specific discourse practises, and then by finding out through more detailed field research what goes on in discourse communities. A particular type of literacy, eg. reading operating instructions when learning how to use home electronics, relates to much more than the processed content or format involved. I propose that the common view that literacy skills are easily transferred from one context to another should be reconsidered and tested. What ultimately boils down is the *function that is embedded in the contextualised situation*, as constrained and modified by necessary reading. This could be a guideline for developing curriculum and instructional approaches.

The power of the text, for discourse meaning and related real-world technical application, is dependent on how the text connects with the "mental interface" (set of representations) which the reader constructs, modifies, and re-constructs on the basis of his/her knowledge, discourse experience, and literacy practices. Needless to say, these have more relevance for the reading process and outcome than the text, which in essence incorporates index marks of the real world on paper or screen. In most cases, using a text for practical work is beneficial, but sometimes these indexes and landmarks of practical

work may cause more problems and access difficulties than open up freer facilities for the reader-actor.

The findings of the present study suggest that the role of English as a foreign language which may cause extra difficulties for the functional reader is less prominent than expected. English of science and technology is an important lingua franca that provides a reference base and a cultural model of professional discourses (cf. Gee 1992:8-21) for both the student and professional of engineering. Put another way, the linguistic and discoursal distance between the use of L1 (Finnish) and L2 (English) is not great in this particular reading context. Three considerations lend support to this conclusion.

First, a great majority of the text read aloud in collaborative reading comprises content words with a high level of contextuality and an immediate connection to the real world of the technical application. Examples of words read aloud in the VCR manual are: *clock*; *button*; *video channel*, and [to] *record.* Function words are very rarely read out; in fact, the collaborating reader is very skilful in leaving them out in the sentence that s/he chooses to read aloud for the pair. Secondly, most of the manual terms whose meanings are collaboratively constructed fall within the category of content words (especially nouns or verbs). Also, the majority of the words underlined in the manual and discussed during the after-session interview are content words. Thirdly, comments that can be interpreted as readers' complaints of the rhetorical properties of the manual text which create access problems concern discourse coherence, information gaps, and superfluous information. These seem to coincide with the problems that L1 readers bring up in reading-to-learn situations at the university level. (Viitala 1995).

The hypothesis of a threshold of L2 competence and reading (cf. Bossers 1991) looks tempting. In simple terms, the threshold implies that a reader

will access written text in L2 as a result of progressing past a certain crucial point in the acquisition of L2. So realising that the hard-access items of this study were technical terms in most cases, can we use this threshold metaphor and assume that after passing a stage of foreign language proficiency, major problems of text access tend to be caused by terminology alone? It should be emphasised here that the assumption would not reach beyond the range of participants, situations and functional reading configured in the context of a case study like this.

However, as Bossers (1991) points out, the concept of threshold in L2 reading is problematic. He posits that the threshold "cannot be defined in absolute terms" (cf. also Swaffar et al. 1991:43). If the threshold is to be taken as a relative concept, there is the more reason to question its usability. With no accountable framework at hand explaining what L2 proficiency, L2 reading, and the threshold are all about, we might run the risk of vagueness or may get stuck on a number of circularities. The construct of L2 proficiency, it might be suited for everyday purposes, whereas in a research context it is massive, unclear, and ill-defined, a dinosaur to put it bluntly. It reflects the positivist rationale where "causes" more less directly result in "consequences" (cf. Silverman, forthcoming). It contributes to a one-dimensional view of the phenomenon. I propose that L2 proficiency be replaced by probabilistic considerations, eg. thinking in terms of language-use situations, where people with limited knowledge of L2 have a lower probability of knowing a particular linguistic item. Alternately, we may replace the concept of L2 proficiency by thinking of multiple skills and competencies of a more narrow definition.

5.3 How to teach L2 functional literacy?

Reading is generally seen as an essential part of the competencies in the agenda of language instruction, not only because it is an important medium for the acquisition of L2. So in what way do we want to see L2 reading develop? Not too many have tried to answer the question in a systematic way. Bernhardt's model (1991a; 1991b) stands as one of the few holistic attempts to conceptualise reading development in a foreign language. The model introduces five reading factors, across the variables of L2 proficiency and an error rate of reading (see Section 2.8). Waiting for an explanation of how the concepts and variables of Bernhardt's model could account for the special difference between L1 and L2 reading development, we might achieve some understanding of L2 reading development through more data-driven studies, possibly with a longitudinal perspective.

The majority of current instructional approaches to L2 reading development are based on a conceptualisation of L2 reading as if it was made up of componential, additive constructs (eg. word recognition; skimming and scanning; schema activation). The constructs are fitted into a framework with a high priority in the design of activities, lesson plans, and curricula. The framework of instruction tends to be driven by language-processing and other cognitive theories adapted from psychology (see eg. Grabe 1991; Stoller 1986; Barnett 1989:110-143; Bernhardt 1991b:5-17, 67-69). This is evidently a consequence of the fact that L2 reading studies are mostly product-oriented and derive their research focus from inferences. In other words, the studies do not trace reading development in actual language use (Bernhardt 1991b:69; cf. also Wenestam 1993). In what follows I will take this alternative stance and discuss the implications of the study from a process-oriented perspective, again focusing on the reading-to-do vs. reading-to-learn dimension.

In the present study we witness a wide variation of both the process and outcome; we can see how situational and individual differences come to play in task-and-reading. On the basis of the research findings of this study, what would be an appropriate approach to instructing learners who wish to acquire functional literacy skills that will be applicable in a technically oriented environment?

Firstly, it seems that the student would benefit from being allowed to develop his or her functional language processing skills in the full context of the task. This would be an alternative to various "activity-driven" approaches with carefully designed student input of linguistic content and learner training that typically attempts to monitor and model the text-processing strategies of the student (cf. Bernhardt 1991b:186-187). I propose a task-based approach where the student proceeds from the whole-task perspective, with instructional exposure and input similar to the real-life functional context. (For definitions and approaches of task-based L2 learning, see Candlin 1987 and Wright 1987.)

Task-based learning is seen as more motivating and meaningful for the student, and it should compare favourably with the target skills of the specialist domain which the student is being trained for. Materials, media and tools should be chosen that the student is likely to use after training; assessment techniques and student evaluation should support this. Learner contribution in the design stage of the task is highly recommended (cf. Breen 1987). But how can the teacher - who in most cases would teach L2 reading in a more piecemeal fashion - manage the (potential) variability of ensuing learning situations and cognitions?

The teacher should in the first place tune in for the "global" aspect, ie. keep an eye for both cognitive and social processes in the class/group. I suggest that monitoring how the students process the linguistic input is of secondary pedagogic importance. As Uljens (1995) puts it,

> A teacher who aims to influence the learner's study activity should focus on controlling how the learner understands the world as well as on how the learning environment is arranged, not on controlling the psychological processes by which the individual is thought to treat the information received. (Uljens 1995:221.)

The individual development of professional literacy skills and strategies might be best achieved by promoting context-specific transfer of learning and learner independence. The teacher's main concern would be to facilitate the acquisition of functional literacy practices for successful problem-solving and related cognitive processes.

Secondly, the instructional tasks assigned to students can be completed either individually or collaboratively. The findings of this study indicate that pair collaboration is positive and helpful; it makes practical problem-solving with reading faster, facilitates synergetic processes, and potentially leads to a high amount of shared cognition. In a realistic way, the participants recognise and modify the various roles they have in task-and-reading. The motivational basis for collaboration - which must be culturally and institutionally related - seems to be substantial; disagreement on a joint cognitive process is only to be found on a practical issue, not on the foundation of collaboration. The participants also produce a wide range of realistic evaluations about their own and their pair's contribution. This indicates that metacognitive and learning-to-learn skills are naturally acquired in such a setting.

Rather than working from a model of a "strategic reader", the teacher should set out to establish an instructional climate which supports the development of various roles required both in collaboration and self-direction. It would seem a good practice to observe how the students read and co-operate during the task completion, and to resort to indirect rather than direct feedback while the reflective problem-solving process is in progress. This approach would let the practical task "talk" to the student and "teach" him/her.

Thirdly, as the task-based learning in engineering education requires materials, media, and tools for processing that are rarely to be found in the immediate learning environment of the language classroom. Through team-teaching and other similar forms of teacher collaboration, language educators should, whenever possible, experiment with the introduction and development of literacy skills across the curriculum. This would bring in content teachers with their special professional contributions and enable a more reliable way of recognising domain-specific, context-based discourse practises.

The curricular objectives of ESP (English for Specific Purposes) usually covers technical writing as well. Here the full scale of functional literacy could be explored by involving the students in a reading-writing connection (eg. Grabe 1991), ie. in L2 instruction where the reading and writing of texts takes place parallelly. Classroom activities could, for instance, combine the study of authentic manual texts and the design of operating instructions for real-life equipment that are available in the language class or in the school premises. It is likely that process writing in a collaborative manner would be especially beneficial for this kind of instructional approach.

5.4 Evaluation of the research approach

This study has explored functional literacy in a foreign language using a qualitative approach. Through triangulation of data-collection techniques, it combines protocols of participants' conversation, questionnaires completed by the participants, and individual interviews of participants. Of these techniques, the most significant yield - an enhanced understanding of the social/interactive and cognitive aspects of functional literacy - is gained through discourse analysis of the interaction protocols. This supports the view presented above

(see Section 3.1) that protocol analysis of audio and video recordings works as a valid instrument for the study of naturally occurring phenomena. A successful compilation of research data for protocols was only possible after technical details of data-gathering were tested for their practical validity and feasibility. Accordingly, it took a great deal of experimenting with several pilot runs to accumulate practical "research knowledge".

Qualitative research typically offers an approach where research questions narrow down, while constructs and concepts emanate as the analysis proceeds (eg. Seliger and Shohamy 1989:22-42, 111-134, who use the terms funnelling and recycling.). As was anticipated to a degree, some of the interactional and cognitive phenomena which emerge in protocol analysis, partially fell out of reach or escaped the scope that was expected to be caught by interview or questionnaires (cf. Silverman 1993:201-203). On the other hand, some aspects of data-collection became superfluously represented. A critical assessment of how these components of triangulation work with findings achieved through protocol analysis - and of how the "secondary" instruments of triangulation could be improved for their validity - boils down to the following:

Survey questionnaire on reading strategies. The items for the questionnaire were adapted from reading research studies in reading-to-learn contexts (Hosenfeld et al. 1981, Barnett 1995, Valtanen 1994). It was not possible to modify the questionnaire items with pilot runs, or improve them against data from pilots. Conceptually, the items dealt with the areas of monitoring and evaluating the reading process, heuristics and inferencing, use of domain knowledge, and translating from L2 to L1. An improved version of the questionnaire could certainly be developed by an analysis participant's answers to the question "How should one read manual text, in a situation like

this?", which was discussed in Section 5.6 above. The questionnaire should, in other words, focus on the crucial elements of contextualised reading.

Word-recognition test. The knowledge of technical vocabulary for accessing texts in a functional literacy context could not be validly explored by the (version of the) word-recognition test administered during retrospetive interviews. The results of the test showed that the participant who had concentrated on practical work and, accordingly, read less in the manual than his pair, was likely to denote individual word items as unfamiliar, because he had not encountered these items in the manual text. Indeed, the participant doing more of the practical work and reading less in most sessions indicated double the amount of word items as unfamiliar than did his pair, who was more in charge of the reading. In other words, the word recognition test would here serve the purpose of testing the reading participant's learning outcome - not the long-term knowledge of terms. Running the word-recognition test at the beginning of the session, before the participants could encounter them in the manual, could help evade the problem. However, adapting this alternative procedure, we would have to take the risk that this might affect "naturalness" at the subsequent reading session.

Unlike the word-recognition test, underlining hard-access words or passages in the manual, during post-session interviews, served the designed purpose adequately. It brought out hard-access terminology items in a more valid way than the word-recognition test. Underlining hard-access words worked well for contextualising and directing the interview itself. In fact, one of the participants, OP10, said in his interview that if he saw every second word of the VCR manual individually, without context, "it would be problematic", and he would hardly understand them, but as elements of coherent text - and with appropriate pictures - he can comprehend them much more easily.

5.5 Suggestions for further research in functional L2 literacy

Adopting a similar non-obtrusive, non-experimental approach as was used in the present study, it would seem worthwhile to explore the variability of functional L2 literacy practices in a somewhat wider scope than. The "permutation" of participant background might cover eg. education and social group; gender; cognitive style, and procedural/declarative knowledge. If successful, such research could bring a wider understanding of functional literacy for both the instructional and every-day setting. It is also likely that the writers of utility texts would benefit from ensuing research findings, as the accessiblity assessment of utility texts is less satisfactory when based on textual analysis only.

In this study we saw how participants in task-integrated reading sessions adhered to roughly the same discourse processing orientation in an "easy" and a "difficult" reading-and-task. There is some indication that in one or two cases this contributed to a less favourable outcome than expected. It seems that the participants might have difficulties adapting their functional reading approach (ie. contextualised reading strategies/tactics) to the requirements of cognition.[1] Further research might look into this and various other aspects of real-life literacy from the perspective of cognitive flexibility (see Spiro, Coulson, Feltovich, and Anderson 1987, 1994 for the concept of cognitive flexilibity).

Finally, we may want to compare L1 and L2 functional literacies. This is feasible by studying how people read and act in a comparable functional context if the utility text is given in the native or in a foreign language.

---

[1]Note that this does not mean that we should posit generic discourse processes as examples of "successful" and "good" reading.

7. BIBLIOGRAPHY

7.1 Primary sources

Installation Guide. Mouseman™ Serial/Mouse Port Mouse. Logitech.

Owner's Manual. TASCAM TEAC Production Products. 22-2 2-Track Recorder.

Operating Instructions for Salora SV 990 VCR.

7.2 Secondary sources

Afferbach, P. 1990. The influence of prior knowledge on expert readers' main idea construction strategies, *Reading Research Quarterly* 25, 31-46.

Alasuutari, P. 1993. *Laadullinen tutkimus*. Jyväskylä: Vastapaino.

Alderson, C., and A. Urquhart 1988. This test is unfair: I'm not an economist, in P, Carrell, J. Devine and D. Eskey (eds.), *Interactive Approaches to Second Language Reading*, Cambridge: C.U.P., 168-182.

Anderson, R. 1978. Schema-Directed Processes in Language Comprehension, in A. Lesgold, J. Pellegrino, S. Fokkema, and R. Glaser (eds.), *Cognitive Psychology and Instruction*, New York: Plenum Press, 67-82.

Anderson, R. 1994/1984. Role of the Reader's Schema in Comprehension, Learning, and Memory, in R. Ruddell, M. Ruddell, and H. Singer (eds.) *Theoretical Models and Processes of Reading*. Fourth Edition. Newark, Delaware: International Reading Association. 469-482.

Anderson, R. and Pearson P. 1984. A Schema-Theoretic View of Basic Processes in Reading Comprehension, in P. Pearson, R. Barr, M. Kamil, and P. Mosenthal (eds.) *Handbook of Reading Research*. London: Longman, 255-291.

Argyle, M., A. Furnham, and J. Graham 1981. *Social Situations*. Cambridge: Cambridge University Press.

Atkinson, R. L., R. C. Atkinson, E. Smith, and D. Bem 1993. *Introduction to Psychology*. 11th Edition. Forth Worth: Harcourt.

Barnes, S. 1994. Hypertext literacy, *IPCT - Interpersonal Computing and Technology. An Electronic Journal for the 21 Century*, 2:24-36. (October 1994.) Archieved as BARNES IPCTV2N4 on LISTSERV@LISTSERV. GEORGETOWN.EDU.

Barnett, M. 1989. *More than Meets the Eye: Foreign Language Reading. Theory and Practice*. Englewood Cliffs: Prenctice Hall.

Bernhardt, E. 1991a. A Psycholinguistic Perspective on Second Language Literacy, *AILA Review* 8, 31-44.

Bernhardt, E. 1991b. *Reading Development in a Second Language. Theoretical, Empirical & Classroom Perspectives*. Norwood, N.J.: Ablex.

Bloome, D., and J. Green 1984. Directions in the Study of Reading, in P. Pearson, R. Barr, M. Kamil, and P. Mosenthal (eds.) *Handbook of Reading Research*. London: Longman, 395-421.

Bossers, B. 1991. On Thresholds, Ceilings, and Short-Circuits: The Relation between L1 Reading, L2 Reading and L2 Knowledge, *AILA Review* 8, 45-60.

Block, E. 1986. The Comprehension Strategies of Second Language Readers, *TESOL Quarterly* 20, 463-494.

Block, E. 1992. See How They Read: Comprehension Monitoring of L1 and L2 Readers, *TESOL Quarterly* 26, 319-343.

Bransford J., B. Stein, and T. Shelton 1984. Learning from the perspective of the comprehender, in J. Alderson and A. Urquhart (eds), *Reading in a Foreign Language*. London: Longman, 28-47.

Breen, M. 1987. Learner Contributions to Task Design, in C. Candlin and D. Murphy (eds.) *Language Learning Tasks*. Lancaster Practical Papers in English Language Education. Vol 7. Englewood Cliffs, NJ: Prentice-Hall, 23-46.

Brown G., and G. Yule 1983. *Discourse analysis*. Cambridge: C.U.P.

Butler, B. 1995. Using WWW/Mosaic to support classroom-based education: an experience report, *IPCT - Interpersonal Computing and Technology. An Electronic Journal for the 21 Century* 3:17-52. (January 1995.) Archieved as BUTLER IPCTV3N1 on LISTSERV@GUVM.GEORGETOWN.EDU.

Candlin C. 1987. Towards Task-Based Language Learning, in C. Candlin and D. Murphy (eds.) *Language Learning Tasks*. Lancaster Practical Papers in English Language Education. Vol 7. Englewood Cliffs, NJ: Prentice-Hall, 5-22.

Carrell, P. 1983. Three components of background knowledge in reading comprehension, *Language Learning* 33, 183-207.

Carrell, P. 1988a. Introduction: Interactive approcahes to second language reading, in P. Carrell, J. Devine and D. Eskey (eds.), *Interactive Approaches to Second Language Reading*, Cambridge: C.U.P., 1-5.

Carrell, P. 1988b. Some causes of text-boundedness and schema inference in ESL reading, in P. Carrell, J. Devine and D. Eskey (eds.), *Interactive Approaches to Second Language Reading*, Cambridge: C.U.P., 101-113.

Carrell, P., Pharis, B., and Liberto, C. 1989. Metacognitive Strategy Training for ESL Reading, *TESOL Quarterly* 23, 647-75.

Carrell, P., and Eisterhold, J. 1983. Schema Theory and ESL Reading Pedagogy. *TESOL Quarterly*, 17:553-573. Reprinted in P. Carrell, J. Devine and D. Eskey (eds.) 1988. *Interactive Approaches to Second Language Reading*, Cambridge: C.U.P., 73-91.

Carver, R. 1992a. Reading rate: Theory, research and practical implications, *Journal of Reading* 36, 84-95.

Carver, R. 1992b. Effect of Prediction Activities, Prior Knowledge, and Text Type upon Amount Comprehended: Using Rauding Theory to Critique Schema Theory Research, *Reading Research Quarterly* 27, 165-174.

Colley, A. 1987. Text Comprehension, in R. Beech and Colley A. (eds.) *Cognitive approaches to reading,* Chichester: Wiley, 113-138.

Cook, G. 1995. Principles for research into text accessibility, in H. Nyyssönen and L. Kuure (eds.) *Principles of Accessibilty and Design in English Texts - Research in Progress*. Publications of the Department of English, University of Oulu, 9-18.

Cooligan, H. 1994. *Research Methods in Statistics and Psychology.* London: Hodder & Stougton.

Cooper, J., M. McKinney, and P. Robinson 1991. *Journal of Staff, Program and Organization Development.* 9:240-251.

Cunningham J., and J. Fitzgerald 1996. Epistemology and reading, *Reading Research Quarterly* 31:36-60.

Dechant, E. 1993. *Whole-Language Reading. A Comprehensive Teaching Guide.* Lancaster, PA: Technomic.

Dixon, P., J. Faries, and G. Gabrys 1988. The Role of Explicit Statements in Understanding and Using Written Directions, *Journal of Memory and Language* 27, 649-667.

Enkvist, N. 1981. Experiental iconism in text strategy, *Text* 1-1, 97-111.

Ericsson, A., and H. Simon 1987. Verbal Reports on Thinking, in C. Faerch and G. Kasper (eds.) *Introspection in Second Language Research.* Clavendon: Multilingual Matters, 24-53.

Eskey, D. 1988. Holding in the bottom: an interactive approach to the language problems of second language readers, in P. Carrell, J. Devine and D. Eskey (eds.) 1988. *Interactive Approaches to Second Language Reading*, Cambridge: C.U.P., 93-100.

Faerch, C., and G. Kasper 1987. From Product to Process - Introspective Methods in Second Language Research, in C. Faerch and G. Kasper (eds.) *Introspection in Second Language Research.* Clavendon: Multilingual Matters, 5-23.

Gernsbacher, M. A. 1990. *Language Comprehension as Structure Building.* Hillsdale, N.J.: Erlbaum.

Gill, S., S. Melchert, and D. Wright 1994. The theories behind a hypermedia learning environment, in M. Thomas, T. Sechrest, and N. Estes (eds.) *Eleventh International Conference on Technology and Education. London, England March 27-30,1994.* Austin, TX: Univ. of Texas at Austin, 1258-1261.

Glaser, R., and M. Chi 1989. Overview, in R. Glaser and M. Chi (eds.) *The Nature of Expertise*. Hillsdale, N.J.: Lawrence.

Goldstein, L., and S. Conrad 1990. Student Input and Negotiation of Meaning in ESL Writing Conferences, *TESOL Quarterly* 24, 443-460.

Goodman, K. 1967. Reading: A Psycholinguistic Guessing Game. *Journal of the Reading Specialist* 6, 126-135.

Goodman, K. 1994. Reading, Writing and Written Texts: A Transactional Sociopsycholinguistic View, in R. Ruddell, M. Ruddell, and H. Singer (eds.) *Theoretical Models and Processes of Reading*. Fourth Edition. Newark, Delaware: International Reading Association, 1093-1130.

Grabe, W. (1991). Current Developments in Second Language Reading Research, *TESOL Quarterly* 25, 375-406.

Graesser, A., and L. Clark 1985. *Structures and Procedures of Implicit Knowledge*. Volume XVII in the Series Advances in Discourse Processes. Norwood, N.J.: Ablex.

Hammodou, J. 1991. Interrelationships among Prior Knowledge, Inference, and Language Proficiency in Foreign Language Reading, *Modern Language Journal* 75, 27-38.

Hatakka, O. 1994. Auttaako hypermedia oppimaan, in *Interaktiivinen teknologia koulutuksessa-konferenssi. Hämeenlinna 22.-23.4.1994.* Helsinki: Hämeen kesäyliopisto.

Hatano, G., and K. Inagaki 1991. Sharing Cognition Through Collective Comprehension Activity, in J. Resnick et al. (eds.) *Perspectives on Socially Shared Cognition.* Washington. D.C.: American Psychological Assocation.

Hirsjärvi, S., and H. Hurme 1982. *Teemahaastattelu.* 2nd edition. Helsinki: Yliopistopaino.

Hosenfeld, C. et al. 1981. Second language reading: A curricular sequence fro teaching reading strategies, *Foreign Language Annals* 14, 415-422.

Hudson, T. 1991. Content Comprehension Approach to Rading English for Science and Technology, *TESOL Quarterly* 25, 77-104.

Hutchinson, T., and A. Waters (1981) Performance and Competence in English for Specific Purposes, *Applied Linguistics* 2, 56-69.

Hutson, B. 1987. Literacy at School and Literacy at Work, in D. Bloome (ed.) *Literacy and Schooling*. Norwood, N.J.: Ablex, 225-257.

Järvela, S. 1995. The cognitive apprenticeship model in a technologically rich learning environment: interpreting the learning interaction, *Learning and Instruction* 5, 237-259.

Jokinen, A., K. Juhila, and E. Suoninen 1993. *Diskurssianalyysin aakkoset.* Tampere: Vastapaino.

Kalaja, P. 1991. Deviance, did you get it? An experiment in reading to learn, *System* 19, 419-423.

Kintsch, W. 1988. The Role of Knowledge in Discourse Comprehension: A Construction-Integration Model, *Psychological Review* 95, 163-182.

Kintsch, W. 1987. Contributions from Cognitive Psychology, in R. Tierney, P. Anders, and J. Mitchell (eds.) *Understanding Readers' Understanding. Theory and Practice.* Hillsdale, N.J.: Lawrence Erlbaum, 5-14.

Kintsch, W. 1986. On modeling comprehension, in S. de Castell, A. Luke, and Kieran Egan (eds.) *Literacy, Society, and Schooling.* Cambridge: Cambridge University Press.

Kintsch, W., and T. van Dijk 1978. Towards a model of text comprehension and production, *Psychological Review* 85 363-394.

Kuure, L. 1995. A reader prespective into text accessibility, in H. Nyyssönen and L. Kuure (eds.) *Principles of Accessibilty and Design in English Texts - Research in Progress.* Publications of the Department of English, University of Oulu, 119-134.

Lappalainen, O. 1995. *Oppimistyyli harkitsevuus vs. impulsiivisus ja tiedonhankintatyylit.* Acta Universitatis Tamperensis. A: 441.

Leppänen, S. 1993. *The Mediation of Interpretive Criteria in Literary Criticism.* Studia philologica Jyväskyläensia 29. Jyväskylä: University of Jyväskylä.

Linna, M. 1995. Koulutus ja tutkimus tietoyhteiskunnassa - opetusministeriön strategia, in *Interaktiivinen teknologia koulutuksessa-konferenssi. Hämeenlinna 21.-22.4.1995.* Hämeenlinna: Hämeen kesäyliopisto, 23-28.

Linnakylä, P. 1988. *Miten opitaan teksistä. Ammattiopiskelijoiden tekstistä oppimisen arvioinnin taustaa. Osaraportti 1.* Kasvatustieteiden tutkimuslaitoksen julkaisusarja A. Tutkimuksia 17. Jyväskylä: Jyväskylän yliopisto.

Linnakylä, P. 1991. Toimiva lukutaito - valtaa ja vapautta, in M. Hiltunen and M.-L. Toukonen (eds.) *Toimiva lukutaito.* Suomen Unesco-toimikunnan julkaisuja no. 55, 8-29.

Long, S., P. Winograd, and C. Bridge 1989. The effects of reader and text characteristics on imagery reported during and after reading, *Reading Research Quarterly* 24, 353-372.

Lorch, R., E. Lorch, and M. Klusewitz 1993. College Students' Conditional Knowledge about Reading, *Journal of Educational Psychology* 85, 239-252.

Lundeberg, M. 1987. Metacognitive Aspects of Reading Comprehension: Studying Understanding in Legal Case Analysis, *Reading Research Quarterly* 22, 407-432.

Matsumoto, K. 1993. Verbal-Report Data and Introspective Methods in Second Language Research: State of the Art, *RELC Journal* 24, 32-60.

Meara P., and G. Jones 1988. Vocabulary Size as a Placement Indicator, in P. Grunwell (ed.) *Applied Linguistics in Society. Papers from the Annual Meeting of the British Association for Applied Linguistics. British Studies in Applied Linguistcs 3.*

Mendonca, C., and K. Johnson 1994. Peer Interview Negotiations: Revision Activities in ESL Writing Instruction, *TESOL Quarterly* 28, 745-769.

Metz, M. 1994. Computer-Mediated Communication: literature review of a new context, *IPCT - Interpersonal Computing and Technology. An Electronic Journal for the 21 Century* 2, 31-49. (April 1994.) Archieved as METZ IPCTV2N2 on LISTSERV@ LISTSERV.GEORGETOWN.EDU.

Mikulecky, L. 1990. Literacy for What Purpose? In R. Venezky, D. Wagner, and B. Ciliberti (eds.) *Toward Defining Literacy*. Newark, DE: International Reading Association, 24-34.

