Leena Vaurio

Lexical Inferencing in Reading in English on the Secondary Level

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JYVÄSKYLÄ STUDIES IN EDUCATION, PSYCOLOGY AND SOCIAL RESEARCH

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Esitetään Jyväskylän yliopiston kasvatustieteiden tiedekunnan suostumuksella
julkisesti tarkastettavaksi yliopiston Villa Ranan Blomstedt-salissa
joulukuun 12. päivänä 1998 kello 12.

Academic dissertation to be publicly discussed, by permission of
the Faculty of Education of the University of Jyväskylä
in the Building Villa Rana, Blomstedt Hall, on December 12, 1998 at 12 o´clock noon.

UNIVERSITY OF JYVÄSKYLÄ

JYVÄSKYLÄ 1998

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Cover
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ISBN 951-39-0352-4
ISSN 0075-4625

Jyväskylä University Printing House, Jyväskylä
and ER-Paino Ky, Lievestuore 1998

ABSTRACT

Vaurio, Leena
Lexical Inferencing in Reading in English on the Secondary Level
University of Jyväskylä, 1998, 147 p.
Jyväskylä Studies of Education, Psychology and Social Research,
ISSN 0075-4925; 145)
ISBN 951-39-0352-4
Diss.

The study investigated the strategies and problems of Finnish high school students when inferring meanings of unknown words in English texts. It also studied the changes in lexical inferencing as students' proficiency in English improves, and how lexical inference tasks compare with the school exit examination in English.

The subjects were Finnish high school students (N=26). They translated a number of unknown words in English texts into Finnish. They did the same task twice: with and without explanations for the translations. The answers were analysed for the students' strategies and problems. In addition, the answers of two unsuccessful students were analyzed.

A comparison of the answers showed that there were both quantitative and qualitative changes, indicating improved proficiency. The qualitative changes were: 1) a better sensitivity to the syntactic patterns of English 2) better vocabulary skills 3) more refined answers, and 4) more top-down processing. The analysis of the answers of the two unsuccessful students revealed two different learner profiles. A comparison with the matriculation examination in English showed that the strongest connections with the inference tasks were between the subtests of open-ended reading comprehension, structure-vocabulary, and composition.

The results indicate that lexical inferencing and foreign language proficiency are related. Secondly, there seems to exist a threshold level which must be passed before proficiency can improve. Thirdly, the main causes of failure seem to be poor word recognition, mistaken meaning of homonyms, incorrect morphological analysis, and failure to check the guess against the context. This study paid also special attention to the problems caused by Finnish, and to the way lexical inference improves with increasing proficiency.

Key words: Lexical inferencing, reading in a foreign language, reading comprehension, foreign language learning, English as a foreign language

PREFACE

Learning has never ceased to intrigue and fascinate me. What are the prerequisites and conditions of successful learning? In what ways do individuals differ in the ways and outcomes of their learning? What is the role of teaching in learning? Is learning of foreign languages similar to other kinds of learning or is it a special form of learning? These were some of the fundamental questions that made me want to go into the world of learning a bit more deeply than is possible in the everyday business of teaching at school. Taking up post-graduate studies seemed to be a suitably disciplined way to gain more knowledge of - and hopefully insight in - learning in general and foreign language learning in particular.

In the long process to complete this study I have certainly learned a lot: About learning, about long work processes, about the ways in which research in this field is conducted, and about myself. I have not, however, obtained any definite answers to my initial questions and, frankly, I think that these questions will always remain partly unanswered because of the complex nature of human learning. This is, of course, the reason why they are so intriguing. I hope, however, that this study sheds some light on foreign language learning so that the reader will benefit from reading it. I certainly have benefited from writing it.

Fortunately, this study was not conceived or born in isolation. Professor Sauli Takala, Centre for Applied Language Studies, University of Jyväskylä, was involved right from the very beginning. During all the years of working on this thesis he has given me generous help and support whenever I felt the need for it. His profound expertise in the field of foreign language learning, teaching and testing - and his extensive library - have always been at my disposal. I am very much indebted to him for his help.

I owe many thanks to Professor Leena Laurinen, Department of Education, University of Jyväskylä, for the sound and insightful advice she gave me on several occasions. She did not count the hours she spent discussing the work in progress with me. These discussions were very important, industructive, and delightful.

I am also very grateful to Professor Sirkka Hirsjärvi, Department of Education, University of Jyväskylä, who has been most encouraging, even in my worst moments of doubt. Without her friendly persistance this study might not have been finished at all. I have great admiration for her ability to see through to the core of matters and for her way of guiding post-graduate work in a positive and constructive way. I want to express my gratitude to Professor Irma Huttunen, University of Oulu, for her insightful comments. She has long been one of my idols in the field of foreign language teaching.

Post-graduate work can be very lonely at times and the researcher occasionally takes a good ride on the roller-coaster of extreme emotions. Fortunately, I did not have to suffer these ups and downs all by myself: The Weird Sisters, Dr. Hanna Jaakkola, University of Helsinki, and Dr. Maija Saleva, University of Turku, were there for me, gave me encouragement when there was a need for it and kept my feet on the ground when that was necessary. They read and commented on the manuscript several times during the work process. Their

comments were invaluable. I am going to miss those long discussions with those two wise and knowledgeable experts. But luckily discussion on other topics will continue on less disciplined occasions. Thank you, Hanna and Maija.

I also wish to thank the principal of my school, Mikko Sinisalo, for being so understanding about the leaves of absence I had to take to write this study. Working in The Second Teacher Training School of The University of Helsinki has been very rewarding, due to the employer's positive attitude, enthusiastic and active colleagues, and great students. I am thankful to all of them for providing such a stimulating and supportive working environment. Very special thanks go to Marjatta Vapaasalo, a colleague and an art teacher, for designing the cover of this study.

I was also financially assisted by a grant from the Eeva Rauhankallio Fund of Finnish Culture Foundation. I want to extend my thanks to the fund.

Friends and relatives are usually the ones who have to suffer social neglect and absent-mindedness on the part of the scholar. My friends and relatives have been patient, understanding, and have always expressed faith in me. It is good to know that I can count on the support and good will of so many people dear to me. I dedicate this study to my late parents, who always stressed the value of learning and studying over more materialistic values. They would be happy for me now.

CONTENTS

INTRODUCTION

To be able to read English is an important skill for everyone, but even more so for the members of such a small language community as Finland. Both access to information in one's studies and success in working life are often dependent on one's ability to comprehend written English. Chances to read for pleasure are also enhanced if the reader is able to read English fairly fluently.

To acquire a sufficiently good reading skill in English requires, however, a great deal of work and good reading strategies. The enormous size of the English vocabulary, in particular, presents problems to foreign learners, especially to those whose mother tongue is as unrelated to English as Finnish is. Consequently, it is important to develop efficient reading strategies to help learners overcome vocabulary problems as easily as possible. One such strategy is lexical inferencing, i.e. the ability and willingness to infer meanings of unknown words as they appear in written texts. Lexical inferencing is the focus of the present study.

This study has its roots in practice, not in theory. The initial interest was aroused by the problems that the author, a high school English teacher, had discovered in the reading strategies of her students. The purpose of the study is to explore the problems that Finnish senior high school students of English encounter in lexical inferencing and what strategies they use to solve those problems, and by doing so, to gain insight into how processing of written English develops.

The specific research questions addressed in this study are:

1. What kinds of strategies and sources of knowledge do Finnish-speaking high school students use when they try to infer meanings of unknown words in English texts?
2. What problems and causes of failure can be detected in their lexical inferencing?
3. Are there any qualitative or quantitative changes in lexical inferencing as the students' proficiency in English improves?
4. How do the scores in lexical inference tasks compare with those of the high school exit examination (matriculation examination) in English?

The collection of data, the observations, and the instruction in lexical inferencing took place in a natural classroom context, with the teacher as the researcher. Research of this kind has several disadvantages compared to experimental studies because numerous factors cannot be controlled, the subjective element is substantial, and the possibilities of verifying the results through sophisticated quantitative means are rather meagre, if not non-existent.

On the other hand, there are advantages in a teacher-as-researcher study. Because the school circumstances, the teacher, the instruction, and the students can remain the same throughout the study, these factors are more stable than in studies using more rigorous means of investigation. An additional advantage is the longitudinal perspective: a teacher who teaches the same students for almost three successive years is familiar with their personalities and circumstances and has much more information about how the students' proficiency develops than an outside researcher could possibly have. This knowledge can be exploited, among other things, when interpreting the results.

Another important aspect in classroom research is its realism. The real world is so much more complex and unpredictable than the world of controlled studies that many language teachers find experimental research unrealistic, irrelevant and unhelpful in their work. An additional aim of this study is to try to overcome this obstacle by building some links between theory, research, and practice.

1 THEORY AND CONCEPTS

1.1 Cognitive theory

The theoretical orientation that provided the initial basis for studying lexical inferencing was the cognitive approach to learning. As the work on the topic continued, it turned out that the thoretical framework that indeed seemed to be the most helpful in organizing and explaining the data of the present study was the current cognitive approaches. They see second language learning and reading as complex skills, they understand reading comprehension as the construction of meaning, and they emphasize the role of previous knowledge in the processing of new material, which all are relevant factors in reading in a second language and in lexical inferencing.

There are, however, inadequacies in the cognitive learning theory as far as second language learning is concerned. Firstly, it is vague regarding the role of explicit grammar knowledge in language learning and does not offer a clear explanation of transfer (Towell & Hawkins 1994, 54). Secondly, the cognitive approach, which sees learning a second language only in terms of the acquisition of a complex cognitive skill, does not take into account some specifically linguistic constraints (McLaughlin 1990, 126). In second language learning there are some universal and developmental elements which cannot be taught. R. Ellis (1990), among others, claims that the theory cannot explain the presence of those acquisitional sequences that cannot be influenced by instruction. Since, however, most language material is language specific and learnable (Bialystok 1992; Jackendoff 1992), the cognitive learning theory provides a suitable *general* framework for the purposes of the present study.

1.2 Schema theory

Within the cognitive approach, the *schema theory* (e.g. Rumelhart 1980) also helps to organize and understand the data of the study at hand. R. C. Anderson (1985, 372) defines the reader's schema as "his organized knowledge of the world which provides much of the basis for comprehension, learning and remembering ideas in stories and texts."

The schema theory has predominated in second language reading research for the past decade (Koda 1994, 16) and it too has been criticized (e.g. Norris & Phillips 1987; Forrester 1996). For example, it has been noted that the theory has its limitations because it focuses on the knowledge that the reader already has. It does not deal with the new information that does not fit into the reader's existing schemata although people are able to understand it (McNamara et al. 1991, 490). Schema theory also neglects the importance of word recognition - a lower level of verbal processing which is particularly critical in reading in a second language (Koda 1994, 16).

On the other hand, as Grabe (1991, 384) points out, in second language research the concept of schemata is of practical help and has offered a useful metaphorical explanation for many research results. It also offers a consistent view of the various phenomena of such complex processes as reading (Forrester 1996, 164). In the field of second language reading comprehension and instruction, it explains the importance of knowledge of language and textual organization, and the help that is provided by the activation of relevant content information, and why the lack of this activation can be a source of difficulty (p. 390). Because of its practicality and explanatory power in second language reading research, the schema metaphor is adopted in this study, keeping the reservations mentioned above in mind.

Readers' schemata have been formed by real-life experiences. There are three types of schemata which are useful in understanding written text: prior linguistic knowledge, knowledge of the content, and knowledge of the rhetorical structures of texts (Nurss & Hough 1992, 291). Schemata are used to guide the processing of the text and also to fill in the information that is not overtly stated but has to be inferred in order to construct a coherent picture of the contents of the text.

If the reader has the necessary skills and schemata to process the content and the language, the processing is automatic and effortless. Readers do not have to allocate their attention to the processing itself, and their brain capacity can be devoted solely to comprehension. Brain studies show that the processing of familiar material causes much less activity in different parts of the brain than the processing of new information does (Raichle 1994, 40). If, on the other hand, the topic is unfamiliar, the reader's brain has to struggle much more to fill in the many slots in the schema. Such brain work is often required of second language readers because there are gaps in their knowlegde of the language, and these slots are the more numerous the less well the language has been learned.

1.3 Second language acquisition theories

The cognitive learning theory provides a general framework, but because the subject of the present work is second language learning, a theory or model of this specific area of learning would be useful to account for and explain the findings. However, no such dominant, generally accepted theory exists although diverse and oppositional theories and models abound (Long 1993, 223).

The focus of this study is on *instructed* foreign language learning. A good theory should not only explain this but also be flexible enough to be able to explain the phenomena that are common to all language learning, irrespective of the learning context. In addition, it should account for language acquisition that takes place outside school, in informal contexts, as well as for incidental language acquistion in the classroom. Because such a theory or model does not exist as yet, a few relevant issues introduced by a few theories are briefly taken up.

Among the theories that offer explanation on why second language learning improves with time is McLaughlin's (1990b) theory of automation and reconstruction, based on the notions of automatic and controlled information processing (Schneider & Shiffrin 1977; Shiffrin & Schneider 1977). According to this theory, qualitative changes take place in language learning when attention-demanding operations become automatic through practice. The learners become able to process language in increasingly larger chunks. Consequently, they shift strategies and restructure their internal representation of the target language (McLaughlin 1990b, 125). Structures that have seemed unlearnable suddenly become transparent and learnable. This is an indication that restructuring of the language material has occurred (McLeod & McLaughlin 1986).

A controversial and relevant issue in instructed foreign language learning is the relationship between *implicit* knowledge and *explicit* knowledge. Three positions are advocated. The first one is that explicit knowledge cannot become implicit (e.g. Krashen 1982; Paradis 1994), in other words language cannot be learned, but it is acquired. The second view is that there is a strong connection between explicit and implicit knowledge that can be consciously learned and therefore taught. The traditional grammar-translation instruction represents this view. The third position claims that at least some explicit knowledge can become implicit (see Schmidt 1994) so instruction can have a beneficial effect on some aspects of language learning.

The last view (the so-called weak interface model) is advocated, among many others, by R. Ellis (1994). In his theory of instructed second language learning, explicit knowledge plays an important role. Among other things, it can help the learner notice some linguistic features that might otherwise go unnoticed and in that way promote the learning of that particular feature. Explicit knowledge may also facilitate the process of noticing a possible gap between the learner's interlanguage and the target language and consequently indirectly contribute to the development of the learner's interlanguage. Thirdly, explicit knowledge of linguistic rules may become implicit knowledge directly if the item or rule is not developmental or if the learner is ready for it. Knowing the foreign language rules may also inhibit negative transfer of the mother tongue rules into the learner's inter-language (pp. 97-102). Practical experience appears to support this view.

Another model that appears to be relevant to instructed foreign language learning is the *Multidimensional Model* of second language learning (Pienemann, Johnston & Brindley 1988). This model states that in language learning there are both developmental features that cannot be affected by instruction and variational features which can. Instruction, however, can be effective only if the learner's interlanguage is close to the point when the structure to be taught is acquired. In other words, this *Teachability Hypothesis* (Pienemann 1985, 37) states that instruction can only be effective if it is directed to the variational features at the right moment when the learner is about to learn them. This notion is akin to Vygotsky's famous idea of the zone of proximal development (Vygotsky 1934/1986).

To sum up, this study is based on three assumptions: that the different roles of automated knowledge, control of knowledge, and reconstruction of knowledge can account for some findings; that conscious noticing and explicit knowledge of linguistic features promote language learning, and that instruction can have an effect on some aspects of language learning but not all.

1.4 Terminological issues

Because some key terms - such as second language and foreign langugage - in the field of language learning research are often vaguely or imprecisely used, some clarification may be in order. Some writers (e.g. Ellis 1990) do not distinguish between the terms *second language* and *foreign language* but use second language to denote any language that is learned after the mother tongue or the first, primary language (L1). Often, however, a distinction between second language and foreign language is made. Then second language (SL) refers to the dominant language of the community. Thus immigrants are typically learning a second language, either formally at school or naturally in real life, or both. A foreign language (FL), on the other hand, is the language of another language community. It, too, may be learned in formal instructional contexts and/or informally.

In this study the notation L2 is used as an umbrella term to refer to any non-primary language, be it a second language or a foreign language, because frequently the distinction is not relevant to the issues at hand. When the notations SL and FL are used, they refer to second language and foreign language in the above-mentioned meanings and indicate that the relationship between L2 and the surrounding society is of importance.

Another distinction often made in connection with the SL/FL issue is the one between *acquisition* and *learning* (see e.g. Krashen 1982), although also these two concepts are often used interchangeably. When the distinction is made, *acquisition* usually refers to the unconscious, informal and implicit side of taking in new language, whereas *learning* is used to denote its conscious, formal and explicit aspects. Consequently, the concepts second language acquisition (SLA) and foreign language learning (FLL) are often juxtaposed because foreign languages tend to be taught and learned in formal contexts, and second languages are often acquired informally. It is important to bear this distinction in mind because much of the

research today - especially in the Anglo-American context - is conducted in SLA circumstances. Therefore, the conclusions and results may not be directly applicable to the FLL context (see also Jaakkola 1993 for a review of the terminological confusion)

1.5 Second language/foreign language continuum

From a sociolinguistic point of view, FL and SL do not present a dichotomy but rather a continuum. At the FL end of the cline are those cultures in which the target language is not often encountered outside the FL classroom. At the SL end are those in which the target language is almost exclusively used in and out of classroom (Berns 1990). Finland, as far as the English language is concerned, is somewhere in the middle of the continuum. English is studied by practically all students at school from their pre-teen age, and most young Finns have at least seven years of English behind them when they finish their compulsory education. Those who go on to secondary education in senior high school (about 60 per cent of the age group) will study English for another two and a half years. In higher education, many of the textbooks are in English, and instruction in English in both secondary and tertiary education is becoming increasingly popular.

Outside the classroom, English is extensively used in the media, especially on television, where a great number of programs are in English. Most of them are not dubbed but subtitled, so Finns have ample opportunity to hear spoken English on television. English is also often used with foreign visitors, as it is the *lingua franca* of international communication. Advertising, movies, videos, popular music, electronic communication, and computer games are among the many areas of life where Finns also come in contact with and use English daily. In short, English plays an important role in Finnish life, remote as the two languages typologically may be from one another.

In this study the language learning context is learning of a foreign language through instruction in the classroom. This context has some characteristics that have to be taken into consideration because they have an effect on the learning outcome. Among the obvious factors are the limited chances of exposure to the target language in the classroom. Instruction in a foreign language is also guided - and often restricted - by such factors as the syllabus, national examinations and textbooks. Among other external determinants are the size of the class and the availability of materials, audio-visual aids, and electronic devices. In addition, the language teaching traditions as well as the instructional philosophy, practice and personality of the teacher all have their influence on the learning of the foreign language.

However, much of the students' English is not learned but acquired in the above-mentioned meanings of the words. As a result, it is difficult or even impossible to distinguish whether some linguistic item has been acquired or learned. Therefore, the distinction between learning and acquisition is not of much practical importance in this study.

2 READING

There is no single clearly agreed-upon model of reading (Rayner et al. 1990, 636). The two principal approaches draw their explanation from more general learning theories and from ideas what brain architecture is like. They are the *global*, holistic models, (the connectionist, interactive-activation, neural networks, and the parallel distributed processing (PDP) models), and the *modular* models, which presuppose the autonomy of the subprocesses.

Despite the sometimes heated debate between the proponents of the two views, they agree at least that reading is "a constraint satisfaction process" (Norris 1990, 342), and many researchers have reached a compromise (Perfetti 1990). They see that since there are various processes involved in reading (such as word recognition, parsing, comprehension, and breakdown in comprehension), each model provides explanations for different sub-processes. For example, the modular model may account for word recognition and parsing as well as for other processes connected with working memory, whereas the connectionist models may be more suitable to explain processes that involve representations stored in the long-term memory (Rayner et al.1990, 635). Norris (1990) suggests that modularity is essential in initial learning but this does not prevent the system from developing into a more interactive one (p. 341).

It would be reasonable to assume that fluent reading is more connectionist in nature because it presupposes stored representation. On the other hand, some aspects of foreign language reading, especially in its initial and intermediate stages, may be of a more modular nature. The suggestion that there is a qualitative processing difference between fluent and non-fluent reading gets support from neurological findings which show that different areas of the brain are activated with unpractised and practised language behavior (Raichle 1994, 40; see also Niemi et al. 1993).

2.1 The interactive models of reading

Although there is no one universally accepted model of reading, there seems to be a fairly widespread agreement between experts today on the *general* nature of reading. Reading is considered to be an active, constructive, and controlled process in which both the properties of the text and those of the reader interact (see e.g. Williams & Moran 1989). This interaction is essential to understanding (Block 1992).

In the interactive models of reading, there are two basic interacting processes. In *the top-down process*, the reader's background knowledge and his schemata guide the interpretation of the text. In *the bottom-up process*, on the other hand, it is the text and its features that direct the reading process. In research literature, these two processes are also referred to by many other terms such as conceptually or hypothesis-driven vs. data-driven processing (R. C. Anderson 1985; McClelland & Rumelhart 1985); knowledge-based vs. text-based processing (Spiro 1980); context-bound vs. text-bound processing (Grabe 1988); global vs. analytic recognition (Samuels 1985), and processing from the whole to a part vs. from a part to the whole (Rumelhart 1980).