Moore, W. 1983. A Case for Naturalistic Assessment of Reading Comprehension. *Language Arts*, 60, 159-170.

Muikku-Werner, P. 1993. *Impositiivisuus ja kielellinen variaatio. Julkisten keskusteluiden käskyt ja kysymykset kielenopetuksen näkökulmasta.* University of Joensuu Publications in Humanities no. 14. Joensuu: University of Joensuu.

Nunan, D. 1995. Closing the Gap Between Learning and Instruction, *TESOL Quarterly* 29, 133-158.

Niiniluoto, I. 1990. *Maailma, minä ja kulttuuri.* Keuruu: Otava.

Nofsinger, R. 1991. *Everyday conversation.* Newbury Park: Sage.

Nunan, D. 1992. *Research Methods in Language Learning.* Cambridge: Cambridge University Press.

Nyman, S. 1991. Understanding Operating Instructions. A Study of the Language from a Psycholinguistic Point of View. Unpublished Pro Gragu Thesis. Department of English, University of Turku.

O'Malley, J. M., and A. U. Chamot 1990. *Learning Strategies in Second Language Acquisition.* Cambridge: Cambridge University Press.

Paivio, A. 1986. *Mental Representations. A Dual Coding Approach.* New York: Oxford University Press.

Paivio, A., and I. Begg 1981. *Psychology of Language*. Englewood Cliffs, N.J.: Prentice-Hall.

Paran, A. 1996. Reading in EFL: facts and fictions, *ELT Journal* 50, 25-34.

Pearson, P., and D. Stephen 1992/1994. Learning about Literacy: A 30-Year Journey, in C. Gordon et al. (eds.) 1992. *Elementary Reading Instruction: Process and Practice.* Ginn Press. Reprinted in R. Ruddell, M. Ruddell and H. Singer (eds.) *Theoretical Models and Processes of Reading*. Fourth Edition. Newark, Delaware: International Reading Association, 22-42.

Phillips, G. 1994. A Nigtmare Scenario: Literacy and technology, *IPCT - Interpersonal Computing and Technology. An Electronic Journal for the 21 Century* 2, 50-73. (April 1994.) Archieved as PHILLIPS IPCTV2N2 on LISTSERV@LISTSERV.GEORGE-TOWN. EDU.

Pica, T., R. Young, and C. Doughty 1987. The Impact of Interaction on Comprehension. *TESOL Quarterly*, 21, 737-758.

Rancourt, R. 1985. *Brain Dominance and Psycho-Epistemic Dominance of Special Education and Computer Education Teachers*. A manuscript.

Rauste-von Wright, M., and J. von Wright 1994. *Oppiminen ja koulutus*. Porvoo: WSOY.

Reinhardt, A. 1995. New ways to learn. *BYTE* 50-73. March 1995.

Reed, J., and D. Schallert 1993. The Nature and Involvement in Academic Discourse Tasks. *Journal of Educational Psychology* 85, 253-266.

Rees-Miller, J. 1993. Critical Appraisal of Learner Training: Theoretical Bases and Teaching Implications. *TESOL Quarterly* 27, 679-689.

Rosenblatt, L. 1994. The Transactional Theory of Reading and Writing, in R. Ruddell, M. Ruddell and H. Singer (eds.) *Theoretical Models and Processes of Reading*. Fourth Edition. Newark, Delaware: International Reading Association, 1057-1092.

Ruddell, R., and N. Unrau 1994. Reading as a Meaning-Construction Process: The Reader, the Text, and The Teacher. In R. Ruddell, M. Ruddell, and H. Singer (eds.) *Theoretical Models and Processes of Reading*. Fourth Edition. Newark, Delaware: International Reading Association, 996-1056.

Rumelhart, D.E. 1977. Toward an Interactive Model of Reading. *Attention and Performance* 6, 573-603.

Rust, J., and S. Golombok 1989. *Modern Psychometrics*. London: Routledge.

Sadoski, M., and A. Paivio 1994. A Dual Coding View of Imagery and Verbal Processes in Reading Comprehension, in R. Ruddell, M. Ruddell and H. Singer (eds.) *Theoretical Models and Processes of Reading*. Fourth Edition. Newark, Delaware: International Reading Association, 582-601.

Sadoski, M., E. Goetz, and J. Fritz. 1993. Impact of Concreteness on Comprehensibilty, Interest, and Memory for Text: Implictaions for Dual Coding Theory and Text Design. *Journal of Educational Psychology* 85, 291-304.

Sadoski, M., A. Paivio, and E. Goetz 1991. A critique of schema theory in reading and a dual coding alternative. *Reading Research Quarterly* 26, 463-484.

Samuels, S., and Kamil, M. 1984. Models of the Reading Process, in P. Pearson, R. Barr, M. Kamil, and P. Mosenthal (eds.) *Handbook of Reading Research.* London: Longman, 185-224.

Seliger, H.S., and E. Shohamy 1989. *Second Language Research Methods.* Oxford: Oxford University Press.

Silverman, D. forthcoming. *Discourses of Counselling.* London: Sage.

Silverman, D. 1993. *Interpreting Qualitative Data: Methods for Analysing Talk, Text and Interaction.* London: Sage.

Skehan, P. 1989. *Individual Differences in Second-Language Learning.* London: Edward Arnold.

Spiro R., R. Coulson, P. Feltovich, and D. Anderson 1994. Cognitive Flexibility Theory: Advanced Knowledge Acquisition in Ill-Structured Domains, in R. Ruddell, M. Ruddell, and H. Singer (eds.) *Theoretical Models and Processes of Reading.* Fourth Edition. Newark, Delaware: International Reading Association, 602-615.

Spiro, R., W. Vispoel, J. Schmitz, A. Samarapungava, and A. Boerger 1987. Knowledge Acquisition for Application: Cognitive flexibility and Transfer in Complex Content Domains, in B. Britton and S. Glynn (eds.) *Executive Control Processes in Reading.* Hillsdale, N.J.: Erlbaum.

Stoller F. 1986. Reading Lab: Developing Low-Level Reading Skills, in F. Dubin, D. Eskey, and W. Garbe (eds.) *Teaching Second Language Reading for Academic Purposes.* Reading, Mass.: Addison-Wesley, 51-76.

Swales, J. 1991. *Genre Analysis. English in Academic and Research Settings.* Cambridge: Cambridge University Press.

Swaffar, J. 1988. Readers, Texts, and Second Languages: The Interactive Processes. *Modern Language Journal* 72, 123-149.

Swaffar, J., K. Arens, and H. Byrnes 1991. *Reading for a meaning.* Englewood Cliff, NJ: Prentice-Hall.

Tella, S. 1994. *Uusi tieto- ja viestintätekniikka avoimen oppimisympäristön kehittäjänä. Osa I.* Helsingin yliopiston opettajankoulutuslaitos. Tutkimuksia 124. Helsinki: Yliopistopaino.

Thornborrow, J. 1991. Orderly discourse and background knowledge, *Text* 11:581-606.

Uljens, M. 1995. *School Didactics and Learning*. An unpublished manuscript.

Väänänen, P. 1992. Need of English in Mechanical Engineering: a Target Task Identification. Licentiate Thesis in English Philology. University of Jyväskylä.

Valtanen, H. 1994. Metacogition and Reading in L2, *FINLANCE. Finnish Journal of Applied Linguistics* 14, 67-96.

Valtanen, H. 1995. Comprehension: products and processes. Product and process data from two case studies of Finnish readers of English, *FINLANCE. Finnish Journal of Applied Linguistics* 16, 19-43.

van Dijk, T. 1990. The future of the field: Discourse analysis in the 1990's, *Text* 10, 133-156.

van Dijk, T., and W. Kintsch 1983. *Strategies of Discourse Processing*. London: Academic.

Venetzky, R. 1990. Definitions of Literacy, in R. Venezky, D. Wagner, and B. Ciliberti (eds.) *Toward Defining Literacy*. Newark, DE: International Reading Association, 2-16.

Viitala, T. 1995. On Reading in University Studies, in H. Nyyssönen and L. Kuure (eds.) *Principles of Accessibilty and Design in English Texts - Research in Progress*. Publications of the Department of English, University of Oulu, 155-159.

von Wright, J. 1996. Oppimisen tutkimuksen opetuksella asettamia haasteita, *Kasvatus* 27:9-21

von Wright, J., M. Vauras, and P. Reijonen 1979. *Oppimisen strategiat kouluiässä I. Tutkimuksen viitekehys ja esitutkimus*. Psykologian tutkimuksia no. 33. Turun yliopisto. Psykologian laitos.

Warschauer M., L. Turbee, and B. Roberts 1995. *Computer Networks and Student Empowerment*. NFLRC Research Notes # 10. University of Hawaii at Manoa.

Wenestam C., 1993. A critique of research on cognition and cognitive processes, *British Journal of Educational Psychology* 63, 34-45.

Wright, T. 1987. Instructional Task and Discoursal Outcome in the L2 Classroom, in C. Candlin and D. Murphy (eds.) *Language Learning Tasks*. Lancaster Practical Papers in English Language Education. Vol 7. Englewood Cliffs, NJ: Prentice-Hall, 47-68.

APPENDIX 1

Pilot Three, Part A August 1993.

(The participant pair, OP01and OP02, graduated from our Institute in May 1993. They are both married and today co-own a small engineering company, which was started at the time of the pilot.)

(OP01ja OP02 read the INSTALLATION GUIDE)
OP01: *(Browsing in the INSTALLATION GUIDE.)* Could you check if you can start the machine?
OP02: What?
OP01: See if the plug is in the socket.
OP02: Well, this one goes to... No, it doesn't...
OP01: At the back, somewhere. This....
OP02: What?
OP01: The switch.
OP02: *(Tries to switch on the PC.)* It's no good. This system needs another cable...
OP02& OP01: *(Together to researcher.)* One cord is missing.
OP01: Do you think we should start checking which... which one of those... interrupts is free. Next, we should do the setting of the board... *(Picks up the bus board that is still in the plastic package, shows it to OP02.)* ... on this board. We could set the...
OP02: Yeah...
(OP01 opens the package.)
OP01: *(Reading some of the boot-up error messages on the screen.)* This machine seems to be a bit confused.
OP01: *(Reading aloud the pin settings in the GUIDE.)* Number Two, Three, Four and Five.
OP02: Well, yes, sure... what could it be?
OP01: Let's put it in number Five.
OP02: Parallel Printer Port, in this case it's LPT2.
OP01: Number Five ja LPT2.
OP01: *(Keys in the changes.)* Now it's changed.
OP02: *(Stands up and prepares to open the PC cover.)* Let's open him.
OP01: Let's open the cover.
OP02: *(Cracking a joke.)* Get rid of that gooey stuff....
OP01: *(Pushing the PC on the table, to get the cover off)* I think we must move it ... this way.
OP02: Yeah... put some force behind it...
OP01: Next, just open it...
OP02: That one...
OP01: *(Instructing OP02.)* Fasten it.
OP02: *(Tightening the bus board screw.)* Uhm-hm.
OP01: *(Picks up the Installation Disk and prepares to install the mouse software.)* Okay, let's test it, then. Did you connect the power cable?
OP02: Yeah.
OP01: Now, let's plug the mouse cable in .there.. Here...
OP02: Where is it? *(OP01 gives the mouse to him.)* Here we go... Okay.
OP01: It's [drive] B, didn't remember that.
OP02: *(Reads on the screen.)* Reinstall.
OP01: What it needs is one like that...
OP02: *(Reads a file name on the screen.)* ... install.bat.
OP01: I wonder what it is? ... LPT2.
OP01: Where could it be... *(Takes the USER GUIDE and reads in it.)* ... See, we ought to put it in LPT2, 'cause we just loaded in there...
OP02: Yeah.
OP01: If it still is in LPT2.
(OP01 reads the USER GUIDE, browsing, and OP02reads the INSTALLATION GUIDE.)
(After reading under INSTALL THE SOFTWARE in the INSTALLATION GUIDE for some time, points to a paragraph in the text, and interprets for OP01.)
OP02: Seems INSTALL is only for DOS, and Windows needs that WINSTALL. I wonder what we should do now?
OP01 *(Reads the paragraph shown by OP02, thinking for a while.)* Let's choose INSTALL...
OP02: INSTALL.
OP01: *(Starts to install the mouse software and reads its messages)* Okay, I'm putting it there.
(The installation procedure continues. OP01 operates the keyboard while OP02 watches. Occasionally they stop to read screen messages for a longer time. After installation is completed OP01 checks that the mouse driver is in the correct directory)
OP01: *(Loads the bus mouse he has just installed.)* Let's test it a bit.
(OP02 backchannels in consent; inaudible)
OP01: I wonder if there's a program we could test the mouse with?
OP01: *(Tests the mouse using the MS-DOS Edit facility.)* Well, now, looks as if it works now... Next, let's launch Windows.
OP02: Yeah, but it didn't work in the Windows environment.
OP02: *(Reads, ianaudible; probably translating.)* It needs to be installed on the hard disk.
OP01: Hang on...
OP02: *(Reads in the INSTALLATION GUIDE.)* You'll have to start Windows... it says so here.
OP01: Start Windows?
OP02: Yes.
(OP01 works with the keyboard, checking various directories.)
OP02: *(Reads the INSTALLATION GUIDE, showing OP01.)* ... Program Manager..
OP01: (Sees the installation option on the screen. Cries out.) Logitech!
OP02: *(Goes on reading.)* ... Program Manager..
OP01: *(Continues to key in mouse specifications; inaud.)* Bet we might run into some difficulties here, since we are installing it from drive B...
OP01: *(Tests the mouse, which is now opearational.)* It's set up now .
(Duration ca. 20 min.)

APPENDIX 2

MUUTAMA KYSYMYS LUKEMISESTA:

1. Olen **lukenut** (koulukirjojen lisäksi) **englanninkielisiä**...
   a) sanomalehtiä
   b) viikko- tai aikakauslehtiä
   c) sarjakuvalehtiä
   d) kaunokirjallisuutta
   e) käyttöoppaita ja opaskirjoja
   f) tietokirjallisuutta
   g) harrastuslehtiä
   h) tekniikkaan, esim. laitteisiin liittyviä ohje- ja opastekstejä (mikron näytöltä tai kirjasta ym.)

2. **Englannin lukutaitoni** on mielestäni...
   a) erittäin hyvä
   b) hyvä
   c) kohtalainen
   d) melko heikko
   e) hyvin heikko

3. Miten luet **suomenkielistä asiatekstiä**, esim. tenttikirjoja?
   a) nopeasti ja tehokkaasti
   b) melko hitaasti mutta tehokkaasti
   c) nopeasti mutta hieman tehottomasti
   d) kovin hitaasti ja tehottomasti
   e) jotenkin muuten; miten? _____

4. Miten luet **suomenkielistä ohje- ja opastekstiä**?
   a) nopeasti ja tehokkaasti
   b) melko hitaasti mutta tehokkaasti
   c) nopeasti mutta hieman tehottomasti
   d) kovin hitaasti ja tehottomasti
   e) jotenkin muuten; miten? _____

5. Miten luet **englanninkielistä ohje- ja opastekstiä**?
   a) nopeasti ja tehokkaasti
   b) melko hitaasti mutta tehokkaasti
   c) nopeasti mutta hieman tehottomasti
   d) kovin hitaasti ja tehottomasti
   e) jotenkin muuten; miten? _____

APPENDIX 3

LUKEMISEN JÄLKEEN (TEHTÄVÄ 1) Nimi:

Ympyröi sopiva vaihtoehto tai EOS (=en osaa sanoa)

1. Lukemani **ohjetekstin (manuaalin) kieli oli vaikeustasoltaan** mielestäni...
   hyvin helppo 1 2 3 4 5 6 7 hyvin vaikea EOS

2. **Tekstin sisältö** oli mielestäni..
   hyvin helppo ymmärtää 1 2 3 4 5 6 7 hyvin vaikea ymmärtää EOS

3. Miten hyvin **teksti ohjasi** Sinua tehtävän suorittamisessa?
   teksti ohjasi erittäin hyvin 1 2 3 4 5 6 7 teksti ohjasi erittäin huonosti EOS

4. Tekstin **aihepiiri:** näiden laitteiden aihepiiri oli minulle..
   erittäin tuttu 1 2 3 4 5 6 7 täysin tuntematon

5. Tekstin **kiinnostavuus:** teksti oli mielestäni...
   hyvin mielenkiintoinen 1 2 3 4 5 6 7 erittäin tylsä EOS

6. **Miksi** tekstin ymmärtämisessä oli **mahdollisesti vaikeuksia**? Ympyröi yksi tai useampia kohtia.
   (Ellei vaikeuksia ollut, hyppää kohtaan 7.)

   a) sanaston tuntemuksemi ei riittänyt (tekstissä oli paljon vieraita sanoja)
   b) lauserakenteet tuottivat vaikeuksia
   c) tekstin aihepiiri oli minulle vieras
   d) ohje oli sekavasti kirjoitettu
   e) ohjeesta puuttui tärkeitä teknisiä yksityiskohtia
   f) tekstin sisältö ei kiinnostanut minua
   g) lukutilanne oli minulle hankala (parityöskentely, opettaja oli läsnä, istunto videoitiin)
   h) olen hitaampi tai nopeampi lukija kuin parini
   i) luin ohjetekstiä huolimattomasti
   j) hermostuin kun en itse ymmärtänyt tai kun parini ei ymmärtänyt tekstiä
   k) muusta syystä; kerro tarkemmin _____

7. Luonnehdi muutamin sanoin, **miten ohjetekstiä/manuaalitekstiä pitäisi lukea** tällaisessa tilanteessa:

_____

_____

_____

_____

APPENDIX 3

LUKEMISEN JÄLKEEN (TEHTÄVÄ 2) Nimi:

Ympyröi sopiva vaihtoehto tai EOS (=en osaa sanoa)

1. Lukemani ohjetekstin (manuaalin) kieli oli vaikeustasoltaan mielestäni...
   hyvin helppo 1 2 3 4 5 6 7 hyvin vaikea EOS

2. Tekstin sisältö oli mielestäni..
   hyvin helppo ymmärtää 1 2 3 4 5 6 7 hyvin vaikea ymmärtää EOS

3. Miten hyvin teksti ohjasi Sinua tehtävän suorittamisessa?
   teksti ohjasi erittäin hyvin 1 2 3 4 5 6 7 teksti ohjasi erittäin huonosti EOS

4. Tekstin aihepiiri: näiden laitteiden aihepiiri oli minulle..
   erittäin tuttu 1 2 3 4 5 6 7 täysin tuntematon

5. Tekstin kiinnostavuus: teksti oli mielestäni...
   hyvin mielenkiintoinen 1 2 3 4 5 6 7 erittäin tylsä EOS

6. Miksi tekstin ymmärtämisessä oli mahdollisesti vaikeuksia? Ympyröi yksi tai useampia kohtia. *(Ellei vaikeuksia ollut, hyppää kohtaan 7.)*

   a) sanaston tuntemuksemi ei riittänyt (tekstissä oli paljon vieraita sanoja)
   b) lauserakenteet tuottivat vaikeuksia
   c) tekstin aihepiiri oli minulle vieras
   d) ohje oli sekavasti kirjoitettu
   e) ohjeesta puuttui tärkeitä teknisiä yksityiskohtia
   f) tekstin sisältö ei kiinnostanut minua
   g) lukutilanne oli minulle hankala (parityöskentely, opettaja oli läsnä, istunto videoitiin)
   h) olen hitaampi tai nopeampi lukija kuin parini
   i) luin ohjetekstiä huolimattomasti
   j) hermostuin kun en itse ymmärtänyt tai kun parini ei ymmärtänyt tekstiä
   k) muusta syystä; kerro tarkemmin _____

7. Luonnehdi muutamin sanoin, miten ohjetekstiä/manuaalitekstiä pitäisi lukea tällaisessa tilanteessa:

_____

_____

_____

_____

APPENDIX 4

VIERASKIELISEN TEKSTIN LUKEMINEN

Tämän kyselyn tarkoituksena on selvittää äskeistä lukemistapahtumaa. Mieti miten alla olevat väittämät kuvaavat Sinun tapaasi lukea tätä äsken lukemaasi tekstiä.

Vastaa asteikolla 1... 7 ja/tai EOS; rengasta ko. vaihtoehto kunkin väittämän jälkeen.

1 = ei koske minua lainkaan; ei pidä paikkaansa
7 = koskee minua täysin, pitää täysin paikkansa
EOS = en osaa sanoa

(1) Ennen kuin aloin lukea tekstiä tarkemmin, vilkaisin sen nopeasti lävitse, jotta saisin selville mitä se käsittelee.
1 2 3 4 5 6 7 EOS

(2) Pystyin lukiessani erottamaan tekstin pääasiat sivuasioista. 1 2 3 4 5 6 7 EOS

(3) Kun havaitsin, etten ollut ymmärtänyt jotakin kohtaa tekstissä, mietin mitä se muun tekstin perusteella voisi tarkoittaa. 1 2 3 4 5 6 7 EOS

(4) Aikaisemmat tietoni tekstin käsittelemästä aiheesta auttoivat minua sisällön ymmärtämisessä.
1 2 3 4 5 6 7 EOS

(5) Käytin vähemmän aikaa sellaisten tekstikohtien lukemiseen, joissa esitetyt asiat olivat minulle entuudestaan tuttuja. 1 2 3 4 5 6 7 EOS

(6) Luin tekstin kaikki osat yhtä huolellisesti lävitse.
1 2 3 4 5 6 7 EOS

(7) Kun huomasin, etten ymmärtänyt tekstiä, luin eteenpäin ja toivoin asian selviävän.
1 2 3 4 5 6 7 EOS

(8) Lukiessani kiinnitin huomiota tekstin rakenteeseen, esim. väliotsikoihin ja kappalejakoon.
1 2 3 4 5 6 7 EOS

(9) Ennen tekstin lukemista, muistelin mitä ennestään tiesin tästä aiheesta. 1 2 3 4 5 6 7 EOS

(10) Pysähdyin aika ajoin pohdiskelemaan, mitä olin lukenut. 1 2 3 4 5 6 7 EOS

(11) Luettuani yhden kappaleen lävitse kertasin siinä esiintyneet pääkohdat. 1 2 3 4 5 6 7 EOS

(12) Kun tekstissä esiintyi vieras sana, yritin arvata sen merkityksen muun tekstin perusteella tai muiden osaamieni kielten perusteella.
1 2 3 4 5 6 7 EOS

(13) Minulla oli lukiessani selkeä käsitys siitä, milloin olin ymmärtänyt lukemani ja milloin en.
1 2 3 4 5 6 7 EOS

(14) Ajatukseni katkesi, jos jouduin selvittämään vaikeita sanoja tai rakenteita. 1 2 3 4 5 6 7 EOS

(15) Huomasin ymmärtäväni tekstiä, vaikka en jokaisen sanan merkitystä tarkkaan tietänytkään.
1 2 3 4 5 6 7 EOS

(16) Jos en saanut selvää jostakin tekstikohdasta, ohitin sen ja jatkoin lukemistani edelleen.
1 2 3 4 5 6 7 EOS

(17) Käänsin mielessäni koko ajan lukemaani tekstiä.
1 2 3 4 5 6 7 EOS

(18) Luin nopeammin sellaiset kohdat, jotka mielestäni eivät olleet oleellisia sisällön kannalta.
1 2 3 4 5 6 7 EOS

(19) Kun huomasin, etten ole ollut ymmärtänyt lukemaani, palasin tekstissä takaisin ja yritin uudelleen.
1 2 3 4 5 6 7 EOS

(20) Lausuin vieraan sanan mielessäni "ääneen", helpottaakseni sen tunnistamista.
1 2 3 4 5 6 7 EOS

APPENDIX 5

Instructions for semi-structured interview

Preparation: After the task-reading session, a break of 2 - 6 hrs takes place. This is required for preparation, as the participant's responses for questionnaires are analysed in outline.

PART 1 A

Short description of Part 1 A: View the video recording and let the participant describe. This is to take 10 - 15 mins.

Objective of the interview: To make the participant (a) recall both his reading-and-task, and to make him (b) reflect upon his reading-and-task, and the challenge involved in it.

(a) Fast-forward and play Camera Two full-view shots of the pair's first reading-and-task.

(b) Next, while viewing the recorded reading-and-task in fast-forward mode, the participant is asked to describe what took place during the first task. The participant may ask the interviewer to stop the tape, rewind the tape etc. The interviewer might start by asking: "Could you briefly describe to me, as if I were someone who never attended the session, what happenend during this session?"

A reminder for the interviewer: (i) Avoid reference to "mistakes". The aim is to carry out the interview in a neutral way, without evaluating the outcome. (ii) The participant is allowed to express himself freely; he is not to be interrupted. The interviewer must not get carried away.

PART I B

Objective of the interview: Making use of the text, to analyse the recent reading process, and if required, the task. The participant is expected to mediate information about his text access and text processing, so that this information can be compared to the task-integrated reading protocol. (This is assumed to improve the accountability of protocol analysis.)

The participant is given a copy of the manual text and a pencil. He is informed that the aim is now to review and dicuss the manual text in some detail.

(1.) *Indicating processed points in the text.* Interview questions:

(a) "Which parts of the manual text did you read *more rapidly*? Please indicate these in the text (eg. by drawing a line next to the text, or by circling the text). Also, write "NOP." next the mark." - The interviewer writes "NOP = nopeasti [*rapidly*]" on the blackboard.

(b) "Which parts did you read *more slowly*? Please indicate these in the text (eg. by drawing a line next to the text, or by circling the text). Also, write "HIT." next the mark." - The interviewer writes "HIT = hitaasti [*slowly*]" on the blackboard.

(c) "In which parts of the text did you encounter really difficult words or parts of a sentence? Please underline these."

2. If the participant seems to expect it, words or parts of the text that were hard to process are discussed.

3. "How well did the guidelines of text help you carry out the task?" "Any additional comments about the text?" The participant is asked to indicate "unclear parts" of the text that he wants to discuss. The interviewee is also asked about visual elements that might have crated difficulties for him during the task-and-reading.

4. Question about the use of a dictionary, if there was any, during the task-and-reading. "Where did you use a dictionary? - Did that help you?"

PART II A and II B.

Replicate procedures in Part I A and I B.

PART III

Objective of the interview: To learn what the participant thinks about collaboration in the recent task-and-reading situation.

- How was your collaboration with your pair? What things and in what way did you negotiate with your pair? Where and how did you get the help you needed?

- How does/did pair work differ from individual work in task-and-reading? Would you have done the same things alone, or would you have done things in a different way? How?

- How was division of work (subtasks) carried out? Was the eventual division of work successful? As to task division, would you have liked to have a different role ?

The participant takes Rancourt's KAMI (Knowledge Access Mode Inventory) - duration ca. 5 - 10. min.

As a "cooling-off" activity, the participant is asked general questions about the session and the interview (the meaningfulness of the reasearch, from the participant's the point of view; general impression etc.

The participant is informed about the confidentiality of the project. To guarantee accountability, the participant should not reveal details of the research project to his fellow students.

APPENDIX 6

Erityissanasto

Tämän kyselyn tarkoituksena on selvittää erityissanaston tuntemusta.

Periaate on yksinkertainen: **Viivaa yli kaikki ne sanaluettelon sanat, joita et tunne hyvin ja jätä ilman merkintää ne sanat, jotka tunnet hyvin.**

unplug	port	attach	connector	receptor
insure	package	bus board	avoid	cross out
pin	configure	installation	expansion	insert
slot	firmly	unit	thumbscrew	utility disk
display	button	relaxed	remove	tighten
cord	illustration	edge	cable	reconnect
volume	upgrade	unattended	interpret	transmit
internal	terminate	toggle	initialize	manage
support	instruct	interface	subroutine	main
sufficient	structure	string	permanent	priority
property	random	repeat	retrieval	reverse
schedule	screen	semiconductor	gate	highlight
advanced	channel	indication	allocation	position
available	skip	prefer	AC outlet	scan
restore	receivable	command	blink	mode
engage	depress	search	keypad	appear
view	cancel	decrease	fine-tuning	select
operate	store	built-in	shipment	invalid
receiver	tolerance	section	strength	knob
preset	feature	loudness	circuit	band
source	gold-plated	rejection	frequency	sensitivity
distortion	programmable	amplifier	continuous	adjustment
forward	eliminate	terminal	balanced	relay
damping	power supply	track	pickup	direct drive

APPENDIX 6

Erityiskielen tuntemus I B

Tämän lyhyen jälkitestin tarkoituksena on selvittää, kuinka ykstityiskohtaisesti Sinä tunnet äsken lukemiesi ohjetekstien kieltä.

Periaate on yksinkertainen: **Viivaa yli kaikki ne sanat (kohta A) ja lauseet (kohta B) joita et tunne hyvin ja jätä ilman merkintää ne, jotka tunnet hyvin.**

A. SANAT

unplug	port	attach	connector	IRQ block
insure	package	bus board	avoid	cross out
pin	configure	installation	expansion	insert
slot	firmly	unit	thumbscrew	utility disk
display	button	relaxed	remove	tighten
cord	illustration	edge	cable	reconnect
default setting	jumper	outlet	interpret	peripheral device
internal	configure	toggle	initialize	manage
support	instruct	interface	phone jack	main
sufficient	structure	string	permanent	priority
port	random	repeat	AC outlet	reverse
power supply	screen	metal plate	drive bay	illuminate

B. LAUSEET

Protect the bus board.

Allows you to connect a headphone to the drive.

Specifies drive ID (identity).

This is good practice whenever you install new hardware.

Remove the cover from your system.

See your computer manual for card installation instructions.

Locate a free 8-bit slot in your system.

Change to the \BCD directory.

If there is no audio output, refer to Appendix G.

Plug in the connector.

APPENDIX 7

Session 2A (OP05 + OP06)
Task One

1 *(Researcher gives instructions about VCR[1].)*
2 OP05: Monesko päivä tänään on?
3 *(Researcher says what date it is, completes instructions.)*
4 OP05: Hm..
5 *(Researcher gives instructions on channels, asks part.s to start.*
6 OP05: Kolometoista.. *(Leafs through table of contents.)*

7 OP06: Kymmenen laukausta omaan tahtiin...
8 (11)
9 No ni,
10 pitäskö se järjestellä sitte?
11 OP05: Hmm.. Pitäs PCR *(p.o. VCR)* saaja päälle, hetki.. *(Picks up RCU[2], operates RCU.)*
12 (8)
13 Tuolta. *(Finds the right button in RCU.)*
14 (13)
15 OP06: *(Mutisee)* *(Points at manual page.)*
16
17 (6)
18 Misä se VCR on? Löysiksää sen? Nyt
19 se meni vaan itestään..
20 OP05: {Joo-o..
21 OP06: {Tai sitte...
22 OP05: Joo, koko ajan.
23 OP06: Videokanava päälle.
24 OP05: Siinä on.
25 OP06: Niin joo. Ko vaihtuu kanava.
26 (18)
27 OP05: Onko täällä voimaa? ... On. *(Removes lid of RCU battery space, checks batteries.)*
28 (16)
29 OP06: Pistiksää tuonne jo sen? *(OP06 reads, points at p 16.)*

30 (4)
31 OP05: Näkyykö tänne asti? ... On se VCR:llä. *(OP05 operates RCU and looks*
32 *at the VCR display panel, OP06 watching.)*
33 OP06: Mitä.. niin sää tuon nyt teit? *(OP06 points at manual page.)*
34 [Note: If the VCR/TV...] ***..clock.. clock***
35 ***cannot be set.***
36 OP05: Hmm.
37 OP06: ***Press the clock button.*** *(OP06 moves on in text, reads same p.,*
38 (20) *points at same page.)*
39 OP05: (Viheltää hiljaa) Ootappa, milles tää nyt meni.. *(OP05 reads, operates RCU.)*
40 OP06: Kokeilepa painaa ykköstä välillä. *(OP06 points at manual p. 13.)*
41 OP05: Joo, joo. .. Se pitäs ottaa ensin.. *(OP05 presses RCU buttons.)*
42 (6)
43 Tosta ottaa noin.. Sitte...
44 [Set the.. and minutes] .. ***using the key-pad.*** *(OP05 reads same p.; mutters, inaudible.)*
45 (12)
46 Millä se menee tonne...
47 OP06: [When setting the clock during...].. *(OP06 reads and points at p. 13.)*
48 ***CANCEL..***
49 {Ooksä tuolla..
50 OP05: {Ootappa ny.. *(OP05 reads manual page. OP06 reads*
51 (22) *briefly, then looks at TV screen.)*

52 Tuossa se on.. *(OP05 presses RCU's Manual Tuning*
53 viis.. perjantai.. siinä se on. *buttons and number keys.)*
54 OP06: Nyt se pitää.. *(OP05 and OP06 read manual page,*
55 (12) *then OP05 operates RCU.)*
56 Pistäskö siihen pistää set? ***Press the SET***
57 [button to start the clock.]
58 OP05: Niin, tai sehän on .. valmis jo.. *(OP05 operates RCU.)*
59 OP06: Ai jaa.
60 OP05: Se pitää vaan siirtää varmaan tonne.
61 (4)
62 Ei, ko tänne se alakuun...
63 Tuolla me ollaan jo menossa. *(OP05 points at manual page.)*
64 OP06: Niin, mää aattelin, että tuohon vuosi, ne on jo *(OP06 points at manual page.)*
65 paikallaan.. että pitäskö.. Että ***press SET***, niin
66 kello käynnistyy.
67 OP05: Niin.
68 (5)
69 Se on siinä. Kello on nyt laitettu. *(OP05 operates RCU.)*
70 OP06: Joo... hetkinen. Eikö se pitäis tulla tuonne videoihinkin,
71 kello, jos se on päällä?
72 OP05: Eiku tää on tuota niin... ajastin tuolle kasetille varmaan.
73 OP06: Ai jaa.
74 OP05: Kato ko siinä on.. tunnit ja minuutit ja sekunnit... sen pitäs
75 saaha muutettua takasin kelloon. Nyt se veti sen tonne *(OP05 operates RCU.)*
76 taas.
77 (4) Mutta mehän saahaan se ko me..
78 pistetään näin. Nyt siellä on kello{aika.
79 OP06: {Joo.
80 OP05 No niin, se on laitettu.
81 OP06: Joo. Sitte video nauhottaan.
82 OP05: Katotaanpas täältä. *(OP05 leafs back and stops at*
83 *table of contents.)*
84 (13)
85 OP06: ***Timer recording.*** *(OP06 reads from table of contents.)*
86 OP05: Hm.
87 OP06: Kaheksantoista. *(OP06 refers to table of contents.)*
88 (15)
89 OP05: (Haukottelee väsyneesti) Saa kai sen tästä jo? .. *(OP05 leafs onwards to p. 18.)*
90 Saa. *(OP05 operates RCU.)*
91 (25)
92 OP06: Siellä muuten pitää olla kasetti sisällä.. jos.. sehän
93 pistetään äänitykselle.
94 OP05: No joo, laita sisälle se.
95 (10)
96 OP06: Saako tämän laittaa? *(To researcher)*
97 (*Researcher: "Joo"*).
98 (21)
99 OP05: Joo, se on toi.. mille se piti laittaa.. *(OP05 refers to researcher's instructions.)*
100 (5) *(OP05 operates RCU.)*
101 OP06: Onkse?
102 OP05: Nuin...
103 (9)
104 OP05: Ootappa ny... kaheksantoista nollanolla.. ja *(OP05 operates RCU.)*
105 yheksäntoista...kaheskymmenes viiettä...
106 OP06: Onko vielä.. se kanava?
107 OP05: Ykköskanava.. ei siinä muuta... kai.. *(OP05 operates RCU.)*
108 (12)
109 OP06: Pitäs nyt oikeastaan vielä painaa että... tiiäkkö että se

110 on..
111 OP05: Oota ny.. että se on siellä tallessa. *(OP05 leans forward to see VCR display*
112 *panel, then operates RCU.)*
113 OP06: Joo. Nyt sun pitää... kato että niin...
114 (4)
115 PROG
116 (6)
117 painoiksää PROG:ia?
118 OP05: Hm... Se on siellä tallessa.
119 OP06: Onkse valamis?
120 OP05: On.. {hm..
121 OP06: {Periaatteessa nytten pitäs vaihtua {kanava.
122 OP05: {Mutta kun se
123 on tuo... miten niin? Oota ny... mää käyn kattoon
124 tuota.. *(OP05 leans forward to see display panel.)*
125 Mutta kato tuossa.. *(OP05 points at manual page.)*
126 (5)
127 [The Programme & Clock screen will] ***disappear.***
128 OP06: ..***The Programme & Clock*** *(OP06 first reads whispering, then reads*
129 ***screen will disappear.*** *aloud.)*
130 (23)
131 OP06: Onko se?
132 OP05: Joo, se taimeri pitää lyyä päälle.
133 OP06: Niin, joo, joo.
134 OP05: Käypä katoon tuolta, onko se jo videosta.
135 OP06: Ai mitä?
136 OP05: Taimeria.. tuossahan se on.
137 OP06: Joo.
138 OP05: No nyt se nauhottaa sen. Se on siinä.

APPENDIX 8

Session 2B (OP05 + OP06)
Task Two

1 *(Researcher gives instructions about task.)*
2 OP05: Nauhotus kolometoista.. *(OP05 reads from table of contents.)*
3 Tuossa on tuo seittemäntoista sivulla nuo nauhotuksen *(OP05 leafs through table of contents.)*
4 sääjöt.
5 OP06: Hm.. *(mutters, inaud.)*
6 OP05: Sitten tässon nuo..
7 OP06: Katotaanpa tuo kuva. Vilikasen äkkiä.. onko tässä mitään...? *(OP06 points at VCR buttons.)*
8 Nämä napit justiin, että mitä nämä on on.. nämä täältä
9 pitäs löytää. Ykkönen, kakk....
10 Tää just tää... nämä.
11 OP05: Mitä?
12 OP06: Mitä nämä on? Näistä muistaakseni kelattiin... tai niinkö..
13 OP05: Hm-hm. Kyllä se seleviää sitte.
14 (6)
15 Nyt pitää kattoo *(OP05 leafs through table of contents.)*
16 miten tuo nauha viiään tonne sisään.
17 (20)
18 Tuossa. *(OP05 points at p. 11: a picture of VCR)*
19 *(Researcher asks OP05 and OP06 to speak somewhat louder.)*
20 OP05: Joo.
21 OP06: Joo.
22 OP05: Ootappa.
23 (7)
24 Tuo menee.. *(OP05 and OP06 thread recording tape.)*
25 OP06: Niin joo, tämä on, {tämä..
26 OP05: {Laitetaan ensin täältä..
27 OP06: Joo....
28 OP05: Ootappa ny.... tuosta ja.. ja sitte meni siitä ja...
29 OP06: Yläpuolelta..
30 OP05: Sinne, paa sinne kiinni se.
31 OP06: Sitte vaan paan tosta.. *(mutters, inaud.)* Vai oisko
32 se pitänyt jostakin napista...
33 OP05: Hm.. sehän on väärin..
34 OP06: Ai joo..
35 OP05: Kierteellä. Otappa uusiks.
36 OP06: Niin mutta en mää tiiä miten se.. kiertää.. {ai niin..
37 OP05: {Sehän
38 vetää jengalle.. Käännä niin päin se. Sehän kiertää
39 vähän..
40 OP06: Kylläpä se kiertää vähän aikaa.. ko tuo..
41 OP05: Annapa tänne se..
42 (5)
43 Se kyllä pyörähtää näin..
44 OP06: Mutta sisälle.. just..
45 OP05: Eihän se kierrä yhtään..
46 OP06: Joo, siellä on nuo... Ko se ei mee tuosta.. Miten tuo...
47 (11)
48 OP05: Nyt se lähti väärin tuonne.
49 (8)
50 Sitte... Kolometoista. *(OP05 turns over to p. 13 and 14.)*
51 (7)
52 Päätetty.. nauhotusnopeus.

53 OP06: Tuolla oli...
54 OP05: Joo ***speed***, *high - low*, jaa siinä *(OP05 reads from p. 13.)*
55 ei oo ku kaks nopeutta.
56 (8)
57 ***REC MODE***... Oootappa... siinä on tuo..
58 ***Left or Right***. Missä se on?
59 OP06: Onko.. väliä.. {näkyykö} siinä?
60 OP05: {No ei} sillä oo väliä. Tuikkaa nyt vaan se....
61 *mic*.
62 (6)
63 Mikki on *lefti*. Jos se on tällä puolen... joo.
64 Vaiko.. meinaakohan se sitä? Pakko son meinata... ***Monitor***. *(OP05 reads quickly from manual.)*
65 OP06: Ai niin, ja täältä pitää laittaa ällä päälle.. Tos on ällä {ja..
66 OP05: {Joo.
67 (14)
68 ***Controls***... Pitää ***REC MODE***:kin
69 laittaa sitte... Näin. ***Controls to***..
70 OP06: Mikä olis..
71 OP05: Mikä tuo on? *(OP05 points at manual page.)*
72 OP06: Pystyyks..
73 OP05: Katopa tuota.. *(OP05 points at manual page.)*
74 OP06: [5. Set MIC and Line controls] ***to MIN***. Nämä pitäs laittaa *(OP06 reads first almost inaudibly, then*
75 minille. Tai täällä on. *aloud.)*
76 OP05: Hm..
77 OP06: Mikä siinä on? Olikohan mikki ja linja...?
78 OP05: Joo..
79 OP06: Sitte siinä lukee vaikka että.. pistetään nää
80 kuulokkeet päähän.
81 OP05: Hmm. Misä ne kuulokkeet on?
82 OP06: Niin ne on tuosa, joo. Meijän pitäs vaikka äänittää jotain.
83 OP05: Hmm, sää kuulet oman äänes sitte. *(OP05 gives headset to OP06.)*
84 OP06: Ai joo.
85 OP05: Varmaan... laita päähän ne.
86 (9)
87 Ootappa ny. Et sää vielä kuule mitään sieltä.
88 OP06: Joo.. *(laughs)*
89 OP05: Koitapa huutaa siihen.
90 OP06: Eipä tietenkään, ko sitä ei oo äänitetty. Ai jaa, niin, joo.
91 Ha-haa-höö. *(OP06 tests microphone.)*
92 OP05: Koitapa laittaa, ee.. nyt se..
93 OP06: Ei, mitä..
94 OP05: Ei tässä oo mitään semmosta..
95 OP06: En mää usko. Pitäskö sitä kokeilla äänittää suoraan?
96 (23)
97 ***Now the deck is ready to make the recording.***
98 [Start the] ***programme source and press the RECORD***...
99 ***Start the programme***.. Missä sää oot menossa?
100 OP05: Oota ny ko mää katon.. *(OP05 points at manual page.)*
101 (6)
102 OP06: ***Start programme source*** *(OP06 reads whispering, then aloud.)*

103 Täällä oli semmonen jossain. ***Source*** *(OP06 reads whispwering again.)*
104 Nauha varmaan, ko se..
105 (10)
106 OP05: Missä on ***Line In***?
107 OP06: Tämä, se ois ollu tämä ällä varmasti.
108 (7)
109 Se pitää mennä kii..

110 (14)
111 OP05: Tossa on tuo.. tuo [The needle of the respective] *(OP05 points at manual page.)*
112 *VU* [meter]..***will start to move.***
113 ***3. Feed the programme source into*** [the 22-2 LINE IN
114 terminals and] ***gradually increase*** [the input level by
115 turning] ***up the LINE knob(s)***
116 OP06: Hei son varmaan.. oisko se tämä?
117 (4)
118 OP05: Koitapa. Koitapa äänittää siihen... Ei. Kuuluuhan se tuosta.
119 Ei sun tarvi sitä.
120 OP06: Niin, joo.
121 (5)
122 OP05: Täsähän saa nää molemmat pois. Ei tää mitää auta.
123 OP06: Pitäskö tästä kuulua jotain?
124 OP05: Koitapa.. Joo. Liikkuu tuossa.
125 OP06: Tällä?
126 OP05: Sanopa vielä kovempaa.
127 OP06: *Lukutoimintaa, sanakirjassa..*
128 OP05: Vielä. Vielä
129 OP06: *-lä kuiskaa, please. Left, right.*
130 OP05: Heilahtaa se.
131 OP06: Tiiäkkö, tämä on muuten niin toiselle kaiuttimelle erikseen.
132 OP05: *(Thoughtfully:)* Hm. Se on stereo.
133 OP06: Pitäskö sen olla keskellä?
134 OP05: Mitä keskellä?
135 OP06: *Left - Right.*
136 OP05: No ethän sää voi *(raising his voice)* ko siellä *Right*issa
137 ei oo mitään, joka voi liikkuakaan.
138 OP06: *Right.*
139 OP05: Löysikkö?
140 OP06: Nuo vasen ja oikee.
141 OP05: Niin.
142 OP06: Tajuakko sää ko levysoittimissa {on.
143 OP05: {Joo.
144 *(Irritated:)* Niin niin, mutta ko tää ei nuahota ko toiseen
145 kaiuttimeen.
146 OP06: Jaa.
147 OP05: Stereo.
148 OP06: Joo-o.
149 (17)
150 OP05: Lyöpä nyt pää{hän ku}... *(insisting)* Kuule, lyöpä päähän nuo.
151 OP05: {Pitäskö} mun...
152 Oliks että kuulokk..
153 OP05: Kuuliks sää sieltä jotain ääntä? Kokeilepa.
154 OP06: Kuuluu. *Lukutoiminta, sanakirjassa..*
155 OP05: Kuuluuko?
156 OP06: Joo.
157 OP05: Hm.
158 (6)
159 No niin ja rupee nauhottaan.
160 OP06: Jaaha, pitää sitä puhua sinne. Haluakko puhua?
161 OP05: Nii-i. Selosta nyt tuo vaikka.
162 *(OP06 tries to start recording, but fails.)*
163 OP05: Eikö oota niin kauan ko tuo menee ensteks.
164 OP06: Joo, ruskeelle.
165 OP05: Ni niin, nyt se menee sille... nauhalle.
166 (4)
167 OP05: Onko se *RECORD*in päällä?

168 OP06: Ai jaa.
169 OP05: Se lähtee tuosta *PLAY*:lta. Ei se lähe. Painapa *PLAY*:ta sitte.
170 Siitä. Nyt se nauhottaa.
171 OP06: Ei mutta nyt palaa valot tuolla.
172 OP05: Nyt se nauhottaa. Ei nyt se pyörii väärin päin. Mites se noin?
173 OP06: Suunanvaihto.
174 OP05: Koitapas jo se lähtee tuolta.. ootapa.
175 OP06: Meillä on nuo kaikki päällä.
176 OP05: Joo, joo, pitäs suunta vaan saaha vaihettua.
177 OP06: Oisko se olla väärässä?
178 OP05: Ei.. ei oo.
179 OP06: Tämä on väärin päin.
180 OP05: Ei oo.
181 (7)
182 ***Deck*** *(mutters, ianaud.)* katotaan.. *(mutters, inaud.)* *(OP05 leafs through manual.)*
183 Hmm...
184 (14) *(OP05 reads, then leafs through, and reads.)*
185 Joo, ei.. ei oo ko ***Making a recording***..
186 OP06: Ei täällä oo mitään nappia.. mää katoin, ainakaan, että mikä
187 tulis mieleen.. jolla vaihettas suuntaa. Otapa se, nääksä, *(OP05 leafs through manual.)*
188 siinä oli se kuva siitä.. *(OP06 mutters, inaud.)*

189 OP05: Hmm.. viitonen *(OP05 reads.)*
190 (6)
191 OP06: Tuo pyörii.. *(OP05 reads while OP06 operates.)*
192 OP05: Mitä?
193 OP06: Ko tuo pyörii.
194 OP05: Ei ko se pyörii aina.
195 (29)
196 OP06: Vaihetaan paikkaa.. tuolta.. oisko siinä.. mikä vois olla?
197 OP05: Eikö, pyörähtääköhän se.. tästä.. ei, lähti vaan irti. *(OP05 laughs.)*
198 OP06: Ei mutta jos.. ei.
199 OP05: Paapa takasin se.
200 OP06: Eikö käännetään, tänne.
201 OP05: Niin, jos vaihetaan näitä.
202 OP06: Tässä ei muuta nappia..
203 OP05: Eeeii... ei me niin tehä. Ei.
204 OP06: Se lähtee tuosta..
205 OP05: Katopa.
206 (6)
207 Ei ny viihti rueta vaihtaan puolta.
208 OP06: Varo, eiks siinä oo jotain muuta..
209 OP05: Eikä nyt vaiheta.. vaihetaan se suunta, sen on pakko sitte
210 pyöriä toisin päin.
211 (5)
212 OP06: Paukahti
213 OP05: Anna tänne se.
214 OP06: Joo..
215 OP05: Oota ny, katotaan ny ensin mistä se.. *(OP05 reads from p. 6, 7, and 8.)*
216 OP06: (Hiljaa:) Joo, mä laitan tän paikalleen.
217 (6)
218 Oliko muuten sulla se kuva? Olikse.. täältä? Muistaksää?
219 Kato..
220 (7)
221 Menikö nuin nyt oikeen? Meneekse.. *(OP06 loads recording tape.)*
222 OP05: *(Thoughtfully:)* Hm-m. *(OP05 reads from p. 6, 7, and 8.)*
223 OP06: *(Whispering, inaud.)*

224 OP05: Laita vaan siitä, pyörität sen sinne. Perhana, ko mää
225 muistan että.. -lä laita kiertään sitä. *(OP05 instructs OP06.)*
226 (16)
227 OP05: Noin.. Pyöritä.
228 (10)
229 No niin. Jos se lähtis.. Nyt se on kelannu sitä.. All right.
230 OP06: Kyllä se menee siihen nauhalle.
231 OP05: Menee se ainaki nauhalle.
232 OP06: Niin, mutta se tulee väärin päin.
233 OP05: Mutta mehä {kelataan..
234 OP06: {Kelataan koko nauha.
235 OP05: Hmm. Voihan sen näinki tietysti tehä. *(OP05 rewinds tape manually.)*
236 OP06: Niin se ajaa saman asian, vaikka vaihtaa...
237 OP05: No niin. Tuosta kelataan. Paa ny päähän ne niin tästä
238 tuleeki jotain.
239 OP06: Laitetaan niin on kohalla se..
240 OP05: No niin.
241 (6)
242 No niin, mää paan nauhottaan.
243 OP06: Joo. *(OP06 reads from p. 6, 7, and 8.)*
244 OP05: Nyt toivottavasti. Lue tuosta..
245 OP06: *(Reads text from whiteboard)* "*Tehtävä: Tutustu* *(OP05 leafs through manual,*
246 *laitteeseen ja selvitä, miten äänitys/nauhoitus tehdään.* *looks at p. 5 ja 8.)*
247 *Nauhoita omaa ääntäsi tai työparisi puhetta riittävän*
248 *pitkä nauhoitus. Tarkista oma nauhoituksesi laatu; onko*
249 *hyvä? Tee uusi nauhoitus, jos on tarpeen.*"
250 (*Reads again:*) "*Tehtävä: Tutustu laitteeseen ja*
251 *selvitä, miten äänitys tehdään.*"
252 OP05: Se oli siinä. Katotaanpa taaksepäin. *(OP05 rewinds tape, checks recording.)*
253 (5)
254 OP05: Kuuluuko mitään?
255 (7)
256 No ni. Se oli niin lyhyt.
257 OP06: *(Mutters, inaud.)* Yes.
258 OP05: Eikö siihen mitään tullu? Miten on mahollista?
259 OP06: Hei, kuulusko se jos ottas tän pois?
260 OP05: Eei.. Mistä se sitten kuuluu, kai ei mistään..
261 OP06: Kaiuttimesta, onhan tässä kaiutin tässä.. Nyt! Kuuluu
262 musiikkia.. että: *"Oot saldo"*..
263 OP05: Niinkö?
264 OP06: Joo.
265 OP05: *(Laughs.)* Se kuuluu, kato ko tuo...
266 OP06: Puhetta ei kuulu.
267 OP05: Kuuluko nyt mitään?
268 OP06: Nyt kuuluu vasemmasta kaiuttimesta täällä alla olevaa laulua.
269 OP05: Painetaan tuo nollille.
270 OP06: Kokeillaan nyt.
271 OP05: Niin, sieltä. Otapa uusiks.
272 (5)
273 Hmm.. Nyt!
274 OP06: Kuuluu laulua. Ja puhetta samaan aikaan korvista.
275 OP05: Miten se ei ottanut tuota?
276 OP06: Mikä sulla on? Sulla on PLAY ja äänitys päällä samaan aikaan.
277 OP05: No pakkohan se on olla. Kuuluuko nyt?
278 OP06: Kuuluu yöö-ööö-öööäää... venyttää... Hei oisko tuossa ollu sitä
279 meiän puhetta, mun puhetta.. en tosta osaa sanoa.
280 OP05: Ootapa.
281 OP06: Ei tuosta saa selevää.

282 OP05: Oliko?
283 OP06: Ootapa! .. Nyt kuuluu oikeen nopeesti.
284 OP05: Niimmkö se..
285 OP06: Hia.. hiastuu jotenki.
286 OP05: Nyt tu{lee
287 OP06: {Hei!
288 OP05: *(Laughs)* Kuuluuks..
289 OP06: Mitä?
290 OP05: Kuuluuks sieltä mitään?
291 (4)
292 Nyt tuli taas musiikkia.
293 OP06: Nyt kuulu meijän ääntä varmaan.
294 OP05: Nyt.
295 OP06: Hei! Oota..
296 OP05: Sun pitäs nyt puhua siihen kunnolla sitte.... Kuuliks sää
297 mitään?
298 OP06: Aivan ku viroo puhutaan tässä tai jotain semmosta, tiiäkkö..
299 Olisko se ollu mun ääntä?... -yvääyäää Kuuluuko ny
300 mitään? Otanko vähän taa{k..
301 OP05: {Eheheeii! *(Laughs)* Väärin päin
302 kuuluu...
303 OP06: Väärinpäin?
304 OP05: Niin.
305 OP06: Noh! Nyt kuuluu jotaki.
306 OP05: No kuuluu.
307 OP06: Joo, nyt kuuluu englantia. Mitä? Väärin päin tullu?
308 OP05: Niii-i. Heh-heh *(laughs)*.
309 OP06: Mitä sää tarkotat tuolla.. väärin päin?
310 OP05: Väärin päin. Näin pyöri nauha.. Annapa.. koitetaanpa..
311 OP06: Suuntaa vaihda..
312 OP05: Kuuliksää?
313 OP06: Kokeillaan äänittää.. niinkö äänittää. Nollat mittariin.
314 Nollasiks sää?
315 OP05: Hm-m *(irritated)*. Kuuliksää mitään? Siitä kuuluu taas ääntä..
316 OP06: -änitänkö mää.. äänit.... Kokeilaan uuestaan.. sulla on
317 nollilla.. tuo..?
318 OP05: Oota ny!... Katotaanpas vielä täältä. *(OP05 leafs through manual,*
319 Hmmm. *then reads p. 13-14.)*
320 (30) *(OP05 reads p. 13.)*
321 Misäs tuosa on.. katopa, onko sielä puolen mitään.. *(OP06 looks at manual and reads*
322 OP06: *Arc Deck Mode*. Pitäskö muuttaa sitä? *quickly, without concentrating on it.)*
323 OP05: Miks?
324 OP06: No, jotain pitä tehä.
325 OP05: Löytyyhän.. nauhottaan. Oota ny.
326 OP06: Jotain pitää tehä, ko ei homma toimi.
327 OP05: Onko siellä toisella puolella mitään täällä?
328 OP06: Ei.
329 OP05: Ei sieltäkään löy-y mitään. Kato ko tuossa on tuo.. *(OP05 reads manual p.13, pointing.)*
330 ***Source Monitor Switch***.
331 (9)
332 OP06: ***Source*** pitäs olla niinkö.. alahalla.. sitte tota niin.. ***Tape*** *(OP06 reads from manual, pointing.)*
333 ylähällä. Missä täälä on se *Tape? (Points at recorder.)*
334 (6)
335 OP05: Nyt on *Tape.*
336 OP06: Niin, joo. Meillä oli kaikki nää pohojassa. Sillon ko äänitettiin.
337 ... sitte se oma..
338 OP05: Näytäpä ny.. ei ku *Monitor. (Points at recorder)* No niin,
339 koitapa näin.