The interactive models of fluent native language reading take into account both the bottom-up and top-down processes and claim that the decoding of text and the interpretation of its contents take place simultaneously. The reader has a schema or a mental model about both the discourse topic and the language, and with the help of the textual features the reader verifies and completes the schema. Top-down processing ensures that the reader does not go astray if there is an ambiguous word in the text or if multiple interpretations are possible. If, on the other hand, the original schema is inaccurate, bottom-up processing helps the reader revise it on the basis of the information provided by the text. (For a more comprehensive view of the interactive reading process see e.g. Adams & Collins 1985; Anderson 1985; Carrell 1988a; Carrell & Eisterhold 1988; Devine 1988; Eskey 1988; Eskey & Grabe 1988; Grabe 1988; Ruddell & Speaker 1985; Rumelhart 1985; Samuels & Kamil 1988, and Underwood & Batt 1996).

2.2 Fluent reading

Fluent reading requires a good command of the structures of the language, a large vocabulary, and knowledge of text structures. The automatic recognition of words spares the reader from the time-consuming processes of deciphering the words and contextual guessing, and the processing capacity is reserved for interpretation.

Success in both the decoding and the interpretation of text depends on prior knowledge, language proficiency as well as information processing skills. Firstly, in order to decode text fluently, one has to have a good knowledge of the language and automatic processing skills. Interpretation requires both prior knowledge and inferencing skills. The combination of knowledge and skill varies from reader to

reader. Similarly, the different skills and knowledge required from the reader vary depending on the topic, the difficulty of the text, and the reading purpose.

A model of reading proposed by Underwood and Batt (1996) distinguishes three levels of activity in reading. On the first level readers form a surface level presentation on the basis of the visual information, combines it with their knowledge of words and makes use of the syntactic rules of the language (p.206). On the second level of activity readers perform a semantic analysis, decide the propositions given in the text and understand the sentence. Often these two levels suffice for understanding the text. On the third level, inferences are made and readers interpret the text (206-207).

Among the properties of a text that influence the reading process are its topic, genre, organization, and its conceptual and linguistic difficulty. Readers may have to adopt different reading strategies depending on any of these properties (Prichard 1990). In fact, the ability to use one's reading strategies flexibly and appropriately appears to be typical of fluent reading (e.g. Jimenez et al. 1995; Paris et al. 1991, 611).

2.3 Non-fluent reading

However, not all reading, even in the native language, is fluent. Firstly, there may be defects in the automatic bottom-up processing. The reader may be learning to read, have little experience in reading, may be a dyslexic or may not yet have learned efficient reading strategies. During the school years, reading strategies undergo developmental change. The direction of progress is from an atomistic micro-level and reproductive processing towards a more efficient holistic strategy, where prior knowledge influences the transformation of the information in the text (Vauras 1991, 199-200).

Yet another reason for non-fluent reading may be the lack of a suitable schema, either for the topic or the language of the text. In that case, any of the processes of word recognition, syntactic analysis, and semantic interpretation may be disrupted. Competition for attention between these various processes overtaxes the processing capacity, and comprehension is hampered. Problems may also occur in integrating the input data into a coherent construction of the text.

If processing capacity is overloaded, readers often have to resort too exclusively either to the top-down or to the bottom-up processes. If readers do not have a relevant schema, or it is not activated, they have to overly rely on the information in the text and use *text-biased* processing. If the text does not provide enough cues or if they go unrecognized or unintegrated, readers can exploit only those cues that they are able to interpret, which may be insufficient for comprehension.

On the other hand, *knowledge-biased* processing may occur when readers have - or think they have - a good background knowledge but do not have a sufficient knowledge of the language, or when they do not pay enough attention to the data that the text provides. Then the preconceived schema may lead to wrong interpretation.

Reading fluency is naturally influenced by individual differences as well. People may, for example, differ as to the ease of word recognition, the size of their vocabulary, topical knowledge, and working-memory capacity (Just & Carpenter 1987). Phonological short term memory is also related to L2 vocabulary learning and reading development (Gathercole & Baddley 1993; Service & Kohonen 1995). Good readers are better at the meaning-getting aspects of reading than poor readers, who tend to emphasize decoding skills. They can also detect errors more easily than less skilled readers (Garner & Kraus 1981-82). Monitoring and metacognitive abilities, which are important in reading, vary from individual to individual (Daneman 1991, 53) and so does the ability to draw spontaneous inferences (see Pearson & Gallagher 1983 for review; also Laurinen 1985; Valtanen 1994).

Non-fluent reading may also be the result of lack of motivation, certain personality traits or misconceived ideas about reading. Furthermore, there are differences that are connected with such social factors as attitudes at home or the value society places on literary skills. Some of these differences are related to individual abilities, others are maturational and developmental in nature.

2.4 Reading in L2

There are two prevalent views of L2 reading which stem from two different perspectives of foreign language competence. These are the *Universal Grammar* view and the *language-specific* perspective (Koda 1994). The first sees L1 and L2 competences alike, and the ideal to strive for is that of the monolingual, native speaker. The second view sees L2 competence as qualitatively different, as *multicompetence*, "the compound state of mind with two grammars." The ideal then is the fluent bilingual (Cook 1992).

In line with these philosophies, there are also two views on the relationship between reading in the mother tongue and reading in a second language. Corresponding to the Universal Grammar view is the *Universal Hypothesis*, also referred to as the *Linguistic Interdependence Hypothesis* and the *Common Underlying Proficiency Hypothesis* (Bernhardt & Kamil 1995, 17). This hypothesis contends that the two reading processes are similar and that L2 reading is L1 reading in embryo form, and will, with developing proficiency, more and more resemble the reading process in the native language (e.g. Rigg 1988, 206). According to this view, L2 reading is more a reading problem than a language problem.

The language-specific view contains the idea that learners from different L1 backgrounds use different cognitive tactics in their L2 reading (Koda 1994, 4), and that an insufficient knowledge of the target language prevents the transfer of L1 reading skills. This is the *Linguistic Threshold Hypothesis* (Bernhardt & Kamil 1995, 17), also called the *Ceiling Effect* or the *Short Circuit Effect* (Clarke 1980). The threshold level varies from text to text. The more difficult the text is, the more important proficiency in the target language becomes. If the language of the text is very difficult, or the topic is unfamiliar to the reader, even a proficient foreign

language reader resorts to inefficient reading strategies (see e.g. Alderson 1984, 16; Bernhardt 1991; Clarke 1980, 120; Devine 1988, 260). Accordingly, L2 reading is more a language problem than a reading problem.

A widely accepted view among researchers is that the decisive factor is neither the knowledge of the foreign language nor the reading skill alone, but the interaction between the two (Devine 1988, 161; Nurss & Hough 1991, 286). The impact of each factor varies with proficiency. Bernhardt and Kamil's (1995) review of relevant studies seems to indicate that the linguistic element is a more powerful predictor (30%) than the reading element (20%). Bossers (1991), too, in his review of L2 reading studies, concluded that knowledge of L2 is a far more powerful predictor than reading in L1, the more so the less proficient the L2 readers are. L1 reading seems to be a significant variable only at a high level of L2 proficiency (p. 56). In addition, also FL and SL reading may differ in this respect: Carrell's (1991) results seem to indicate that the linguistic element is more prominent in FL than in SL (see pp. 14-15 for the difference between FL and SL).

In conclusion, these two perspectives are neither competitive nor mutually exclusive but complementary because reading involves universal cognitive skills, such as reasoning and inference as well as language-specific language processing skills (Koda 1994, 4). L2 reading can be seen as interaction between reading skills and L2 proficiency. This interactive view is adopted here because both research (see e.g. Carrell 1991) and practical experience seem to support it.

2.4.1 Qualitative differences in L1 and L2 reading

There are several differences between L1 and L2 reading but, due to the interaction between the reading factor and the language factor, it is often difficult to point out exactly which factor causes the difference. Many of the differences are, however, qualitative in nature. The qualitative differences between L1 and L2 reading are discussed from the following aspects: Perception, word processing, cue and constraint utilization, automaticity, speed, top-down and bottom-up processing, global comprehension, compensatory behavior, and language proficiency.

Perception

The knowledge of the orthography, lexis, syntax, and semantics of the language has an influence on even such a low-level process as perception. For example a letter or a word is perceived better if it appears in a familiar linguistic context (Rumelhart 1985, 726-731). To non-proficient L2 readers, the linguistic context is often so vague that they may literally misread words. A review of miscue studies shows that unskilled L2 readers are much more likely to suffer grammatical as well as lexical miscues. More than L1 readers the also tend to substitute words with graphic similarity rather than semantic similarity to the target words (Nurss & Hough 1992, 288). This misperception is caused by an insufficient knowledge of the L2. This naturally affects understanding because the correct perception of letters and words is a pre-requisite for comprehension.

Word processing

Even fluent bilinguals - unlike L1 readers - tend to be logocentric (word-driven) (Jiménez et al. 1995, 89). Moreover, unskilled L2 readers tend to process text unselectively word by word, which may result in misinterpretation of word groups, clause groups, and pronoun references (Nurss & Hough 1992, 288).

Cue and constraint utilization

The L2 reader may lack the necessary knowledge to make use of all or some of the intralingual cues and constraints that help comprehension. This ability to exploit the textual constraints to the full is thought to be crucial in the reading process (Norris 1990, 342). Studies show that unskilled L2 readers are less able to use syntactic cues for accurate predictions than monolinguals (Nurss & Hough 1992, 288). Not even advanced L2 readers appear to utilize semantic and syntactic cues as well as they could (McLeod & McLaughlin 1986, 120). McLaughlin (1990b) suggests that the reason for even the advanced students' poor use of various cues is that they are still using old strategies aimed at decoding the text although their abilities would allow them to apply new strategies directed at meaning. In other words, the process of restructuring has not occurred yet (p. 117).

According to Cziko (1978, cited in Alderson 1984) there are three different kinds of constraints, all of which may influence comprehension: *syntactic* constraints, *semantic* constraints, and *discourse* constraints brought about by the topic and the genre of the text. Learners are able to make use of these constraints to a varying degree, depending on their language skills and background knowledge (p.15).

A reader who has problems with *syntactic* constraints is not able to make use of the syntactic rules of the language and is unable to distinguish, for example, the word classes, parts of speech, or tenses. Such poor knowledge of syntax results in an inability to establish the relationships between the words in a sentence or between sentences. Correct syntactic processing (parsing) is thought to be crucial for establishing these relationships (Mitchell et al. 1990, 286). When there are problems with syntactic processing - as often is the case in L2 reading - then reliance on semantics and pragmatics may have too strong an influence on processing (Perfetti 1990, 277).

If L2 readers are unable to use the *semantic* constraints, they may be unable to utilize the constraints which the preceding and following words set to the possible interpretation of a word, or unable to infer the meanings of unknown words on the basis of some other words in the text. Analogy, contrast, and collocations are also among the semantic constraints that limit the number of possible interpretations.

Misunderstanding may also originate on the *discourse* level because the reader may ignore or is incapable of utilizing the discourse constraints that would aid in comprehending the text. If the schema of the discourse topic is not activated, readers may resort to shallow text-bound processing or activate an inaccurate schema because of an incorrect linguistic interpretation or because of lack of relevant cultural knowledge. They may also be unaware of or unfamiliar with such discourse features as genre, style, or register, which give cues to successful comprehension.

Automaticity

The difference between controlled and automatic processing (Schneider & Shiffrin 1977; Shiffrin & Schneider 1977) is particularly relevant in L2 reading. One reason why problems in L2 reading arise is the fact that the formal aspects of the target language have not yet become automatized but are under conscious control. Controlled processing is much more capacity consuming than automatized processing. Because the controlled element is much stronger in L2 than in L1 reading, there is a qualitative difference between the processing of a foreign language text compared to the processing of a text written in the mother tongue (McLaughlin 1987, 142-143).

The less experienced L2 readers are, the more they have to pay conscious attention to grammatical and lexical forms. This attention requires effort as well as room in working memory; as a result there is less cognitive capacity left for the semantic aspects and comprehension of the text. The meaning aspects of reading have to compete with the formal aspects of language for each reader's limited attentional capacity.

This competition between the allocation of attention to form and to meaning makes it very difficult for the beginning or intermediate L2 learner to handle both form and meaning at the same time. This difficulty is particularly pronounced in spoken language, when the learner is trying to concentrate on the content of the message in real time (VanPatten 1990). The advantage in reading is that the learner can re-read the problematic parts and shift attention back from form to meaning, whereas in listening the real time factor serves as an additional handicap.

As readers become more proficient in the target language, their L2 reading starts to resemble more their reading in L1 (Davis & Bistodeau 1993, 468). The processing becomes more automatic, the formal aspects of language do not tax their capacities to the same extent, and they are freed to concentrate on understanding the message of the text (McLaughlin 1987, 140). Because global comprehension depends heavily on the automatization of the lower-level processes (Tommola 1983), it is obvious that the qualitative difference in the global comprehension of L1 and L2 readers is the greater the less automatic the processing of the formal aspects of language is.

Speed

Lack of automaticity naturally has an effect on reading speed as well. Even skilled bilingual readers read 30% more slowly and with less ease in their L2 due to mainly the reduced automaticity in feature and word recognition, parsing and the assembly of propositions and their integration in working memory (Segalowitz et al. 1991).

Time is a cognitively constraining factor in reading because hesitation in the integration of information interferes with the construction of meaning (Bialystok 1990, 125). Consequently, the quality of L2 readers' comprehension is affected by the slowness of reading.

Top-down and bottom-up processing

Some L2 learners rely almost entirely on text-based processing and do not use knowledge-based processing effectively, while others overemphasize background knowledge at the expense of the linguistic properties of the text itself (Carrell 1988a, 103). Such imbalance in the interaction of bottom-up and top-down processing is rarely observed in normal, skilled L1 readers.

Carrell (1988a) suggests the following reasons for the overemphasis of either way of processing: Firstly, if readers' knowledge of language or their reading skills are deficient, they may overly use either way of processing. Secondly, if they do not have the appropriate schema, or it is not activated, readers tend to overemphasize the role of the print. Thirdly, cognitive style and reading strategies may influence the method of processing. For example, too much reliance on text may be a sign of a more general tendency to be stimulus-bound in learning. An impulsive style, on the other hand, may lead to premature interpretation (pp. 103-111).

Readers may also have the "meaning is in the text" fallacy and therefore they do not use the extratextual knowledge they may have (Carrell 1988a, 111). This phenomenon is typical especially of reading in formal instruction conditions. The possible culprits, Carrell suggests, may be the teachers' overemphasis on decoding skills, the reading of short, unrelated and irrelevant texts, and tests which emphasize literal content and not the integration of content with background knowledge (p.111). Kellerman (1991), too, suggests that one reason for the fact that learners do not use their compensatory strategies to the full may be the inhibitory nature of a typical classroom setting with its emphasis on grammatical correctness (p.156).

Sometimes the interaction between top-down and bottom-up processing may be virtually non-existent. To use an analogy from the field of reading disabilities, such foreign language readers resemble *hyperlexics*, i.e. readers who have good decoding skills but who show little comprehension (Rispens 1990, 609). This "deficiency" can often be observed, for example, when learners read aloud in the L2. Decoding and pronunciation - combined with possible performance anxiety - take up the reader's entire attention and no room is left for understanding the contents of the text. The extreme surface processing may also be caused by poor learning and reading habits, lack of motivation, or irrelevant reading assignments.

Global understanding

In short, L1 readers - skilled or unskilled - face a different, easier task than L2 readers because they are able to devote more attention to comprehension, they more often invoke prior knowledge, and they do not usually need to determine the meaning of unknown words (Jiménez et al. 1996, 106). The L1 learners' reading comprehension also shows more detailed schematization (Horiba 1990). In addition, there are some indications that information which is read in L1 is represented differently in the mind than the same information read in L2, the former more holistically, the latter more as a network of propositions (Jenkin & Prior et al. 1993).

Compensatory behavior

Something that normal L1 readers rarely have to do is to compensate for their insufficient knowledge of language or inefficient reading skills, whereas compensatory strategies are commonly used by L2 readers, often by exploiting the context or their knowledge of the world. The *interactive-compensatory model* (Stanovich 1980) states that any deficit in language processing results in a greater reliance on other knowledge sources. The model explains, for example, why some L2 readers may be able to understand the main ideas of a text even if they do not know many of the words and structures in the text. Such successful compensatory behavior is typical of, for example, experts, who know their particular field and its special vocabulary well, but do not necessarily master the foreign language. Another example of compensatory behavior is lexical inferencing: If a reader meets an unknown word in the text, he can compensate for this gap in his knowledge by using the context to infer its meaning. Compensatory behavior is a valuable heuristic tool in the learning stages of L2 if not used recklessly or unwarrantedly.

Language proficiency

Many researchers agree that the learner has to reach a certain threshold level before good L2 reading skills can emerge (Devine 1988, 262-267; Grabe 1988, 58; Laufer 1992a). The threshold may be connected either with the knowledge of the structures of the L2 or the size of the L2 vocabulary, or both. Which is the greater problem, structure or vocabulary, varies with the text and the reader (Williams & Moran 1989). One estimate of the size of the general vocabulary on the threshold level, i.e. the turning point when good L1 readers can be expected to transfer their reading strategies in L2, is about 3,000 word families (Laufer 1992a).

There are, however, other factors involved than the size of vocabulary or knowledge of structures alone. As a result, it is not possible to define precisely what and where the threshold level is: it varies according to the text, the task, the learner's cognitive level and background knowledge (Alderson 1984, 19; Bossers 1991, 57). The topic of the text is another factor that may greatly affect comprehension (Bernhardt 1991, 32). The turning point at which the reader starts to apply effective mother-tongue reading strategies to L2 texts is not a static phenomenon but relatively susceptible to changes caused by non-linguistic factors (Hudson 1982; Kern 1989), such as age.

Although L1 and L2 reading are different, they resemble skilled and less skilled L1 reading in many ways (Segalowitz et al. 1991, 20). Therefore analogies from reading and learning deficiency research, if used with due caution, may be used to illustrate the problems L2 readers may have. For example, reading deficiency research has shown that the poor word recognition (decoding) skills of many unskilled or dyslexic L1 learners have a detrimental effect on their reading comprehension (Rispens 1990, 609). L2 learners also have decoding problems which impair their understanding. The difference is that in non-dyslexic L2 readers this deficit is a transitory developmental lag, not a permanent perceptual processing limitation - a trait that is hard to remediate, but which has to be compensated for

(van der Leij 1990, 624-625). In contrast, non-dyslexic L2 readers can, with experience and practice, reduce the lag and improve their performance.

Summary

To sum up, much research seem to indicate that L2 reading is not quite like L1 reading. It is a "different literacy" (Bernhardt 1991, 32), which, however, with increasing proficiency and experience, becomes more and more like reading in the mother tongue. The L2 reading process can be seen as a set of continua, each continuum representing a different aspect of reading. The general direction in this set is from recognition to interpretation. It is difficult to give some hierarchical organization to the changes taking place because many of them are interconnected and simultaneous. At least the following changes may take place as a beginning L2 reader becomes fluent:

Recognition of words and word classes improves
Recognition of the morphological features improves
Logocentric processing diminishes
Ability to discriminate important words from less important ones increases
Linear processing becomes more parallel
The influence of L1 and the L1 way of processing written text diminishes
Reading in chunks increases
Sensitivity to syntactic, semantic, and discourse clues improves
Textbound reading diminishes
Controlled and conscious processes become unconscious and automatic
Text processing becomes faster
Top-down processing skills develop more processing capacity
Exploitation of general knowledge and schemata increases
Predicting during reading increases
Expectations become richer and more elaborated
Comprehension becomes more holistic
Flexibility in using different reading strategies increases
Comprehension improves

At any time, any one learner may be at any point of any of these continua, unique to this particular individual. Each L2 reader's skills and abilities also vary from text to text and task to task (Eskey 1988, 96). This phenomenon explains the great variance in reading comprehension in any one individual and between individuals.

2.4.2 L2 reading as a receptive skill

Reading, along with listening, is often characterized as a receptive skill in contrast with the productive skills of speaking and writing. In everyday usage, these two facets of language proficiency are referred to as the passive and active skills respectively. These commonplace labels are, however, misleading: reading and listening are far from being passive, they just activate different sections in the brain

than do writing and speaking (Raichle 1994, 38). Both reading and listening require constant language processing, inferencing, and integration of the incoming linguistic material. Furthermore, as some experts point out, receptive and productive processing do not form a dichotomy but rather a continuum (Coady 1993, 15; Stoller & Grabe 1993, 36).

In both receptive and productive processing, the ultimate goal is meaning construction. However, there are some features in the receptive processes in general which distinguish them from the productive ones. Firstly, the direction in production is from meaning to form whereas in reception it is from linguistic form to the assignment of meaning (Ringbom 1990, 140).

Secondly, the learner usually has much less control of the content and the language in receptive than in productive tasks. Although one can re-read or slow down reading if the text is difficult, this lack of control is more pronounced in reading than in listening, because when listening the learner often has an interlocutor who can be asked to repeat, paraphrase or explain any difficult language. This is normally not possible in reading. As a result of the lack of control over the language, the learner has to have a much larger passive than active knowledge of the language to be successful in understanding.

Thirdly, the receptive competence forms a basis for productive competence. For this reason it is easier to learn a related than an unrelated language: the recognition and understanding of common or similar forms and words speed up the learning, at least in the initial stages. In fact, the difference in learning related and unrelated languages is largely due to different development of receptive competence (Ringbom 1987, 154). Therefore, it is of primary importance that the learners of an unrelated language - such as Finns studying English - develop efficient receptive skills as early as possible.