340 (4)
341 OP06: Pistetään nollalle.
342 OP05: Mmm.. Niin, koitapa ny..
343 OP06: Nyt on ainaki hilijasta.
344 OP05: No, puhu siihen.
345 OP06: Joo. *(Reads text for recording:) "Tehtävä: Tutustu..stutu lai..ai..*
346 OP05: No anna mennä vaan *(persuading OP06:)*, mitä sillä on väliä.
347 OP06: En mää pysty puhumaan, ko se tulee perässä, tiiäkkö, kaikki..
348 OP05: Hmm.
349 OP06: .. jos mää sanon jotaki.
350 OP06: *(Reads text for recording) "Tehtävä: Tutustu laitteeseen ja selvitä,*
351 *miten äänitys/nauhoitus tehdään. Nauhoita omaa ääntäsi tai*
352 *työparisi puhetta riittävän pitkä nauhoitus. Tarkista oman*
353 *nauhoituksesi laatu; onko hyvä? Tee uusi nauhoitus, jos on*
354 *tarpeen."*
355 OP05: No niin, katotaanpa. Tällähän se..
356 OP06: Se tuli niinkö perässä, jos mää sanoin, että *tauot, tauot..*
357 OP05: Hmm.
358 OP06: Just samaan aikaan tuli..
359 OP05: Tuota niin-niin..
360 (14) *(OP05 rewinds tape, then plays tape.)*
361 Kuuluuko?
362 OP06: Tä? Taitaa olla takaperin. Sitä mörinää.
363 OP05: Eikö nyt!
364 OP06: Mitä?
365 OP05: Nyt! Nyt pitäs kuulua sun, tuon..
366 OP06: Nyt on eristä.. oota vähän aikaa.
367 OP05: Ei kuulu..
368 OP06: Ei kuulu mitään. Se on niistä.. Nyt tulee!
369 OP05: Son..
370 OP06: Nyt tulee! Ootapa! Nyt kuuluu.
371 OP05: Kuuluuko hyvin?
372 OP06: *(Mutters, inaud.)*
373 OP05: Se ei kuulu ko toisesta. Eihän kuulu?
374 OP06: Joo... Kyllä, se muuten meni jo ohi.
375 OP05: Ootapa, mää kelaan. *(OP05 rewinds tape, then plays tape.)*
376 (12)
377 OP06: Onko täälä volyymi jossain?
378 (19)
379 Kuuleksä?
380 OP05: Joo, nyt kuuluu hyvin.. no niin, son selvä.

APPENDIX 9

Session 4A (OP09 + OP10)
Task One

(Researcher gives OP09 and OP10 instructions about task.)
1 OP10: Mää on oikeakätinen.
2 OP09: Käytäksää oikeakätistä hiirtä?
3 OP10: Hä? Tottakai oikeakätistä.
4 OP09: Mää käytän oikeakätistä hiirtä, tai oikealta puolelta.
5 Oikealla kädellä hiirtä, vaikka oon vasenkätinen.
6 OP10: Ookko?
7 OP09: Joo.
8 OP10: Vasenkätiset ei pääse taivaaseen.
9 OP09: Mää en osaa käyttää vasemmalla hiirtä.
10 {Joitain jota en osaa tehä.
11 OP10: {Joo-o.
12 *Researcher makes a remark about the mouse.*
13 OP10: Hetkinen.
14 OP09: Sitä ei opi vaan, siihen ei oo tottunu. Se oli sen takia,
15 ku ensimmäisen kerran käytti hiirtä oikealla kädellä;
16 se on siihen vaan jääny. Sitä on pakko käyttää oikealla
17 kädellä.
18 OP10: Joo. Tämmösiä meillä mää kokoilen aina huvikseni.
19 *(Laughs.)*
20 OP09: Mitä täällä on sisällä? - Hiiri.
21 OP10: Kyllä, kyllä, joo. Se on hiiri ja tässä on tota nii..
22 OP09: Siinä on kortti.
23 OP10: Kortti, joo.
24 OP09: Täällä on ohjelmat sitte.
25 OP10: Joo. Softat.
26 OP09: Ohjelmia ei ensimmäisenä tarvi.
27 OP10: Määki luulen ettei ainakaan heti ensimmäisessä.. ei nyt ihan
28 vielä, mutta...
29 OP09: Niin.
30 *Researcher turns participants' attention to handtools.*
31 OP10: Se ristip.. ristipää ois oikein kiva saaja, että sillä..
32 OP09: Joo, että sais tuon auki.
33 OP10: Se vois olla huomattavasti helepompi asentaa.
34 Voiis {olla..
35 OP09: {Kyllä se.. on siellä jotain reikiä..
36 *Researcher says he is going to give another handtool for participants.*
37 OP10: Joo, tuo voi olla mukavampi.
38 *Researcher makes a remark about bus mouse package.*
39 OP09: Niin.
40 OP10: Niin. Mikä tämä on, ***User's Guide***.. Tämä sitte tarvitaan
41 {sitte ku} sitä softaa ruvetaan.. ..
42 OP09: {No niin.}
43 Ensimmäisenä pitäs olla, että otetaan töpseli irti seinästä.
44 OP10: Jaaha.
45 OP09: Sen pitäs sähköinssin tajuta itteki.
46 OP10: Kyllä kyllä.
47 OP09: Siellä on jossaki virtakytkin.
48 OP10: Joo.
49 OP09: Täällä.
50 OP10: Sieltä..
51 OP09: Mihin tää menee? Menee töpseliin.

52 OP10: Se menee töpseliin, joo. Mutta tota niin, tuleeko.. hetkinen, onko
53 tuolla oma virtajohtonsa? On, siellä oma, niin sillä ei oo.
54 OP09: Monitor, eiks monitoriin tule täältä.. Ainaski uuemmis
55 koneis on...
56 OP10: Monitori on tämä, tämä näin.
57 OP09: Tää on se... monitoriin mene kaks piuhaa, toinen on virta ja
58 toinen on se kuva.
59 OP10: Kyllä, kyllä, mutta..
60 OP09: Kato, mitä piuhoja monitorista lähtee. Sieltä lähtee kaks
61 piuhaa, kato mihi se toinen menee.
62 OP10: Joo, tämä ja sitte tuo... Tämä on mikä monitoriin menee.
63 Monitoriin menee suoraan tuonne, elikkä..
64 OP09: Anna.. anna vaan monorissa olla virta.
65 OP10: Hä? Joo. Mutta pitäskö tämä ottaa irti?
66 OP09: Mikä - monitorin kautta?
67 OP10: Nii.
68 OP09: Se on ruuveilla kii, että..
69 OP10: Antaa olla vaan.
70 OP09: Onko paikoillaan?
71 OP10: Kyllä, kyllä. Ristipäällä auki vaan ja.. Osaaks sää varmasti nyt
72 käyttää sitä ristipäätä?
73 OP09: No mä on vähä ruuvaillu.
74 OP10: Vähä liian.. tekninen laite.
75 (6)
76 OP10: Ei pistetä kovin monta ruuvia hukkaan.
77 OP09: Siinä oli yks jo hukassa.
78 OP10: Joo niinpä näkyy olevan.
79 OP09: *(Laughs.)*
80 (9)
81 OP10: Pistä ne kaikki samaan läjään, nämä.
82 OP09: Joo.
83 OP10: Sen pitäs nousta. Jaa mutta pitääkö meiän otta ne kaikki johot
84 sieltä irti? Miten se oli? Onko ne tiellä, että tuleeko se ylös?
85 OP09: Hmm. Mutta mitenkä tää nousee?
86 OP10: Se tuota niin..
87 OP09: Kyllä se näyttää siltä, että se ois kone siellä tiellä.
88 OP10: Mitä? Mitenhän tämä aukee tästä?
89 OP09: Mitenkä se on aateltu?
90 (5)
91 OP10: Pitääkö sitä ottaa jotenki taaksepäin?
92 OP09: Näissä on joku ovela niksi.
93 OP10: Kyllä kyllä.
94 OP09: Sillon ku mää hankin oman koneen niin mää ainaki katon, että
95 sen saa auki ilman työkaluja. Näissä joissaki on semmone
96 luukku vaan, {niissä on kaks painonappia vaan; sitä
97 OP10: {Joo..
98 OP09: .. tästä sitte nostetaan niinku konepelti.
99 OP10: Tämä tuota tulee sinne.. sen pitää niinkö.. mennä taaksepäin.
100 OP09: Pitää otta nää kaapelit irti täältä vissiin.
101 OP10: Kato ko tuota niin.. tuossahan nuoki.. että sen pitää tulla
102 vähä taaksepäin ja sitte ku se menee tonne. No joo..
103 OP09: Otetaan vanha hiiri irti, eiköhän tätä saa.
104 OP10: Mitä? Niin, joo.. jos ottais suoraan vanhan hiiren irti ja laittais
105 sen paikalle.
106 OP09: Eihän se..
107 OP10: Nii ei.
108 OP09: Täs on kortti..

109 OP10: Nii on.. joo. Tiedän, tiedän... Pitääköhän nämäki
110 ottaa kaikki irti?
111 OP09: No ota ny, kai sen muistaa, missä ne on. Onko täällä lisää
112 ruuveja? Ei ole.
113 OP10: Mitenhä se.. tuo..
114 OP09: Jos sen vetäs taaksepäin, tai jotenki..
115 OP10: Joo, kyllä kyllä.
116 OP09: Sorkkarauta... Kokeillaanko?
117 OP10: Joo, mutta onkohan.. Miksei.. Tuleeko se taaksepäin ollenkaan
118 täältä?
119 OP09: Jos tietokoneelleki löytys manuaalia?...
120 OP10: Tosiaan, sen pitää tulla taaksepäin, koska.. ainakin sentin,
121 melekeen. Sen pitää tulla taaksepäin, koska noita menee noista
122 siivekkeistä..
123 (5)
124 OP09: Varopa, mä pyöräytän tän.. Katotaans, olisko täällä lisää
125 ruuveja.
126 (7)
127 Nuo on sitte niitä, jotka pitää emolevyä kiinni.
128 OP10: Mitä nämä nyt on? Pitääkö näistä painaa jotenki?
129 OP09: Ei ku nää pitää etuk.. etu.. etupaneelia kiinni.
130 OP10: Pitääkö se ottaa ensiks etupaneeli irti?
131 OP09: En tiiä... Ei kyllä se on suunniteltu.. että otetaan tää päälly.
132 Irrotetaanko?
133 (9)
134 OP10: Pitää var.. varmaan ottaa tää viimenenki pitäs ottaa.. varmaan
135 irti. Mitä luulet? Katoko nämäki pitää tulla tänne taaksepäin.
136 OP09: Joo mutta tähän tarvitaan sitte erilainen ruuveimeisseli.
137 OP10: Jaa, mutta jos tätä vois vetää suoraan taaksepäin, ja sittehän sitä
138 ei tartte ottaa.
139 OP09: Mistä tuo on kiinni? Tää ninnku pitää koko telaa..
140 (4)
141 OP10: Tässä on nyt jotain mitä me ei tajuta..
142 OP09: Kyllä se joissaki on helempompaa..
143 OP10: Hä? Onko se tuolla jossain alla?
144 OP09: Mikä?
145 OP10: Meneekö se sinne alle?
146 (6)
147 OP10: Käännetäänpäs takaisin. Käännetäänpä takaisin...
148 *Researcher writes task on blackboard, reads aloud for participants.*
149 OP10: Jaaha. Tarvitaanko me..
150 OP09: Onko tää teknikoitten suunnittelemaa, ei oo insinöörit ollu asialla.
151 OP10: Ohops! Eipä nyt sitä pistetä palasik Tämä oli nyt.. kato ku se
152 lähtis täältä, täältä irti, mutta sen pitäs lähtee liikkumaan koko..
153 OP09: Varopa, onko täällä jostain..?
154 (8)
155 Siellä jossain luki.. kyllä ne kaiken järjen mukaan piti..
156 OP10: Niinku se täältä takana ei olis näin kiinni.. mutta niinku täältä
157 jostain ois kiinni.
158 OP09: Keikautetaanpa.
159 (10)
160 OP09: Mitä nämä ruuvit sitte?
161 OP10: Ei ne oo, ne vaan pitää ylhäällä tätä.
162 OP09: Jaa pitää ylhäällä tätä.
163 OP10: Tää tulee molemmilla ruuveilla.. en tiiä. Niinku täältä se ois vähä..
164 Kun sen pitäs tulla.. se varmaan tuli. suoraan, ko vetäis
165 taaksepäin. Se on niin hankala. Otaks sää pohojasta kiinni, jos

166 mää yritän kiskasta?
167 (4)
168 OP09: Saaksää sen..
169 OP10: Se on täältä pohojasta, tunutus olevan irti, niinko toiselta puolelta
170 se ei olis irti.
171 OP09: Onko siellä joku.. joku nipukka joka pitää sisällä sitä?
172 (6)
173 OP10: Tämä oli mielenkiintone... Nyt tuon..
174 OP09: Jo niitä ei oo alunperin mitotetu sopiviks?
175 OP10: Niin.
176 OP09: Kasattu ylijääneistä osista.
177 OP10: Kyllä kyllä.
178 (4)
179 Kato pitä tuota painaa, ko se on.. tuonne niinko alle meni
180 {jotain.
181 OP09: {Joo-o [HR Inton.].
182 OP10: Pistetäänpä alas ja samaan aikaa sitte kö vetää niin painaa
183 sieltä. Tämäpä oli hankala tapau
184 OP09: Täällä on jotain.
185 (6)
186 OP10: Jaa-a. Pitääkö meiän ottaa tämä etupaneeli irti?
187 OP09: Ei sitä taia ees saada, ko se on suunniteltu niin.. ilmeisesti
188 niin, että..
189 OP10: Joo, ei.
190 OP09: Se otetaan ensin tää päällinen irti.
191 (5)
192 OP10: Koitapa ruuvata tätä ruuvimeisselillä vastaan tuosta.
193 OP09: Onko tämä jo se?
194 OP10: Hajookohan se?
195 OP09: Tää on tällane nii.. Jaa mutta. No ni.
196 OP10: Sillä ei oo palijo väännetty, se on tommonen sopiva {Täältä..
197 OP09: {Tää.. tähän.
198 OP10: ...se ois niinkö..
199 OP09: Tähän ei löy-y käyttöohjeita. Hei! Koneeseen..
200 OP10: No niin.
201 (6)
202 OP09: Se on sieltä irti.
203 OP10: Mitä? Mistähän tämä on kiinni?
204 (5)
205 OP09: Mistä kohtaan se on vähä kiinni?
206 OP10: Tämä oli mielenkiintone... Se on, koto ku tuonne menee alle
207 tuommonen joku läppä.. Nääkkö?
208 OP09: Hm-m. Onko sen en.. onko se tässä etupaneelissa kiinni?
209 OP10: Ei ole ylhäällä. Nääkkö, tonne alle menee..?
210 OP09: Joo-o. Joo-joo.
211 OP10: Se yleensä.. kyllä sen pitäs tulla vaan, ko sen sais vejettyä.
212 (12)
213 OP09: Varopa. Kiepauttaa jotenki näin päin...
214 OP10: Tämä tulee kyllä... se ois niinku..
215 OP09: Eihän siinä..
216 OP10: Tästä jostain nurkasta.. vänkää..
217 OP09: Varo mulla on sormet välissä.
218 OP10: Vänkää se.. Mistä tämä voi olla? Tähän varmaan tarttee jonku
219 manuaalin nyt.
220 OP09: Niin tarttee, mutta seki on hukassa tietenki.
221 OP10: Tie-tysti.
222 OP09: Otetaanko tämä vanaha hiiri pois? Sitä ei vissiin tarvita.

223 OP10: Niin, Rita ja kumppanit on koonnu tämän viimeks nii..
224 OP09: *(Laughs.)* Joo..
225 OP10: Hetkinen..
226 OP09: Tai jos ne on koonnu sen sitte niin..
227 (6)
228 OP10: Ei se voi... Mikähän tuo on tuolla?
229 OP09: Oon mää nähäny helempomminki avattavia.
230 OP10: Olen minäki. Joo mutta pitäsköhän tämän jotenki tulla..
231 Ei, tuolla..
232 OP09: Ei kun se se on yheks osaks niinku.. {pur.
233 OP10: {Joo, niin.
234 OP09: .. ristetu tähän metalliin, kuori.
235 OP10: Kyllä nyt..
236 OP09: Kokeile, otapo tuo ruuvimeisseli.
237 OP10: Kyllä kyllä.
238 OP09: Sieltä.
239 OP10: No..
240 OP09: Kokeilaan jos se on.. Onko se tästä?
241 (4)
242 OP10: Kokeiles täältä päin.
243 OP09: Siinä on tällanen, että sen pitäs niinku nousta jotenki. Siltä
244 vaikuttaa.
245 (6)
246 OP10: Se vaan lähtee se..
247 OP09: Varo, liikkuuko tämä?
248 OP10: Se etupaneeli lähtee ensimmäsenä irti.. tämä pitä otta ekana,
249 mää uskoisin. Käännäpäs kyljelleen.
250 (11)
251 OP09: Tässä pyörähtää epupaneeliki näin päin.
252 OP10: Mitä?
253 OP09: Kohta on yks AT vähemmän tässä koulussa.
254 OP10: Tämä on tutkimusta ja..
255 OP9: Ei kai siinä voi olla, että etupaneeli otetaan ensin irti,
256 ensimmäisenä?
257 (4)
258 OP10: Nyt se lähti.
259 OP09: Oho. Se oli tollanen systeemi. Siellä on kyllä yk. yks
260 johto on kiinni.
261 OP10: Pitäsköhän tuo ottaa irti?
262 OP10: Se ois mukavempi olla, saatas tuo.. Hä?
263 OP10: Okei.
264 (6)
265 OP10: Se on ku saatas se tämän varaan, niin.. Kyllä kyllä.
266 OP09: No ni.
267 OP10: Mää laitan tämän tuohon lattialle.
268 OP09: Ni.
269 OP10: Tai tuonne.. apupöyälle. No nyt.
270 OP09: Paskaa.. sisällä.
271 OP10: Vähän on pölynen, joo.
272 OP09: No joo. Täällä on korttipaikat.
273 OP10: Joo, niin on.
274 OP09: Lyyään nyt johonki noista rei' istä.
275 OP10: Kyllä kyllä.
276 OP09: Sitte pitäs olla nii, että..
277 OP10: Se pitäs määritellä, että {mihin oikia
278 OP09: {Tässä on lii..
279 liitin, niin.

280 OP10: Sen pitäs tulla {sinne.
281 OP09: {Sen pitäs tulla jostain uloski..
282 se pitäs ottaa..
283 OP10: Tuo poi
284 OP09: Tämä tästä, joo.
285 OP10: Se on ristipää. Annanpas, mää otan tosta.
286 OP09: Se pitäs ottaa ensin.
287 OP10: Tuo tuosta, ku.. kyllä.
288 (9)
289 OP10: Sormilla niin ei mee mihinkään hukkaan .. Tämä tulee sitte
290 pois vaan täältä.
291 OP09: Joo.
292 OP10: Se vaan veetään, justiin.
293 OP09: Se pannaan sitte talteen, että..
294 OP10: Joo, se pitää laittaa talteen, että saa joskus takasin paikoilleen
295 sen.
296 OP09: Sitä tarvitaan jo tulevaisuudessa.
297 OP10: Kyllä kyllä.
298 OP09: No ni. Sitte.. *(OP09 leafs through manual.)*
299 OP10: Määpäs nostan tämän pois tämän näppäimistön.
300 OP09: Ja sitte luetaan ohojeita. *(OP09 leafs through manual.)*
301 (6)
302 OP10: Mitäs siellä sanotaan?
303 (5)
304 Jaaha, noita ollaan tehty.
305 OP09: *(Thoughtfully)* Hm-m? *(OP09 leafs through manual.)*
306 OP10: Katopas onko siellä siitä kortin asentamisesta. Mihinkä..
307 miten se tulee {ja..
308 OP09: {Elikkä.. *(OP09 points at manual p. 2.)*
309 OP10: Ko ei tässä oo mitään muuta ko..
310 OP09: Se vaan ku lai.. {liittää kortti.
311 OP10: {Näitä..
312 Niin. Joo.
313 OP09: Tuolla kortilla niin liittää sitä. *(OP09 turns to p.3.)*
314 OP10: Tämä vaan törkätään tuonne, ilimeisesti, katopas siitä
315 kortista, että miten se asennetaan, koska se on kuitenki
316 tässä kaikista... riskaabelein. Siinähän se on. *(OP09 leafs manual from p. 4 to p. 6.)*
317 OP09: Joo.
318 OP10: Sehän on, tuota, tästäki sen näkee, kö
319 (4) *(OP09 looks at p. 6.)*
320 ***Install*** se ..Tämä vaan lyyään kato tuossa suunnassa.
321 OP09: Siinä on suunta.
322 OP10: Joo.
323 OP09: Meneekö se sinne?
324 OP10: Hetkinen, mistäs se kuuluu.
325 (8)
326 Hetkinen..
327 OP09: Sinne se menee ihan näin, paik.. painamalla.
328 OP10: Hetkinen.
329 OP09: Pidäs näistä ny.
330 OP10: Onko tämä nyt oikein päin? On {sitte
331 OP09: {On se oikein päin, ku se on..
332 OP10: Sopiiko se sinne? Kato ku se ei taho sopia. Tossa on tuo..
333 Se ei taho sopia, ku siinä on se ede.. alla olevan..
334 OP09: Ei ko ne on kaikki kyllä saman kokoisia.
335 OP10: On, joo.
336 (5)

337 Se vaan asennetaan sinne.
338 OP09: Nyt se on.. paikallaan.
339 OP10: Ei se oo, ei sen pitää olla..
340 Täytyyhän sen.. Se ei oo
341 kato oikialla kohalla, tuo .. Tota se ei liity tohon, se pitäs saaha
342 sinne päin.
343 OP09: Ei se mee sinne liittimeen kii.
344 OP10: Mitä? Ei mee sinne liittimeen kiinni?
345 (5)
346 Hetkinen.
347 (4)
348 Kato ko..
349 (5)
350 Onko tässä liian..
351 OP09: Onko se nyt liittimet väärällä kohalla, vai? Varro, mitä siinä
352 lukee, katotaan.
353 (7)
354 Ei kyllä sen pitäs ihan vaan...
355 OP10: Näytäpäs tänne...
356 OP09: Varro, täällä on joku..
357 (5)
358 Kato nyte hei! Ensin miten tämä alkuperäinen oli.
359 Verrataanpa
360 OP10: Se on ihan vastaavaa.
361 OP09: On. Ne on ihan vastaavia. Varropa, onko se.. Hei! Mää en
362 nyt oikeen ymmärrä tätä jotenki paikoilleen.
363 (6)
364 OP10: Ei se meni väärään paikkaan nyt... Sinne pitäs mennä.
365 Ottapas, mää painan tästä. Nyt se meni. Nyt se meni sinne.
366 Niin, se kato pitää saaja tonne..
367 OP09: Nii se, seki pitäs saaha sinne.
368 OP10: Tuo ei oo suo.. onko tuo aivan suorakaan tuo , se on vähän
369 vääntyny tuonne päin. Joo mää ens kokeilen laittaa...
370 OP09: Se ensi siihen.
371 OP10: Joo, hetkine. Ootapas käsi poi Mää katon tästä.
372 OP09: Nyt se menee. Tuo. No ni.
373 OP10: Nyt - onko se kohallaansa? Sitä pitäs nyt vaan saaja työnnettyä.
374 OP09: Joo, se on kohallaan.
375 OP10: Nyt, nyt meni, joo.
376 OP09: No ni.
377 OP10: Sitte ei muuta {ko..
378 OP10: {Se..
379 OP09: ..vaan ruuvia..
380 OP10: Ruuvi kii.
381 (4)
382 Joo.
383 (5)
384 Ny ko vaan muistetaan, mikä se oli nuista.
385 (7)
386 OP09: Keskellä. Keski{mm..
387 OP10: {Joo.. kyllähän sen tunnistaa jo täältäki, joo.
388 OP09: {No..
389 OP10: {Kyllä.
390 OP09: .. mitenkä.
391 OP10: Mitä sitte? Sitte vaan, tota niin, koppa päälle ja..
392 OP09: Ei kai tässä.. Onko tässä jotain?
393 OP010: Siellä.. kato poistetaan.. kansi ja sitte ehitään oikee paikka ja

394 sitte vaan lyyään paikoilleen.
395 OP09: Onko tä.. se näin yksinkertanen?
396 OP10: Ja sitte vaan liitetään.. hiiri sinne.
397 (8)
398 OP10: Tossa näytetään kato, että tuosta haetaan paikka sitte, sinne
399 lyyään ja..
400 OP09: No ei kai tässä muuta oo.
401 OP10: Laitetaan sitte tuota niin se kansi paikoilleen. Mää otan sen
402 kannen..
403 OP09: Missä se kansi on?
404 OP10: Joo.
405 (8)
406 OP09: Voiko se olla näin yksinkertasta?
407 OP10. Hetkinen, se pitää laittaa sinne täältä ekana, takaa, että
408 se menee oikeen.
409 (5)
410 Se ei oo vielä.
411 OP09: Ko son.. {noin
412 OP10: {Noin. Nyt sen pitäs olla oikein siinä - joo-o. Laitaksää
413 ruuvit ekana kii, niin mää rupeen kattelemaan näitä.. Mihinkä
414 nämä kaikki tulivat.
415 (13)
416 Nuin.. Sitte tulee..
417 OP09: Onko tää ny var.. varmasti oikeassa?
418 OP10: Mitä?
419 OP09: Laitetaanko se sitte oikeen?
420 OP10: Kyllä se on oikeen... Kummatin päin.. se tulee näin. Ei ku toisin
421 päin, tietysti.
422 OP09: Ne menee vaan yhellä tavalla sinne.
423 OP10: Joo. Missä se oli se.. meisseli?
424 OP09: Tääl{lä.
425 OP10: {Tuolla.
426 OP09: Mää laitan. No niin.
427 OP10: Laita sä ny ko sää innostuit niin kauhiasti laittelemaan niitä.
428 Hyvä. Mitäs muuta täältä puuttuu?
429 (4)
430 Tästä tulee näppäimistö.
431 (5)
432 Päästään kohta asentelemaan sitä softaa. Kyllä kyllä hetkinen.
433 Näppäimistöhän tulee tuohon, ilimeisesti, niin tuohon. Kyllä.
434 OP09: Sitte { hiiri.
435 OP10: {Se on hiiri, se tulee sinne.
436 OP09: Kummin päin tää on - hetkinen. Nuin päin.
437 OP10: Joo-o.
438 OP09: Pahasti on tuolla välissä.
439 OP10: Näyttöön tulee siitä.
440 (5)
441 Ei tässä oo muuta ko se viimisenä. Virta viimisenä.
442 OP09: Tuohon reikään sopii.
443 OP10: Meniks se tarpeeks?
444 OP09: Joko se on tarpeeks?
445 OP10: Miten se oli näin kauhian ylö Tuntuu niin ou' olta. Tossa
446 on tuo ylimääräinen, laitetaan se.. tuonne pois tieltä.
447 OP09: *(Thoughtfully)* Mm-m. Mihinkäs me jäätiin tässä? *(OP09 leafs through manual.)*
448 On nyt laitettu kiinni.
449 OP10: Mää siirrän, otetaan nämä tota nii, tossa on.. Tässä on siitä..
450 ilmeisesti softasta. Joo.