There are a few other special features that set reception apart from production. In the first place, L2 comprehension is typically partial or approximate in nature, which is often sufficient for communicative efficiency (Ringbom 1990, 141). This is because receptive tasks do not often require a completely specified knowledge of all the words to understand the general meaning; often a fairly vague denotative knowledge suffices. Furthermore, knowing all the connotations of a word is not a pre-requisite for understanding. Of course it is task-dependent how precisely or comprehensively words should be understood. For example, in a scientific text specialized academic terms should be understood with some precision. In addition, some non-specialized but infrequent words that are used to explain the new scientific terms should be understood as well (Parry 1997, 67)

Secondly, such linguistic features as derivations, collocations, and register are already provided in the text, and the learner's task is just to recognize, not to know them (Crow 1986). Detailed grammatical analysis is essential for accurate production, but not for comprehension (Swain & Lapkin 1995, 384). In fact, a reader can comprehend a text with rather scanty grammatical knowledge (Grabe & Stoller 1997, 116).

To sum up, successful reading in L2 requires both a large passive vocabulary and a reasonably automatic skill in recognizing the main morphological, syntactic, and stylistic features of the language. The size of the passive vocabulary and

completeness and accuracy of recognition of forms are dependent on the reading purpose and the task.

2.5 Reading comprehension in L2

Reading comprehension has no established definition. The term has been used interchangeably with reading ability and reading competence (Rost 1993). Sometimes it also appears to be synonymous with reading proficiency or just reading.

The construct of reading comprehension can be approached from various angles. Depending on the perspective, the questions that need to be answered are somewhat different. The different approaches often overlap and are interdependent. In the following, reading comprehension is considered from the following perspectives: the product, the process, levels, depth, learner factors, skills, strategies, purpose, and research. Attention is paid to second language reading comprehension when relevant.

Product

Reading comprehension can be approached from the point of view of general meaning construction. The constructivist view appears to be prevalent in much of the reading literature (e.g. Pearson et al 1992, 149; Gordon & Hanauer 1995; McNamara et al. 1991). One such constructivist view is the *Mental Model* based on The Mental Model Theory by Johnson-Laird (1983) and van Dijk and Kintsch (1983) and advocated by McNamara et al. (1991). They view reading comprehension as "a process of building and maintaining a model of situations and events described in the text" (p. 493). In their model, readers process text at a propositional level and construct a mental model which is analogous in structure to the events, situations or layout described in the text. It depends on the text material and the reading task whether the reader emphasizes the construction of a mental model or the encoding of a propositional description. Readers may also just encode the propositions of the text: they prefer propositional encoding when they want to remember something verbatim or when the text is indeterminate in nature. Mental models are used when the text is an instruction, a narrative, or a spatially determined description (493-495).

Process

Another perspective is to emphasize the properties of reading comprehension as a process. What happens when the reader is trying to make sense of a printed text? When the process has been the center of interest, reading behavior has been described for the purpose of inferring the process. In such studies verbal protocols of different kinds have been used (Cavalcanti 1987, 230-231; Pressley & Afflerbach 1995; Haastrup 1991b). Among the methods used in such process oriented research have been study of eye movements (e.g. Just & Carpenter 1987), miscue analysis

(e.g. Allen & Watson 1976; Goodman & Burke 1973, both cited in Rigg 1988; Rigg 1988), recall tasks (e.g. Bernhardt 1991; Riley & Lee 1996), and reading monitors or recorders (e.g. Tommola 1985).

Levels

Language comprehension processes work on different levels: the word level and the integrative level at which sense can be made of the successive words and sentences (Daneman 1991, 526-527). Poor L1 readers have been shown to have problems at the integrative level, usually caused by poor working memory capacity or lack of use of background knowledge (Danemann 1991, 526). Because L2 reading takes up much more working memory capacity than L1 reading, L2 readers resemble poor L1 readers in this respect. Monitoring and revising one's comprehension errors require integration of successive ideas, and this is difficult for L1 readers with small reading span (Daneman 1991, 529). Non-fluent L2 readers, too, have small reading spans.

At the word level, the comprehension of a concept intially requires retrieval or activation of salient semantic properties. In fluent reading this retrieval is rapid and context-dependent, probably automatic (McNamara et al. 1991, p.508). In less fluent L2 reading there may be no retrieval (i.e. the reader does not know the word) or it may be slow. In the same way, syntactic processing, which in L1 reading is automatic and cost beneficial, may be slow and laborious in L2 reading, thus affecting comprehension.

Depth

Reading comprehension can also be examined in the surface-depth dimension. It is different to understand the main points of the text (*gist comprehension*) than to understand the literal meaning (*literal comprehension*) or the implications and connotations in the text (*inferential comprehension*). Sometimes the understanding of the main propositions in the text may be a sufficient signal of successful understanding of the text, at other times reading comprehension requires also deeper integrative or interpretative processing of the text. The desirable depth of understanding naturally depends on the purpose of reading.

As far as L2 reading comprehension is concerned, the question that should be addressed is whether the purpose of reading is to improve one's language proficiency or to learn content matters, or perhaps both. In the classroom, an additional question is what depth of understanding can reasonably be expected from young or inexperienced readers. Is it enough, when learning to read in a second language, to be able to decipher the surface forms and understand the main propositions in the text? Because the automatic, lower-level processing skills are so important in L2 contexts (for a review see Grabe 1991, 390) and they are still developing at school age, comprehension based on more literal understanding rather than interpretative understanding should possibly be the focus of reading comprehension instruction in school. Inferencial understanding has shown to be much more difficult than literal or propositional understanding (N. J. Anderson et al. 1991). For example, interpretation may require a more detailed knowledge of the

meaning of words - such as their connotations and nuances - than would literal comprehension (Stoller & Grabe 1993, 30).

Learner factors

Individual differences also influence reading comprehension. Naturally such factors as ability, motivation, and intelligence play a role in language understanding, but individual differences also arise from differences in fluency in word recognition and topic knowledge (Just & Carpenter 1987, 481). Content-free *working memory capacity*, too, has been shown to affect reading comprehension (Engle at al. 1990; Harrington & Sawyer 1992). In L2 learning working memory capacity has been shown to be an important factor (Harrington & Sawyer 1992; Service 1992; Service & Kohonen 1995). In particular, L2 reading comprehension has been shown to correlate with working memory and linguistic-analytical skills even when intelligence is partialled out (Geve & Ryan 1993). Working memory has also been shown to determine how well readers can use the cues provided by the text to comprehend unfamiliar words (Daneman & Green 1986).

Reasoning ability is another important factor in reading comprehension. In her studies in foreign language learning, Kristiansen (1990, 1992) found that reasoning - both verbal and nonverbal - and second language learning are connected. Poor reasoning ability may prevent the learner from making the connections necessary for comprehension. Much of comprehension ability seems to rest on the ability to construct appropriate mental models, and therefore inadequate construction of a mental model may cause errors in syllogistic reasoning (McNamara et al. 1991, 508). In other words, poor reasoning causes inadequate mental models which in turn cause more poor reasoning.

Reading comprehension is naturally also influenced by *language proficiency*. This aspect is particularly relevant in L2 reading comprehension. Both syntactic and vocabulary proficiency affect comprehension (Barnett 1986, 346). Among the linguistic factors that have been shown to be significantly related to L2 reading comprehension are awareness of form class (morphology), lexical knowledge, and knowledge of discourse grammar (Guarino & Perkins 1986). The connection has been shown to be causal at least between lexical knowledge and reading comprehension (Coady 1993, 19).

In addition to knowledge of the language, comprehension requires *knowledge of the world*. Bernhardt (1991, 32) even thinks that world knowledge should be considered the third important factor in L2 reading comprehension in addition to the reading and language factors.

Skills

The construct of reading comprehension can also be approached from the point of view of skill analysis. What skills are needed for comprehension to occur? van Krieken (1986), for example, cites Davis' model in which reading comprehension requires the following independent skills: determining word meaning in context, recognizing information stated explicitly in the text, recognizing information stated implicitly in the text, grasping the central thought of a passage, and recognizing the

author's attitude, tone, mood and purpose. Even if reading subskills may not exist in any tangible way, they may represent a useful working construct for teachers and test constructors (Lumley 1993, 230).

Strategies

The focus on reading comprehension strategies provides another perspective. What strategies do readers use to arrive at meaning? Which of these strategies lead to successful reading comprehension? Does strategic reading interfere with comprehension because it is conscious and effortful?

There are numerous studies exploring different successful and unsuccessful reading comprehension strategies (e.g. Hosenfeld 1984; McDonough 1995; Oxford 1990). Nevertheless, it is difficult to draw any definite conclusions because the constructs of reading comprehension and strategy are very differently conceived in many of the studies.

Purpose

The purpose of reading and comprehending texts in L2 adds yet another dimension. Is it a real life functional literacy, reading to learn, academic reading or, perhaps, improving one's proficiency in a foreign language? Some of these purposes may overlap. Text genre, too, affects what the purpose of reading is. For example, to understand instructions is quite a different thing than to understand fiction.

Research

One can also look at reading comprehesion from the point of view of research. How is reading comprehension operationalized in various assessment measures? How are the results of correlational studies to be interpreted in terms of cause and effect? What other factors might be active? Rost (1993, 79-80) points out that no consensus has been reached as how to specify and adequately operationalize the reading comprehension construct even in L1. There are the holistic g-factor theories, the multiple-factor models, and a middle position, which claims that the two factors effective in reading comprehension are literal reading (vocabulary) and inferential reading, which helps one to figure out the meaning of unknown words from context (p. 86).

Because of the vagueness of the construct it is not easy to validate evidence from various studies in a comparative way (Bernhardt 1991; van der Leij 1990, 621-622). For the same reason, there are also problems in researching reading comprehension. Gordon and Hanauer (1995, 320) recommend qualitative methods for reading comprehension research because otherwise invalid inferences about the reading ability may be made.

To sum up, reading comprehension is a complex and many-faceted concept, which reveals something of the complexity of language learning and its evaluation. The question is whether all the aspects should be considered with every reading comprehension task, or whether reading comprehension should be redefined for

every task, or whether the prevalent, rather vague notion, would be sufficient for practical purposes.

2.6 Assessing L2 reading and reading comprehension

Because there is no universally agreed definition of the construct reading comprehension, there can be no consensus concerning the way reading comprehension is best conceived and operationalized in assessment tasks. The traditionally used tests are the multiple-choice, alternate response tests (such as true-false tasks), various cloze formats as well as content-based open questions. All these test formats - widely used both in instructional, achievement and proficiency testing as well as in research - have been criticized (e.g. Bernhardt 1991; Weir 1993) and there has long been a call from experts for less traditional ways of testing (Cohen 1993) and for more authentic tests, which would also correspond more to instruction (McAuliffe 1993; Weir 1993).

It is not inconsequential what kind of task is used to assess foreign language learners' reading comprehension because the type of task affects the test results, especially at the lower level of proficiency (Wolf 1993a). The task also has an effect on the reader's processing strategies (Anderson et al. 1991), the nature of product and, if used extensively and exclusively, learning style as well. In other words, the task matters. Even the question type in a test affects both the test scores (Shohamy & Inbar 1991) and the strategies readers use (N. J. Anderson et al. 1991).

In research, qualitative measures such as think-alouds, verbal reports, verbal recalls, interviews, and on-line reading tasks are also used, but such measures are difficult to employ in assessment in real life circumstances because they are too time- and resource-demanding. Yet, they often yield much more relevant information both to the teacher and the students about the comprehension process and language proficiency than the traditional product-oriented tests. The test format used in this study - a lexical inferencing task with occasional written verbal reporting - is an attempt to adapt more informative and authentic assessment methods to natural classroom circumstances.

In addition to the question of test format, another issue that is often brought up in connection with L2 comprehension assessment is the choice of language of the answers. Many researchers and teachers use only tests in which the answers are given in the target language. In a second language situation, it may often be the only possibility because the students may come from different language backgrounds. In a monolingual foreign language classroom, however, where also the teacher is a native speaker of the students' L1, the language of the answers is a matter of choice (see Cook 1992).

Some experts in foreign language reading believe - and some studies show - that the use of the target language in comprehension tasks hides true comprehension and may underestimate the proficiency of the students because production of the foreign language is involved (Bernhardt 1991; Lee 1986; Wolf 1993a). On the other hand, the proficiency may also be overestimated because if a

test is poorly designed, the learner may be able to give a correct answer merely by copying the text (see e.g. Salojärvi & Laurinen 1994).

Because the foreign language classrooms in Finland are almost exclusively monolingual, the use of the mother tongue is a feasible alternative. In this study the students were asked to give their answers in their mother tongue because it was thought that it would be easier for them to demonstrate true understanding and it would be easier to draw inferences about their processing and proficiency if the foreign language production problems did not further obscure the results.

One often expressed requirement for language tests is that they should be as authentic as possible. In a reading test, the authenticity requirement covers both the text and the task. One authentic task every reader of a foreign language has to face is to decipher the meaning of the unknown words crucial for understanding. This task is lexical inferencing.

From a teacher's point of view, it is important that the task and test results should tell the teacher as much as possible about each student's proficiency level and ways of processing language. The lexical inferencing task - especially when the students also give short written reasons for their inferences - provides information about the reading and inferencing processes as well as the student's English proficiency. Naturally, in the lexical inferencing task much more information is lost than in many of the introspective tasks used in qualitative research. When inferring word meanings the learner has to comprehend much of the surrounding language, at least the proposition in which the word appears, and very often longer passages of the text. In that sense, the lexical inference task can be seen to assess comprehension.

2.7 Differences between Finnish and English relevant to reading

The mother tongue plays a significant role in L2 learning. This role may be facilitating (positive transfer) or detrimental (negative transfer), mainly depending on the relatedness of the two languages. When the languages are related, L2 learning is faster, especially in the early stages of learning (see e.g. Sjöholm 1995). The many cognates and a similar linguistic system make early learning easier and more rewarding.

The native language influences both the learning and the processing of L2. In her review of research, Koda (1994) concludes that "the linguistic orientation created by L1 linguistic features not only influences L2 acquisition but also constrains the cognitive procedures used in L2 processing... L1 has a significant impact in shaping the L2 processing skills and strategies"(p. 4). When the effect of the native language is negative, students may, for example, quite systematically ignore or not notice some of the properties of the target language that are different in their native language. Hammerly (1991, 65) calls this phenomenon the inhibitive interference of the mother tongue.

The closer the native language is to the target language, the easier the L2 reading process is, especially at the initial and intermediate stages. The reason for

the facilitating effect is that in reading, the often familiar-looking forms of the input effortlessly activate relevant existing knowledge that will help understanding. The less similarity there is between the input and the existing knowledge, the greater effort will be required in the form of application of conscious inferencing procedures (Ringbom 1990, 145). Conscious processes require much more load in working memory, and as a result reading becomes laborious and slow. Such is the case when Finns learn to read in English.

Finnish is very different from English: it is not even an Indo-European language but belongs instead to the Finno-Ugric family of languages, along with Estonian and Hungarian. Typologically, Finnish is a synthetic, agglutinative language: it expresses the syntactic relations through inflections rather than through auxiliary words, such as prepositions and articles, as the analytic languages (e.g. English) do. The different linguistic systems of English and Finnish present many more obstacles to Finnish learners than to those students of English whose native language has a similar language system.

The following differences between English and Finnish that cause problems in reading are described: Grapheme-phoneme correspondence, conception of the word, high and low attachment, word order, passive, compound words, cognates, gender, some other language features, punctuation, and explicitness versus implicitness.

Grapheme-phoneme correspondence

Different default values of certain regular features of the mother tongue and the target language may affect the processing of the foreign language. An example relevant to reading is the relationship between the phonemes (sounds) and graphemes (letters) in the language. Some languages are extremely consistent in their use of particular letters to mark particular phonemes, in other words they demonstrate *shallow alphabetic orthography* (Seidenberg 1990, 49). Finnish is such a language: the close correspondence between graphemes and phonemes makes Finnish rather easy to read because words are almost always written as they are pronounced.

English, on the other hand, shows *deep alphabetic orthography* (Seidenberg 1990, 49) and tolerates a huge amount of markings with many different functions as well as irregular patterns (MacWhinney 1995, 302). Although there are some spelling patterns, there can also be a remarkable incompatibility of how words are sounded and written as well as a certain unpredictability, which makes English more difficult to read and write, especially for speakers of other languages.

A difference in grapheme-morpheme relationship has consequences when learning to read in a foreign language, because the reader's expectations are based on L1. To my knowledge, there are no studies carried out with Finnish readers of English, but it has been shown that for instance Spanish and Serbo-Croatian readers, on the basis of their mother tongue spelling, expect a highly regular correspondence between the graphemes and phonemes of the language (Gibson 1985, 231; Seidenberg 1990, 49). This expectation slows down the processing of the differently realized foreign language. The same may also be assumed to be the case

with native speakers of Finnish, to whom the irregularity of spelling and the mismatch between spoken and written forms in English often cause problems.

Languages with simple and direct correspondence between written and spoken forms are thought to encourage the use of phonological information in reading, whereas orthographies with irregular spelling-sound correspondences are thought to discourage phonological recoding (Seidenberg 1990, 49). Finnish readers tend to read and sound the words letter-by-letter as they are written because this is what they do in their mother tongue. Since all L2 readers tend to process text according to the properties of their native writing system, Finns learning to read English often pronounce every letter in the word. This happens particularly at the elementary stages, but even at more advanced levels when the reader encounters an unknown word. In contrast, language students in whose native language the spelling-sound correspondence is more irregular do not expect that there is a sound which correponds to each letter, which, of course, may be the cause of different kinds of reading problems.

If the preferred processing strategy originates from reading an L1 with shallow alphabetic orthography, this affects the speed and efficiency of reading in L2 with a deep alphabetic orthography. Readers may not even recognize the written word as the same one they may know in the spoken language and as a result, they do not have access to their mental lexicons. Conversely, too, the L2 learners may not recognize a word when it is spoken even though it is familiar to them in its written form. Both of these phenomena are common as far as Finnish learners of English are concerned.

Conception of the word

Finnish readers have also a different parameter for the concept of the word. A Finnish word often contains much more information than an English word. Many single Finnish words interact with the grammatical patterns: they carry an element of meaning which makes inference possible (see Jackendoff 1992, 57). For example, the single Finnish word *koulussammekin* would require four English words: *in our school too.* In speech, the Finnish word is also a more independent and important unit than the English word, because it is framed by such regular features as fixed primary stress and the vowel harmony, which signal the word boundaries in spoken Finnish (Karlsson 1977).

The different default value for the concept of word may be the reason that, for example, phrasal verbs or prepositional phrases so common in English often cause breakdown in comprehension in Finnish readers (see Sjöholm 1995), or that articles and prepositions are taken to be such insignificant features that they are often ignored by Finnish readers. For example, some Finnish learners of English do not always literally perceive articles or prepositions, or they do not react to the meaning they carry. This is because there is no article system and a very limited prepositional system in Finnish.

There may be real differences in processing words and morphosyntax between speakers of such different languages as Finnish and English. It appears that lexicon and morphosyntax are distinct subsystems which are represented differently in the brain (Frazier et al. 1993). Lexicon appears to be at least in part

subserved by the declarative memory, while morphosyntax is connected with procedural memory (Paradis 1994, 397).

High and low attachment

In such languages as English, processing is done mainly in reference to entire sentence patterns, and decisions are based on large chunks of input. In some other languages relatively short input chunks make grammatical decisions possible, and the entire processing model is more analytical (Pléh 1989, 184). Finnish is such a language. In Finnish the processing of language proceeds word for word because each word contains more information about how the input is going to continue whereas the processing of English takes place in longer segments (Sajavaara 1987, 75). This tendency to process text word for word may be detrimental in understanding other kinds of languages, because, if used unselectively by giving equal attention to content and grammatical function words, it may result in the misinterpretation of word groups, clause groups, and pronoun reference (see Nurss & Hough 1992, 288, for a review).

The mother tongue syntax influences the preference to decide the class and case of a word early (*high attachment*) or late (*low attachment*) (Mitchell et al. 1990, 299). English is a low-attachment language, whereas Finnish favors high attachment. In other words, Finns tend to decide very early on what the syntactic function of a word is and to interpret any other incoming information accordingly. This early decision on meaning may be so strong that the reader will not revise it even if the subsequent information in the sentence does not agree with the initial interpretation.

If the reader makes a premature parsing decision it may lead to misinterpretation or confusion. For example, if the reader decides that the third element in "The old train" is a noun and expects the following word to be a verb such as "moves slowly," the processing of the whole sentence "The old train the animals" may be hampered. If readers are misled, it may be difficult for them to revise their interpretation, especially if their knowledge of the language is imperfect. Moreover, there appears to be a general tendency in readers to commit themselves to just one structural analysis at points in the sentence when two - as in the example above - or more alternative interpretations are possible - a phenomenon known as *gardenpathing* (Mitchell et al. 1990, 287).

Homonomy is often the cause of gardenpathing. English abounds in homonyms. Since homonyms in English can also be members of different word classes, or they can play different syntactic roles, a reader who fixes the class and case of the word very early may easily go astray.

In Finnish, assignment to class and syntactic function is different from English: mostly inflections, not the word order as in English, determine the relationships between the elements in a sentence. In Hungarian - a Finno-Ugric language language related to Finnish - the most important single determinant of sentence interpretation has been shown to be case marking (Pléh 1989, 164-165).

Word order

In English many relationships between the elements of a sentence are revealed through word order, whereas in Finnish the relationship between the different parts of speech are indicated by inflections (see Vilkuna 1989 for a comprehensive discussion of the relatively free word order in Finnish). Therefore, the Finnish learner of English is often unable to utilize the regular and relatively rigid word order of English declarative sentences (subject-verb-object, SVO) in sentence interpretation. In Finnish the order of words is much freer and all combinations (SVO, VOS, OVS, OSV, SOV, VSO) are possible, if not always common. Sentence processing appears to be heavily constrained by the linguistic word order properties specific to each language: speakers of richly inflected languages with variable word order appear to trust morphological cues rather than rely on word order, which is the preferred cue for meaning for English readers (Bates & MacWhinney 1989, 12). Yet, there seems to be some kind of psychological appeal in the SV order because even in inflective languages naive readers tend to apply the SV-based strategy when facing difficulties in interpretation (Pléh 1989, 174).

Finnish is also a *prodrop* language: it may omit the subject pronoun completely, which may further complicate the processing of English. As a result, it is sometimes difficult to the speakers of such prodrop languages to remember to make use of the 'first-noun-is-the-agent'-strategy (Bever 1970, cited in Pléh 1989, 166) and the regular word order of English as a cue to meaning.

The real source of Finnish readers' processing problems may rather lie in the absence of case markers and inflections combined together with the relative freedom of Finnish word order. Whichever the dominant reason is, sentences with a long and complex noun phrase as the subject part of the following sentence will slow down the reading process of even advanced Finnish readers of English.

> "The principle means by which both implicit and explicit knowledge become automatic is practice." (R. Ellis 1994, 99)

Such sentences are fairly common in literary and academic English.

In addition, there may be negative transfer from other foreign languages Finns study - notably Swedish and German - with their special word order rules, which may blur the importance of SVO word order in English.

Of course, the negative transfer works in the other direction as well. Because word order is an important cue of meaning to English-speaking learners of foreign languages, the L2 sentences that do not follow the regular SVO order of English may be easily misinterpreted (LoCoco 1987, 126). English speakers might find the "pay-attention-to-the-ends-of-the-words"-stategy useful (Slobin 1973, cited in Pléh 1989, 171) when studying inflected free word order languages such as Finnish.

Passive

Another linguistic feature problematic to Finnish learners of English is the passive voice. The functions of the passive overlap only partially in the two languages. The English passive has a textual function in that it transfers sentence elements to new positions, while in Finnish the passive is a way of giving expression to an indefinite

agent. It is not possible, under normal circumstances, to have an agent in a Finnish passive sentence as is possible in English (Sajavaara 1987, 76).

In the English language processing of the passive causes problems even to native speakers, who automatically assign the first noun a subject status (McNamara et al. 1991, 506). Since this appears to be the tendency among naive language learners, passive sentences, especially those with agents, take longer to process and often cause confusion.

Compound words

Another feature of English that causes difficulties to Finnish readers is the the way compound words are formed. In English it is often sufficient to put, for example, one noun after another to form a compound word, but in Finnish either inflectional forms or orthographic conventions or, in spoken language, the word stress normally shows the relation between the two or more elements. For example, *kitchen door* would be *keittiön ovi*, where *keittiön* is the genitive form (kitchen's); *multiple choice test* would be *monivalintatesti*, where the writing of the three different elements (*moni -valinta -testi*) as one word signals that it is a compound word. In spoken Finnish the compound nature of the word would be indicated by the stress on the first syllable of a long compound. Because English does not have such clear signals for compounds, Finnish readers have sometimes problems in comprehending English compounds correctly.

Cognates

The L2 reader's task is facilitated if the two languages share some common vocabulary. In related languages, such as English and Spanish, students learn quite early on how to utilize their mother tongue knowledge in deciphering meaning in the target language (see e.g. Jiménez et al. 1996). This ability increases with age, reflecting a developmental trend (Hancin-Bhatt & Nagy 1994).

On the other hand, speakers of a non-related language to English - for example Korean - are less successful in completing cognate-based tasks than speakers of Spanish (Hahn 1983, cited in Hancin-Bhatt & Nagy 1994, 292). This holds also true of native speakers of Finnish. Even though there is an increasing number of recent English loanwords in Finnish, the vocabularies of the two languages are very different. Finnish learners of English may not notice even quite obvious cognates because they are not accustomed to finding them in other languages (Ringbom 1987). In addition, English loanwords quite soon are written and pronounced according to the Finnish conventions, which makes their English origin rather opaque to Finns and native English speakers alike. This lack of cognates also makes lexical learning more challenging (MacWhinney 1995, 292).

Gender

Finnish is not a gender language. Nouns are neutral and there is only one third person singular pronoun used for both males and females. In reading, this may cause difficulties in finding the correct referent for a pronoun (anaphora) because

Finns are not so sensitized to the *she/he* distinction as speakers of English and similar gender languages are. The process of anaphora interpretation is based on the relationship between subsequent clauses and sentences (Pléh 1989, 179), and the misinterpretation of a pronoun referent has a negative effect on coherent global understanding. The problem is even more pronounced in speaking and writing: the confusion between the pronouns *he* and *she* may leave the native English-speaking listener or reader quite bewildered.

Other language features

There are some regular features in Finnish which may influence how written language is processed. Among those are the wealth of vowels, as opposed to consonants, and, except in some recent loan words, the absence of certain consonant sounds [b, c, f, g, q, x, z and sh]. Again with the exception of loan words, only one consonant is possible at the beginning of words and syllables, and only certain consonants can end a word, namely [l, n, r, s, t]. It is likely that these features affect the speed and precision with which English texts are processed, at least at the elementary stages. Foreign language teachers' everyday experience is that, for example, the non-Finnish consonants cause misreadings of words and consequent misunderstanding. An example of a notoriously common confusion is between "chance" and "change," which are very often misread (see e.g. Hakulinen 1979 for a full account of the special linguistic features of Finnish).

Punctuation

In general, L2 students often do not attend to capitalization and punctuation even though they signal meaning (see e.g. review by Nurss & Hough 1992, 287; Johnston 1972, cited in McLeod & McLaughlin 1986, 115). Therefore punctuation, too, is sometimes the source of misinterpretation in reading. The English and Finnish rules of punctuation are of a different order. In general, Finnish punctuation is governed by rather rigid rules, whereas in English the rules are very complex. Consequently, Finnish readers often process the text according to the Finnish conventions and misinterpret or ignore the cues that English punctuation provides. This is particularly true of the use of commas and capital letters, but it is also true of other graphic signals.

Explicitness versus implicitness

Among other factors which influence reading comprehension in L2 is lack of familiarity with the possible differences in the conventions of written discourse as well as an awareness of more general cultural differences (Bensoussan 1986). Koda (1994,14-15) cites several studies which show that discourse knowledge appears to be language specific.

For example, there may be cultural differences in the explicitness and implicitness of discourse. In homogenous cultures discourse tends to be more implicit than is generally the case in the more heterogenous Anglo-American culture. English-speaking cultures value verbal articulateness, whereas in

homogenous cultures it is not necessary: understanding is not jeopardized because of the sociocultural homogeneity (see Maynard 1985 and Takemoto 1982 for evidence from the Japanese culture).

The Finnish culture is relatively homogenous, and this fact has an effect on discourse patterns as well. In her comparative study on English and Finnish discourse patterns in academic writing, Mauranen (1993) found that Finnish scholars tend to rely more on implicit knowledge than their American and British colleagues do. The language of writing does not seem to matter because these differences are apparent even when Finns are writing in English. This difference would, however, be a disadvantage to speakers of English when reading texts written in English by Finns rather than vice versa, because explicitness adds to intelligibility but implicitness of discourse may have an impeding or even inhibiting effect on comprehension.

To sum up, there are many factors caused by the unrelatedness of the Finnish and English languages that affect the ability of Finns to read in English. The list presented here gives an indication of the problems the Finnish readers of English encounter. In addition, the homogenous nature of the Finnish culture as well as the different conventions in the written language may be a source of processing difficulties.

3 LEXICAL INFERENCING

One of the purposes of this study is to explore how Finnish students go about inferring the meaning of unfamiliar words while reading English texts. In the following section, an attempt is made to relate lexical inferencing to the wider contexts of inferencing in human thinking as well as in reading comprehension. Lexical inferencing is then defined and its nature as a strategy and skill is discussed. Relevant research in lexical inferencing both in L1 and L2 is reviewed and evaluated. Finally, the lexical inferencing task is discussed from the task demand perspective.

Because of the comprehensive and elusive nature of the concept inferencing, it is difficult to give a definition of it that would be broad enough to be both applicable in all circumstances and precise enough to be of practical use. For the purposes of the present study, however, such a definition is not a prerequisite because lexical inference as a subconcept of inference is easier to define.

3.1 Inference in discourse comprehension

The term *inference* often refers to a very comprehensive psychological and philosophical concept (Manktelow & Over 1990). In science, inference is a central and multifaceted concept with many subspecies (Niiniluoto 1983). In everyday usage, inference often means the same as understanding implicit rather than explicit information, "reading between the lines", and making the necessary conclusions based on this implicit information. The term is also sometimes used interchangeably with reasoning.

The wide and varied usage of the term inference has caused it even to become "an obstacle...to our understanding of inferencing in discourse comprehension" (Kintsch 1993, 193). Sanford (1990) claims that "the ubiquity of inferences in text comprehension makes the study of reading comprehension look like a subset of the study of inference making" (p. 515). Despite - or because of - its universal character,

research in inference in reading is relatively recent. Many different testing methods and paradigms have been used, but not much consensus has been reached (Keenan et al. 1990, 378-379) nor much progress made (Kintsch 1993, 193).

In reading comprehension literature, inferencing is often used to refer to a process involving reading between the lines and going beyond the information given in the text (e.g. Bernhardt 1991; Collins & al. 1980; Hansen & Pearson 1983; Johnson & Johnson 1986; Perkins & Brutten 1992; Reutzel & Hollinsworth 1988). In the words of Williams and Moran (1989, 224) inferring is thought to be a skill which "generally refers to the reader coming to conclusions that are not explicitly stated in the text, but for which the text provides evidence." Experts agree that inference is "a cognitive process used to construct meaning...in other words a thinking process that involves reasoning a step beyond the text, using generalization and explanation" (Hammadou 1991, 28). Inferential comprehension of this kind includes drawing conclusions, inferring motives, feelings, and reasons as well as cause and effect relationships (Perkins & Brutten 1992, 76).

If the ability to infer is understood in the above way, it is necessary for understanding language, even at the most elementary level (Manktelow & Over 1990, 3). For example, when reading a simple text such as "Come on. The walk will do you good" one has to make at least the following inferences: this is a communicative situation with more agents than one person, the agents are probably but not necessarily indoors and there is a suggestion of going for a walk together. There are also elements of persuasion or pressure as well as reluctance involved, and the question of improving either the mental or physical condition of one of the interlocutors is brought up. All our successful communication - oral, written, or nonverbal - depends on making relevant inferences of this kind.

3.2 Classifications of inferences

In psycholinguistic literature several classifications of the inferences made during reading have been proposed. Little agreement exists on how to classify inferences (Vonk & Noordman 1990, 448) nor is any particular way of classification sufficient (Kintsch 1993, 194). These classifications vary in comprehensiveness and preciseness as well as in their relationship to one another (Sanford 1990). Often the various classifications also overlap, and further confusion arises because of the variable terminology. In the following, a simplified overview is attempted, and only those aspects are brought up which are considered relevant to the present study.

Perhaps the most common distinction between inferences is between *necessary* and *elaborative* inferences (Vonk and Noordman 1990, 448). Necessary inferences are those which have to be drawn in order to maintain cohesion and to create coherence while reading the text, whereas elaborative inferences are made to fill in the picture. Cohesion is established by relating the current information to previous information in the text through *backward* (bridging) inferences, whereas the current information is related to possible subsequent information through *forward* (anticipatory) inferences, which are needed for the elaboration of the textual information (Just &

Carpenter 1987). The backward inferences are necessary and text-based, whereas the forward (possible, invited, pragmatic, anticipatory, global) inferences rely on the world knowledge of the reader (Fincher-Kiefer 1992; Vonk & Noordman 1990).

Backward inferences are drawn more rapidly at all age levels if coherence requires it, and the ability to draw both kind of inferences increases with age (Casteel & Simpson 1991). Much of the inferencing expected from students in this study is backward in nature, however also forward inferences are probed.

Another dimension in classifying inferences is their *completeness* (Vonk & Noordman 1990). The grouping of inferences can be based on the degree of their completeness or incompleteness (Sanford 1990), in other words, on how complete the inference must be to help understanding.

Keenan et al. (1990) report further distinctions in inferencing according to the way the inferencing process is activated. There are two ways of activation: One is through the intralexical associations created by the reading of related words in the text, i.e. *word-based* (bottom-up) priming. The other one, *text-based*, takes place when one´s knowledge about the situation described in the text (top-down) is activated. According to the authors, most researchers are inclined not to regard word-based priming as inference at all (p. 382). In this study, however, word-based priming is considered inferencing as well.

Keenan et al. (1990) also cite two additional dimensions in defining an inference. One is the *unit* of inferencing; whether it is an activated concept, a proposition, or a schema. The other dimension is the *level* at which an inference is processed. The inference level may range from simple activation to the selection for maintenance in working memory all the way to incorporating the inference into the long-term representation of the text (p. 382).

Inferencing can also be examined as a *process*. When viewed as a process, inferencing is thought to involve or to be analogous to such general cognitive processes as hypothesis testing (Johnson & Johnson 1986), problem solving (Haastrup 1991), and predicting (Smith 1985). The inferencing processes in comprehension can be automatic and happen during reading, or they can be controlled and occur during or after comprehension in response to specific task demands (Kintsch 1993, 194).

Inferencing is necessary in reading because writers cannot and do not make explicit everything that they want to communicate. Nor do they need to. Instead, they may rely on their readers to fill in whatever gaps may exist in the message (Keenan et al. 1990, 377). But do readers really make all the inferences necessary to fill in the gaps? Perfetti (1990, 215) observed that L1 readers adhere to "the minimal inference principle," that is, to save mental energy, readers try to use their processing capacity as little as possible. There is experimental evidence that, in general, readers do not spontaneously make the necessary inferences but rather process the text in a shallow way unless they have a special purpose to draw inferences or unless the topic is familiar enough for them to make inferencing rather effortless (Vonk & Noordman 1990). There are also individual differences in spontaneous inferencing activity (Laurinen 1985).

3.3 The concept of lexical inferencing

When readers encounter an unknown word in a text, they may either ignore it or try to make some sense of it. In the latter case, they may use their general knowledge, the topic of the text, the factual, logical, and linguistic cues provided in the text or the word itself to infer its meaning. In research literature, a number of terms are used to refer to this commonplace phenomenon. For example, the following terms appear:

- inferencing (Carton 1971; Oxford 1990)
- lexical inferencing (Haastrup 1991; Moran 1991)
- word inference (Kern 1989)
- inferring from context (Williams 1985)
- mediated word identification (Walker 1983)
- contextual and structural analysis (Just & Carpenter 1987)
- intelligent guessing (Mackay 1979; Oxford 1990; Rivers & Temperley 1978)
- educated guessing (Laufer 1981)
- guessing from context (Barnett 1988; Haynes 1984; Nattinger 1988)
- contextual guessing (van Parreren & Schouten-van Parreren 1981)
- guessing the meaning of unknown words (William & Moran 1989)
- guessing (Laufer 1997; Kelly 1990).

This wealth of terms occasionally causes confusion and even misunderstanding. Some writers (e.g. Williams & Moran 1989, 224) distinguish between guessing and inferring the meaning of unknown words, but this distinction is not very often made. If the term *inference* is used as a synonym for *lexical inferencing*, the reader may become puzzled whether the correct referent of the term is general inferencing or lexical inferencing. Lexical inferencing naturally involves similar processes as general inferencing but, as a phenomenon, it is narrower and may, therefore, be seen as a special case of general inferencing.

Guessing is another term used for lexical inferencing which seems to be a source of misinterpretation. Guessing is often taken as something that happens recklessly without any deeper processing (Smith 1985), whereas lexical inferencing requires deeper processing than mere guessing (Perkins & Brutten 1992). Therefore, *wild guessing* would be a more appropriate term for the shallow process of reckless guessing. Some researchers, however, apply the terms (lexical) inferencing and guessing as synonyms (e.g. Mondria & Wit-de Boer 1991), others use guessing when they obviously mean wild guessing (Kelly 1990; dos Santos & Sanpedro Ramos 1993), and yet others make a distinction between guessing from context and inferencing (Barnett 1988).

The umbrella term chosen here is *lexical inferencing*: the attribute "lexical" narrows it to the phenomenon that this study deals with. Inferencing, on the other hand, connects it with a wider framework of mental processing, of which it is an instance. But, for the sake of variety, some of the other terms mentioned above are used in this study, too. If the term *guessing* alone is used, it denotes the non-

arbitrary process of lexical inferencing. Arbitrary, reckless guessing is referred to as *wild guessing*.

There are also several different definitions of lexical inferencing, ranging from rather simple ones such as "the use of context clues" (e.g. Schatz & Baldwin 1986) to fairly comprehensive ones. Haastrup's (1991) definition covers all the important aspects of lexical inferencing relevant to the present study and therefore it is adopted here. According to her "the procedures of lexical inferencing involve making informed guesses as to the meaning of a word in the light of all available linguistic cues in combination with the learner's general knowledge of the world, her awareness of the context and her relevant linguistic knowledge" (p.13).

3.4 Lexical inferencing and reading comprehension

Some authors see inferencing skill only as a vocabulary skill with no connection with syntactic proficiency (e.g. Barnett 1986, 346). This is certainly not true in lexical inferencing. Rather, it is more related to comprehension processes because the same type of semantic, syntactic, and integration processes that are used to comprehend a text with known words also help a reader infer the meaning of unknown words (Danemann 1991, 525).

Lexical inferencing abilities have been shown to correlate with reading comprehension (Sternberg & Powell 1983) and language proficiency (Hammadou 1991; McDonough 1995, 60). General analytic reasoning abilities undoubtedly also have an effect on the outcome of lexical inferencing (see e.g. Kristiansen 1990, 1992). It is difficult to estimate the influence of each factor in lexical inferencing because they vary from text to text, task to task, and individual to individual, and they are often interdependent.

In this study the focus of interest is the network of relationships between lexical inferencing and two factors: language proficiency and reading comprehension.

3.5 Lexical inferencing as a reading strategy or a skill

Lexical inferencing is often characterized either as a reading skill (Williams & Moran 1989) or a reading strategy (e.g. Barnett 1988; Williams 1985; Oxford 1990; Schouten-van Parreren 1992). What is really meant by skill and what by strategy remains often uncertain because the uses of the two terms show considerable inconsistency, and many questions concerning them remain unresolved (Williams & Moran 1989, 223). Quite often they appear to denote the same phenomenon.

Because strategy and skill are such ambiguous concepts, their definitions vary. So do the many taxonomies (Kellerman 1991, 143). However, an often-mentioned distinguishing factor between skills and strategies is consciousness (e.g. Paris et al.

1991, 610; Pearson et al. 1992, 169; Williams and Moran 1989, 223). A skill is regarded as an acquired ability which is automatized and operates largely unconsciously, whereas a strategy is a conscious procedure carried out to solve a problem.

There is, however, some disagreement among experts on the role of consciousness. Some claim that a strategy is always a conscious procedure that is accessible to verbal reporting (Anderson 1991, 460) while others think that strategies can be either conscious or unconscious (Barnett 1989, 66; McLaughlin 1990b, 114) or potentially conscious plans for solving a problem (Faerch & Kasper 1980, cited in Feldman & Stemmer 1987, 258). Lexical inferencing can also be seen both as an automatic, unconscious skill or a conscious, controlled strategy. Skills can become strategies when they are used intentionally, and a strategy can become a skill when it is automated (Paris et al. 1991, 611).This distinction between skills and strategies is related to the distinction between procedural, implicit knowledge and declarative, explicit knowledge.

McDonough (1995, 35-36) argues that because reading cannot be broken down into generally agreed-upon component skills, it is preferable to speak of reading *skill*, and of the more local components as *strategies*. This view is adopted here for the sake of simplicity and practicality. In the present study, in which the nature of the lexical inferencing task requires that the student pay conscious attention to the unknown item words and the context in which they appear, lexical inferencing can be considered as a conscious strategy. This is not to say, however, that it could not be automatic and unconscious under different circumstances.

Strategy use in reading

Strategy use in reading appears to be influenced by both development and proficiency. It is affected by age (Paris et al. 1991, 609), but language background does not seem to influence the patterns of strategy use, which is not dependent on language-specific features (Block 1986, 484-485). In that sense it seems to be a universal phenomenon. However, there appear to be individual differences in strategy use.

There is some conflicting evidence on whether the individual differences in strategy use are quantitative or qualitative, or both. For example, flexibility in switching strategies differentiates between more and less experienced L2 learners (McLaughlin 1990; Haastrup 1991). Proficient readers do not necessarily use more strategies than intermediate learners but they may use even fewer (depending, of course, on what is considered as a strategy). For example, when faced with a syntactic problem in lexical inferencing, the less proficient learners, taken as a group, use a variety of strategies (e.g. guessing, ignoring, word-for-word translation, application of grammatical rules) whereas, generally, L1 more advanced L2 readers preferred re-reading and guessing from context (L'Huillier & Udris 1994, 179-180). On the other hand, a good bilingual reader was shown to use more strategies than a poor one in deciphering the meaning of unknown words, such as using context, invoking relevant prior knowledge, questioning, inferencing, searching for cognates and translating (Jiménez et al. 1995, 98-100; see also Wolf 1993b).