451 OP09: Mikä täs - hei! *(OP09 stops to read p. 5 in manual.)*
452 OP10: Laitetaan nää ruuvimeisselit tonne toiselle pöyälle pois tieltä. *(OP10 moves screwdrivers.)*
453 OP09: Oliko tässä jotain, katopa, hei. *(OP09 draws OP10's attention.)*
454 (10) *(OP09 and OP10 read.)*
455 OP10: Hiiren yhdistä{minen..
456 OP09: {Tämä. *(OP09 points at IRQ block picture.)*
457 Mikä tämä on? ***Jumperi***.
458 (4)
459 OP10: ***Bus board***. .. {Eikö tossa oo.. mitä.. *(OP10 reads aloud, then whispering.)*
460 OP09: {Pitikö se... *(OP09 re-points at picture.)*
461 pitikö tuolta jotain tollastaki ettiä sisältä?
462 (5) *(OP09 points at picture, p. 5.)*
463 OP10: Oiskohan se sitte ollu siinä.. piirikortista? Sehän riippuu *(OP09 turns to p. 6.)*
464 kato, että minkälainen laite on. *(OP09 and OP10 turn back to p. 5.)*
465 OP09: Kokeillaan, jos se toimii {ilman.. *(OP10 points at IRQ block, p. 5.)*
466 OP10: {IBM
467 AT, se on sitte kakkosessa.
468 OP09: Mutta se on IBM AT, {tää, tää on *(OP10 points at IRQ block.)*
469 OP10: {Niin joo..
470 OP10: ..Unisys.
471 OP09: ..on kopio. Voi olla, että se toppii, valittaa. Kokeillaan,
472 toimiikse. *(OP09 closes manual.)*
473 OP10: Mistä.. mistäs löyän virran?
474 OP09: Siellä on takana {virtakytkin.
475 OP10: {Takana virta,
476 se on semmonen malli, vanhempi malli.
477 (5)
478 OP09: Kokeillaan lähteekö käyntiin.
479 OP10: Kyllä se sitte rupee käryämään, jos ei se lähe käyntiin. *(OP10 starts up the computer.)*
480 OP09: Ei se kärähä. Se on suunniteltu niin.
481 (4)
482 OP10: Saajaanpahan valo- ja ääniefektejä.
483 OP09: *(Laughs)*
484 (5)
485 OP10: CD-ROM, se on ihan kiva kanssa.
486 OP09: Se on vaan paha, jos sieltä on jääny joku laittamatta.
487 OP10: Mitä?
488 (8)
489 Mikä on jääny laittamatta? *(OP09 and OP10 watch PC start.)*
490 OP09: Tämä, mikä tää ny on? Tätä hyppyä *(OP09 turns to back p. 5, points at IRQ,*
491 (8) *block, OP09 and OP10 read.)*
492 OP10: Ei, se on tuota niin.. se vaan lyyään..
493 OP09: ***How to install for DOS***.
494 OP10: Kato ko se on tuota niin.. Se saattaa olla tuo tossa että... *(OP09 turns to p. 6 and 7.)*
495 näytäpä mitä siinä lukee. *(OP10 turns back to p. 5, points at IRQ.)*
496 OP09: *(Thoughtfully)* Hm-m. *(PC boot-up is completed.)*
497 (6)
498 Kyllä se käynnisty.
499 OP10: Joo.
500 OP09: No-ni.
501 OP10: Windowsiin, vai?
502 OP09: Määs käyn haj.. hakeen.. ei ku.. *(OP09 turns to p. 7)*
503 OP10: Mitä mää laitan?
504 OP09: Ei ku [How to] ***install for DOS***
505 OP10: [How to] ***install for DOS***, niin, joo, tietysti.
506 OP09: Kokeillaanpa ei kyllä tässä oo muuta ko että korppu asemaan ja
507 A-asemasta heti Install. Kokeile mitä tapahtuu. A kaksoispiste.

508 OP10: Pelkkä *Install.* *(OP10 operates PC keayboard*
509 OP09: Install. (9) *Setting for mouse.* *and launches installation software.)*
510 OP10: Joo. Jos ois tehokkaampi kone, niin ei pyörähtäis niin kauan
511 tässä.
512 OP09: Joo mutta se on paha.. jos ei se löyä sitä. *(OP09 refers to finding mouse driver.)*
513 OP10: Odottelua.. Mitä? Löysi. *(OP10 reads from computer screen.)*
514 (10) *(OP09 and OP10 take turns to operate*
515 *Press the high-lighted letter in the...* *PC keyboard.)*
516 OP09: Niin, kato tää *high-light*, se on justiin tuo *Continue/Quit.*
517 OP10: Joo.
518 OP09: Nyt mää laitan *Continue..* {enterillä.
519 OP10: {Enterillä.
520 *Mouse software drive and directory.* Pannaanko
521 Mouseen se?
522 OP10: Hä?
523 OP09: Pannanko DOS-hakemistoon? DOT. *(OP09 starts installing mouse driver*
524 OP10: Enteriä vaan.. {hä?. *into directory called DOS.)*
525 OP09: {Hei! -lä paa vielä.
526 OP10: Vai pitäskö laittaa tälle joku oma? Että sen sais poistettuaki
527 näppärästi sieltä.
528 OP09: Voihan se olla mouse, mutta sillonhan se tekee autoxec.bat:iin
529 kummiski jotain muutoksia.
530 OP10: Mutta laitetaan tuota joku oudompi, vaikka mou - hä?
531 OP09: Nyt se ehätti - laita mouse.
532 OP10: No nii, laitetaan sitte mouseen. *And utle* [pitäisi olla utility] *(Driver is being installed into directory*
533 OP09: Hmää... *called MOUSE.)*
534 OP10: *Install* vaan, eiks se ole - mitä sanotaan?
535 (5) *(OP10 reads.)*
536 Joo-o.
537 OP09: ***Install mouse driver and utilies*** [should quote: **utilities**]...
538 OP10: ***Before you leave the main installation menu***
539 ***we recommend that you select Run Turorial from the***
540 ***main menu***.. Jaaha. *Run the tutorial mouse..*
541 Mee alemma. Se! *(OP09 selectes option from pull-down*
542 OP09: Mitä se on? *menu.)*
543 (8)
544 Vautsi!
545 OP10: Jaaha.
546 OP09: Niin. Se.. tää on tällane.. täällä sanotaan *..next* - mitenkä *(OP09 runs mouse tutorial software.)*
547 *(downgrading) double click.*
548 OP10: Niin, ja tässä saa testata sitä.
549 OP09: Jaa. *(downgrading)* Tällanen..
550 OP10: Joo tollanen. Vaan testau Ota tuota nii mee pois, *exit*iä..
551 OP09: Exitiä
552 OP10: Ja install mouse..
553 OP09: Luistaa tää... Onkohan se.. *(OP09 operates PC mouse, which slides.)*
554 OP10: Tuossa on tuo.. *(OP10 refers to software menu.)*
555 (6)
556 Katotaas täältä vielä..
557 OP09: Tässä on kans tällanen joku pienempi..
558 OP10: Mitä? pienempi?
559 (9)
560 OP09: Mitähän siinä ois seuraavaks?
561 OP10: Katotaanpas täältä. *(OP10 leafs manual, then reads p. 8.)*
562 ***How to install for Window.*** [If] ***you are using***
563 ***Windows*** [3, you must install the special MouseWare
564 driver and utilities that Logitech provides for *Window*]

565 (10)
566 OP09: ***Windows*** kolome.. Näytäpä sitä Windowsia sieltä. *(OP09 points quickly at manual page.)*
567 OP10: Mitä? Että sen ois saanu niinko Windowsiinki... tiiäkkö? *(OP09 points again at manual page.)*
568 (8)
569 OP09: Et se niinku.. jos se on nyt.. Okei, mää lopetan tämän.
570 OP10: Joo-o.
571 (5)
572 OP09: *Please remoot* [should read: reboot] *the machine.* *(OP09 reads text from computer screen.)*
573 Mikä se on tomm.. Control+Del?
574 OP10: No joo, lyö vaan ko luit mitä siinä lukee.
575 OP09: No nii, otan tään pois asemasta. Tuossa tuo DOS ensin.
576 OP10: Mitä?
577 OP09: Korppu pois asemasta, sillon ku käynnistetään konetta. *(Computer is booted up.)*
578 OP10: Niin tietysti, joo. Jos ei se oo sitte.. käynnistyslevyke.
579 OP09: Se yrittää ny kummiski ettiä sitä tuolta.
580 OP10: Luonnollisesti.
581 OP09: Njoo, se valittaa sitte, piippaa siinä ja sanoo että..
582 OP10: Joo.
583 OP09: ... ei oo DOS-levyke..
584 OP10: Niinpä melekeen joka päivä käy tälleen.
585 OP09: Siinä on vaan paha, että jos koneessa sattuu olee virus,
586 sehän menee sillon sinne levykkeelle, tulle sillon levykevirus,
587 tai jos on käynnistyslohkovirus, painuu sinne sisälle..
588 OP10: Joo, niin tietysti.
589 OP09: .. käynnistää vahingossa sieltä.
590 OP10: Me asennetaan sitte sinne Windowsiin.
591 OP09: Joo. Nyt hei! Kokeillaan? EDITiä, kirjota EDIT. *(OP09 tests the mouse using*
592 Mitenkähän... toimiiko tää? Nyt toimii. *EDIT program.)*
593 OP10: Mitä? Ei se vielä..
594 OP09: Kyllähän se..
595 OP10: No niin, nyt.
596 OP09: .. hiirtä heiluttaa.. Kokeilepa Alt.. AltGrF - ekkö osaa
597 käyttää näppäimistöä? Joissaki auttaa, ko se - aa-pap-pa - *(OP09 makes a mistake.)*
598 mouse kirijottaa. *(OP09 keys in "mouse".)*
599 Heije! Se ei oo autoexec.bat:issa. Joo, nyt se toimii.
600 OP10: Joo, nyt se on täysin, joo.
601 OP09: Mennään pois täältä. Se ei on autoexec.batissa, ettei se..
602 OP10: Joo, niin tietysti, että jos sen sinne laittaa.

APPENDIX 10

Session 4B (OP09 + OP10)
Task Two

(Researcher gives instructions about task.)
1 OP10: Käynkö mä lyömässä nauhan tänne?
2 OP09: Kenenkä tää on? *(OP09 picks up RCU for TV.)*
3 OP10: Mää törkkään nauhan sisään, niin saajaan käyttää sitä...
4 {tuota, nauhotetaan vaikka pätkä. *(OP09 operates RCU.)*
5 OP09: {Kumpi näistä on videon kaukosäädin, hetkinen.. *(Asks researcher.)*
6 (10)
7 Tää on sitte... {valtavan himmee tuo videon näyttö..
8 OP10: {Katopas.
9 Mikä?
10 OP09: Tuo..
11 OP10: Niin, tuo himmee, se näyttö. Saa, kas. Voiskohan sitä...
12 OP09: Joo, saako tuosta CLOCK?
13 OP10: Joo-o.
14 OP09: Täällä on jo nauha ja..
15 OP10: Siitä saa tuota suoraan tuota niin... kymmenen kolkyt-yk
16 Sen.. vois asentaa. Mutta katotaan.. kokeillaanpas *(OP09 gives RCU to OP10.)*
17 pyörittää vähän aikaa, otetaan vaikka.. mistä me saahan
18 PLAY:ta? Tuleekohan.. täällä ei oo nauhotettu ilimeisesti
19 yhtään mitään. On täällä.
20 OP09: Ruotsin teeveetä. Eikö tää oo ruotsinkielistä ohjelmaa?
21 OP10: Sotalaivat ampuu.
22 OP09: (*To researcher*) Ei kai tää oo tärkee, tää.. nauhotus, täs
23 kasetilla?
24 (*Reseacher says it is not.)*
25 OP10: Ruotsinkieliset uutiset, joo. Otetaas tuohon se, mitä *(OP10 gives RCU to OP09,*
26 nauhotetaan. *OP09 starts operating RCU.)*
27 OP09: Stop. Ja {nyt vois} laittaa kello oikeaan aikaan.
28 OP10: {Kelaa se..} Joo.
29 OP09: Tuossa lukee CLOCK, kokeillaan sitä.
30 OP10: Siitä saajaan, joo.
31 OP09: No niin, se näyttää.. yheksän..
32 OP10: Yheksän-nolla-yheksän, pitäs olla kymmenen kolkyt-yk
33 Sää meet jollak.. noilla nuolinäppäimillä alaspäin. Mää..
34 {Tuo tuosta. Nyt olla{an.
35 OP09 {Mi. {PROG... *(OP09 presses keys for text TV*
36 Oh, God. *mode.)*
37 OP10: Hetkinen, pitäskö meiän kattoo tuolta ohojekirjasesta?
38 OP09: Joo, luetaan ohojekirijaa, tästä. *(OP10 picks up RCU, gives it to OP09.)*
39 *(OP09 starts scrolling.)*
40 OP10: Jaa mutta anna sen olla tuossa.. {kato.
41 OP09: {Kokeillaan kelloajan
42 asetu.. ensin.
43 OP10: ***Setting the clock and the VCR channel Setting the clock..*** *(OP10 points at table of contents,*
44 Kolometoista. *then OP09 points at same.)*
45 OP09: Sivu kolometoista.
46 OP10: Joo... jo rupes löytyyn... *(OP09 leafs through to p. 12 and 13.)*
47 Eikä me ny nuita rueta.. *(OP10 points at pictures on p. 12 .)*
48 OP09: Joo, ei nuita kaikkia tartte osata.
49 OP10: ***Set***.. niin joo ko meiän pitää painaa tuota {SET:iä, noin.. nyt. *(OP10 operates RCU, OP09 points*
50 OP09: {***Setting***.. *quickly at manual page.)*
51 Kokeile naputella se kelloaika, se on.. kymmenen....

51 Kokeile naputella se kelloaika, se on.. kymmenen....
52 Ei reagoi.
53 OP10: Ei reagoi mitenkään.
54 OP09: Nyt laita TV ja video päälle, laita TV videokanavalle... on. *(OP09 points at manual page.)*
55 Nyt pattereitten varmistus, sitte että joo. *(OP10 opererates RCU.)*
56 OP10: No niin, nyt tuossa piti kattoa tuo.. vielä tuota *(OP10 points at manual page.)*
57 MANUALia niinkö noin. *(OP10 operates RCU.)*
58 OP09: No niin, nyt kokeile naputella numeroista.
59 OP10: Kymmenen ja.. koklkyt-kolme.
60 OP09: Joo.
61 OP10: Se päivämäärä.. {on väärin.
62 OP09: {Kaheskymmenes viie
63 OP10: Kaheskymmenes viie Ja..
64 OP09: Toukokuuta. May. -m-aa-yy. {October
65 OP10: {Eikö nyt tuli väärin, kö täälä
66 niinkö, täälä on nämä kaikki. Tuosta. {Ei, nyt meni väärin.
67 OP09: {Nyt, nyt se on väärin..
68 OP10: Oho.
69 OP09: Ota taaksepäin. Kato.. menee kohdistinnäppäimillä.
70 OP10: Okei, otetaanpas uuestaan. SET ja sitte laitetaan MANUALi
71 noin ja.. kymmenen-kolkytneljä, ja sitte laitetaan {samoin
72 OP09: {Kahes-
73 kymmenesviie
74 OP10: Kaheskymmenesviies, May ja sitte laitetaan..{yheksän
75 OP09: {Viton..
76 vitonen, joo ja.. yheksän neljä, se on oikein.
77 OP10: Joo, nyt se on oikein. Yhdeksän-neljä, laitetaan vaan ja..
78 OP09: Nyt hyväksytään se jostain.
79 OP10: Mistä, hetkinen, katotaanpa, mitäs sitte, [[2] Press the
80 <-- or -->] ***MANUAL TUNING button until*** [the data *(OP10 points at manual page.)*
81 you wish to corect blink [[4]] ***Press*** [the] ***SET*** [button *(OP09 points at same page.)*
82 when all] ***data has been corrected.***
83 SET, joo, oikein. Noin, nyt son oikeen.
84 OP09: No-ni.
85 OP10: Sitte, mi. mistä tästä pääsi pois? Painetaan sitä CLOCK:ia
86 uuestaan.
87 OP09: Joo. *(OP10 points at manual page.)*
88 OP10: Nyt se meni. *(OP09 turns to p. 14.)*
89 OP09: Joo... hm.. mitä se kello näyttää? *(OP09 turns backs to table of contents.)*
90 OP10: Se menee automaatisesti.
91 OP09: Katotaanpa mitä se kello näyttää sitte. Näkyykö se tuossa
92 videossa ollenkaan?
93 OP10: Joo, se johtuu sii ... tuota mää uskon, että se näkyy
94 ainoastaan sillon, kun laitetaan virta pois.
95 OP09: Jaa, nyt {se alako..
96 OP10: {Mistäs mää pääsin pois?
97 OP09: Sää säätelit sitä, hei.
98 OP10: En, se..
99 OP09: Ykstoista on nyt kello.
100 OP10: Oliko?
101 OP09: Oli, oli... Kokeilepa uuestaan.
102 OP10: CLOCK..
103 OP09: Ykstoista.
104 OP10: SET ja no entäs MANUALi?
105 OP09: Kymmenen.
106 OP10: Yks-nolla-kolome.
107 OP09: Nelijä.

109 OP09: Ja nyt sitte MANUAL.
110 OP10: MANUAL, joo.
111 OP09: Mikä se on - lopeta? SETti. {Mikä SETti?.
112 OP10: {SETti - noin.
113 Se lähtee ilimeisesti automaattisesti, ko. siitä
114 pitää ottaa, se on ilimeisesti, siitä videosta näkee kellon
115 silloin ko se on virta poi
116 OP09: No joo, se kummiski {toimii.
117 OP10: {Tuotanii, kokeillaanpas ottaa virta
118 pois, missä tässä on.. tuossa on off-nappula.
119 OP09: On tuo.. Power.
120 OP10: Siellä on Power.. Joo, nyt on oikeessa.
121 OP09: Joo, se näkyy siinä... Niin, sitte katotaan, miten se
122 nauhottaa. Ööö.. ***recording***... ***timer***. *(OP09 points at table of contents,*
123 OP10: ***Timer recording***. *running his finger over page.)*
124 OP09: Kaheksantoista.
125 OP10: Mutta kokeillaanpa. elä ota vielä.. kokeillaans nauhottaa
126 jotakin tuohon kasetille, tästä jotakin kanavaa.
127 OP09: Kyllä kai se nyt toimii. Tuo on ykkönen. Kokeillaan *(OP09 turns to p.18.)*
128 vaan.. paina REC:iä.
129 OP10: Joo, REC:iä, joo.
130 OP09: Ja ny videoon.. onko videossa virta kanavalla?
131 OP10: .. Se vähän hitaasti ottaa, huonosti.
132 OP09: Joo. {Ootapa.
133 OP10: {Se merkkaa vähän täältä index-systeemillä, että se
134 merkkaa, tuota niin, tuon.. mitä se nauhottaa.
135 Sen saa sitte nau.. kelata mihin kohtaan haluaa, sen *(OP09 points at manual page.)*
136 nauhotuksen alakuun, sen avulla. Mulla on tuota niin nuo
137 learnit. Tässä on se hyvä puoli, että sää pystyt {koodaamaan
138 OP09: {Jaa..
139 OP10: .. tästä muitakin toimintoja, noille nappuloille. Mutta siinä on
140 se huono puoli, että sitte jos, tuota nii, sää jotakin television
141 kaukosäätimestä sää.. koodaat, niin sää painat jotain
142 nappulaa, niin tele.. televisio rupee liikkumaan.
143 OP09: Katotaan sitte.. *(OP09 points at manual page.)*
144 OP10: Joo. Katotaanko taaksepäin vähän? Son puoli minuuttia
145 tullu jo, eiköhän se oo tarpeeks pitkä aika meille? Kelataan
146 alakuun. Katotaan meiän nauhotus.
147 (4)
148 Noin.
149 OP09: Siitä.
150 OP10: Joo, vähä huono kuva on, kuvanlaatu, tuossa alussa. Joo, nyt
151 se on niinkö oikein kohallaan. Kyllä.
152 OP09: No niin, sitte {ää..
153 OP10: {Se on siinä.
154 OP09: Aikanauhotus, {kaukosäätimestä. *(OP09 points at manual page.)*
155 OP10: {Aikanauhotus. Kaukosäätimestä.
156 (6)
157 Mitähän tämä nyt teki? ... Niin, se laittaa
158 heti automaattisesti päälle, kun tulee, kelaa alakuun.
159 OP09: Joo.
160 OP10: Ilimeisesti... PROGram on tuolla.. tuosson tuo..
161 OP09: Joo.
162 OP10: Ykköstä painetaan.
163 OP09: Ylös siitä.
164 OP10: Start.. jaha...
165 OP09: Se on.. ottaa ta.. tuon ajan ensiks. Kaheksantoista-nolla-nolla.

165 OP09: Se on.. ottaa ta.. tuon ajan ensiks. Kaheksantoista-nolla-nolla.
166 OP10: Ei, hetkinen, yk. {kaheksan.. nolla-nolla
167 OP09: {Kaheksan.. nolla-nolla..
168 OP10: Ja sitte..
169 OP09: Yheksäntoista-nolla.
170 OP10: Yks-yhdeksän nolla-nolla. Ja se on nyt oikea päivämäärä.
171 Ja sitten tossa on *position*, se on niinkö kanava {on ykkönen.
172 OP09: {Joo.
173 OP10: Sehän {on oikein.
174 OP09: {Eikö sen tollaa pitäs mennä?
175 OP10: Kyllä se {vissiin..
176 OP09: {Mutta kokeilepa, hei..
177 OP10: Nyt laitetaan vaan tosta.. tästä saatas *channel*eita, kato.. jos
178 mää laitan tähän kaheskymmenesviie Nyt mää saisin.. tästä
179 *channel*ia laitettua, vaihettua näistä nappuloista.
180 OP09: Joo.
181 OP10: Niinkö tossa näytetään. Tuolla sivussa, {tuo kutonen. *(OP10 points at manual page.)*
182 OP09: {Hm.
183 OP10: Mää pystyn, niinkö mää haluan, seittemään asti. Sitte
184 kaheksan, se on hyvä.
185 OP09: Ykkösellä vielä nauhottaa, joo.
186 OP10: Joo. Ja sitte tuota nii, jo. sitte laitetaan vaan tosta..
187 (7)
188 OP09: Hyväksyt, mi.. {millä tavoin se hyväksytään?
189 OP10: {Se tulee vaan tällä näin, tuolla, eikö tuukki,
190 tuosa on se aika? Joo, selevä, nyt se sammuttaa.. videot.
191 OP09: Joo.
192 OP10: Se ala{kaa sitte...
193 OP09: {Kokeillaan laitta toinenki nauhotu *(OP09 takes RCU from OP10, OP10*
194 OP10: Joo. Ota se pois päältä. {Noin. *instructs OP09 pointing at keys.)*
195 OP09: {Po.. poweri. Mistä se oli?
196 OP10: Sää saat tuota niin tuolta.. PROG{ramista..
197 OP09: {PROGramista, joo.
198 OP10: Paina sitä vaan. Noin. *(OP09 operates RCU.)*
199 OP09: Ja kakkonen. Miten sen syöttää, miten, {antaa..
200 OP10: {Laittaa} numeroita vaan.
201 OP09: Op-op..
202 OP10: Ei, nyt sää menit väärään suuntaan.
203 OP09: Kakkonen.. ja laitetaan kymmenen..
204 OP10: Laita.. yheksäntoista.. taikka yheksäntoista kolome-
205 kymmentä.
206 OP09: Laita, hei..
207 OP10: Yheksäntoista kolomekymmentä. Jaa, mutta {lait..
208 OP09: {Ei, ko nyt
209 katotaan, että se toimii, {alusta..
210 OP10: {Laita kymmenen nelijäkymmentä.
211 OP09: Kymmenen..
212 OP10: Kymmenen.. kolome.. niin, mutta ei se vielä, kato laita..
213 Oisit laittanu kymmenen nelijäkymmentä, se ei alota
214 kuitenkaan nyt...
215 OP09: Tänään, ja sit tosta hyväksytään.
216 OP10: Joo, mutta olisit laittanu yhen..
217 OP09: Jaa, mutta pitää laittaa nyt SET.. Sen pitäs kohta mennä
218 nauhalle. *(OP09 puts RCU on table.)*
219 OP10: Ei se alota, kato ko se on sama aika ko sillä on. Se olis
220 pitäny laittaa minuutti eteenpäin. *(OP10 picks up RCU.)*
221 OP09: Se on minuutti eteenpäin.

222 OP10: Eii oo ko sama aika, ko kymmenen kolokyt-kaheksan.
223 OP09: Kymmenen kolokyt-yheksän mää laitoin.
224 OP10: Et laittanu, se loppumaan kyllä, mutta.. {lai..
225 OP09: {Laitoinko
226 mää väärin sen?
227 OP10: Laitetaanko..
228 OP09: Ei, kymme{nen kolokyt-kaheksan.
229 OP10: {Miten se tulee tää..
230 OP09: Kakkonen.
231 OP10: Noin. Ja sitte nyt laitetaan tuonne..
232 OP09: Kymmenen..
233 OP10: Yk. ei..
234 OP09: Kakkonen, paina kakkosta.
235 OP10: Joo-o... Pistä se tohon kolomoselle, laitetaan tää
236 kymmenen..
237 OP09: *(Sighs.)* Joo.
238 OP10: Kymmenen-nelijä.. yks, vaikka laitetaan. Sitte laitetaan tähän
239 {kymm..
240 OP09: {Oli se, kerran.. miten se oli, {kymmenen kolokyt-kaheksa.
241 OP10: {kymmenen kolokyt-kaheksan.
242 Niin, mutta se alako kymmenen kolokyt-kaheksan, kello oli
243 jo niin palijo, niin se ei varmaan rupia.. nauhottamaan.
244 OP09: Joo. Saatto olla.
245 OP10: Nyt se pitäs ruveta.. nelijä.. nelijä-yks nauhottaan. Tässä
246 menee muutama minuutti, sillä aikaa katotaan vähän, mitä
247 muuta täälä sanotaan. *(Sighs.)*
248 (4)
249 Sit tuola neuvotaan nuo, että miten saa.. tuolta laitteesta
250 ittestään... {laitettua.
251 OP09: {Nauhottaaks
252 se nyt? Ei nauhota.
253 OP10: Ei nauhota, ei. Pari {minuuttia oottaa, niin
254 OP09: {Niin, no, tuossa on kai se ajatus, että
255 tuskin sitä säädetään laitteesta, paitsi jos kaukosäädin on
256 hukassa.
257 OP10: Niin, tai se menee rikki, tai.
258 (4)
259 {Mi. *(OP09 and OP10 turn to p. 19,*
260 OP09: {Joo, täs on näi... malli *leafing through manual together.)*
261 OP10: Joo, että miten se tulee sinne, joo. *(OP10 points at manual page.)*
262 OP09: Hiiri ois kyllä näppärä tossa.
263 OP10: Kyllä, ois se ihan kätevä, joo... Laitettiinko väärään
264 paikkaan se kortti? Oiskohan pitäny {laittaa tonne..
265 OP09: {Joo... *(OP09 laughs at OP10's joke.)*
266 OP10: .. videoihin?
267 OP09: Kortti on vääräs paika
268 OP10: Eiköhän semmosen joskus tule joku keksimäänkin, sitte.
269 OP09: En mää mitä tohon tuli..
270 OP10: Joo-o.
271 OP09: Pitäs olla Show-View- systeemi. Onks teillä sellasta? *(OP10 turns to p. 20, 21, 23 and 24.)*
272 OP10: Hä? Ei oo.
273 OP09: Oppiihan sen muutenki, nauhotus kameralta. *(OP09 talks about manual section 7.4.)*
274 OP10: Joo.. ***Playback***.. Näitä ihan vaan.. ***Visual search***... näit..
275 näitä normaaleja toimintoja, mitä kaikki tuntuu osaavan jo.
276 Nyt, oota, minutti {pitäs olla.
277 OP09: {Joo... Se heittää päälle sen.
278 OP10: Tässä on nuot laskimet ja...

279 OP09: Nuo pitäs poistaa sitte, että.. poistaako se automaattisesti,
280 ko se on nauhotettu?
281 OP10: Mitä?
282 *Researcher says the timer is set ok.*
283 OP10: Joo, että se pit.. se nauhottaa ihan kohta, pitä. {Ko se
284 OP09: {Minuutin
285 päästä.
286 OP10: ... vaihtuu nelijä-ykköselle. Mitenkähän, ennakoikohan se
287 näillä videoilla, että..?
288 OP09: Kyllä ne saattaa vähä..
289 OP10: Että se alottaa viis sekuntia aikasemmin, ko siinä
290 kumminkin menee aikaa, ko {se menee päälle..
291 OP09: {Joo.
292 Ko se hin.. vetää ne.. nauhan sinne kuvarummulle ja..
293 OP10: Joo-o. Siinä mielessä tämä..
294 OP09: Son palijon hankalampi näillä vanhoilla, joissa on suhteellinen,
295 se aikailmaisu... kahen päivän päästä nauhottaa, siinä on
296 laskemista.
297 OP10: Joo.. että.. jos parin päivän päästä pistää. Joo, {nyt
298 OP09: {Joo, nyt se
299 heittää päälle.
300 OP10: Joo, se nauhottaa sen, minuutin ajan nauhottaa ja sit..
301 tekstikuvaa.
302 OP09: Joo.

APPENDIX 11

Session 5A (OP11 + OP12)
Task One

1 OP12: Ens pääpiirtettäin.. *(OP11 and OP12 point to manual page.)*
2 OP11: Niin... mikä tämä nyt, luulis häijympi homma olevan.
3 (7)
4 Täsä et tarvinnu sitte sen kummempaa.. tuota
5 niin niin rueta tutkiin, muuta ko tekeen nuo hommat tuosta..
6 *(Researcher reconfirms the task and says he will get dictionaries.)*
7 OP11: Tuo nyt ei.. luulis olevan paha.
8 OP12: Tuosahan on nelonen, ***Setting the clock*** [and the VCR
9 channels]
10 OP11: [Setting the clock and] ***the VCR channels***, joo.
11 OP12: Sieltä {sivu kolometoista..}
12 OP11: {Ei kai siinä muuta ko..}
13 niin justiin, kolometoista.
14 (7)
15 Hm-hmm...
16 (20)
17 OP12: Misä siinä on semmonen.. *VCR/TV*-näppäin? Kai siellä
18 patterit on sisällä?
19 OP11: No joo.
20 OP12: Luulis.
21 OP11: *(Laughs)* Pitääkö tarkistaa? .. No on kai ne. *(OP11 checks RCU batteries.)*
22 Totta Mooses.
23 OP12: Vaikka kuin palijo.
24 OP11: Joo.
25 OP12: Löytyykö sieltä tuommonen näppäin, ***VCR/TV***?
26 OP11: *PROG, SET, VCR*, joo..
27 (5)
28 Tuola. *(OP11 studies RCU buttons.)*
29 OP12: Se.. pitäs olla.. VCR-asennossa. *(OP11 operates RCU.)*
30 OP11: Mää alan tästä näin, tuota niin niin. Mikäs se nyt..
31 Tiukka moodi on päällä.
32 OP12: Painapa uuestaan.
33 OP11: En mää oo vielä painannu tätä ollenkaan, mutta mää rupesin
34 kattoon, että kö tuo on tuo..
35 OP12: Joo. Koitapa.. näpäyttää..
36 OP11: Kato..
37 OP12: Nyt siinä on..
38 OP11: Kumpi siinä on.. se on siinä VCR:ssä.
39 OP12: On se VCR. Nyt on VCR.
40 OP11: Joo.
41 OP12: Se palaa tuolla.
42 (4)
43 OP11: Joo..nn.. se on VCR, ei auta mikään. *(OP11 puts RCU down on table,*
44 OP12: Joo, hienoa. *then points at manual page.)*
45 OP11: Ruvetaanko heti kylymästi näppäileen, vai kahtotaanko
46 tuota.. ensin vähä läpi? *(OP11 points at manual page.)*
47 OP12: Niin, voishan sitä vilikasta.
48 OP11: Kellonäppäintä.. onko se ykkönen, tuosa? *(OP11 points at p. 13.)*
49 OP12: Joo, siitä alakaa. Vois olla sama.. heti vetää tuonne.
50 OP11: Se tulee TV-näyttöön, tiäkkö, tuo? Kato. Se tulee tieten *(OP11 points at manual page.)*
51 TV-näyt{töön sit..

52 OP12: {Kokeilepas painaa CLOCKia.
53 (5)
54 Ei tapahtunu mitään.
55 (8)
56 Hm.. [The Programme & Clock screen
57 will appear] ***on the TV screen***.
58 OP11: Hm..
59 (22)
60 OP12: {When setting the clock during the daylight saving time period,
61 press the] ***BAND/CANCEL S/W*** -nappi.. [button, and make
62 sure the "S" for Daylight Saving time apperas on the screen.]
63 OP11: Hm..
64 (8)
65 ***When setting the clock*** [during the daylight
66 saving time period, press the BAND/CANCEL S/W button, and
67 make sure the "S" for Daylight Saving time apperas on the
68 screen.]
69 OP12: Se pitäs..
70 OP11: Päiv.. paiväaikaa säästävä..
71 OP12: Pitäskö sinne nyt pistää ässä?
72 OP11: Niin.
73 OP12: Se ois tuosa. Mihinkähän se nyt tuon laittaa? Oho! *(OP12 operates RCU.)*
74 Oisko se nyt siinä?
75 (12)
76 OP11: Siihen tulee kolome vaihtoehtua. *(OP11 points at manual page.)*
77 OP12: *(Laughs)* Nyt siinä on H, nyt siinä on U, nyt siinä
78 on L.
79 OP11: Niin, tuolta, joo.
80 OP12: Onko mulla nyt oi{kia näppäin?
81 OP11: {Kato, mää katon tuolta ylähältä, niin
82 sieläki, mutta tuota...
83 OP12: Onko mulla nyt.. väärä näppäin kiinni? ... Tuosa. *(OP12 operates RCU.)*
84 (4)
85 ***BAND***. On se oikein.
86 OP11: On, tuola. Ilmestyy näyttöön. -ssä näyttää.
87 OP12: Eipä ilmesty.
88 OP11: Joo.
89 (7)
90 Mutta mikä tämä nyt on? ... *(OP11 points at manual page.)*
91 [When setting the] ***daylight saving time period***, [press
92 the BAND/CANCEL S/W button, and make sure the "S"
93 for Daylight Saving time apperas on the screen.]
94 OP12: Onko tuola mitään väliä? ...
95 OP11: Sillon ko laitetaan.. säädetään.. tuo kello.
96 (4)
97 Päivänvalon säästämisaika. Mikä tää on? Mikä tää on
98 nyt oikeen?
99 OP12: Mikä on homman nimi?
100 (29)
101 OP11: Kato.. täälä on se ***Daylight Saving time***? Jatkuukohan tää? *(OP11 points at manual page, then*
102 (13) *turns to p. 14 and goes back to p. 13.)*
103 Niin.. {joo.. *(OP11 points at p. 13.)*
104 OP12: {Se on ko muuttuu.. ne eteen..
105 OP11: Joo..
106 OP12: ..päin tai taa{ksepäin siirretään kello.
107 OP11: {Joo, niin onki.
108 (7)

109 Tällä systeemillä *(OP11 points at manual page.)*
110 laitetaan tuo.. ässä, täsä selevitetään se.
111 OP12: Hm.. mutta eihän meiän nyt tuota tarvi tehä.
112 OP11: Niin, ei kai se nyt oo..
113 OP12: Että tuota ei tarvi tehä ollenkaan. Ko sais ens nyt ajan sinne.
114 OP11: Niin, ei kai..
115 (4) *(OP11 and OP12 read manual p. 13)*
116 OP12: Määpäs painan uuestaan tuota *CLOCK button*ia, jos se
117 muuttus. *(OP11 points at manual page.)*
118 OP11: Muuttuuko se sitte? No, koitapa.
119 OP12: Ei se muutu miksikään. *(OP12 presses RCU button.)*
120 OP11: Ei.. ootas ny.. Ei siinä kato.. mutta ko laitetaan tuota *(OP11 points at manual page.)*
121 tunnit ja minuutit. Sen näppäimistön avulla.
122 OP12: Näppäimistön - tästä näin?
123 OP11: Niin.
124 (8)
125 Nyt on ykköskii..
126 OP12: Kaheksan viistoista.. nyt se on seittemäntoista nelikyt-kuus. *(OP12 looks at his watch, then*
127 OP11: Ei kai siinä oo muuta ko kylymästi vaan... *presses RCU buttons to set time.)*
128 OP12: Ei kyllä täsä on nyt kyllä jotakin häikkää. Ei ko nyt täsä ei *(OP12 looks at TV screen.)*
129 pysty säätään.. asemia.. kohalleen... jos mää oikein
130 ymmärsin.
131 OP11: *(Thoughtfully:)* Hmm-hm.
132 OP12: Kato ko sinne ei tuu mittään.
133 OP11: Joo..
134 OP12: Kokeillaanpa alusta uuestaan.. tuolta. *(OP12 points at manual page..)*
135 OP11: Joo.
136 OP12: Tuosta, {pistetään..
137 OP11: {Joo, teeveeki on videokanavalla. *(OP11 points at manual page..)*
138 OP12: Joo.
139 (7)
140 OP11: Nyt on nauh..
141 OP12: Nyt on se VCR päällä.
142 (7)
143 OP11: Jos.. jos on TV:llä, niin kelloja ei voi asettaa, että onko *(OP11 points at manual page..)*
144 se nyt sitte..
145 OP12: Kyllä, eikö se nyt oo? Nyt son pois.. Nyt siinä on *(OP11 an OP12 look at TV screen.)*
146 puku päällä. Mutta ko ei tuosta saa selevää.. Heissun
147 vei se on..
148 OP11: Käyppä pomppimassa.
149 OP12: Määpäs käyn pomppimassa. *(OP12 stands up and goes to have*
150 (5) *a look at VCR display.)*
151 On siinä.
152 OP11: On se VCR:llä.
153 OP12: Kaikki hyvin.
154 OP11: No ei kai siinä auta. *(OP11 points at manual page.)*
155 OP12: No ei. Ja nyt ***clock button.*** Tuosta näin. ... Eii..
156 (4)
157 OP11: Ottaako.. kai se nyt ottaa siihen?
158 (5) *(OP11 operates RCU.)*
159 OP12: Hm..
160 (11)
161 OP11: Sielä pitäs kato.. justiin.. kato väläkkyä tuola noin, että.. *(OP11 points at manual page.)*
162 OP12: Joo.
163 OP11: Niikö että se oottaa, kato että paineltas se.. numerot
164 sinne.
165 OP12: Ei kyllä tämä pitäs saaja nollattua jostain, mää oon

166 painellu tätä väärin täsä.
167 OP11: Joo.
168 OP12: Tuosahan on käynnisä.. tommoset.
169 OP11: Powerit kylymästi pois päältä...
170 OP12: Niin, nyt alotetaan, pistetään tuonne VCR-näyttöön, tästä.
171 .. Näin. Sitte painetaan CLOCK. ... Joo.
172 *(Mutters, inaud.)*
173 (5)
174 OP11: Se lähe saaha päälle. Se oli tuota niin.. Vaan se oli ensin *(OP11 points at two sections in manual text.)*
175 kato VCR:llä, piti laittaa.
176 OP12: Joo, kyllä se on, mää pistinki.
177 OP11: Joo justiin, no niin.
178 OP12: Ja nyt son sitte painettu *CLOCK*ia, tuossa näin, me ollaan *(OP12 points at manual page.)*
179 nyt täsä menosa.
180 OP11: Hm.
181 OP12: Ja nyt siellä vilikkuu joku.
182 OP12: Mutta ei sielä viliku nyt, eihän se oota tota noin niin... että
183 sinne syötetään.
184 (4)
185 OP12: Hm.. *(OP12 points at manual page.)*
186 (6)
187 OP11: Koitetaanpa kylymästi painaa tuo{hon
188 OP12: {Painelepa sinne..
189 OP11: Mikä se oli.. yheksäntoista vai {mikä.. *(OP11 operates RCU.)*
190 OP12: {Seittemän{toista... *(OP12 points at manual page.)*
191 OP11: {Seittemäntoista...
192 OP12: Ei ilimesty mittään.
193 (4)
194 OP11: Joo, ei..
195 OP12: Mistäs se.. ootapa nyt..
196 (9) *(OP12 points at manual page.)*
197 OP11: No hei, kylymän rauhallisesti, ***Correcting clock data***, jos *(OP11 points at manual page.)*
198 ei.. se oo nyt kato.. yheksän nelijäkyt-yheksän, eikö ookki?
199 OP12: Joo...
200 OP11: Pistetäänkö tästä kylymästi, muutetaan tää.
201 OP12: No muutapa siitä.
202 OP11: Tai *(laughs)* koitetaanpa muuttaa. Painetaan taas *(laughs)* *(OP11 operates RCU.)*
203 kellonäppäintä.. *CLOCK*.. Lähtikö se nyt pois?
204 OP12: Lähti vetään *(laughs)*. Painapa uuestaan, kato ko se
205 meni pois. Nyt.
206 (7)
207 OP11: Kyly{mästi näppäimistö vain...}
208 OP12: {Tuommone *hour*-näppäin} *(OP12 points at manual page.)*
209 OP11: .. tuosta, onko se ***MANUAL TUNING***, hä? Näitä vaan. *(OP11 continues to operate RCU.)*
210 OP12: Mistä sä tommosen hour-näppäimen löysit?
211 OP11: Ei, mutta täsä {täs.. oli, nuoli tai.. kato niin.
212 OP12: {Niin, jaa..
213 No niin, nyt rupes.. nyt muuta ko {pistää sinne..
214 OP11: {Ai.. kylymästi
215 ykkönen siihen.. *(laughs)* kylymästi.
216 Seittemäntoista..
217 OP12: Viiskymmentä.
218 OP11: Viiskymppä, tuos pistäs kyly.. lai.. laittaa kans, kuule.
219 Monesko päivä?
220 OP12: Kyllä se on kuule kuues päivä.
221 OP11: Ai tämä on sitte oikeen?

222 OP12: Joo.
223 OP11: Ja May. January, February..
224 OP12: May, June, July. Niin mutta nyt on kesäkuu. *(OP11 continues to operate RCU.)*
225 OP11: *(Muttering names of months; sub-audible.)* No niin, {nyt
226 OP12: {Kuu
227 on väärin.
228 OP11: Laitetaan kylymästi. Joo, laita vaan.
229 OP12: Mites siinä kuu vaihtuu? (7)Varmaan jostakin nuoli- *(OP12 points at manual page.)*
230 näppäimestä vaan.. Ei, tuosahan se lukee. *(OP12 points at RCU button.)*
231 OP11: Voi kylymä, joo. Nyt mennäänkö niinkö kesään sitte.
232 OP12: Sielä mennään... Joo, ja vuosiluku on oikein.
233 OP11: Ja maanantai, jeh. *(OP11 points at manual page.)*
234 OP12: Miten ne nyt saa sinne muistiin? (4) *(OP11 continues to operate RCU.)*
235 OP11: [[4] Press the] ***SET button*** [when all data has been
236 corrected.]
237 OP12: Joo, muuta ko SET:iä nyt.
238 OP11: [[4] Press the SET button when all data] ***has been*** *(OP11 points at manual page.)*
239 ***corrected***. Onko siinä nyt kaikki kondiksessa?
240 OP12: Kyllä nyt taitaa olla.
241 OP11: Seittemäntoista viiskymmentä, maanantai.
242 OP12: Joo.
243 OP11: Eihän siinä muuta?
244 OP12: Ei muuta. Painapas sitä... No ne on siinä.
245 OP11: Ne ois siinä. (4)
246 OP12: Jaa nyt se häipyki taas.
247 OP11: Joo näin pitäs tehäki, muutaman sekunnin jäläkeen... *(OP11 points at manual page.)*
248 Eihän {se oo..
249 OP12: {Ny pitäs sitte saaha se ohojelma. *(OP12 returns to table of contents.)*
250 Muuta ko täältä kahtua, ettäs..
251 OP11: *(Mutters, inaud.)* *(OP11 turns RCU upside down.)*
252 (5)
253 OP11: [Recording] ***TV Programmes***... ***Timer*** *(OP12 leafs through manual, pointing.)*
254 [Recording]... *(OP11 reads from table of contents.)*
255 OP12: Eikö se taimerilla tuu? *(OP11 and OP12 browse at table*
256 OP11: Joo. ***Quick Timer Recording*** - kumpi? *of contents.)*
257 (5)
258 Ajetaan keksatoista sivulle, katotaan.. Yheksäntoista on
259 vieressä.. *(OP11 turns to p. 18)*
260 OP12: Hmm..
261 (9)
262 No.. katotaan, mitä pitää tehä, ennekö..
263 OP11: Tsekata... ***Check***, **check**.. ***Programming for timer*** *(OP11 points at manual page and reads.)*
264 [recording]
265 OP12: Ens pitää lykätä kasetti siälle ja sitten niin.. hm-hm... *(OP12 points at manual page.)*
266 nuo läpyskät mikkä on tuola tuossa on niin.. pitäs olla.. *(OP12 interprets.)*
267 paikallaan. Sehän onki, kasetti, on tommonen uus.
268 (4)
269 OP11: Joo.
270 (5)
271 Ei kai siinä ny..
272 (5)
273 [Turn on the] ***TV set*** *(OP11 points at manual page.)*
274 ***and set the video channel*** .. se on edelleen..
275 OP12: Hm..
276 OP11: Ja se on se VCR päällä, on.
277 OP12: Ei.. on.. {on se.
278 OP11: {On se päällä joo . Eikö näykki?

279 OP12: Joo.
280 OP11: Ja kello näyttää oikiaa aikaa. Käy kahtoon.. kahtoon *(OP11 operates RCU.)*
281 kylymiltähän vielä tuo CLOCK, niin se on siinä, sielä on... *(OP12 points at manual page.)*
282 OP12: Son hienosti..
283 OP11: Hei..
284 (4)
285 [Make sure the EXT indicator] ***is not lit***.. mikä..
286 OP12: Mikäs tuo EXT indicator... *(OP11 puts RCU on table.)*
287 OP11: [Make sure the EXT indicator] ***is not lit***. Lit - mitä se on?
288 OP12: Onko se..
289 OP11: "Näytössä"?
290 OP12: Niin. Jotain "päällä" tai "näytössä" tai..
291 OP11: No ei kai {siin..
292 OP12: {Misä semmonen on? Ootapas vähä. *(OP12 leafs back to beginning of manual.)*
293 OP11: Se on tuota niin niin. *(OP11 points at picture on p. 2.)*
294 OP12: Täältä varmaan löytyy nämä.. Mikä se on?
295 OP11: ***EXT***.
296 (5)
297 OP12: Ei tuossa oo... Tuola kato lukee, että EXT. *(OP 12 points at picture on p. 2.)*
298 OP11: Sehän siinä onki, sehän näkee siitä, että painetaan
299 EXT:iä ja kahtotaan että se tulee siihen. *(OP11 operates RCU.)*
300 OP12: Aha.
301 OP11: Se ottaa sen pois.
302 (4)
303 Ei tapahu kyllä mitään... *(OP12 returns to p. 18.)*
304 Nn.. tuleeko.. tuleeko se? ...
305 OP12: Ei tuu.
306 (5)
307 OP11: Ei...
308 OP12: Jaa niin mutta siinä on tuo.. homma päällä, pistäpä se pois. *(OP12 points at manual page.)*
309 Painapa nyt sitä. *(OP11 operates RCU.)*
310 OP11: Joo.
311 OP12: No nyt tuli EXT.
312 OP11: Otetaan se pois, eikö niin?
313 OP12: Joo.
314 OP11: Tulee päälle ja pois, no niin, nyt se on pois. *(OP11 puts RCU on table.)*
315 OP12: Sitte.. tuo.. onko tuo se normaalinauhoitus, ***SP***? *(OP12 points at same p.)*
316 OP11: Joo, ei ***long {play***
317 OP12: {Se pitäs sille pistää. Joo.
318 OP11: VCR. Videon etupaneelista. Eiks täälä oo sitte sitä ollenkaan? *(OP11 points at manual page.)*
319 (5)
320 OP12: Eikö löy-y. *(OP11 studies buttons of RCU.)*
321 OP11: Ei taija olla muuten.
322 OP12: Määpäs käyn tuolta kurk{kimaan.
323 OP11: {Käy, käypäs ny kurkk..
324 (5)
325 OP12: Misä täälä on luukku? Tuola. Joo, tuossa... {SP *(OP11 leafs through RCU.)*
326 OP11: {Joo.
327 {Miltä näyttää?}
328 OP12: {Nyt sais.. } Joo.
329 OP11: Joo, siellä.. vasemmassa.
330 OP12: Joo nyt on SP.
331 OP11: Joo.. Oliko se LP:llä? *(OP11 points at manual p. 18)*
332 OP12: Eeeii. Se tais olla SP:llä.
333 OP11: Joo.
334 (5)
334 ***PROG***.

335 OP12: Niin että siellä näkyy..
336 (11)
337 OP12: ***MANUAL TUNING***:ista pyyhitään sitte joka on tuo{la...
338 OP11: {Niin,
339 joo, ei kai siinä... eikö siinä oo.. tuossa ei oo muuta ko *(OP11 points at manual page.)*
340 kylymästi PROGramia.. ***Programming for timer recording*** *(OP11 operates RCU.)*
341 OP12: Muuta ko **PROGram butt{on**.
342 OP11: {Sehän tuota niin niin tämähän tulee
343 nyt ykköseltä sitte tämä, jossa on..
344 OP12: Joo.
345 OP11: .. Suomen kanava tai ykkönen, tuo YLE:n ykkönen.
346 OP12: Onpa se tieten.
347 OP11: *(Laughs)*
348 OP12: *(Laughs)*
349 OP11: Kyllä kai se niin pitää olettaa... Kakkonen, ykkönen. *(OP11 continues to operate RCU.)*
350 Kakskyt-ykkönen. Mitenkä se ei muuten vaihu, ko vaiht..
351 painaa kakkoskanavaa - no vaihto se sen. {Pikku viive.
352 OP12: {Onko siinä
353 joku viive. Aha.
354 OP11: Ei, ny se on..
355 OP12: Siellä.. vähä siitä..
356 OP11: Vähä venaa tuossa. *(OP11 puts RCU on table.)*
357 OP12: Joo.
358 OP11: No.
359 OP12: PROGrammia.
360 OP11: Heitetäänkö kehiin? *(OP11 operates RCU.)*
361 OP12: Hienosti rupes vilkkuun.
362 OP11: [[2] Select the] ***programme number*** [where you wish to
363 enter data using the key-pad.] No.. tuohan se on se ykkönen.
364 OP12: Pis{tä vaan se.
365 OP11: {PS ykkönen. Se on kato siinä. Kyllä D.. PS.. ykkönen, *(OP11 ja OP12 point at manual page.)*
366 siinä on kato.. tieten nuo kanavat.
367 OP12: Eikö täsä on kaheksan.. *(OP11 points at manual page.)*
368 OP11: Paikkaa, joo.
369 OP12: .. paikkaa, mihi voi nauhotta{a.
370 OP11: {Joo.
371 OP12: .. eri ohojelmille. No nyt sen saa pistää mihin tykkää.
372 OP11: Joo. *(Mutters when reading, inaud.)*
373 (10)
374 Alakuaika vaan, eikö niin? *(OP11 goes on operating RCU.)*
375 OP12: {Hmm.
376 OP11: {Yhreksäntoista reikä-reikä. Painetaanko siihen?
377 OP12: Kokeile painaa... Sitten siihen.
378 OP11. Pitääkö painaa täältä sitte? Jos se lähtee sieltä.
379 OP12: Jaha, sen pitää liikkua nuin sitte.
380 OP11: Ja tuolla lailla.
381 OP12: Nuin... No sitte.. painelepa sitä samaa, että se menee *(OP12 points at RCU button.)*
382 eteenpäin. Sitä...
383 OP11: Joo.
384 OP12: .. oisko tuosta.. Vielä kerran.
385 OP11: Joo, ny sitte se päättymisaika.
386 OP12: Joo, kakskymmentä nolla-nolla.
387 OP11: Reikä-reikä.
388 (4)
389 OP12: Näin.
390 OP11: Katotaanko.. [[5] Set] ***the date using the key-pad***... *(OP11 points at manual page.)*
391 Pitääkö laittaa eteenpäin vielä.. Laitetaanko vielä..

392 OP12: Joo, painele..
393 OP11: Joo, justiin.
394 OP12: No se tulee automaattisesti...
395 OP11: {No se on {nyt, joo.
396 OP12: {.. tämä .. {nykyinen.. päivä.
397 OP11: Ja PS on ykkönen.
398 OP12: Joo.
399 OP11: Ei tartte muuttaa.
400 OP12: Ei tarvi.
401 (5)
402 Mmm...
403 OP11: Se on se.. tuo kanava, kato. *(OP11 points at manual page.)*
404 OP12: Nyt se on {ykkönen.
405 OP11: {Se ***channel***.
406 OP12: On oikein.
407 OP11: [[6] Set the channel, from which you] ***want to record*** [using
408 the CHANNEL buttons or the key-pad.]
409 OP12: Ja nyt vaan PROGrammia.
410 OP11: [[7] When you are] ***ready***, [press the] ***PROG button*** [to]
411 ***memorize*** [the] ***timer recording*** [data.] Ei kai siinä..
412 OP12: Ei kai siinä..
413 OP11: PROGram. *(OP11 operates RCU.)*
414 OP12: Se ehkä on.. siellä sisäp..
415 OP11: Ehkä. Näin tässä käy. [The VCR has] ***now been*** *(OP11 points at manual page.)*
416 ***programmed***. [However, to actually record programmes,
417 you need to set the] ***VCR to*** [the] ***stand-by*** [timer recording
418 mode, as explained in the following sections.]
419 Niin, [The VCR has now been programmed. However, to
420 actually record programmes, you need] ***to set the VCR*** [to the
421 stand-by timer recording mode, as explained in the following
422 sections.]
423 OP12: Niin, tuosa nyt selitetään, että pitää painaa sitä.. no siinä
424 pitää ehkä lyyä videokasetti sisälle. *(OP12 points at manual page.)*
425 OP11: Niin, pitääkö se.. se pitää tieten tehä siihen kuntoon, että
426 se sitte kans nauhottaa.
427 OP12: Niin. Määpäs käyn heittään tuosta luukusta.
428 OP11: Hm.
429 (22)
430 OP12: Pyöräy{täpä alakuun. *(OP11 continues to operate RCU.)*
431 OP11: {Et sää sitä kattonu, että siinä oli ne.. nipukat *(OP11 points at manual page.)*
432 paikallaan?
433 OP12: Oli se paikallaan.
434 OP11: Oli sielä.
435 OP12: Oli paikallaan.
436 (4)
437OP11: Tuota niin..
438 OP12: Oli se aika alussa, mutta pyöräytäpä, että se varmasti..
439 Oisko se..
440 OP11: No, se nyt on ainaki alussa.
441 OP12: Joo-o. Sitte ***timer button***. Eikö löy-y? Onko nyt.. *(OP12 points at manual p. 18.)*
442 (6)
443
445 Mikäs tuo on? Misä täälä on ne.. selitykset, että mitä *(OP12 leafs back.)*
446 tehään milläki napp..
447 OP11: Tää, kato. 3. Mikä tuola on? Onko se tuola paneelisa? *(OP11 points at manual page.)*
448 OP12: Jaa, sitä ei saa ko sieltä?
449 OP11: Ja tuosaki on kyllä nämä kelausnapikki on täsä.. merkittynä.