Lexical inferencing in the hierarchy of reading strategies

Lexical inferencing can be placed in different positions in the hierarchy of reading strategies. It can be seen as a *general cognitive learning strategy* (O'Malley & Chamot 1990) applied to a specific task. It can also be regarded as one of the *L2 learning strategies* which the second language learner can consciously employ to facilitate mastery of the target language (Bialystok 1981). Some experts view it as readers' mental operations of making sense of what they read, in other words a stratgey employed specifically in reading (Barnett 1988, 150).

In lexical inferencing, the general strategic behavior is concerned with what to do when there is a gap in knowledge and one has to somehow compensate for that gap. In reading comprehension lexical inferencing strategies are needed to compensate for the absence of meaning attached to an unknown word (Haastrup 1991a, 121). Using linguistic and other cues in making intelligent guesses at the unknown word can also be seen as a *compensatory strategy* (Oxford 1990, 91) or - to use Kellerman's narrower term - as a *lexical compensatory strategy* (Kellerman 1991, 143).

The scope allotted to contextual guessing as a strategy varies in the literature. For example, Schouten-van Parreren (1992) distinguishes between the strategies of *lexical guessing* and *analysing*. Bialystok (1981) sees inferencing as a strategy used primarily to derive meaning from the target language rather than to infer formal or structural features. Haastrup's definition (1991, cf. p. 44) seems to encompass both guessing and analysis. Barnett (1988), on the other hand, divides effective reading strategies into text-level strategies and word-level strategies. She considers contextual guessing a word-level strategy. However, since lexical inferencing very often involves reading the whole passage or large parts of it using background knowledge and other text-level strategies, it can be regarded as a text-level strategy as well.

Lexical guessing is a strategy in itself but it also consists of sub-strategies. Walker (1983) mentions several strategies used in lexical inferencing, such as guessing and use of graphemics, morphemics, and syntax. Paris et al. (1991, 612) recommend using context and looking forward and backward in the text as useful strategies when new words are encountered. Anderson et al. (1991) provide a list of 47 processing strategies that L2 readers employ while taking a reading comprehension test. Many of those strategies are involved when a reader guesses the meanings of unknown words from context. These are three of the many categorizations of lexical inferencing strategies that are suggested in the literature. It is not purposeful here to describe them in detail, because many of the classifications have different points of departure and perspectives.

Lexical inferencing can also be approached from the good learner's viewpoint. Good language learners are good and willing guessers, with the ability to use cues and background information efficiently (Rubin 1975; Cohen 1991). They also seem to be aware of the practicality of lexical guessing: when college students of Spanish were asked to rate different FL reading strategies in the order of usefulness, lexical guessing ranked highest along with skimming (Rusciolelli 1995). In addition, finding ways to deal with unknown vocabulary appears to be a major concern for both proficient and less proficient bilingual readers (Jiménez et al. 1995, 92).

From a teacher's perspective, the challenge presented by these strategies is that they apparently can be taught, and, once or if they are internalized they become transferable and permanent (see e.g. Garner 1992, 247). There is evidence that contextual guessing as a strategy is trainable (e.g. Kern 1989; Sternberg 1990; van Parreren & Schouten-van Parreren 1981). Therefore it is a valid objective of instruction. In fact, many researchers and teachers recommend instruction in lexical inferencing. A few of them also propose teaching procedures on how to do it (e.g. Barnett 1989, 124-134; Danemann 1991, 525; Nation & Coady 1988, 104-105; Nattinger 1988, 62-63).

However the relative efficiency of theses procedures - direct or indirect instruction or both (e.g. Mulder forthcoming) - is controversial. The present study is based on the view that explicit instruction coupled with direct and indirect practice is worth the educational effort.

3.6 Lexical inferencing and vocabulary acquisition

In the research literature a distinction is often made between getting the meaning of an unknown word from context cues, and learning or retention of this meaning (Nation & Coady 1988, 102). Here the distinction is maintained because the primary purpose of lexical inferencing in this study is to get to the meaning of the text, not so much to learn new vocabulary, as is sometimes assumed (e.g. Kelly 1990; Mondria & Wit-De Boer 1991).

Lexical inferencing - as understood here - involves both totally new words and those words which the reader has never met before but nevertheless can understand on first encounter. The latter words belong to the so-called *potential vocabulary* (Berman et al. 1968, cited in Takala 1984, 68).

We do, however, learn much of our native and foreign vocabulary incidentally through contextual guessing (Sternberg 1987, cited in Sternberg 1990, 274; Parry 1993) although lexical inferencing may not always be a successful strategy for *productive vocabulary* learning (Jenkins et al. 1989; Hulstijn 1992, 122). This is the case when not only the meaning but also the morphological properties of the word are supposed to be mastered (Parry 1993; Grabe and Stoller 1997). But sometimes mere directing attention to the unfamiliar word is sufficient for incidental learning to take place and can lead to increasing vocabulary knowledge (Joe 1995). This may result in both learning an individual word and also its morphological and syntactic aspects. Because little or no learning can take place without noticing the thing to be learned, lexical inferencing, through turning one's attention to the unknown word, can be regarded as the first stage of vocabulary learning (Ringbom 1991, 175).

The relationship between context and vocabulary acquisition is bidirectional: learning from context helps in the learning of new words, and a good vocabulary knowledge facilitates learning from context (Sternberg 1990, 150). In other words, language proficiency and lexical inferencing are interconnected and mutually reinforcing.

Motivation and relevance are important, too, if the unknown words that have been inferred are to be acquired as well. If the word is relevant to the reader's needs, then incidental learning may occur. For example, adolescent boys often learn a great number of foreign words necessary in their computer games. Even weak students may learn some difficult words that they have seen only once if the text is enjoyable and the context conspicuous (Schouten-van Parreren 1992).

Another prerequisite for incidental learning is that the text has to lend enough support for it (Nagy & al. 1987). The learner also has to know a good many words in the context (Barnett 1989, 124). In general, there have to be enough useful cues - linguistic or pragmatic - for the reader to be able to employ the strategy of lexical inferencing (Laufer 1997, 27-28). Especially, a problem may arise when a reader who is trying to understand a text with an unfamiliar content attemts to accomplish two things at the same time: to grasp the meaning of the whole text and to comprehend unfamiliar words. In this case, because there are two simultaneously competing activities involved (data-limited processing and resource-limited processing (Feldmann & Stemmer 1987, 257), the reader may end up not understanding anything at all.

Sometimes those who are critical of lexical inferencing as a reading strategy base their view on studies in which texts with non-salient words are used (e.g. Bensoussan & Laufer 1984; Kelly 1990; Haynes 1984). This negative reaction may be due to the fact that in some countries (e.g. the United States) lexical inferencing was strongly advocated as the main reading strategy in L2 reading instruction (Haynes 1984). This overemphasis must have passed into textbooks because there has been also "substantial agreement among materials writers on the importance of the skill of guessing the meaning of unknown words" (Williams & Moran 1989, 224). Thus the nature and relevance of the texts and tasks may have been unsuitable for profitable lexical inferencing.

Learning the word for future purposes is not, however, necessary in lexical inferencing. Very often it is sufficient to infer the meaning of an unfamiliar word temporarily for the purpose of understanding the text at the moment of reading. This temporary comprehension is the focus in this study.

To recapitulate, in this study the central concept lexical inferencing is taken as a compensatory reading strategy used to deduce the meaning of unknown words in texts containing enough linguistic and pragmatic clues for the words to be guessable. It is considered to be primarily neither a learning strategy nor a strategy that is advisable to employ in all circumstances and with all texts. It is here assumed to be connected at least with language proficiency, and it is thought to be a trainable strategy.

3.7 Research in lexical inferencing

For the past couple of decades lexical inferencing in the *native language* has been a center of interest and a popular pedagogical practice in reading instruction,

especially in the United States, recommended by reading experts and teachers alike (e.g. Eeds & Cochrum 1985; Danemann 1991; Schatz & Baldwin 1986).

One reason for the wealth of studies is undoubtedly the psycholinguistic view of reading that dominated the reading scene for a decade or two from the 1960s on. This view saw reading, in the words of Goodman, as "a psycholinguistic guessing game" (Goodman 1967, cited in Coady 1993, 3). The earlier studies concentrated mainly on L1 reading, but gradually, from the 1980s on, lexical inferencing has become a matter of interest also in L2 reading. Research in L2 has been conducted in many countries, for example in Denmark (Haastrup 1991), the Netherlands (Mulder 1993; Schouten-van Parreren 1992; van Parreren & Schouten-van Parreren 1981; van den Brandt 1993), Israel (Bensoussan 1992; Bensoussan & Laufer 1984), Brazil (Holmes & Ramos 1993; dos Santos & Sanpedro Ramos 1993), Japan (Aizawa 1998), the United States (Chern 1993; Hosenfeld 1984; Huckin & Bloch 1993; Lee 1993; Wolf 1993b), and Finland (Palmberg 1987).

In the following sections, studies in lexical inferencing in a second language are reviewed and discussed. These studies are grouped according to the main perspective or emphasis: *proficiency-related* studies are interested in the connection between lexical inferencing and L2 proficiency; *ability-related* studies approach lexical inferencing from the point of view of linguistic ability; some studies focus on *item word or error analysis*; *strategy-oriented* studies are mainly concerned with how readers go about solving lexical inferencing problems, and some studies focus on *easy guessing*.

In the second section, studies with an emphasis on instruction in lexical inferencing are brought up.

3.7.1 Factors related to lexical inferencing in L2

Proficiency

In their research project, van Parreren and Schouten-van Parreren (1981) studied the errors made by subjects who were trying to guess the meaning of unknown words from context in a foreign language text or to fill in blanks in mother tongue texts. Their instruments were thinking-aloud and written protocols. The subjects (N=113) were of different ages and proficiency levels, and they were tested on several foreign languages. The protocol analyses indicated that a subject can act on different linguistic levels, which are hierarchically organized. The levels are - from the lowest to the highest - *the syntactic level, the semantic level, the lexical level,* and *the stylistic level.*

When a reader is trying to sort out the grammatical structure of a sentence, he is working on a syntactic level. He is acting on the semantic level if he is looking at the immediate or wider context of the unknown word in order to find out its global meaning. When the reader studies the form of the word, he is acting on the lexical level. Sometimes readers act on the stylistic level and try to establish the stylistic, precise usage of the word. The subject can arrive at a correct solution on a certain level only if there is no problem on any of the lower levels.

The errors the subjects make could be grouped according to the level, but readers also make general errors when they produce their hypothesis prematurely or do not test it sufficiently. These general errors may appear on any level.

When expert behavior was compared with that of less skilled L2 readers, it was noticed that experts were able to act on each of the four levels and, at the same time, were able to adapt their guessing behavior to the difficulty and importance of the unknown word.

In her extensive study on lexical inferencing, Haastrup (1991) used data from think-aloud protocols and retrospective reports of 62 pairs of Danish high-school students of English. They were at two proficiency levels: low and high. The students' task was to figure out the meaning of 25 unknown words in an otherwise comprehensible text. Elaborating on Carton's (1971) three main cue types - contextual cues, intralingual cues, and interlingual cues - she suggests six knowledge sources: the *co-text*, *knowledge of the world*, the *test word* itself, the *syntax of the sentence*, the *mother tongue*, and *other foreign languages*.

In addition to analysing the informants' answers with reference to these knowledge sources, Haastrup also examined the types of inferencing processes they used. Her processing taxonomy - in the order of increasing effectiveness - consists of the following seven types: 1) pure bottom processing (no interaction) and the interactive processes of 2) bottom-ruled processing, 3) conflict of ruling, 4) top-ruled processing without integration, 5) top-ruled processing with partial integration, 6) top-ruled processing with full integration, and 7) pure top-down processing. These processing types form a continuum, showing increasing activation and utilization of cues from more than one level.

When the results were examined, it was found that there were differences between the two proficiency groups. For example, the high proficiency students made better use of the different cues - particularly syntax and other foreign languages - than the low proficiency students. The more advanced students also made use of wider co-text than the intermediate students, who tended to use the immediate co-text more. The number of sources used to infer the meaning of unknown words was about the same in both groups, but the higher-level students showed more variation in their combination of sources. The more proficient students were also able to distinguish more clearly between different item types and to adapt their processing and use of knowledge sources accordingly. The better group also used the interactive processing types more, although both groups showed the strongest preference for the same types, namely pure top processing and interactive top-ruled processing without integration.

The two information groups had been selected so that they did not differ from one another in other background variables except for their age (one to three years) and the length of their English studies (four to seven years). Because the older, more advanced students proved to be more successful inferencers than the intermediate ones, improvement in contextual guessing may be considered an indication of better foreign language proficiency. Haastrup interpreted her results also as an evidence for the necessity of a certain threshold level for successful inferencing in L2 reading.

Chern (1993) studied the contextual word-solving strategies of adult Chinese students of English at two proficiency levels. Her results show that both groups,

both of which were comparatively good readers of English, used sentence-bound cues quite frequently. However, the ability to use global cues (backward cues, and particularly forward cues) distinguish the more proficient readers from the less proficient ones.

The study also showed that there is a hierarchy of strategies ranging from the reliance on lexical information to reliance on contextual information as the students' proficiency level increases. The contextual word-solving strategies of the Chinese students turned out to be similar to those of the native speakers of other languages. This suggests a certain universality of successful reading strategies.

Wolf (1993b) studied lexical inferencing in students of Spanish at three levels of proficiency and of native speakers of Spanish (N=28). The data were collected via a think-aloud task. The item words were Spanish-looking nonsense words. There was no significant difference in the ability to deduce word meaning between the native speakers and the advanced learners, but significant differences were found between the advanced learners and the intermediate learners as well as between the intermediate learners and the beginning learners.

The qualitative analysis of the strategies employed to infer word meaning revealed that L2 proficiency level influences the types of strategies used as well as their degree of success. The better the students knew Spanish, the more strategies and knowledge sources they had at their disposal. The advanced students and the native speakers tended to rely mostly on top-down strategies (i.e. context and background knowledge); the intermediate students utilized combinations of top-down and bottom-up strategies. The beginning learners tried to use context to deduce word meanings but did so unsuccessfully.

Wolf concluded that "L2 proficiency may affect the strategies or textual cues that are accessible to readers to infer meaning, as well as the degree of success with which they are used" (p. 9). This finding also supports the threshold hypothesis.

To sum up, L2 proficiency seems to have an influence on the success of lexical inferencing. The more proficient learners appear to use more knowledge sources in a more flexible way and more successfully than the less proficient learners.

Ability

As part of a larger project concerning mixed ability teaching, Schouten-van Parreren (1992) examined the different L2 reading and vocabulary strategies of 12 to 15-year-old Dutch students of mixed ability (N=60). The foreign language the students were studying was French. One of the strategies under scrutiny was guessing the meaning of unknown words from context. The elicitation method was think-aloud, both individually and in pairs.

The results of the study show that low-ability students differed from good ones particularly in two strategies: lexical guessing and analyzing the form of an unknown word. Firstly, when guessing the meanings of unknown words from context, low-ability students generally experienced difficulties in using and integrating information from the different sources available to them. They tended to pay attention almost exclusively to the source that was most salient for them. Secondly, low-ability students often failed to take the sentence structure into

account. Thirdly, the low-ability students often showed a more restricted knowledge of the world, which makes guessing more difficult.

There were also differences in word-form analysis. The low-ability students' knowledge of their mother tongue vocabulary was not as good as that of the good students; therefore they could not exploit cognates as much as would otherwise have been possible. Only the most obvious cognates were recognized, and very often their guesses were wrong. When reading in the foreign language, low-ability pupils had considerably more difficulties in generalizing from already learned words and word groups to slightly different new words and word groups. Low-ability students also tended to cling to their first hypothesis and did not change it in the light of later evidence, as better students did. As a result, making the wrong initial analysis was far more dangerous for them than for good students.

Accuracy in word recognition

Laufer and Bensoussan (1982) asked 60 Israeli EFL (English as a foreign language) university students at the intermediate level to infer the meanings of unfamiliar words in a short text. The authors analyzed the incorrect answers and concluded that a common source of mistakes was an incorrect "preconceived notion" about certain words: students think that they know the word but actually they confuse it with some other word. Laufer and Bensoussan suggested four main causes for the confusion. Firstly, if the word has several meanings, students may choose a wrong one (e.g. *since* = *because* vs. *from the time of*). Secondly, if the word sounds like another word, the wrong choice can be made (e.g. *merrily* vs. *merely*). Thirdly, students may perform the morphological analysis incorrectly (e.g. *outline* as *out of the line*). And fourthly, students may misinterpret an idiom (e.g. *amounts to* as *are the quantity of*).

These misinterpretations show that the students in this study did not use much top-down processing but instead relied heavily on textbound processing. They were not able to guess many of the words, and some of the words were misinterpreted. No doubt, one of the reasons for the poor performance was the text used in the study. It was fairly difficult, the topic was rather remote and abstract for young adults, and some of the words could not be inferred by using contextual clues. Laufer and Bensoussan justified the difficulty of the text by pointing out that students would have to face such texts in the course of their academic studies.

However, the difficulty of this text skewed the results: it only showed that the students were not able to use the inference strategy with this particular text because they had not yet reached the threshold level required by the text, not that they were unable to infer word meanings in general. Neither an advanced foreign language learner nor a non-expert native language reader is able to infer the meanings of unknown words on the basis of insufficient contextual clues or if lacking relevant background knowledge.

Local and global cues

Haynes (1984) studied the efforts of adult university students of English as a second language coming from different language backgrounds (N=63) to decipher the

meanings of two unknown nonsense words in two short passages. Nonsense words were used to ensure that no student would have previous knowledge of the words to be guessed. One of the words could be guessed by using local cues; the other one required that cues from the entire text be considered. The results showed that, on the whole, the words defined by local context were easier than those requiring integrated comprehension of the entire passage. Haynes concluded that guessing from context is not always a fruitful strategy. Therefore students should learn to recognize those cases in which context is of no help and resort to other strategies, such as skipping the word or consulting a dictionary.

Word analysis was also found to be sometimes misleading, especially with speakers of cognate languages. If the word to which readers had access in their memory was spelled and/or pronounced differently from the word on the page (graphemic or phonemic mismatches), this then resulted in wrong guesses. In cases of incorrect word analysis and mismatches, there was often a conflict with the syntactic context. Haynes recommends practice to improve the accuracy of students' word recognition so that they can increase the speed and efficiency of their lexical retrieval.

Haynes used nonsense words as test items. This may have had some effect on the test results because if there is nothing in the word itself to help inferencing, the reader has fewer knowledge sources to draw from and therefore fewer possibilities to derive the correct meaning. Nonsense words are frequently used in experiments, presumably to ensure that no student knows the target words beforehand. Yet, if a real-life situation is to be simulated as closely as possible, this is an artificial element.

Inferencing strategies

Huckin and Bloch (1993) explored the lexical inferencing strategies of three Chinese graduate students studying in the US. They were at an intermediate-proficiency level, and the text material was related to their field of study. A list of the target words and some distractors were presented to the subjects both before and after reading and translating the two texts used in the study. The think-aloud protocols indicated that the three subjects relied mainly on local context clues to help them guess unknown words, and that this strategy was mostly successful.

The most common clue was another word in the same sentence. In general, the context helped the learners both generate and evaluate their guesses. If the successful inferencer guessed at the meaning through word-level clues, such as morphological analysis, he used the context to evaluate his guess. Sometimes the context was used to generate the inference.

The major source of failure in lexical inferencing with these subjects was the failure to use the context or check the guess against the context. This failure to use context clues was mainly caused by the fact that the reader thought he knew the word but did not. He then forced his misinterpretation into the translation. The authors call this mistaken identity. These errors often appeared to be persistent.

Another major strategy in unsuccessful inferencing was simply to avoid the target word in the translation. The subjects had apparently noticed a conflict between their interpretation of the word and the contextual clues, but could not resolve it.

A case study like this yields much data about inferencing, but, of course, the conclusions are dependent on the interpretative skills of the investigators, as the authors point out (p. 159). In addition, the subjects in the study were also highly educated, motivated adults, which undoubtedly has a skewing effect on the results as well as on the ease of interpretation.

Other factors

Some studies (e.g. dos Santos & Sanpedro Ramos 1993) show that students may make lexical inferences on the basis on minimal linguistic and/or extra-linguistic knowledge and mental effort. In these cases of *wild guessing*, there is no sign of capacity limitations. The reason for their behavior may be that the learners have so little knowledge of the language that lexical inferencing is not even attempted and therefore working memory is not overburdened.

In other cases the effort of contextual guessing does not seem to overtax working memory either, but the lexical inferencing is successful. Palmberg (1987) found out that some Swedish-speaking Finnish children, (N=21), with a very short exposure to English at school, were able to infer the meanings of unfamiliar words correctly by exploiting a familiar schema (a fairytale) and their L1 knowledge. Here, no doubt, the fact that Swedish and English are rather closely related languages has an effect on the ease of lexical guessing.

The form of the unknown word itself often helps in inferencing its meaning. Sometimes this facilitative function of the item word form is not taken as part of the inferencing process. Kelly (1990), for example, defines contextual guessing as "looking for meaning that fits that part of the sentence or passage in which it occurs without the reader having recourse to any [formal guessing]" (p. 201). He claims that this strategy seldom allows the reader to arrive at the correct meaning. But what Kelly calls formal guessing, i.e. cognates, root knowledge, morphological analysis, and onomatopoeia, is a natural and integral part of lexical inferencing in real-life reading. In this study, lexical inferencing is taken to include both *contextual* and *formal* guessing.