450 Ne löytyy täältäki. Oiskohan se tuo taimeri sitte?
451 OP12: Siinä ois kyllä kellon kuva, että painapa sitä.
452 (5)
453 Kenties {se nyt nauhottaa sitte.
454 OP11: {Jaa..
455 Kato, siinä.. on oikia aika vielä, seittemäntoista viiskyt-
456 kahdeksan.
457 OP12: Njoo, se on minuutin.. myöhässä.
458 OP11: Menee automaattisesti.. pois päältä. Joo ja sitte se oottaa *(OP11 points at manual page.)*
459 kato sitte. Ihan se.. [4. The VCR will automatically turn on
460 and off the] ***memorized timer*** [programmes]. *(OP11 turns to p. 19)*
461 OP12: Nyt pitäs toimia. Tuolla on vielä jotain muistia.
462 (13)
463 Jos ei siinä oo sitä läpyskää siinä nauha{sa niin} kasettisa, se
464 sylykäsee sen ulos.
465 OP11: {Hm.. Joo.
466 (23)
467 OP11: Hmm-hm. [H-F inton.] Ei kai siinä.
468 OP12: Tuosa on sitte, että jos..
469 (5) .. jos nauhottaa samaan *(OP12 points at manual page.)*
470 aikaan monelta kanavalta, niin se ottaa pienemmältä
471 järjestyksessä olevan. Siinä mitä pistettiin sinne, niin oli
472 kaheksan niitä, niin se ottaa niistä pienimmän.
473 OP11: Joo.
474 OP12: Että jos {pistää päällekkäin, nauhottaa yhtä aikaa.
475 OP11: {Joo päällekkäin, joo, näinhän se oli..
476 Joo ei kai siinä niistä.. *(OP11 points at manual page.)*
477 (10)
478 OP12: Ei kai siinä muuta.
479 OP11: Ei kai siinä.
480 (8)
481 Kahtotaanpa kylymästi, siinä on tuo PROGrammi vielä
482 niin..
483 OP12: Hm..
484 OP11: .. hei, niin sen pitää olla niin että se.. vois melekeen *(OP11 continues to operate RCU.)*
485 olla hyvä vaikka se ois päällä.
486 (11)
487 Kummako son tossa tuo poweri päällä, tossa.
488 OP12: Jos sen pitää tuosta se ottaa pois, mää {luulisin. *(OP12 points at RCU button.)*
489 OP11: {Niin, joo.
490 Pitäähän sieltä, ei se mikskään mee. Laitetaan..
492 OP12: Ja nyt voi PROGrammista tarkistaa, että ne on..
493 OP11: Kahtotaan.
494 OP12: *(Mutters, inaud.)*
495 OP11: Kuusi on ja PS on ykkönen.
496 OP12: Joo.
497 OP11: Ei siinä mitään.
498 OP12: Hm.
499 OP11: PROGrammit pois ja taimerit päälle, niin se ois siinä.
500 *(Researcher gives confirms that task is completed.)*

APPENDIX 12

Session 5B (OP11 + OP12)
Task Two

1 *(Researcher says they can start now.)*
2 OP11: Joo, ei kai siinä. Ruetaanko kahteleen?
3 (8) *(OP11 and OP12 read manual p. 1,*
4 OP12: Kai ne kaikki romut on tuosa? *then OP11 leafs forward to p. 4.)*

5 (10)
6 OP11: Hmm.
7 OP12: Pitäskö ottaa poweri pois?
8 OP11: Mm, heti, ettei oikei tuu näpeille..
9 (4)
10 OP12: Mm, se on vissiin tämä. *(OP12 diconnects PC mains cable.)*
11 (6)
12 *(Researcher says he can get a dictionary if they need it.)*
13 OP12: Hm-hm.
14 (4)
15 OP11: (Lukee hiljaa) [2. Attach the] ***mouse to a "port"*** [on *(OP11 and OP12 read manual.)*
16 your computer.]
17 (12)
18 Vähän se.. *(OP11 reads manual p. 2 .)*
19 OP12: Pitääkö tuo uuski hiiri pistää? *(OP11 and OP12 study equipment.)*
20 OP11: Hei, hmm.. miten se ny.. *(OP11 leafs back to p. 1.)*
21 OP12: Ne eihän se.. passaa ollenkaan.
22 OP11: Niin {ei.. *(OP11 ja OP12 discuss installation*
23 OP12: {Ei alkuunkaan. *instructions on p. 2.)*
24 OP11: ..eikö se.. tuo, tuola se kortti.. onko tää nyt sama?
25 OP12: Ei, ko kato tuosa on erilainen. *(OP11 turns back to p. 1.)*
26 OP11: Mitähän tämä seko.. *(OP12 leans to see back panel of PC .)*
27 OP12: Löytyykö täältä tuommonen töspeli? *(OP11 opens equipment package.)*
28 OP11: Eikö se ois täsä näin.
29 (9)
30 Se ois täsä näin.
31 Miten se.. rupiaa heti että tuohon laitetaan kiinni? *(OP11 turns to p. 5.)*
32 .. ääää. *OP12 turns back to p. 4.)*
33 OP12: Nyt on kuule oikianlainen, eikö soo tämä? *(OP12 points at manual picture.)*
34 OP11: Joo. Joo niin on.
35 OP12: Se alakaa niinko meillä vasta tästä.
36 OP11: Hm... *(OP11 turn to p. 5.)*
37 OP12: *(Thoughtfully:)* Hm-hm.. *(OP11 and OP12 read manual page.)*
38 OP11: Konfigurointia..
39 (8)
40 ***Bus board*** ja installoi ja jos in.. *(OP11 and OP12 study p. 5, OP11 reads.)*
41 OP12: Mikä on ***Bus board***?
42 OP11: Mikä?
43 OP12: **Bus board.**
44 OP11: Että mikä se on?
45 OP12: Niin.
46 OP11: Tietäis jos.. tieten tämä.. tämä tuota niinkö kortti, lisäkortti. *(OP12 picks up board and studies it.)*
47 OP12: Niin tämä mikä putos pöyälle *(OP11 and OP12 read manual p. 5.)*
48 OP11: Mikä nyt meinaa hajota käsiin. *(Read in a low voice:)* ***bus*** *(OP12 points at manual page.)*
49 ***board***.. Pitäs vaan näp...pärästä käsissä.
50 OP12: Th-jaa, sitäkään ei sais.. käpelöijä.
51 OP11: ***IRQ*** **addressing** .. Vois saaha se oikias.. oikiasti

52 Eikö ookki, kato kakkosesta? Kato vitosessa, se on *(OP11 points at corresp. component.)*
53 tuossa keskellä tuo..
54 OP12: Jaa sää tuota kuvaa, joo.. Hm-hm.
55 OP11: [The IRQ block looks like this, with four pin-sets] ***labelled***
56 ***2*** [through 5.] Joo son sitte siinä kolomosessa tuo.
57 OP12: Niinkö pitääkin.
58 OP11: Hmm.. ***IRQ***
59 OP12: No-ni. Nyt laitettiin, mikä kone?
60 OP11: Joo ja..
61 OP12: Mikä tämä on?
62 OP11: ***Cross out the pin-settings in this*** [table that your system] *(OP11 points at manual p. 5 and reads.)*
63 ***can NOT use.*** Siis siellä pitää nyt sitte ottaa vekeen niinkö.. *(OP12 watches.)*
64 mitä se ei voi käyttää. Eikö ni?
65 OP12: Joo-o.
66 OP11: Onko siinä sitte tuo.. tuo kolomoseen laitettu?
67 (8) *(OP11 points at corresp. component.)*
68 OP12: Joo nyt. Eihän me laiteta.. eikö tuo ***COM2*** nii oo se? *(OP12 points at manual p. 5.)*
69 Portti kakkonen, hiiriportti?
70 OP11: Nii jos sulla on ***If you have*** nii sitte pitäs tuota niin ni.. *(OP11 points at manual p. 5, translates.)*

71 OP12: Mikä tämä vehe on oikeen? Ei {se ainakaan ***IBM*** oo. *(OP12 point at manual page.)*
72 OP11: {Tämä on AT.
73 Ei kö tämä on AT.
74 OP12: Onko?
75 OP11: Joo.
76 OP12: Joo, se on kyllä hyvä tietää. No sitte se pitäs olla kakkosessa.
77 Sitäkö sää tarkotat?
78 OP11: Joo, mutta onko sii.. ***Cross out the pin-settings*** [in this table *(OP11 points at manual page again.)*
79 that your system] ***can NOT use.*** Sitte siinä on että ***If you***
80 ***have.. Cross out*** [the] ***pin-setting*** [s in this table that your
81 system can NOT use.]
82 (11)
83 OP11: Siinä on, jos nyt tuon kakkosen laittaa piilohon niin siinä *(OP11 points at p. and corresp.comp..)*
84 menee ***IBM AT, IBM PS/2.***
85 OP12: Nii sehä ei voi käyttää sitte. Kyllä se tieten tuohon
86 kakkoseen pitää vaihtaa sitte.
87 OP11: ***Use any pin set number*** [*not crossed out* in the above table]. *(OP11 points at page and reads.)*
88 (20)
89 Eikö **cross out**, eikö se nyt oo jotain että "peittää"? *(OP11 points at manual page.)*
90 OP12: On. Joo.
91 OP11: Se on nuo pinnit että [*Cross out* the pin-settings] ***in this*** *(OP11 points at manual page.)*
92 ***table that your system can NOT use.***
93 OP12: Mitäs nämä sitte tarkottaa, voiko tämä kone käyttää noita? *(OP12 points at manual page.)*
94 OP11: Niin että kummin päin tämä nyt on, pitääkö se niihin laittaa, *(OP11 points at manual page .)*
95 että mitä se voi vai mitä se ei voi? Kato ko ***If you have***
96 ***Cross out pin-set.***
97 (11)
98 OP12: Kylläpä mää sen tuohon kakkoseen kumminki lykäisin... sää
99 tieten lykäisit johonki muuhun. (*Reads, quitely:*) ..[Use] ***any***
100 ***pin-set*** [that your system can NOT use.]
101 (4)
102 OP11: Niin en mää sitte ***If you have.***. no ko tässon tuo AT-kone. *(OP11 reads pointing at manual page.)*
103 OP12: Onko.. niin mutta ko.. katopa ko täällä näin.. onko tämä *(OP12 points, comparing components.)*
104 nyt sitte ***jumper clip,*** tämä musta piikki tässä? Niin..
105 (7)
106 Käytä sitä, mihin se.. *(Interprets:)* Käytä siinä, mikä ei esiinny *(OP12 reads and interprets.)*
107 esiinny tässä taulukossa. Etteikö sitä sitte saa laittaa siihen

kakkoseen? Onko se sama mihin muuhun sen laittaa? *(OP12 points at manual page.)*
.. Tuo niinko tarkottas sitä. Että saako sen pistää mihin
muuhun hyvänsä, ko ei vaan laita kakkoseen?
(5)
Onpa vähä hämärästi nyt sanottu tuo.
OP11: Nnjooo.
OP12: (*In a low voice:*) ***Use any pin-set number not*** [crossed
out in the above table.] **Tuosta** kyllä saa sen käsityksen *(OP12 points at manual page.)*
niin että sen saa laitta kaikkiin muihin paitsi ei kakkoseen.
OP11: Onpa kumma, joo.
OP12: Kato jos tämä, jos tämä on nyt tuo AT.. *(OP11 and OP12 point at manual page.)*
OP11: Joo, joo, {se..
OP12: {Sitä ei saa laittaa tuohon.
OP11: Niin.
OP12: Onpa kumma ko sen saa laittaa mihin muuhun hyvänsä vain.
OP11: Kato ny siinä on tuo COM.. kolomosessa on tuo *(OP11 points at manual page.)*
COM-kakkonen vain, ei oo muuta.
OP12: Niin jos tämän laittas kakkoseen, erikseeen niin, sitte sen
sais laittaa, ei kö sitte **ei** sais laittaa siihen.
OP11: Niin, niin että se nyt tuo menis tuo COM-kakkonen vain
tuossa, vai mitä? Sitte se ois, tuo AT ois siinä.
OP12: Kyllähän meiänhän piti.. eihän sitä saanu laittaa COM-
kakkoseen se piti laittaa johonki muuhun, mihin nyt..
OP11: Joo niinhän tämä tuleeki muuhun
OP12: Joo.
OP11: Sen takia justiin se, ei tämä niinkö sulje pois sillon, niinkö *(OP11 points at component.)*
sen vaihtoehtoa, mihin tuo on laitettu, vai mitä?
OP12: Niin, jos vetäis sen yhteen tuohon?
OP11: Häh?
OP12: Se vetää sen...
(8)
Se kytkeeki nämä kaks yhteen, *(OP12 picks up board, points at comp.)*
nuo kummakki kiskot.
OP11: Joo, niin on. Niin että se on yhtenäinen pala tuommonen että..
OP12: Nämä, niin nämä justiin. No kumminki se.. onkohan se nyt
sitte oikein?
(12)
OP11: Non näin, näin {sen kyllä vois.
OP12: {Annetaan sen nyt olla nuin sitte.
Jos ei toimi niin vaihetaan.
OP11: Niin, virta on pois. *(OP11 and OP12 read manual p. 5.)*
OP12: Joo töpseliki on pois.
OP11: Joo. *(OP11 turns to p.6.)*
OP12: Aha, pitäs hajottaa {se. *(OP11 and OP12 read manual p. 6)*
OP11: {Talonmiehen hommia.
(11)
OP12: (*Laughs.*) Tyhyjän välin vain ehtii sieltä. Aukiaisko *(OP12 intrprets instruction on p. 6.)*
tuolla paremmin? *(OP11 and OP12 disconnect screws*
OP11: Se.. pitää avata niitä ruuveja ensin kuitenki. *of PC cover.)*
OP12: No lähtee nyt
(11)
Onko täälä takana yhtään?
OP11: Ei pitäs..
(7)
OP12: On tuosa jotain, mutta ei kai nuita tarvi.. Ei joo ei tarvi ottaa.
OP11: Täältä.
OP12: Pitäs täältä vähä ottaa. *(OP12 dismounts PC cover.)*

165 OP11: Painas tältäki puolelta.
166 OP12: Kato se lähtee nuin. Siinä on tuommoset lipareet
167 OP11: Hä?
168 OP12: Tommoset lipareet.
169 (7)
170 OP11: Ota pois vaan se koko koppa siitä. Varo sielä on takana niitä
171 liittimiä.
172 OP12: Joo. Ootapa nyt, se..
173 (4) Pysysköhän se tuosa? *(OP12 places PC cover on floor.)*
174 OP11: Nosta se tuonne lattialle vaan.
175 OP12: Sielä on nuita liittimiä välisä, mutta nehän saa irti sieltä. Jaa
176 mutta sitte menee nuo kaikki. Pysyiskö se nyt tuossa? Mikähän
177 tämä on? Nyt sen ymmärtää ainaki ite.
178 OP11: Voi..
179 OP12: Ei, vain menee koko pöytä.. (*laughs*) Tohtiikohan tuota repiä?
180 OP11: Siinä on ainaki virta ny pois.
181 OP12: Joo kai sen voi nyt ottaa sitte?
182 OP11: Pitääkö ne nyt kaikki ottaa irti siitä?
183 OP12: Kato ko ne tulee tuolta rai.. välistä. Pysyy se nyt täsä.
184 OP11: Pysyy se. Tää on kyllä nyt huonosti, ko tää on näin päin; non
185 näin päin nuo korttipaikat. Tuosa.. pitääkö se kääntää vielä,
186 pitääkö se vielä kääntää tuota niin ni?
187 OP12: Mihinkä täsä oikeen veetään kortit?
188 OP11: Tuohon ne tulee, näien lomaan, ne on näitä kortiipaikkkoja.
189 OP12: Jaa tuosa..
190 OP11: Joo tuosa justiin ne oli että.. Mitenkähän se ois?
191 OP12: Voiko tätä kääntää?
192 *(Researcher instructs participants on handling the PC.)*
193 OP11: Hmm.
194 OP12: Irrotetaanpa piuha
195 *(Researcher instructs OP12 about moving in the designated space.)*
196 (11)
197 OP11: Tästä.
198 OP12: Son heti jämerämpi ase
199 (14)
200 Joo se tulee tuohon
201 (13) *(OP11 and OP12 open PC cover,*
202 OP11: Laita ruuvit kans sitte. Pyöräyttää vaan. *then disconnect cables.)*
203 OP12: Tuommoset tuommoset händy-ruuvit.
204 OP11: Joo niin ne aukes.
205 (14)
206 OP12: Niin vaan kannattako näitä nyt pistää takasin? {Pistetään. *(OP11 and OP12 connect cables.)*
207 OP11: {Laitetaan
208 vain nii sitte voi..
209 OP12: Sitte voi testata
210 OP11: Niin, testata sitte.
211 (17)
212 OP12: Se siitä.
213 OP11: Hm. Ne on sitte.. kiini siinä. Ei se oo muuta ko..
214 OP12: Riittääkö nuo?
215 OP11: Muuta ko kääntää kylymästi.. Siinä on peräti yks vapaa *(OP11 and OP12 study connecting*
216 korttipaikka sitte. *slots availabe on PC.)*
217 OP12: Jaa, olipa ruhtinaallisesti.
218 OP11: Joo, kuumminpäin tämä nyt kääntyy? Miten sää laitat tuon...
219 skruuvarilla tämä ainuu paikka. {Kumpaan..
220 OP12: {Sekö pitää ottaa irti?
221 OP11: Tuota nii. Onkohan tässä tuota nii.. onhan tässä kolomekki *(OP11 and OP12 mount board.)*

222 paikkaa. Kaks {paikkaa.
223 OP12: {Kaks paikkaa.
224 OP11: Joo.
225 OP12: Tuola ois tuosa reunassa.
226 OP11. Nii, tämä näin ja sitte on.. ei kö perskule, ei kö tuoson
227 kantava tuosa.
228 OP12: Eikö pitääkö tuo ruuvata sitte?
229 OP11: Joo. Kyllä se on tämä, täsä, joo. Joo ei siinä..
230 OP12: Hm.
231 OP12: Mitenhän se on tuolta alahalta kiini?
232 OP11: Onko se sieltäki kiini?
233 OP12: Ei kyllä se nousee.
234 OP11: Joo. Katotaanko mitä täsä lukee?
235 (14)
236 Joo ei siinä oo muuta ko kiini *(OP11 reads manual p.6.)*
237 vain. Ruuvailla. *(OP12 also reads.)*
238 OP12: Joo tuo sitte pitää sitä ruuvia mikä on niin pistää tämä siihen.
239 OP11: Onko se.. mihin se laitettii? Niin son täsä ei.. Onko se tuo? *(OP11 and OP12 go on to install board.)*
240 OP12: Se tais olla.
241 OP11: Ne on kaikki samanlaisia.
242 OP12: Saakohan tämän väärin tuonne laitettua?
243 OP11: Ei kö se..
244 OP12: Tuonne reunaan.
245 OP11: Joo, niin siihen tulee se pää tuonne.
246 OP12: Joo.
247 OP11: Vaikka niin että se on siinä kannassa kiini.
248 OP12: Joo se pitää painaa.
249 OP11: Onko se siellä? On kai se.
250 OP12: (*In a low voice:*) On kai se. Meneeköhän se nyt suoraan?
251 OP11: Joo.
252 OP12: Kyllähän se nyt vissiin.
253 OP11: Oliko se tuo ruuvi? Puuttuuko meiltä yks ruuvi?
254 OP12: Ei niitä, täälä ei ollukaan ko yks tällä puolella vain.
255 OP11: Ai jaa.
256 OP12: Sen huomaa.. ettei lähe lentoon.
257 OP11: Pitäs nähä vaivaa laittaa tuo.. kansi kiinni. (*naurahtaa*)
258 OP12: *(To researcher:)* Täytyykö kansi kiinnittää.. mitenkä se on?
259 *(Researcher says they can freely choose what to do)*
260 OP12: Voishan sen tieten kiinnittää.
261 OP11: Eikö anneta olla noin vaan?
262 *(Researcher says they should watch out for electric shock.)*
263 OP12: Joo, antaa olla.
264 OP11: Joo. Tutkitaan. *(OP11 starts reading manual p. 6.)*
265 OP12: Hutkitaan. Ei siinä oo muutako ***mouse*** ja kiinni. 9 pinniä.
266 (8)
267 [Reconnect your] ***computer cables***. Hmm, ei siinä..
268 OP12: Ei muuta ko töspelit kiinni.
269 OP11: Niin.
270 OP12: Toinen hiiri! *(laughs)* Se on se vanaha.
271 OP11: Mikäs tämä - niin joo tuosa.
272 (8)
273 Nappaakko sen..
274 OP12: Mihin se nyt tuli? Tuonne.
275 (6)
276 Oliko täsä joku pyöräytettävä homma? *(OP12 connects cable to board.)*
277 (7)
278 Näillä se menee nuin. *(OP11 watches on to make sure*

279 OP11: Se ois siinä kiinni. *installation is correct.)*
280 OP12: Ja sitte otetaan 220 voltin.. 20 voltin sähkösokki. *(OP11 glances at manual p. 6.)*
281 OP11: Hm. Se {*(laughs)*
282 OP12: {Virtajohto taitaa puuttua. Se on tuola..
283 OP11: Joo.
284 OP12: Ei kai siinä muuta oo ko pistää..
285 OP11: Eikö täsä vähä lup.. lupaillaan, että tietokonetta päälle.
286 OP12: Joo.
287 (10) *(OP12 connects mains cable.)*
288 OP11: Tuleeko se nyt.. tuleeko, kato ko siinä on pari kappaletta niitä.
289 OP12: Joo, mutta ei tuohon voi sanua.
290 OP11: No, no niin..
291 OP12: Kai se sielä on?
292 OP11: No niin. Nyt siinä ois softan installointi, että laitetaanko
293 päälle vai..? Päälle vain kone. Oota vähä.
294 OP12: Mistäs tämä käynnistetään? {Tuosta.
295 OP11: {Näin *(OP11 switches computer on.)*
296 täällä justiin. Uuuuu.. (*imitates PC sound*).
297 OP12: Armotonta hurinaa.
298 (22) *(OP11 starts reading p 7.)*
299 Pistetäänkö me DOS:ille vai Windowsille?
300 OP11: En tiä. Onkohan sinne laitettu Windowsia nyt vielä? Sama *(OP11 picks up installation disk,*
301 kai se on, jos sen vaikka DOS:ista heittää. ***How to install*** *reads p. 7, turns to p. 8 and then to p.9.)*
302 ***for DOS***. Vai ootapa.. Windowsilla on vähä lyhyempi *(OP11 turns to p.7)*
302 *(laughs)*.
304 OP12: (*Laughs.*) Jos täältä vielä löytyy Windows. *(OP11 holds installation disk.)*
305 OP11: Joo en mää tiiä, ehitään Windows sieltä. Jos löytyy.
306 (31) *(OP11 and OP12 read manual p. 8.)*
307 OP12: Löytyy kyllä.
308 OP11: Hmhm (*laughs*). *(OP11 points at manual p. 7.)*
309 (19)
310 OP12: Mitä tuosa ylähällä sanotaan? ***If you*** [are] ***using*** *(OP12 points at manual page.)*
311 [*Windows 3*, you must install the special MouseWare
312 driver and utilities that Logitech provides for *Windows*.
313 OP11: Mitä - tämä? *(OP11 points at manual page.)*
314 OP12: Tämä.
315 OP11: Niin se vaan jotain muistuttaa, että se käyttää Windowsia
316 niin se vaatii ton kovalevyn.
317 OP12: *(Thoughtfully:)* Hm-m.
318 (7)
319 OP11: [Remember that since *Windows* requires a hard disk, you]
320 ***cannot install*** [the Logitech utilities for Windows onto a
321 floppy disk.
322 (4)
323 ***Floppy disk***:iltä, joo.
324 (16)
325 Joo, se olis siellä kun.. kato ny, vaatis käyttäjätunnusta.
326 No oota vielä. *(OP11 inserts disk into computer drive.)*
327 OP12: Mitä se tuonne hyppäs?
328 OP11: Ei kö se tieten..
329 OP12: Peru..
330 OP11: Ei kö se tuota niin ni. Mitäs me tähän laitetaan?
331 (13)
332 Mitenkäs se oli ko se ei saakko sen 93, [ei?] enää pelaa nyt se,
333 kato sitä vaatii.
334 Laittaako opettaja käyttäjätunnuksen tuohon vai?
335 *(Researcher instructs the participants on how to boot up the PC.)*

336 OP12: Se meni itestään pois nyt.
337 (4)
338 OP11: Vieläkö.. saa vanahan pelaan, ei siinä (*mutters*).
339 Kato siinä se ois sitte tuo.. *(OP11 points at p. 8 and operates*
340 [3. From the] ***File menu*** [of the Windows] ***Program Man..*** *mouse in Windows interface.)*
341 ***Manager***, [select **Run**...] pitäs olla, tuola apuohjelmissa.
342 Ei..
343 OP12: Ei. *(OP11 and OP12 try to find Program*
344 OP11: Varus. *Manager/File.-This is Win. version.)*
345 OP12: Mikä tuo ***Main*** on? Onko se..? (*mutters*) *(OP11 operates mouse.)*
346 OP11: Tiedostohallinta.
347 OP12: Täältäkö se lähti?
348 OP11: Joo, se ***Program Manager***.
349 (11) *(OP11 points at manual page.)*

350 ***From the File menu*** [of the] ***Windows Program Manager***.. *(OP11 reads manual page while*
351 [select Run...] Hetkinen - mitenkäs.. *OP12 watches.)*
352 OP12: ***Program Manager*** pitäs {löytyä.
353 OP11: {Täälä
354 Hä? Niin mutta ko tämä pitää.. tämä on se.. tämän ohojelman *(OP11 operates mouse, glances at p. 8,*
355 pitäs olla se ***Program Manager***. Sieltä pitäs löytyä tuo ***File*** *then points at same page.)*
356 ***Manager***. *(OP12 also reads.)*
357 OP12: Jaa.
358 (11)
359 Se olis voinu löytyä suoraan tuoltaki, eikö se niin..
360 OP11: Hä?
361 OP12: Eikö näissä oo se *File*? Misäs se on? Tuolta ja sitte .. *(OP12 points at computer screen.)*
362 OP11: Niin joo se tiedosto, mutta hetkinen - niin joo. Tottakai!
363 Ootapa, mikäs se oli. Tiedosto. Ei kö..
364 (8) *(OP11 operates mouse, then glances at p. 8.)*
365 OP12: Ei oo sielä.
366 (15)
367 Mutta mää sitä meinasin, että mikä nyt on
368 niinko tiedostohallinta, että olisiko se löytyny tuosta
369 ylävalikosta tuolta? Onko se pistetty suoraan sinne?
370 OP11: Nyt.. tarkotatko eikö se tarkota näitä.. tätä ylävalikkoa täältä
371 justiin?
372 OP12: Että ennen kö sää menit tiedostohallintaan, oisko sieltä
373 löytyny - niin, vai onko se täälä? En mää tiiä misä se on. *(OP11 and OP12 read manual p. 8.)*
374 Aivan outo ohojelma..
375 OP11: Niin mutta ko tämä ***Program Manager*** kato pitäs olla ton.. *(OP11 points at manual page.)*
376 OP12: Jaa son sitte. *(OP12 also reads manual.)*
377 OP11: On ne täälä. Eiks se täältä pitäs löytyä, täältä ***Program***
378 ***Managerista*** tuo *File*?
379 OP12: Joo.
380 OP11: Että se on tämä, tää suomenkielinen versio, niin se..
381 OP12: Niin, se on vähä eri nimellä.
382 OP11: Onko se joku Tiedosto - mikä se on? (9) Häh-hah. *(OP11 points and glances at p. 8.)*
383 OP12: Siitä.. siitä Suorita. Onko se niinkö ***Run*** tuosta?
384 (10) *(OP12 glances at same text section.)*
385 Onko tuo Suorita sama ko ***Run***? *(OP11 reads manual page.)*
386 OP11: Joo, eiköhän se oo?
387 OP12: Mikäs se tähän päättys? Paanko mää {tav..
388 OP11: {Se pitäs
389 olla .. eeeii. eikö se tuo ***File*** olla tuosa nyt? Sitte *(OP11 points and reads manual page.)*
390 painetaan tuo Suorita.