To sum up, studies on lexical inferencing have shed light on this phenomenon from different perspectives. The research results have, however, been inconclusive, partly resulting from the fact that the studies are, more often than not, incompatible. The research design, the focus of the study, the methods, the age and educational background of the subjects as well as their nationality and native language vary from study to study. The texts are of different length and deal with different topics. Moreover, the principles according to which the item words are chosen vary, and so do the criteria of assessing the sufficient accuracy of the answers. Thus the studies, in addition to having different focuses of interest, are highly context dependent. However, they seem to indicate the following:

- lexical inferencing and L2 proficiency are connected
- lexical inferencing and more general language ability are connected
- success in lexical inferencing also depends on the choice of the text and the item words as well as on the availability of content and schema knowledge to the readers, accuracy in word recognition, and the relatedness of the L1 and L2.

3.7.2 Instruction in lexical inferencing

The fact that the student can infer meanings of unknown words in the mother tongue is not a guarantee that he is able or willing to do so when reading in a foreign language. L1 reading strategies do not necessarily and automatically transfer to reading in another language. This observation has puzzled L2 researchers and educators, and it has led to the development and implementation of instructional programs to encourage contextual guessing in L2 reading. Many researchers and educators also recommend extensive reading as the most effective vehicle for improving lexical inferencing and learning words from context (e.g. Cooper 1984; Eskey & Grabe 1988; Nagy, Anderson et al. 1987). Some experts, however, doubt the value of training programs in compensatory strategies because they think that those strategies develop naturally as language proficiency improves. What the students need is more language, not training in strategies (see e.g. Kellerman 1991, 158).

In real-world circumstances, however, study time limits the amount of extensive and rich input. Students also have many other subjects to attend to, and as their workload in any one subject must be kept manageable, the demand for extensive reading may be unreasonable. As a result, the foreign language teacher often has to resort to shortcut methods in guiding the students to more effective learning strategies. There are students who are unwilling or unable to use effective strategies, no matter how proficient they are.

In the following section, studies in the instruction of lexical inferencing in L2 are reviewed. Because instruction in inferencing and lexical inferencing is much more established with respect to the mother tongue than in L2, first some points are taken up from L1 research. The L1 research is influential in the sense that it has inspired many of the L2 studies, including the present one.

Lexical inferencing is often considered a reading comprehension strategy, and a fair number of studies of the instruction of reading comprehension strategies in L1 have been published. In their review of a number of relevant studies in the mother tongue, Pearson and Gallagher (1983) conclude that, in general, students can be taught to apply good reading strategies independently through explicit instruction, provided that the strategies are carefully defined and modelled for the students, and students are given ample exposure to both guided and independent practice (p. 333). In particular, both the inferencing and lexical inferencing abilities of students in their mother tongue were shown to improve through instruction and practice (e.g. Beck & McKeown 1991; Hansen and Pearson 1983; Jenkins, Matlock & Slocum 1989; McKeown 1985, cited in Beck & McKeown 1991; Reutzel & Hollingsworth 1988).

The L2 studies that are concerned with the possiblity of improving the ability to infer meanings of unfamiliar words from context through instruction can be divided into two groups: those which draw mostly on pedagogical experience and insights (e.g. Buikema & Graves 1993; ; Hosenfeld et al. 1981; Kruse 1979; Nation 1990; Sinatra & Dowd 1991; Virkkunen 1992; Williams 1985) and those based on research (e.g. Aizawa 1998; Hosenfeld 1984; Kern 1989; Mulder, forthcoming; Rusciolelli 1995; van den Brandt 1993). In the following, only studies based on research are reviewed.

In one of the first case studies to focus on training lexical inferencing Hosenfeld (1984) explicitly taught lexical inferencing techniques to individual ninth grade students and found that their problem-solving behavior improved when they encountered an unknown word. Hosenfeld first analyzed the unsuccessful reading strategies of her subjects in a think-aloud session and then taught them word-attack strategies that she had found successful readers to use.

Kern (1989) reports that explicit teaching of reading and word inferencing strategies to university students of intermediate French (N=53) improved both their comprehension and inferencing ability when compared to the control group. It was the low-ability students who benefited most from the instruction, whereas mid-ability and good students did not show statistically significant gains. There was, however, an upward trend, especially in the mid-ability group. The better students seem already to have effective native-like reading strategies so there is not much room for improvement. In many instructional intervention studies good students rarely show improvement because they already have adopted the most efficient study habits (see e.g. Hansen & Pearson 1983; Kristiansen 1992; Silvén 1992).

Van den Brandt (1993) studied whether explicit instruction in the use of context in deciphering the meanings of unfamiliar words would improve the reading of German vocational students of elementary Spanish and more advanced English (N=153). Seven FL teachers carried out the experimental program. The results did not show any statistically significant change either in the use of context or in reading comprehension, nor was there any significant difference compared with the control group. The results contradicted the results of a similar previous study (van Esch 1987, cited in van den Brandt 1993). The contradiction can be partly explained, as van den Brandt points out, by the fact that not all the results were reliable because some of the students did not take the post-test seriously. There was also lack of motivation to participate in the training program on the part of some of the students of Spanish because of their very low proficiency in that language.

Among other factors that van den Brandt thinks might have affected the results was the little time (seven lessons in three months) available for the study as well as the teacher variable. Van den Brandt's study shows what difficulties may surface when such studies are conducted in natural circumstances. Students are not passive subjects but have innumerable motivational, emotional, and intellectual features which cannot be controlled for research purposes. There is a difference between what people *can* and *will* do. Furthermore, the time allocated to experimental programs in schools is very often limited because the students have to follow their regular syllabus as well. Furthermore, the lexical inference part of the program used in Van den Brand's study appears to be based on rather abstract conceptualizations, which may have been unappealing to vocational school students.

Mulder (1993, forthcoming) reports the preliminary results of a large quasi-experimental research project in the Netherlands, in which 16-and 17-year-old high school students of French from 35 schools (N=1,500) participated for a year. The purpose of the study was to see whether training - and what kind of training - has an effect on reading competence in a foreign language. Five different conditions were used. There were two metacognitive conditions: *training with heuristic rules* (questions are given to bring about and guide metacognitive reasoning) and *training*

with open reflection (the students do not have to follow any heuristic rules but just think about their inferencing process).Three of the conditions did not involve metacognitive training, namely *no training at all, traditional training* (mainly aimed at passing the multiple-choice reading comprehension test of the national matriculation examination), and *blind training* (doing the exercises prepared for the program but with no explanation or discussion). Six exercise types were prepared for the last three experimental conditions. Two of them had to do with inferring word meanings. In one, the target word was missing, and in the other, it was underlined.

The results indicate that all training improves L2 reading and that metacognitive training was significantly better than traditional training. However, blind training turned out to be as effective as metacognitive training. The use of heuristic rules or open reflection did not influence the results.

To a practicing teacher, this may not be very surprising because many students may learn much language implicitly, without giving any conscious thought to how the language works, by only having enough exposure to the language and by practicing it. Instruction in metacognition to novices does not necessarily improve their learning results (Eteläpaltio 1991, 267), and teenage students can be considered to be novices. On the whole, however, training helps.

Rusciolelli (1995) asked university students of Spanish (N=65) to rate some reading strategies in terms of their usefulness. They had been instructed in the strategies for one semester. The students regarded lexical inferencing and skimming as the most useful ones.

Rusciolelli's instructions for contextual guessing consisted of three steps: First, the part of speech of the unknown word was identified, then the context of the passage was examined and guesses were made as to the meaning of the item word and, finally, since the students quite often failed to keep the main topic or the paragraph topic in mind, the teacher prompted them with review questions.

On the whole, the results of many of the instructional intervention studies in L2 are rather unimpressive. One explanation may be that some of the studies lasted for quite a short time, usually for a few lessons (see e.g. Barnett 1988). Moreover, many of the studies do not report any follow-up studies or long-term results. There is evidence that short instructional programs in general, even if successful in short-term gains, have little or no lasting effect on the students' behavior (e.g. Kristiansen 1992; Silvén 1991). On the other hand, if the duration of the instructional program is longer and more systematic, new strategies may become part of the learners' permanent repertoire (e.g. Mulder, forthcoming). Therefore there is reason to believe that a systematic, long-term instructional program would yield more lasting results.

The gains may be, however, difficult to attribute to the instructional program alone because there are other influences working simultaneously. At school age among the most important ones are emotional and intellectual maturation, linguistic development as well as ongoing improvement of language proficiency.

3.8 Lexical inferencing as a task

Different tasks tap different knowledge sources and require different strategies to complete. Task demands are a powerful determinants of what gets noticed (Schmidt 1990, 143). The crucial variable affecting also the choice of strategy is not proficiency but task (Kellerman 1991, 157). In the evaluation of reading proficiency the way in which comprehension is assessed influences learner performance (Lee 1987, 55). In addition to the task, the task instructions can bias the reader to use more of bottom-up than top-down processing and vice versa (Robinson 1995, 311). In brief, the task matters. Therefore task evaluation is an important phase in instruction, task and test construction.

Vann and Abraham (1990) suggest that tasks be examined and evaluated from four angles: engagement, risk-taking, knowledge of various sources, and control to manage the selection and co-ordination of knowledge. In the following, the lexical inference task is examined in the light of Vann's and Abraham's framework.

Engagement

It is important that test takers be as fully as possible engaged in and committed to the task they are either given or taken up themselves. To be successful in guessing the meaning of an unfamiliar word, engagement on the part of learners is a prerequisite because they simultaneously have to attend to both local and wider contexts, as well as meaning and form. Superficial processing or negligence of one or more vital aspects of the task will almost invariably lead to failure in comprehension.

The lexical inference task is consciousness-raising and engaging because it directs the learner's attention to the specific features of the target language that carry meaning. It also requires language analysis, through which implicit knowledge becomes explicit (Bialystok 1990, 119), especially if learners are required to verbally report the reasons for their inferences. The attention the learner pays to the meanings carried by specific grammatical properties raises their consciousness of the language and this may also lead to learning (N. Ellis 1993, 108). Noticing the input is thus a prerequisite for subsequent L2 development (Schmidt 1990, 1993, 1994).

Risk-taking

When the reader meets an unknown word in a text, it is always more or less risky to infer its meaning. The amount of risk depends on the centrality of the word to global understanding as well as on the student's language proficiency and background knowledge. The more the student has to resort to wild guessing, the higher the risk.

Any L2 situation - and a lexical inference task particularly - is by nature ambiguous and therefore risky. The ambiguous context may be novel, so that there are no or not enough familiar cues, or the context may be too complex, have too many cues. The context may also be insoluble: the cues suggest a different structure

(Chapelle and Roberts 1986, 31). In lexical inferencing all these ambiguous, risky situations may occur.

Knowledge

Vann and Abraham (1990) divide the knowledge component further into procedural knowledge (the knowledge of how to do things), background knowledge (schemata), and knowledge of the language, which is partly procedural. The latter two can been regarded as declarative knowledge (the knowledge of what). Successful inferencing presupposes both procedural and declarative knowledge (Haastrup 1991, 178).

Procedural knowledge

One would expect that experience in L2 reading would develop the necessary *procedural knowledge* of knowing how to integrate the cues from various information sources to infer the meanings of unknown words from context. This may be the case in real-life circumstances but it does not necessarily hold true in formal learning situations (Carrell 1988b; Hansen and Pearson 1983).

One of the reasons why efficient procedural knowledge fails to develop in some L2 students may be language instruction. It may emphasize word-by-word processing and the equal importance of active and passive vocabulary learning (Takala 1984), or mechanical rote memorization type of learning (Stavans & Oded, 1993). The quality of the processing of words may also be affected by language teaching methods. If words are learned as formal items and not in textual contexts, then the formal properties receive primary attention (Heikkinen 1983, 49) and meaning is allotted a secondary role. The inhibitory nature of those classrooms which emphasize grammatical correctness may also prevent the students from using the natural compensatory strategies (Kellerman 1991, 156), such as lexical inferencing.

The materials used in school may also have a negative effect on lexical inferencing. The inauthenticity and irrelevance of many of the texts and tasks may have the effect that students simply have no incentive to make inferences (R. Ellis 1985, 21). Moreover, the shortness of many texts may prevent the schemata which are necessary for lexical inferences from developing (Carrell 1988b, 111). One reason may also be that the teacher simply does not provide the students with a sufficient amount of reading experience. Not even a good language proficiency guarantees the maximal use of clues in context (Bensoussan 1992, 110), if such use is not encouraged and required by the task. Many readers adhere to the minimum effort principle in many situations (McKoon & Ratcliff, 1992) unless the task or text requires them to be more engaged.

Unfortunately, in many Finnish L2 textbooks the exercises are mostly concerned with the language and not with developing learners' skills in understanding the meanings in the text (Järvinen 1994, 161-162) although there have been calls for more meaningful types of reading tasks (Kuure & Saarenkangas 1995).

Background knowledge

Background knowledge refers to the prior knowledge the reader has of the topic of the text as well as the general knowledge gained through pragmatic experience. Text comprehension, discourse processing, and reading strategies have been shown to be strongly affected by relevant background knowledge (e.g. Chen 1997; Royer et al.1996).

The role of background knowledge and its activation is also of central importance in lexical inferencing: it influences the activation of correct schemata, helps in making hypotheses, predictions and inferences, as well as in confirming or rejecting them. Adams' (1982) study showed that even if no more than just the topic of the text is given, it helps readers infer the meaning of embedded unknown words by providing the schema for the text.

However, background knowledge may also lead astray: readers may have incorrect preconceived ideas about the propositions in a text (Bensoussan 1992; Norris & Phillips 1987), and if they do not pay enough attention to the information that the text provides, they may make wrong lexical inferences. Lack of knowledge of the relevant schema, or an inability to activate it, may affect the understanding of even familiar words (Bensoussan 1986). If an unknown word is essential for comprehending the gist of the passage or text, a wrong guess may lead to the activation of a totally incorrect schema, and consequently result in a serious misunderstanding of the whole text (see e.g. Bensoussan 1986; Bensoussan & Laufer 1984). This applies, of course, to any kind of background knowledge, even in the mother tongue (Bensoussan 1986; Norris & Phillips 1987). Therefore, the reader should have sufficient background knowledge of the text topic for lexical inferencing to take place.

If the target language and native language cultures differ substantially and understanding the text requires *cultural background knowledge*, the danger of misinterpretations increases (Carrell 1987; Steffensen & Joag-Dev 1984). Having the correct cultural schemata may sometimes be an even more decisive factor in understanding than being able to handle lexical complexity (Floyd & Carrell 1987; Johnson 1981). Whether the text deals with familiar or non-familiar cultural context may cause changes even in L1 reading strategies (Pritchard 1990).

As far as Finland is concerned, the danger of profound cultural misunderstanding of texts of Anglo-American cultural content is not as imminent as in some other cultures. The Finnish and the Anglo-American cultures are not critically different: Finland is an industrial European country, its culture rooted mostly in the Western tradition. The influence of the English language and Anglo-American culture in Finland, especially through the mass media, is firmly established. Nevertheless, there are many, if sometimes subtle, differences which may cause cultural misunderstanding and misinterpretation. On the other hand, English has increasingly become a *lingua franca*, an international language with no particular references to the Anglo-American culture. Moreover, many of the English texts used in school may deal with other, less familiar cultures, and then the possibility of cultural misunderstanding should be taken into consideration.

Knowledge of language

Another type of declarative knowledge is *knowledge of language*. Poor knowledge of the lexicon and syntax of the target language hampers lexical inferencing because there is not enough processing capacity left for higher-order functions such as inferencing: all the available capacity is expended on bottom-up deciphering of the graphics of the text (e.g. Cziko 1980, 113).

L2 vocabulary knowledge is often mentioned as the most important single factor contributing to language proficiency in general and reading comprehension in particular (see e.g. Nation 1990). Vocabulary size is a good predictor of reading success both in L1 and L2 (see Laufer 1997, 20-21 for a review; Grabe & Stroller 1997, 116). A good knowledge of words is important in lexical inferencing because when the reader is guessing the meaning of an unknown word the other words in the text act as important cues for the reader. Knowing a lot of words does not, however, suffice. The reader needs to have syntactic knowledge as well, because syntax provides important cues for understanding the relationships between the words. If the target language and the mother tongue are unrelated and their syntactic structures are very different, the importance of syntactic knowledge increases.

Function words, such as prepositions, pronouns, conjunctions, and auxiliary verbs, connect the elements of language into larger units, and they may be equally important for understanding as content words, such as nouns, verbs, adjectives, and adverbs (Sim & Bensoussan 1979). Logical connectors, along with modifiers, are among the vocabulary items not easily guessed in context (Bensoussan & Laufer 1984); therefore it is important for the learner to have a reasonably good knowledge of the most common function words to be able to use them as cues when inferring the meanings of unknown words.

Control over the selection and co-ordination of knowledge

If a task requires that the learner simultaneously attend to several aspects of language such as form, meaning, and context, and, at the same time, monitor the processes, cognitive control in coordinating information becomes very important (Bialystok & Ryan 1985). The lexical inference task calls for such control. It is also important to monitor one's inferences by checking the answers against the context. This monitoring also requires integration of processes (Daneman 1991, 529-539). It is also important to pay attention to only the relevant cues and ignore the others. Less proficient students seem to be less able to handle this simultaneous attention, control, and co-ordination (Schouten-van Parreren 1992).

Although meaning construction should always be the main objective of reading activities (McNamara et al. 1991, 509), those activities which focus on both form and meaning have been proved to be effective in enhancing language proficiency. Therefore they are recommended by experts (Cadierno 1995, 191; Long 1991, 45-46). The lexical inferencing task seems to meet these requirements. It may well be that the task itself trains the learner to handle several knowledge sources at the same time and integrate them.

To sum up, when readers are deciphering the meaning of an unknown word - and especially when they are required to give reasons for the inference - readers have to be engaged in what they are doing, process the text more deeply than they might otherwise, and take risks. They must also know how to react when encountering unfamiliar vocabulary, to be able to use both their background knowledge and their knowledge of the target language appropriately, and integrate all this knowledge to arrive at the right solution.

4 GOALS OF THE STUDY

One of the main purposes for teaching and encouraging lexical inferencing in the foreign language classroom is to promote such reading behavior as students will need outside school in real life. In non-instructional situations it is common that people have to read in a foreign language without the help of a more knowledgeable person, such as a teacher, or without having access to or time for a dictionary.

In the first place, being able to guess unknown words from context effectively makes the student a more self-reliant reader (Walker 1983; Nation 1990; Mulder 1993). Secondly, encouraging students to derive meaning from context enhances students' ability to learn new words independently (Jenkins et al. 1989). Thirdly, if the item word is analyzable into useful parts, it will teach the learner about the systematic nature of word-building and enable him to exploit this knowledge on his own when he meets a new word with similar parts (Nation 1990, 130). Such an autonomous student is better off in the outside world. For this reason, among others, learner autonomy is one of the goals endorsed in today's education in general and in language education in particular by the Council of Europe (e.g. Modern Languages: Learning, Teaching, Assesment. A Common European Framework 1996).

Furthermore, lexical inferencing is an especially valuable strategy as far as the English language is concerned because of its extensive and ever-growing vocabulary. No non-native learner of English can be expected to master more than a fraction of all English words. Learning and understanding new English words is therefore, for a non-native, a life-long endeavor (Meara 1995) and, no doubt, for a native speaker as well.

My initial interest in lexical inferencing arose from an observed problem. As a senior high school teacher of English, I had noticed that many students - even though they had several years of English behind them - appeared not to be able or willing to use their inferencing abilities when reading in English in the classroom. I started to wonder if there was anything that a teacher could do to make these students change their reading habits.

Another reason for my interest in contextual guessing originated in my dissatisfaction with the dominant multiple choice format for assessing L2 reading comprehension. I felt a need for a task which would be both useful in real life, promote better learning and deeper processing as well as be more in line with my own educational philosophy and practice than most of the tasks in the text books. Lexical inferencing, I thought, is something natural that skillful readers do, especially when reading in a foreign language.

After giving my students inferencing tasks to do during lessons, I soon discovered, however, that if the students were tested by using multiple-choice or open ended questions or similar traditional testing formats, their inferencing skills did not improve. Students appear to take seriously only the kind of exercises that are similar to test items (Selmes 1987, 24). The next step, therefore, was to start to assess the students' reading comprehension with tests in which lexical inferencing would be the central element. With growing experience with lexical inferencing tasks in tests, I became increasingly interested in the foreign language reading process itself. I began to design tests and an instructional program more systematically. Many questions arose in the process. The purpose of the present study is an exploration of four of them.

1. What kind of strategies and sources of knowledge do Finnish-speaking high school students use when they try to infer meanings of unknown words in English texts?
2. What causes of failure and problems can be detected in their lexical inferencing?
3. Are there any qualitative or quantitative changes in lexical inferencing as the students' proficiency in English improves?
4. How do the scores in lexical inference tasks compare with those of the high school exit examination (matriculation examination) in English?

Through seeking answers to these questions, the main objective of the study is to better understand the foreign language learning and reading process of Finnish high school students of English and, with better understanding, to provide means to improve English instruction.

5 THE METHODS

The methods used were largely dictated by the fact that the study was conducted in natural classroom circumstances by the students' English teacher. No rigorous experimental methods were possible. Therefore, a qualitative, interpretative approach seemed the most feasible and natural. This approach is supplemented by quantitative data, whenever possible and relevant, in order to examine the findings from a different perspective. A pre-test/post-test design was also used to see whether there had been any changes in the students' proficiency.