391 OP12: Niin vaan eikö tuo oo Tiedosto justiin se ***File***?
392 Sehän on kato tuosa.
393 OP11: Mitä Tiedosto?
394 OP12: Eikö se oo *File* tämä Tiedosto tässä? *(OP12 points at computer screen.)*
395 Ko tämä on suomenkielinen versio.
396 OP11: Niin joo. Joo. Joo, näinpä. Suorita. Mutta oota nyt kö se. *(OP11 glances at manual page.)*
397 Suo.. Joo.
398 (4)
399 *(In a happy tone:)* Johou..
400 OP12: *(Happily:)* Oijoi..
410 OP11: Ei kai siinä on muuta ko A:ta ja ja kaksoispiste ja ***Winstall***. *(OP11 reads manual p. 8.)*
411 OP12: Joo.
412 OP11: Nappaapa sinne vaan.
413 (6) *(OP12 operates PC keyboard,*
405 OP12: Tuo.. hmm.. mikäs? *Winstall.* *glances at manual page.)*
406 OP11: Hm.
407 (6) *(OP12 glances at manual page.)*
408 OP11: Se ois siinä. Painetaan vähä OK:ta.
409 (16)
410 Sitte että painetaan *Help*:iä, niin saa enemmän informaatiota. *(OP11 glances at manual page.)*
411 Eiks je? Nyt pitäs kuule... kahtoa tämä toinen.. pruju *(OP11 points and reads from manual.)*
412 tästä vain.. täällä on siitä ***MouseWare*** ja ***User's Guide***.
413 OP12: Joo.
414 OP11: Non..
415 (8)
416 DOS-ohjelmia. *(OP011 interprets.)*
417 OP12: Mutta eihän meiän nyt tarvi käyttää. *(OP12 reads, watching.)*
418 OP11: *(Reads in a low voice:)* [If you plan to use DOS *(OP11 points and reads from manual,)*
419 programs in the Windows environment, you must also *(OP12 reads and watches.)*
420 run the INSTALL program (see previous page) to install the]
421 ***DOS mouse driver*** [and utilities.]. Joo täälä on näitä.. *(OP11 leafs on to p. 9 and 10.)*
422 OP12: Sielähän on.. *(OP12 keeps watching.)*
423 OP11: .. ohojeita vain..
424 OP12: .. miten näpytellään hiirtä.
425 OP11: Mutta mutta. Mää en tiiä.. tartteeko meiän
426 (17) *(OP11 ja OP12 try to install mouse driver*
427 No sen sais nyt alotetutta ton.. ohojelmiston installoinnin, *into PC directory.)*
428 tosta ENTER:istä. *(OP11 oper. mouse while OP12 watches.)*
429 OP12: Joo. Niin ko, mennäänkö noitten ohojeitten mukaan vai?
430 OP12: No kyllä luulis että..
431 OP11: Osa, osa.. katotaan sitte jos tulee epäselevyyttä.
432 OP12: Niin että installoija vaan..
433 OP11: Hmm..
434 OP12: Jo sen vetää sen tänne..
435 OP11: Kovikseen?
436 OP12: .. kovikseen, niin.
437 OP11: Jaa siellon..
438 OP12: Sehän on ennestään jo sielä.
439 OP11: Joo niin siellon.. miten sen nyt - laittaako nyt kyllä vai ei, mutta..
440 Mitä sanot?
441 OP12: Sehän on sama vaikka se siellä jo on, niin pistää uuestaanki.
442 OP11: Niin. No jatketaan nyt kuitenki.. jatketaan, vai mitä?
443 OP12: Pistetää.. vaikka.. KYLLÄ. (*imitating an actor*). Ja niin ko äkkiä.
444 (38)
445 Mitä tuosa?
446 OP11: Se niin että saa vaan että tehokkuutta lisää, että kö keskimmäinen
447 nappi saajaan tuo tuplanäpäytyksen asialle. Tietenki, tai tieten.

448 Niin tup.. keskimmäinen .. sekö on kaks.. ei kö tuo.. justiin.
449 OP12: Aina väärin.
450 OP11: Justiin, joo. Sekottaa tuon
451 (11)
452 No.
453 OP12: Joo, muuta ko... (*inaud.*)
454 (6)
455 OP11: No, onkohan nyt.. tämä niin tähellistä lukia?
456 OP12: Onko täsä vaan nii se stoori, kuka sen on teheny?
457 OP11: Ei kö täsä on viimeisintä tietua tai jotain tommosta.
458 OP12: Aika rankasti.. tekstiä.
459 OP11: Joo.
460 (7)
461 OP12: Onko tähän tullu, käyttöopas veetty tähän? On vähä samat
462 asiat siinä.
463 (11)
464 OP11: Nää.. ei taija.. nää oo niin.. tähellisiä, tieten. Vai mitä luulet?
465 OP12: Eipä taija olla.

Appendix 13: Main results of participant interview. (Abbreviations:T1: Task One, T2: Task Two)

Part.	Division of tasks	Interaction and collaboration	Manual text access	Evaluation of contibutions	Previous exper. & knowledge
OP03	* Did practical work, and occasionally read manual. * Pair was in charge of reading manual.	* Both got help from one another in T1 and T2. * If he had done T1 alone, he would have used manual less.	* Manual helped process T1. * Thinks a dictionary would have helped, but he did not ask for it. *Hard access in T1 manual: *daylight time; "S"; key-pad; indicator"; EXT".* * An entire page in T2 manual remanained very unclear to him. * Reads manuals for equipment he buys; first in one go, carefully, later in step-by-step manner for operating. *Hard access in T2 manual: *IRQ block; keypad; indicator;*	* Thought his pair read too carefully, too much in T1 manual; his pair did'nt skip where necessary. * Thinks T2 was too difficult for him and his pair.'	* Has a VCR at home (=> T1). * He and his pair had about equal level of knowledge on T2; "no experts at all". * Has set VCRs (clock and timer) often (=> T1).
OP04	* Did the reading, while his pair pressed the buttons, for the most part (in T1).	* Has known his pair since elementary school. * Has co-worked with pair, in present eng. ed. programme. * If he had worked alone, he would probably have kept more on the safe side, for details.	* T1 terminology was familiar to him; knew "almost all terms". * T1 terms were easier than terms in T2. *Hard access on T1 manual: *daylight saving time period; defeat tab is intact.* * T2: *expansion slot; serial adapter; cross out; installation; labeled* * Says easier terms should be used in the IRQ block table; special terms should be explained (for laypersons).	* Thought his pair knew more about working with VCR (=>T1). * Felt his pair worked a bit too fast in T1. * He and his pair had about equal level of knowledge in T2. * Reviewing video recording of their session, points out several "errors" problems in T1.	* Has a VCR at home (=>T1). * He had no previous exper. of VCR programming (=>T1); saw at once pair was good at this. * He worked for an engineering company in Sweden, doing maintenance of printed boards.

Part.	Division of tasks	Interaction and collaboration	Manual text access	Evaluation of contibutions	Previous exper. & knowledge
OP05	* Read &commented, while his pair did pract. work in T2. * Division of tasks was o.k. for him.	* Says they had disagreement, about level adjustments, when working on T2. * In T2, says it was good to have pair co-working with him. * Says pair-work gives more reliable outcome. * Working alone would take more time, for testing & checking things.	* Setting the clock and timer (T1) was easy; he had no problems, because the instructions were good. * No hard-access points in T1 manual at all. * Says T2 had "worse" operating instructions; not much help for the novice. * Did not understand some of language in in T2 manual. * However, does not specify any hard-access terms in manual.	* Their work in T2 was "a lot of fuss."	* Reports having operated a lot of VCRs (=>T1); no problems.
OP06	* For T1, his pair did the reading,but they also read some text together. * He did not do much reading in T2 at all - just looked at manual pictures.	* Says co-working with pair is safer than working alone. * Working alone, it would take more time; would have to look up words in the dictionary etc.	* T1 had "clear operating instructions" - easy to understand. * Hard-access terms in T1 manual: *key-pad* * Says T2 manual text was more difficult language (than T1 manual). * T2 manual did not provide proper information "about the buttons". * Does not specify any hard-access terms.	* He knew his pair was "better at English". * InT2 they mainly worked with trial and error. * Doubts if his pair knew all terms in the T2 manual. * He is scared of working with "machines like this... they are expensive and may break."	* Says he had some knowledge of operating VCRs (=> T1).
OP07	* In T1 both read & did practical work. * In T2 he read and his pair did most of practical work.	* Has co-operated to some extent with pair, in present engin. study. * Pair-work on T1 and T2 enabled check-ups by two - safer outcome. * When pair-working, one could advance faster, while the other one lagged behind, and then caught up.	* Says he did not really like the T1 manual. * Says T1 manual had "unnecessary stuff that didn't relate to it" - the many details made things harder. * Does not specify any hard-access terms in T1 or T2 manual. * Dictionary could have helped read T2 manual.	---	* Says he has "an old banger of a VRC" at home (=> T1).

Part.	Division of tasks	Interaction and collaboration	Manual text access	Evaluation of contributions	Previous exper. & knowledge
OP08	* In T1, he and his pair read about as much, whereas in T2 they had more distinct roles of a reader and a technician. * He was technician in T2. * Would have liked to read more when working on T2.	* Has not co-worked a lot with his pair, in practicals etc. * Says he didn't have any difficulties co-operating with his pair. * Working alone, he would proceed more carefully and more slowly than with pair; working alone, he he would have to think more.	* Says a dictionary could have helped to read manual T2.	--	* Has limited experience of installing PC per. equipment.
OP09	* In most of T1 and T2, he read and his pair did practical work.	* Has co-worked in laboratory coursework with pair. * Working alone on T2, he would have read manual more carefully	* Says T2 manual (with pictures) guided pract. work appropriately. *Hard access in T1 manual: *Launch Windows* *In T2 manual: *daylight saving time.*	* Collaboration with pair was successful. * Competition can step in, if you "muck up things a lot"; pair gets nervous because of this.	* Says he was a first-timer to work with tasks like T1 (ie., installing mouse). * Has operated similar VCRs, not this particular model (=>T2).
OP10	--	* Has co-worked in lab. course-work with pair, and he sits next to him in class. * Working as a pair, responsibility is shared; you do not have to think as carefully about what you are doing compared to working alone, because your pair is watching. * Team-work is also more fun.	* Does not specify hard-access terms in T1 manual. * Says if he saw half the words of T1 manual individually, he wouldn't understand them, but as coherent text - with appropriate pictures - he gets the meaning. * Says he "read page by page"; cannot pinpoint any problematic terms in T1 manual. * When interviewer asked, he said he did not know *IRQ block*.	* Says most of their time on T1 was spent on removing the PC cover; "none [of the them] knew what to do". Really needed a PC manual for this. * He and his pair usually have some competition going on.	* He and his pair never did tasks comparable to T1. * On T1, says that he and his pair had revious expreinec of this or similar tasks. * Says T2, or setting the VCR, was familiar to him.

Part.	Division of tasks	Interaction and collaboration	Manual text access	Evaluation of contibutions	Previous exper. & knowledge
OP11	* In T1, he and his pair read equal amounts of text & took turns for doing practical work. * In T2, he read more than his pair.	* Working alone, the task would have taken more time; says he reads slowly and proceeds more slowly when working alone. * Pair-work helps to speed up.	*Hard-access terms in T1 manual: *daylight saving time.* * The section of instructions on installing the mouse software was very short, and "no help at all" for them. * Says the T2 manual should provide more explicit information about how one is to set IRQ.	* Thinks his and his pair's knowledge of English is about the same: "no great differences". * Says one was able to fill in the other one lacked specific knowledge - ie. to compensate. * He is more familiar with PC technology than his pair.	* Says he has a VCR at home, but different from this, so knowing how to operate that did not help him a lot in T1. * Previously, has installed a PC board, but did not know how to do IRQ settings (=> T2).
OP12	* In T1, he and his pair read about as much. * They were "roughly as fast readers", he thought. * In T2, his pair read more; he just read the table of contents.	* Says co-operation with his pair was "reasonably good". * Has co-worked some with pair, in present engin. study. * Working alone, T1 would have "turned out roughly the same" * T2 could take more time, if he was working alone, because his pair knew more, which helped a lot.	* Says T2 manual did not offer much help, it just had "a lot of text". * In T2 manual, the IRQ table was hard to understand. * Software installation was easy in T2, just follow the installation software instructions. * For the user with less expertise, manuals, like the one for T2, should "explain things in more detail". * Hard-access terms in T1 manual: *daylight saving time; preset; built-in timer; carry out; blink; assign automatically; defeat tab.* * Hard-access terms in T2 manual: *cross out pin settings; IRQ block*	* Says his pair knew more about computers (=> T2).	* Has a VCR at home, with Engl. language instructions (=> T1). * Does not have a computer at home, but has done some inst. work with his brother's Amiga.

APPENDIX 14-A

TABLE OF CONTENTS

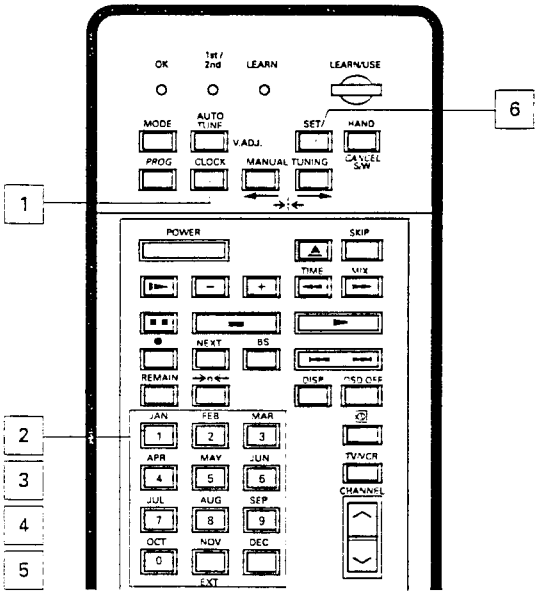
APPENDIX 14-B

4. SETTING THE CLOCK AND THE VCR CHANNELS

4.1 SETTING THE CLOCK

This VCR has a built-in digital timer clock which must be set to the present time. The clock is used to keep time for the quick timer and timer recording functions. Setting the clock can only be done with the remote control unit.

Check before starting:
- Turn on the TV and VCR.
- Set the TV to the video channel.
- Make sure the batteries are properly inserted in the remote control unit, and that the remote control unit's cover is closed.
- Set the VCR/TV switch to the "VCR" position. Note:If the VCR/TV switch is set to the "TV" position, the clock cannot be set.



1 Press the CLOCK button.
The Programme & Clock screen will appear on the TV screen. The item ready for data entry will be blinking.
* When setting the clock during the daylight saving time period, press the BAND/CANCEL S/W button, and make sure the "S" for Daylight Saving time appears on the display. The clock will then keep time according to the daylight saving time.
2 Set the present hour and minutes using the key-pad.
For single digit numbers press the 0 key and then the number.
To set 8:15 for example, press the 0 key, the 8 key, the 1 key and then the 5 key.
3 Set the date using the key-pad.
For single digit numbers press the 0 button and then the number.
4 Set the month using the key-pad.
Each of the 12 keys on the key-pad represent one month. Press the desired key.
5 Set the last two digits of the year using the key-pad.
6 Press the SET button to start the clock.
The clock will start keeping time.
After a few seconds, the Programme & Clock screen will disappear from the TV screen.

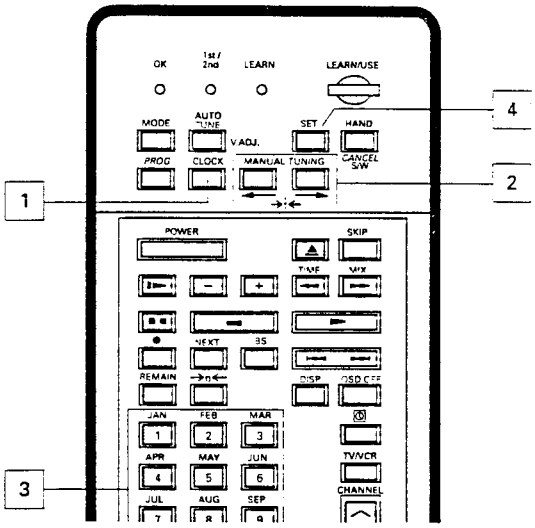
NOTE:
- If you make a mistake during the clock setting procedure and wish to correct the input data, press the <-- or --> MANUAL TUNING button repeatedly to go to the data entry to be corrected, then re-enter the correct data.

Correcting clock data

If the clock time is incorrect, it is very easy to correct it.

1 Press the CLOCK button.
2 Press the <-- or --> MANUAL TUNING button until the data you wish to correct blinks.
3 Input the correct data using the key-pad.
- Repeat steps 2 and 3 to correct other data.
4 Press the SET button when all data has been corrected.

After a few seconds, the Programme & Clock screen disappears.



Daylight saving time

During the daylight saving time period, the VCR clock can be easily set one hour ahead. This operation can also be used to set the clock one hour back to the normal time, once the daylight saving time period is over.

1 Press the CLOCK button.
2 Press the CANCEL, S/W button.
If the clock is set to the normal time (the "S" indicator is NOT displayed), the clock will advance one hour. The "S" indicator will appear to signify the clock has now been set to daylight saving time.
If the clock is already set to the daylight saving time (the "S" indicator is displayed), the clock will be set one hour back. The "S" indicator will disappear.

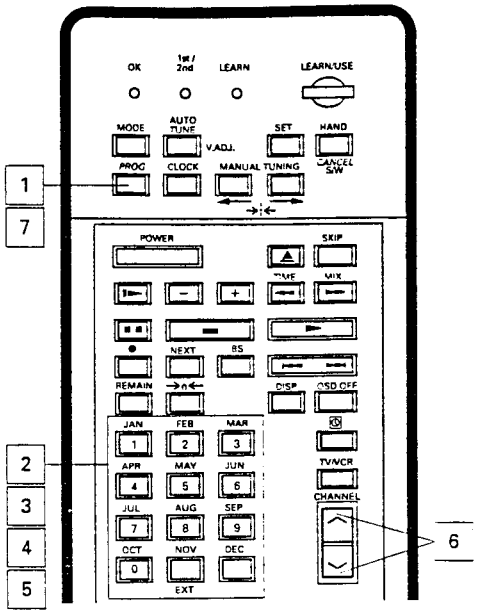
APPENDIX 14-C

7.2 TIMER RECORDING

Using the built-in timer, the VCR can be preset to carry out unattended recording of television broadcasts at a desired time. This is called "timer recording".
Up to 8 different recordings can be programmed for timer recording -- and this can be done up to one year in advance.

Timer programming is done by entering the desired programme data (i.e., recording time, date, month, year and the TV station you wish to record from) into the VCR's timer memory.

Check before starting
- Insert a video cassette tape with the erasure prevention tab intact. Be sure the video cassette tape will last for the duration of the programme to be recorded.
- Turn on the TV and set it to the video channel.
- Make sure TV stations have been preset on the VCR.
- Make sure the clock shows correct time.
- Make sure the EXT indicator is not lit. If it is, press the EXT key once.
- Set the recording speed to SP (video recording) with the SP/LP button on the VCR front panel.
- During programming, the blinking segment on the Programme & Clock screen indicates the item ready for data entry.
- If you make a mistake or wish to change programme data during programming, press the <- or -> MANUAL TUNING button repeatedly until you reach the data entry that you wish to correct and then re-enter the information.
- Note, in the following instructions, when using the numeric keys, press "0" first for single-digit entries.



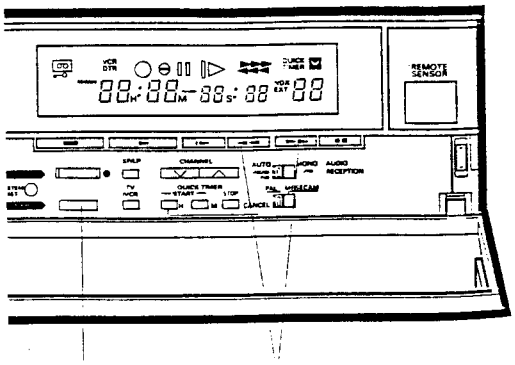
Programming for timer recording

1. Press the PROG button.
2. Select the programme number where you wish to enter data using the key-pad.
3. Set the start time hour and minutes using the key-pad.
4. Set the stop time hour and minutes using the key-pad.
5. Set the date using the key-pad.
   * The month will be assigned automatically, unless the start time is set to a time before the present time. To change the month, press the <-or -> MANUAL TUNING button to return to the blinking month, then set the desired month by pressing one of the twelve keys on the key-pad.
6. Set the channel, from which you want to record, using the CHANNEL buttons or the key-pad.
   * To preset other programmes, repeat steps 2 to 6.
7. When you are ready, press the PROG button to memorize the timer recording data.
   The Programme & Clock screen will disappear.

The VCR has now been programmed. However, to actually record programmes, you need to set the VCR to the stand-by timer recording mode, as explained in the following section.

Proceeding with timer recording

1. Load a blank video tape.
   If the video tape's recording defeat tab has been removed, cover the cavity with adhesive tape.
2. Fast forward or rewind the tape to the point where you want to start recording.
3. Press the Timer button.
4. The VCR will automatically turn on and off in accordance with the memorized timer programmes.



APPENDIX 14-D

Connect the mouse

Your bus mouse has two parts to install: a bus board and a mouse. You do this in three tasks:

A. Configure the bus board.

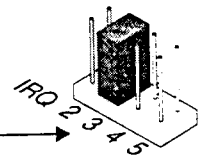
B. Install the bus board.

C. Connect the mouse to the bus board.

Configure the bus board

1. **Carefully remove the bus board from its antistatic packaging.**
   Protect the bus board while you are handling it: especially, avoid contact with electrostatic substances such as polystyrene plastic.

2. **Find the IRQ block on your bus board.**
   The IRQ block looks like this, with four pin-sets labeled **2** through **5**.
   In this illustration, the jumper clip is covering *pin-set 3*.



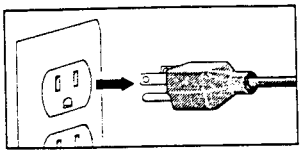
3. **Find the correct setting for the IRQ jumper pins on your bus board.**
   Cross out the pin settings in this table that your system can **NOT** use.

If you have	Cross out pin-set
IBM XT	5
IBM PS/2 (model 25 or 30)	5
IBM AT	2
IBM PS/2 (model 30-386)	2
Serial Adaptor on COM1	4
Serial Adaptor on COM2	3
EGA or VGA Graphics Adaptor	2
Parallel Printer Port #2 (LPT2)	5

4. **Place the jumper clip.**
   Use any pin set number *not crossed out* in the above table.

Install the bus board

1. **Turn OFF your computer *and* unplug it from the outlet.**
   This is good practice whenever you install any new hardware. It insures that there is no power to any of your system components.



APPENDIX 15

Questionnaire on reading strategies with participant responses

Individual use of reading strategies were reported by questionnaire immediately after the first and second task-and-reading. The self-reports were given on Likert-type scale values of 1 through 7, 1 standing for "Is not true of me", 7 for "Is fully true of me," and CS for "I cannot say". Column numbers 1 to 20 refer to strategy descriptions given on next page.

1. Before I started to read the text in detail, I skimmed it quickly to see the topic.
2. When reading I was able to distinguish the main points from supporting details.
3. When I noticed something in the text I hadn't understood , I figured it out on the basis of what I had read.
4. My previous knowledge about the topic made it easier for me to understand what I was reading.
5. I used less time for reading passages that dealt with things that I was already familiar with.
6. I read all the passages of the text with equal care.
7. When I noticed that I didn't understand the text, I read on hoping that it would become clear to me.
8. When reading I paid attention to the structure of the text, eg. subheadlines and paragraph organisation.
9. Before starting to read, I recalled what I already knew about the topic.
10. From time to time, I stopped to think about what I had read.
11. After completing a paragraph, I reviewed what I had read.
12. When there was an unfamiliar word in the text, I tried to guess its meaning from the context, or on the basis of other languages I know.
13. When reading, I had a pretty good idea about what I had understood and what I had not.
14. My process of thinking broke down, if I had to figure out difficult words or structures.
15. I noticed that I was able to understand the text, even if I did not know the exact meaning of every word.
16. If I was not able to figure out a passage, I passed it and went on reading.
17. I translated all of the text in my mind.
18. I read faster the passages that I thought were not essential for the topic.
19. When I noticed that I had not understood the text, I went back and tried again.
20. I pronounced an unfamiliar word in my mind, to identify it.

APPENDIX 15

A. First task-and-reading

Reading strategies

Participant	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
OP03	3	5	6	7	6	3	6	3	6	5	3	6	5	5	5	6	6	6	3	5
OP04	6	7	7	6	3	2	5	5	5	6	6	7	3	2	7	3	2	7	6	6
OP05	1	1	1	1	1	7	1	7	1	1	7	1	1	4	2	1	1	1	7	7
OP06	5	6	6	5	5	3	6	6	5	5	4	6	5	2	6	6	6	6	6	5
OP07	6	3	6	7	7	3	2	1	6	5	2	5	3	6	6	2	6	7	7	2
OP08	7	5	7	6	6	7	6	5	6	2	1	7	7	4	7	7	1	7	1	1
OP09	CS	6	5	7	6	3	5	CS	6	4	CS	5	5	CS	7	5	5	7	5	2
OP10	5	6	7	5	6	2	5	6	5	3	3	7	5	3	7	6	5	6	3	6
OP11	2	6	5	7	6	2	5	7	CS	2	1	7	4	1	6	6	CS	6	6	CS
OP12	2	2	6	7	7	2	3	1	6	6	7	7	6	3	4	4	7	6	5	6
Ave.	*4,1*	*4,7*	*5,6*	*5,8*	*5,3*	*3,4*	*4,4*	*4,6*	*5,1*	*3,9*	*3,8*	*5,8*	*4,4*	*3,3*	*5,7*	*4,6*	*4,3*	*5,9*	*4,9*	*4,4*

B. Second task-and-reading

Reading strategies

Participant	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
OP03	4	5	5	2	5	3	5	3	4	5	3	4	5	5	4	5	5	5	5	4
OP04	6	5	6	2	6	2	5	5	6	5	6	6	6	3	6	2	5	7	6	6
OP05	1	1	1	3	1	5	3	7	2	1	7	3	1	7	3	1	1	1	1	7
OP06	5	6	6	4	3	3	6	6	5	6	4	6	5	2	6	6	6	6	6	5
OP07	6	5	5	4	5	1	6	2	5	4	2	6	3	6	5	6	4	6	6	2
OP08	4	5	5	2	7	3	4	7	3	5	2	6	5	4	6	6	3	5	4	1
OP09	1	4	CS	7	6	1	1	1	7	CS	2	CS	7	1	CS	1	7	7	CS	2
OP10	5	6	7	7	6	2	7	5	6	2	1	7	6	1	7	7	5	6	1	6
OP11	5	5	5	7	6	2	6	4	5	6	2	6	4	2	5	5	CS	4	7	4
OP12	3	2	6	1	3	2	4	1	3	6	6	5	6	4	5	3	6	3	6	6
Ave.	*4,0*	*4,4*	*5,1*	*3,9*	*4,8*	*2,4*	*4,7*	*4,1*	*4,6*	*4,4*	*3,5*	*5,4*	*4,8*	*3,5*	*5,2*	*4,2*	*4,7*	*5,0*	*4,7*	*4,3*