The main method for eliciting data was translation of the target words from English into Finnish and short written reports on the cues that had led the students to their inferences. This introspective method was thought to be the most practical way to gather data about the students' inferencing process in a classroom context where the teacher acts also as the researcher. Think-aloud protocols (see e.g. Pressley & Afflerbach 1995) would have yielded much more information, but were not possible considering the research circumstances.

Because some students have difficulties in reporting their thinking, another possiblity would have been to use a pre-prepared list of strategies. Research shows, however, that it is more informative to let the students explain their choices rather than let them select from a pre-prepared list, and the results between the two methods of data gathering can be remarkably different (Allan 1995).

Introspective methods have, however, their drawbacks compared to forced-choice methods of data elicitation. Interpretation is sometimes very difficult because there is a lot of ambiguity, complexity, and variation in answers (Dollerup et al. 1994, 75). One of the reasons is that students differ in their the metacognitive abilities (Block 1986; Garner 1987; Odlin 1990). Another reason is that sometimes superior language proficiency prevents access to one's thinking process (Ericsson & Simon 1980). Thus, both students of low and high ability may have difficulties in verbalizing their thinking process. In this study, the difficulty was occasionally overcome by classroom or private discussions or the teacher's familiarity with the students and their processing style.

5.1 Subjects

The subjects were senior high school students at a teacher training school in Helsinki and students at another senior high school in Vantaa, a town in the metropolitan area of Helsinki. The age of the students ranged from 16 to 19.

At the time of the collection of the main body of data (1992-1993), the academic entrance standard of the students of the teacher training school was excellent. All senior high schools in Finland are selective and the academic standard varies from school to school. Because of their high mean average, the students at the teacher training school cannot be considered typical representatives of the Finnish high school population. Therefore some material collected earlier at the senior high school in Vantaa, with a more heterogenous student population, was included in the study.

First, in order to see what kind of strategies and sources Finnish students use in contextual guessing and whether there is any regularity in these strategies, the answers of 31 students from both schools were analyzed. This was the *preliminary group*.

Secondly, to gain better insight into the lexical inference processes of the students, a different group, an intact class of ten students at the teacher training school was chosen for closer study. One reason for the selection of this particular group was the small size of the class (N=10; 9 females, 1 male). Another reason was that I wanted to study subjects who were not yet very proficient in English. These students were studying English as their second foreign language, Swedish being their first foreign language. At the time they began senior high school they had been studying English for three years and they were approximately at the lower intermediate level. Their basic language development was therefore still very much in progress. I hoped that studying students who had not yet reached advanced proficiency would shed light on the problems of lexical inferencing as well as the language learning process. This group is called is *Group A*.

Group A entered high school in the fall of 1991 and they graduated in spring 1994. Among the ten students, there were two students, a boy and a girl, whose performance in English turned out to be exceptionally poor for the students of the school. Since their answers were interesting for pedagogical and research reasons, they were singled out for further analysis.

Because of the small size of Group A, another intact class was included in the study to get some quantitative and more qualitative data. This class, *Group B*, consisted of 16 students (9 females and 7 males). Two students (a female and a male) had to be excluded from the study because of being absent in one of the tests. This group was also studying Swedish as its first and English as its second foreign language. These students graduated a year later than Group A. There were no below average students in English in this class: half of them (N=8) could be judged as excellent, the other half were judged as as good.

Since the subjects' academic standard was generally high, it was felt that there was no need to test their mother tongue reading ability. It was presumed that their L1 reading skills were good. Furthermore, Finnish students are generally good readers in their mother tongue. In an international survey, they proved to be the

most proficient readers of all the 31 countries included in the study (see e.g. Linnakylä 1995). Therefore, it could fairly be assumed that all subjects were proficient L1 readers.

The students practised lexical inferencing as a regular classroom routine and took lexical inferencing tests as part of their normal course finals. They were not told until afterwards that their inference tasks and test results would also be used for research purposes so it is unlikely that the Hawthorne effect influenced their work.

5.2 Instruction

Instruction and practice in lexical inferencing were integrated into the regular classroom procedures right from the beginning of the first high school year and lasted for the two and a half years of senior high school. No rigorous program was carried out, however contextual guessing and related tasks were fairly systematically practiced and discussed as part of normal classroom work. The practice tasks were either taken from research literature or I had developed them myself from ideas drawn from relevant studies or practical experience. The tasks aimed at practicing general inferencing, noticing relevant linguistic features, and lexical inferencing proper (Examples of the types of tasks are given in Appendix 5).

My instruction in lexical inferencing usually proceeds along the following lines. When I teach the students what to do when they meet an unknown word in text, I usually start by modelling or explaining. When I model, I think aloud when going through an inference task and let the students hear, for example, what kind of cues I pay attention to, what kind of hypotheses I make, why I reject some hypotheses, and on what basis I make new ones.

After modelling, which is not often necessary, I explain to the students what lexical inferencing is and how to go about it. I tell them that the first thing to do is to decide whether it is vital for overall comprehension to understand the unfamiliar word at all. If not, I advise the students to ignore the word altogether. If, on the other hand, the word is important for understanding the proposition, I direct the students to use the information that the context yields as the first cue, along with their world knowledge. Then they should decide how precise a meaning is necessary for global comprehension, because very often it suffices only to understand whether the word has negative or positive connotations.

I also advise the students to determine the class of the word or to consider another class if the first interpretation does not fit. To help them in this syntactic analysis, I help them recognize the typical cues for each word class. This is important because Finns often confuse English word classes. If there still are difficulties in inferencing, I also encourage the students to use morphological analysis to help their understanding.

The purpose of the instruction to engage the students in more active or deeper processing than is normally the case and to teach them to realize how much context can help them in comprehending L2 texts. This has been shown to be an

effective way of improving comprehension and the acquisition of new vocabulary (see Beck & McKeown 1991, 807, for a review). Students do not necessarily use the cues or analyze the words if left to their own reading or vocabulary acquisition strategies (Lawson & Hogden 1996).

After the modelling and explanation phases, students practise with different kinds of tasks, either on their own or in pairs. Their answers are discussed in class, and students get feedback on their solutions. Then more practice follows, and finally the course test.

On the whole, the procedure follows a cycle of instructional events - explanation or modelling, guided practice, corrective feedback, independent practice, and application. This has proved to be necessary if the strategy learning is to be successful (Pearson & Gallagher 1983, 333).

5.3 Instruments

The test material was collected in 1988 and 1991-1994. The test results and the written verbal reports were examined and interpreted, based on my experience with lexical inferencing tasks from many earlier tests and relevant literature (e.g. Haastrup 1991; Hosenfeld 1984; van Parreren & Schouten-Van Parreren 1981).

Because no lexical inferencing tests were available, I prepared them myself. There are some advantages in this kind of teacher-made test: the texts and test items could be selected with an eye on the particular class and the classroom work done with it. Because the tests were used as achievement tests at the end of the six-week course (the number of lessons during a course varies between 25 and 38), they had to be based on the course material and reflect the instruction. The course sub-test in reading comprehension usually consisted of two or three relatively short authentic or semi-authentic texts, mainly expository in genre, with ten to twenty supposedly unknown words selected for lexical inferencing. Sometimes one of the test parts was a multiple-choice test on structures and vocabulary. In this study, the tests used were one part of such a three-part reading test.

Two such tests were selected as the instruments of this study. One of the texts was an article entitled "Secrets of Straight-A Students" (Reader's Digest, September 1992, Text 1; Appendix 1). This test was used during a course that deals with studying and working. Another test was an abridged article entitled "Street Kids Find a Friend" (Time, October 1988, Text 2; Appendix 2) and it was used in a course which concentrated on such topics as living and social problems. A third text (Text 3) was used to form tentative categories of inference categories and the sources of inference. It was abridged from an article entitled "Making the Best of It: the Trials and Triumphs of Being Learning Disabled" (Psychology Today, January 1986: Text 3; Appendix 3). It was given to the preliminary group as a trial test to elicit more material. All these articles were of general interest and their topics were closely related to the course topics. The students were not expected to need any special background knowledge in order to understand them.

The students translated the item words into Finnish and were asked to explain their inferences as well as they could. The design of the study is presented in Table 1. Group A did Text 2 twice, first as part of their course test, then twelve weeks later as a post-test, with written verbal reports. Group B, on its part, read Text 1 and reported on their inferences on the first lesson of the course (and their sophomore year). This was the pre-test. Six weeks later, they read the same text as part of their final course test. This was the post-test. Group A also had Text 1 as part of their course test, but only once, and Text 1 was likewise part of Group B's final test. When the inference tests were taken as regular course tests, students only gave the translations, because verbal reports might have taken too much of the limited testing time.

TABLE 1 Subject groups and the texts used.

Groups	Pre-test post-test	Time between pre-and	Post-test	Once
A (N=10)	Text 2	twelve weeks	Text 2*	Text 1
B (N=16)	Text 1*	six weeks	Text 1	Text 2
Preliminary				Text 3*

* verbal reports were also elicited

5.3.1 Designing lexical inference tests

The text (its content, genre, register, and formality level) has been shown to be the most important factor in determining the success of a test taker on a reading comprehension test (Shohamy 1984; Swain 1993, 202). Texts with familiar cultural content are naturally easier to understand (Johnson 1982) than texts containing culturally unfamiliar information, allusions, and connotations. If either the cultural content, genre, style, or the register of the text is not within the experience of the students, or the language is too sophisticated, even a factually or linguistically easy text may become incomprehensible to them. Their schemata may not activate at all and, consequently, no inferencing can take place. In addition, the topic of the text has an effect on the strategy use of intermediate L2 readers (Barnett 1990; Davis & Bistodeau 1993, 465). The text really matters.

In order to be able to infer meanings of unknown words in a text the reader has to have a thematic schema for the topic. The text itself provides some of the necessary background knowledge for a mental model to develop, but readers should be encouraged to use their world knowledge as well. The thematic world knowledge varies considerably from reader to reader, depending on their interests and experiences.

Authentic texts have proven to be better for natural processing and understanging (see e.g. Horiba 1990, 199) than artificially designed "language learning" texts. But not all authentic texts always provide enough cues for the

reader to derive word meaning (Beck & McKeown 1991, 809), which must also be taken into account when selecting suitable texts for lexical inferencing purposes.

The texts I chose for this study dealt with general topics and were closely related to the topics discussed in the classroom. Every student could therefore fairly be assumed to know the general topic area. The texts were authentic, only sometimes slightly abridged or edited. The difficulty and style of the language was comparable to those encountered in popular general knowledge magazines. The expository text type of these texts is, perhaps, the most common type students meet.

Nevertheless, not even the most careful selection of text guarantees identical understanding, even if there is not much difference in the language proficiency of the students. Firstly, during the classroom work students may pay varying amounts of attention to different topics depending on such factors as motivation, state of mind, and interest. Secondly, each individual interprets and, in a way, recreates each text somewhat differently, according to his background knowledge (Pearson et al. 1992, 149; Spiro 1980; Williams & Moran 1989, 225). In addition, the initial background knowledge may have been different. There is no reliable way to measure prior knowledge (Hammadou 1991, 31). Even if there were, such assessment would have an influence on students and a different effect on different students. Accordingly, there cannot be any completely identical comprehension.

There is, however, reason to believe that the students of an intact, fairly homogenous monocultural class, who have read the same materials and have been instructed by the same teacher, have relatively similar background knowledge and at least theoretically equal chances to succeed in lexical inferencing.

One of the assumptions in this study is that the lexical inference task, if properly designed, taps the students' knowledge of the target language and can therefore be used to assess language proficiency. To be able to infer the meanings of carefully selected unfamiliar words, the learner has to have a fair knowledge of the structures and syntax of the foreign language and a sizeable vocabulary.

Not all words, however, are inferrable. Sometimes there are no contextual cues, or the cues appear in other words which the language learner does not know. The reader must have a sufficiently large and clear context on which to base his inferences (Laufer & Bensoussan 1982).

When I selected the item words the overriding principle was that they would be inferrable, either on the basis of linguistic cues or general knowledge. In other words, I tried to ensure that the text contained enough cues - either in the surrounding text, in the word itself, or in both. Sometimes, however, I misjudged or overrated my students' knowledge of the language or of the world.

In addition to the presence of cues, other important factors are the type and distance of the cues (Carnine et al. 1984). For example. synonym cues make the guessing easier than those which require inference, and cues closer to the target word help more than more distant cues. McKeown and McCaslin (1983) indentify four types of contexts: *misdirective* contexts, which mislead the reader; *nondirective* contexts, which offer no general meaning; *general directive* contexts, which direct the reader to a correct general meaning; and *directive* contexts, whose cues lead to a correct, specific meaning of the target word (cited in Beck & McKeown 1991, 800). In this study an effort was made to choose the item words primarily from general directive and directive contexts.

The second important guideline when selecting the item words was that the understanding of the word should contribute to a more global comprehension of the text than just understanding the immediate context. This principle of importance and the principle of inferrability are sometimes mutually exclusive. As a result, I sometimes chose item words simply because they were inferrable but not necessarily important for gist understanding. However, because one of the purposes of the lexical inference task is to encourage students to use their inferencing abilities, not only to guide and assess their reading comprehension, it was occasionally necessary to sacrifice the principle of importance in favor of the principle of inferrability. Fortunately, it is often possible to choose item words which satisfy both principles.

Other guidelines for item selection were to choose the words so that the students

- would be encouraged to use their knowledge of the world,
- would be forced to distrust their first reaction (especially with a familiar word with a novel meaning or a homonym),
- would be made aware of the possibility of cognates in the two languages, and
- would be required to parse the language and to analyse the word into its parts to arrive at meaning.

Because I used the lexical inference tasks and tests to support other language work in the classroom, I frequently selected a few items on the basis of the work done in the classroom during the course. For example, if homonyms or lexical analysis had been included in the instruction and practice, I often chose items which were inferrable by using the knowledge of homonyms and word analysis.

5.3.2 Scoring

In assessing the lexical inference tests, one of my guidelines was based on the observation that, more often than not, an approximative answer is sufficient for comprehension. In general, absolute measures do not agree well with L2 reading because L2 reading comprehension is typically partial or approximative (Ringbom 1990, 141). There are not only correct and incorrect answers, but degrees of correctness. Therefore, when assesing the tests, I required verbatim translations in only a few rare cases. Very often a more general term, rather than the precise and specific translation, was accepted.

Another principle in my assessment was that no rigid identical norms should be applied to every single item. The interprtations of each target word was judged in its own right on the basis of such factors as the inherent difficulty of the word, the amount of help that the context offered, the learners' breadth and depth of experience, and what had been the focus of instruction and practice.

The scoring of the tests was done according to the following principles: Two points were given for a correct translation or a good approximation, i.e. one that did not change the general meaning of the passage. If the answer made sense in a more limited context, but disagreed with the rest of the text, the student got one point. A wrong answer received no points at all but if the student did not give any answer, one point was deducted from the final score. The principle of deduction was adopted because it encouraged effort and risk-taking. Practically all items were

translated after the introduction of the one-point deduction. It should be noted, however, that the threat of losing points may have tempted some students to resort to wild guessing. For example, one very proficient student, who was asked about his irrational inference of a word, explained that since a wrong answer would have no negative effect on the final score, he had written down the first word that had occurred to him.

5.3.3 Validity of the instruments and reliability of measurement

One of the advantages of the lexical inferencing task is that it involves an authentic process. It is natural to try to guess the meanings of unknown words in context on the basis on contextual cues and background knowledge. Many other reading comprehension measures, such as multiple-choice tasks, true and false questions, as well as different kinds of clozes, are rather unnatural and are not encountered in real life situations. Therefore, the lexical inference task has better *face validity* than some other types of tests.

In her discussion of the validity of L2 reading tests, Bernhardt (1991) gives some criteria for a valid reading comprehension test. First, it should acknowledge the status of what the readers already know and what their interest are. Second, a valid test should be able to balance the two phenomena of L2 reading: that the readers are sometimes able to handle units of language separately without true comprehension and sometimes understand quite a lot without being able to handle individual language units. A third requirement for a valid test is that it can provide quantifiable data and in-depth information on how readers cope with the text (pp. 192-194).

The starting point for the preparation of the lexical inferencing tests used in this study was the students and their knowledge base. Secondly, successful lexical inferencing requires that the reader attend both to the overall meaning and to the smaller linguistic elements in and around the item word. Thirdly, the lexical inferencing test provides instructive information on the readers' comprehension process as well as test scores that can be used for comparison and ranking. Therefore, the lexical inference test can be seen to meet Bernhardt's requirements.

In this study, the same tests were used as pre-tests and post-tests. The natural objection to this kind of procedure is that the students were already familiar with the text on the second encounter and that this could have been the cause of possible learning results. The texts and tasks were not, however, available to the students during the six- and twelve-week breaks between the pre-tests and the post-tests. Despite the fact that even one attentive encounter with a word leaves a memory trace (N. Ellis 1994, 42), the learning of a word usually requires much more processing and rehearsing (Lawson & Hogben 1996). It is also unlikely that students would bother to tax their memories with texts that they did not know would be used again.

The use of a different text as a post-test would have caused reliability problems as well. Many studies show that if internal consistency is used as a reliability measure in L2 reading comprehension tests, the correlations are low because no two texts are alike as to topic, content, genre, register, and formality level. Nor should one expect high levels of internal consistency in L2 reading

comprehension testing because then they would not reflect the true variable nature of L2 proficiency (Swain 1993, 202). If, on the other hand, the same test is used as the pre- and post-tests, some of the above-mentioned handicaps of different texts can be avoided.

To have an intrarater reliability measure, I re-rated two of the tests after a break of several months. The rating was very consistent, with only one one-point difference. The ratings were also examined by and discussed with two experts. No major discrepancies were found. The ratings of Text 2 are provided in Appendix 4 for the reader to judge.

It is self-evident that teacher-made classroom tests cannot be judged by quite the same guidelines as standardized tests with large populations. Because of the small number of subjects and the many intervening factors that appear in real classroom situations, such tests do not often comply with the norms that are set for the tests which are subjected to statistical analysis (see e.g. Chaudron 1988). In addition, the thinking behind general proficiency tests and teacher-made tests is different. The teacher tries to help students develop their language skills and the format of the test is one of the means to that end. Pure test-technical considerations may be in conflict with that objective. In that sense, a test may be *pedagogically valid*, even if it may lack some of the properties required for statistical procedures. However, even with teacher-made classroom tests, the teacher should make every effort to ensure that the test is valid and reliably assessed.

6 RESULTS

In order to gain insight into the students' strategies of inferring word meanings, the answers of several tests were analyzed. Since the analysis was based only on the students' written answers, and not on in-depth interviews or think-alouds, it can only be speculative and tentative.

The analysis served the following purposes: to have a better understanding of the sources of inferences, to form categories of the perceived or inferred strategies that students use when inferring the meanings of unfamiliar words, to detect sources of failure; to analyze the problems that Finnish-speaking high school students have when processing written English, to see whether there are any quantitative or qualitative changes in inferencing as the knowledge of the target language improves, and to see whether there is connection between lexical inferencing and more established measures of language proficiency, such as the matriculation examination in English.

The emphasis of this inquiry was on the processes of lexical inferencing and L2 learning as well as the quality of the students' answers, not so much on quantitative data expressed by the scores in the lexical inferencing tests. The numerical score may suffice for assessment but for teaching purposes it is important to describe and analyze the processes so that the knowledge can be exploited in the planning and improving of instruction.

6.1 Strategies in lexical inferencing and sources of failure

A tentative classification of the perceived or inferred strategies in lexical inferencing and sources of failure was made on the basis of the test answers of the preliminary group (N=31). The students were asked to give the translation of ten unknown words that appeared in the article "Making the Best of It: The Trials and Triumphs of Being Learning Disabled" (Appendix 3) and give reasons, as well as they could,

for their choices in writing. On the basis of the analysis of the answers, preliminary inferencing strategies and sources of failure were identified or inferred and named.

Because it was suspected that not enough strategies had surfaced in the preliminary material, the classification of strategies and sources of failure was supplemented and confirmed by data both from the instruments of this study (Texts 1 and 2) and by other data the author had gathered over the years. Classroom and individual discussions with the students were also important sources of information. It was not possible to count any exact frequencies of the used strategies or sources of failure because of the vagueness and ambiguity of many answers, but some conclusions about their general popularity will be indicated.

Percieved or inferred inferencing strategies

After the answers had been analysed, two distinct groups of strategies appeared: those based on the text and knowledge of the target language and those based on knowledge outside the text. Six strategies were named as follows. Each strategy will be described and illustrated by examples.

Text-based strategies

1. Morphological analysis
2. Use of immediate context
3. Use of wider context

Knowledge-based strategies

4. Use of one's prior knowledge/knowledge of the world
5. Use of one's knowledge of conventions of written discourse
6. Use of interlingual knowledge

1. *Morphological analysis* means that the reader analyzes the word into its parts (morphemes) and deduces the meaning of the word from these parts. This requires knowledge of the morphemic system of the target language and is very often a useful strategy, provided that the reader interprets the parts correctly. Awareness of morphology has been shown to be one of the factors significantly related to L2 reading comprehension (Guarino & Perkins 1986). But morphological analysis can also go astray: the reader may have divided the word incorrectly, may have made a wrong inference from the parts, or may not have known the meaning(s) of one or more morphemes. The analysis may also fail because some English affixes can be either ambiguous, misleading, or opaque.

An example of successful morphological analysis is when a student explained that he had inferred the meaning of the item *ineducable* from the word *to educate* and the suffix *-able* (Text 3, item 5). An example of unsuccessful inference is to analyze *notables* into *not-ables* (Text 3, item 6).

2. *Use of immediate context* refers to the inferences based on only the very narrow context. Usually this strategy was expressed by stating "I deduced from the other words in the sentence." Sometimes one word was given as the cue. The immediate context may sometimes be sufficient for deducing the meaning of the word, but if the inferencing fails, the reason often is that too little of the surrounding text was taken into consideration.

Students may also answer incorrectly because they have not processed some other close-by words that are not test items but yet necessary for comprehension. This kind of shallow processing may reflect language instruction and textbooks. Language textbooks abound in fill-in exercises which require that the student pay attention to only minimal amounts of text surrounding the slot.

An extreme case of this kind of local processing is an inference based solely on the item word itself, with no regard for any wider context. This one word bias is a common source of error. The reader may be on the right track but offers, for example, a wrong word class for a homonym as a result of no or an incorrect syntactic analysis. Some students are exceedingly dependent on individual words and show a lack of attention to syntax (see for similar findings Barnett 1989, 99; Dollerup et al. 1994, 76; Laufer & Sim 1985, 9-10).

The test answers of one of my students exemplify this kind of ineffective processing, which was clearly influenced by school routines and textbooks. The student's results in a lexical inference test were much worse than I would have expected on the basis of his other language work in the classroom. When I asked him what he thought was the reason for the poor outcome, he explained that he had used the same strategy as in the easy fill-in tasks popular in the comprehensive school practice books. After having realized that this strategy does not work in the lexical inference task, the student was able to perform a similar task at his general proficiency level.

One of the reasons why the use of mere immediate context often leads to incorrect answers appears to be that the reader does not check whether the meaning he has suggested makes sense in the context by fitting it back in the original sentence. In other words he does not monitor his comprehension. This appears to be common practice of L2 readers (see e.g. Block 1992; Casanave 1988; Waern 1982, 154).

3. *Use of wider context* refers to the fact that the reader has exploited a larger context than a word, phrase, or a sentence to infer word meaning, i.e. a paragraph, a passage, or the whole text. Very often the students give the explanation "I inferred from the context" and it is difficult to tell whether they mean the local or the global context.

The students' global interpretations may be correct. If not, they have often ignored or misunderstood some words in the text and therefore arrived at a wrong solution, or they may have overtrusted their top-down processing and ignored the parts of the text that are contrary to their interpretation.

It seems to be difficult for some students to keep the topic of the text in mind while processing language at the local level (see also Rusciolelli 1995, 268). Consequently, they may go wrong even if they pay attention to a larger context

than just the item word or its immediate surroundings. This may happen also to more proficient students.

An example of successful and global deduction was when a student explained his guess regarding the item *learning disabled* (Text 3, item 2) that "the people mentioned in the article did not learn to read or write properly". A failure resulted when a student who mistook *drug* as referring to narcotics in an article about medicine, evoked a wrong schema and misunderstood the whole text.

4. *Prior knowledge* or *knowledge of the world* was fairly seldom mentioned by students as the guiding principle in inferencing. This may either imply that they are not used to relying on their world knowledge in the classroom or that they feel that only linguistic reasons are acceptable in a language task. However, in class discussions, students quite often refer to their prior knowledge as a source of inference, and since most of the subjects in this study were efficient language processors, it is very likely that many utilized their background knowledge but did not mention it in their answers.

An example of the use of general knowledge can be seen in the answer to the item *thinner* (Text 2, item 5). The student gave the correct translation and gave as the reason for her inference "my own knowledge about the use of thinner" [as an intoxicant].

Students may also have wrong or misleading knowledge of the world, which will inevitably result in misunderstanding. For example, when in a text on the history of the city of Chicago there was a mention of Indians passing on the prairie "in pursuit of game". Many students suggested the meaning *fight* (taistelu) for the item word *game* (riista). It turned out in the classroom discussion that the stereotypical image of the warring Indians of western movies had influenced the interpretation.

Occasionally there may be too much reliance on everyday knowledge: students presume that their knowledge and the facts in the text match, and do not analyse the text properly to gather further support for their interpretation. Both underuse and overuse of prior knowledge appear to be typical of less proficient readers. (see e.g. Carrell 1983; Hammadou 1991; Johnson 1982).

Sometimes it is more hazardous to base one's judgement on erroneous world knowledge than to go wrong in analyzing the language because top-down processing involves schema activation. If a schema is evoked, the reader tends to fit all subsequent information into the schema. If a wrong schema is activated, the whole text may be interpreted completely incorrectly, even if coherently. A local linguistic misinterpretation may affect only the comprehension of the immediate text. But as can be noticed from the *drug* example above, sometimes the incorrect inference of a single word may result in the activation of a wrong schema.

The most common source of prior knowledge is the language itself. The students were asked to indicate whether they knew any of the item words. Fairly often this was the case, especially for the most proficient students. Sometimes, however, the word was only thought to be familiar. For example Item 3 (Text 3) *principal* (pääasiallinen) was mistaken for *principle* (periaate) by a few students.

5. *Conventions of written text* that writers use to clarify meaning and to produce stylistic variety are another source of inference. Such conventions are, for example, the use of synonymy and antonymy, contrasts, examples, definitions, lists, summaries, and punctuation (see e.g. Sinatra & Dowd 1991). They are also called *formal schemata* (Carrell 1987).

Most of these literary devices used in English texts are familiar to Finnish high school students from their mother tongue, which does not, however, guarantee that they are exploited in L2 reading. These devices undoubtedly help in inferencing, but students rather rarely imply that they were their source of inference.

Familiar as the literary conventions may be, students sometimes ignore - or are not aware of - the redundancy of language. For example, they may not always notice that, for stylistic reasons, synonyms are used because the writer wants to avoid repetition.

On the other hand, awareness of literary conventions may also lead to misinterpretation. For example, when, in a text about canoeing, there was a comparison between Indian canoes made of rawhide and wood and Eskimo canoes of animal skin and bones, many students suggested *straw* or *hay* (olki, heinä) for the item word *rawhide* (vuota). When the item was discussed in class, the students defended their answer by saying that they thought that the difference between *rawhide* and *animal skin* was analogous to that between *wood* and *bones* and that they could not be synonyms.

An example of successful use of synonymy was when the meaning of the item *dunce* (Text 3, item 4) was inferred from the familiar synonym *stupid* in the same sentence.

Literary conventions may also be interpreted incorrectly. For example, one student mentioned as her inferential cues both the colon and the fact that it is often followed by a list. She then interpreted the item word *the strip*: (Text 2, item 7) as *the following* (seuraavaa).

6. *Use of interlingual knowledge* is the strategy of inference when the reader arrives at an answer by using the knowledge of either the mother tongue or another foreign language. The inference may again be either correct or incorrect.

Finnish is rather rarely referred to as the source of lexical inferencing. It has been shown that Finnish students may not probably even notice cognates because they are not accustomed to finding them in other languages (Ringbom 1987). Only very rarely do students suggest an answer clearly based on Finnish words. An example of such an attempt may be the rendering of *urchins* (Text 2, item 1) as *spying* (urkkimassa). Here the unsuccessful interlingual strategy appears to be strengthened by the obvious misreading of *-ins* as *-ing*.

In fact, Finnish appears to be more a hindrance than a help: many mistakes are made because of the inhibitive interference of the mother tongue. For example, many Finnish students quite systematically seem to ignore some of the features of English that are different in Finnish, such as articles and prepositions. In lexical inferencing, the result is often either the wrong word class or a misunderstood relationship between the words in a text.

All Finnish high school students have studied Swedish, a language related to English, and many of them study either German, French, Spanish, Russian, Latin, or

Italian as well. Swedish, usually the best-known foreign language after English, seems to help some students in inferencing, but this kind of interlingual influence is not very common. Sometimes words that seem alike but have different meanings in the two languages (the so-called *false friends*) mislead the student. For example, one student based her incorrect inference of *craftmanship* on the Swedish (or German) *kraft* (power).

An example of a successful user of interlingual cues is a student who cited the word *compensated*, which appeared in the same sentence, as his cue to the meaning of *by excelling* (Text 3, item 9) interlingual knowledge. *To compensate* looks very much like the corresponding Finnish word (kompensoida). The point in the text was that a learning-disabled person compensated for his handicap by excelling in sports.

An example of a direct, successful use of the interlingual knowledge when inferring the meaning of the item word *thinner* (Text 2, item 5) was a student's explanation, "It looks the same as the Finnish word" (tinneri).

Causes of failure

When a reader is using strategies to infer the meaning of an unfamiliar word, the same strategies may be used either successfully or unsuccessfully (see also Block 1986; Dollerup et al. 1994; Huckin & Bloch 1993). There are, however, factors that almost unfailingly lead to incorrect inferences. The following sources of failure could be perceived or inferred in the students' answers:

1. Poor word recognition skills
2. Poor syntactic skills
3. One word, one meaning approach
4. Negligence of some relevant linguistic evidence
5. Reliance on impression
6. Wild guessing

1. *Poor word recognition* skills appear to be a major source of quite a few errors in L2 reading in general (e.g. Paran 1996; Segalowitz et al. 1991). If the foreign language reading skill has not been sufficiently automatized, the recognition of individual words may be laborious and often lead to misreading one word for another and, consequently, to misinterpretation of the text. Poor word recognition inevitably leads to incorrect contextual guessing. The phenomenon of mistaking a word for one that resembles it has also been called *mistaken identity*, *mismatches*, and *synforms* (Huckin & Bloch 1993, 160).

For example, when trying to decipher the item in Text 2, one student offered *doubts* (epäillä) for item 4 *daub* (taputella) or *smack his lips* (maiskutella huuliaan) for item 2 *slips in* (sujauttaa väliin). In addition to showing poor word recognition skills, this type of error shows extreme local processing and failure to check one's answer against a wider context.

2. *Poor syntactic skills* prevent the reader from exploiting the support that syntax lends to comprehension. For example, in Text 2 item 1 *urchins* (poikaset) was taken

by a few students as indicative of verbal qualities. They suggested such interpretations as *observes*, *changes*, *spying*, and *watching* (tarkkailee, vaihtua, urkkimassa, katsellen).

The inflection marker *-s* clearly caused the misunderstanding. Students occasionally mix the plural *-s*-ending and the third person singular *-s*-ending of the present tense. For example, *plays* (a noun) in phrases like *She likes plays* is then confused with *plays* (a verb) in sentences like *She plays piano*. Similarly, words ending in *-ing* or *-ed* may be misinterpreted. Nouns and adjectives ending in *-ing* may be interpreted as the present participle form of the verb. For example, *smiling* in phrases like *Smiling is pleasant* or *a smiling girl* may be interpreted to be as the present participle in phrases like *He is smiling*. In the same way, the ending *-ed* may be taken either as an adjective, the past participle or the past tense of a regular verb. For example, *finished* in a phrase like *I'm finished* may be interpreted as the past participle in a phrase like *I've finished* or the past tense in *He finished early*. In case of such confusions, the interpretation usually makes little or no sense. This difficulty of interpretation is fairly common when students try to comprehend participal phrases.

English presents some extra difficulties for Finns because a homonym may be a member of several word classes. For example the word *back* may be a transitive or intransitive verb, a noun, an adjective, or an adverb. If the reader is not able to assign the correct word class with the help of syntax, he is very likely to go wrong.

3. *A one word, one meaning approach* means that the reader knows only one meaning of the word and offers it whatever the context. The reason may be that the learner has not been able to overcome the strong impression of a word learned earlier, usually in its concrete meaning. For example, one student translated *the table of contents* into *competitors on the table* (kilpailijat pöydällä), a solution that makes no sense in or out of context. One of the reasons for the answer he offered for *table* may be that the first-learned, concrete or core meanings of words tend to be remembered better than later-learned meanings. The interepretation of *contents* as *competitors*, on the other hand, is quite likely the combined result of poor recognition and syntactic skills. Maybe the student had a vague remembrance of the word *contest*.

4. *Negligence of some relevant linguistic evidence* means that readers pay attention to only those cues that are salient to them. This seems to be a common source of mistakes in contextual guessing. It seems that readers have a strong desire to make some sense of the text and if there are words or structures that do not agree with their interpretation, they may simply ignore them in order to form a coherent picture of the text (see also Laufer & Sim 1985, 9). The problem appears to be more common among less proficient readers who, instead of systematically exploring the different knowledge sources available to them, pay attention only to the source that happens to be most salient (Cohen 1984; Laufer & Sim 1985, 101; Schouten-van Parreren 1992, 97). Especially with syntactic problems, one of the strategies that the less-proficient L2 learners tend to use is to ignore the problematic structure altogether (L'Huillier & Udris 1994, 179-180).

Among the linguistic features that were often ignored by the subjects - in addition to articles and prepositions - were function words and certain syntactic constraints, such as those caused by the transitivity or intransitivity of verbs.

In a way, such partial attention is also involved when students ignore the text that follows the item word. Sometimes they do it even when what follows is a straightforward explanation or definition. It is as if they stop interpreting when they encounter the item word and do not want to test and re-test the first hypothesis in the light of subsequent evidence. This appears to happen rather frequently. This may result from the fact the in the reading process the backward inferences are necessary for text cohesion and on-line comprehension, whereas the forward inferences are not (Laurinen 1985, 117-118). Another reason may be the influence of the processing of Finnish, i.e. deciding early on what a word meaning is when processing text (i.e. high attachment, see p. 35).

In these cases a task-effect may also play a role so that the signal of the item word may discourage forward inferencing. Homburg and Spaan's study of cloze testing showed that less proficient readers very often do *not* utilize the context following the blank in a cloze test to find cues for the missing words (1981, cited in Cohen 1994). However, for coherence and overall understanding, the subsequent text must also be taken into consideration.

Students sometimes ignore the title or the subtitles. This may have nothing to do with L2 reading proficiency but rather with bad reading habits: when students are doing classroom reading assignments, some of them have to be reminded to read the title and subtitles to guide their top-down processing. This negligence of titles appears to be a rather common tendency also among L2 students of other nationalities as well. Rusciolelli's 1995 study has shown that students' most common strategy is to start reading the text itself straight away without first looking at the title or any of such advance organizers. On the other hand, even when the reader carefully reads the titles, his working memory capacity may be so taxed while reading the text further on, that previous information is forgotten.

Quite a number of students ignored the subtitles in Text 1. One student, for example, offered *poor* (huono) for *sloppy* (sottainen) when the subtitle was "Clean up your act."

5. *Reliance on impression* often causes misunderstanding. Students then explain their choices by using such expressions as "I had the image/mental picture that..." The impression may concern the general idea or the form of the word. If the student has the image of a wrong word in mind, the two words often have some orthographic resemblance. This image is, however, vaguer than the misreading caused by poor word recognition skills. Students sometimes also claim to know the word but are mistaken. This has been shown to be a common strategy of students with poor knowledge of the foreign language (van Esch 1993; Schouten-van Parreren et al. 1993).

For example, in a fictive text there was a mention of a dog, Roger, who *wags* his tail (heiluttaa). One student, who clearly overtrusted her impressions, translated the word into *earns* (ansaitsee) and explained her solution by stating that it perhaps originates from the word *wages* (palkka). She abviously did not understand the word *tail* nor realize that the Roger mentioned in the text was a dog.

6. *Wild guessing* is assumed to be the student's strategy when it is impossible to trace any logic in his thinking. If the word class, however, is correct, this may be an indication that the student had at least a vague idea of the structure of the language. On the other hand, an incorrect word class, doubled with a wrong idea, shows that the student may not have had a clue what the text is about and therefore just made a random guess. Very often, when a student states that "guessing" was involved, the answer is incorrect. Students seem to be able to differentiate between wild guessing and inferencing.

An instance of wild guessing would be when a student infers that *innate* (sisäinen) means *to prepare oneself* (valmistautua). She reported that she had guessed (Text 1, item 4).

When going through the students' answers and explanations, it became obvious that they often use more than one strategy to infer the meanings of unknown words. Studies confirm that this is especially true for good students (Hosenfeld 1979, 59-61; Lawson & Hogben 1996, 123; Papalia 1987, 73). Weaker students also have a similar repertoire of strategies at their disposal, but they use them more mechanically, less flexibly, or inappropriately (Anderson 1991; Knubb-Manninen 1994 ; Stavans & Oded 1993; Vann & Abraham 1990). Nevertheless, even in unsuccessful inferencing, different sources often appear to be interconnected (see e.g Dollerup et al. 1994, 75) although weaker students generally experience a lot of difficulties in using and integrating information from different sources (Schouten-van Parreren 1992, 97). Due to this multiplicity of strategies and sources, it was often impossible to assign only one category to an individual answer or to untangle which strategy was primarily used.

The results of this study are in concordance with those of the above-mentioned studies: many unsuccessful guessers could be assumed to have used or they reported having used more strategies than one to infer word meanings.

Yet only a few students *reported* that they had used several strategies simultaneously. An example of one of the few was a student who reported that he had used the following cues for his deduction of the word *notables* (text 3, item 7): the preceding adjective *historical* (use of immediate context), the list of the names that followed (use of immediate and wider context) and, note-able (morphological analysis).

It is very likely, however, that many of the students actually exploited more than one strategy, cue, or source. One of the reasons why they reported only one might have been the instructions. They were told only to tell how they had reached their inference. The wording does not call for an exhaustive answer, consequently the students may have reported only the most salient or obvious strategy, or the easiest one to verbalize.

As to the frequency of different kinds os strategies and causes of failure in this set of data, by far the most common reported strategy was use of context. The second was linguistic analysis, knowledge of the language was third, and literary conventions was fourth. Knowledge of the world and interlingual cues were very seldom mentioned.

The most common cause of failure appeared to be the neglect of some linguistic evidence. This was followed by poor syntactic and word recognition

skills, a one-word-one-meaning approach, wild guessing, and reliance on impression.

There was also non-systematic variation in individual students' strategies, i.e. the same student used different strategies in getting at the meaning of the same kind of item. This phenomenon was to be expected on the basis of previous research because L2 learners have competing rules which exist in free variation (R. Ellis 1989, 22-45; Swain 1993, 203).

Most of the differences between the students' performances seemed to be caused by differences in proficiency. But in addition to proficiency, there are many other factors influencing the outcome of learning. For example, attitudes, motivation, and personality characteristics have also been shown to be influential in the choice of language learning strategies (Oxford 1989). Students' test-taking strategies differ as well. It is, of course, impossible to deduce, on the basis of the short written answers, what role each of these various factors plays, however observation of and discussions with the students support these findings. The lexical inferencing task often requires willingness to stay on the task, to re-read, and to revise one's hypotheses. If students have attitudinal or motivational problems or if they are, for example, impulsive in character, they may be tempted to resort to wild guessing or to adopt less successful strategies.

6.2 Problems in lexical inferencing

In order to detect students' problems in inferring word meanings, the answers of one test were analysed in detail. The text was "Secrets of Straight-A Students" (Text 1; Appendix 1). The test was taken by Group A (N=10). Only the partly correct or incorrect answers were analyzed to see what kind of errors students made. In the following, the items and answers will be presented and discussed, paying also attention to the students' proficiency and character.

When the class took the test in their second year in senior high school, they had already had four and a half years of English behind them. Lexical inferencing had been incorporated into their English studies since the beginning of the freshman year, for about a year and a half before taking the test as part of their regular course test. The test consisted of 19 items and the maximum score was 38 points. The students were not asked to give any explanations for their inferences because they were taking a course test with a time limit.

In the following account, the item words are in italics and given in their immediate context. However, to decipher many of the meanings correctly often requires that a wider context and the subtitle be taken into consideration. The reader is referred to Appendix 1 for the whole text. The figures in brackets after the extract denote the number of two-point, one-point and no-point answers respectively. They also give an indication of the relative difficulty of each item.

Because the answers were analyzed without the students' explanations or interviewing the students, the interpretations can be only speculative.

> Item 1:"[Straight-A students] get high grades, all right, but only by becoming dull grinds, their noses always stuck in a book. They're *klutzes* at sports and dweebs when it comes to the opposite sex."
> (9 two-point answers - 0 one-point answers - 1 no-point answers).

This was an easy item and most students gave an acceptable answer. The only student who did not, answered *tops* (huippuja). Why did she ignore the cue words *but* and *dull*, words whose meanings she certainly knew? The student had a good knowledge of English, and such partial attention was not her common strategy.

One highly speculative explanation could be her own status at school. Since she herself was good not only at academic subjects but at sports as well and she was socially well-liked, she may have let her first-hand experience override the linguistic evidence of the text. Another reason might be the rest of the text, which gives examples of students who excel in all subjects. In that case, she may have let the main idea of the text blind her to details. In either case, background knowledge and top-down processing must have misled her. It has been my experience that sometimes students tend to interpret texts from a rather egocentric point of view, which, considering their age, is quite understandable.

> Item 2: "For two years she [an excellent student] *maintained* a 4.0 grade-point average (GPA), meaning A's in every subject." (9-1-0).

Another easy item, with no totally incorrect answers. The student who got one point for *to get full points* (saada täydet pinnat) clearly understood the general meaning but she had ignored part of the sentence. The verb is a transitive verb and she should have taken the object into account. She was a below-average student who often had problems with the structure of English. She also had a fairly limited vocabulary.

> Item 3: "He [another straight-A student] played varsity basketball, exhibited at the science *fair*, was chosen for the National Honor Society and National Association of Student Councils and did student commentaries on a local television station."(3-7-0).

This item proved to be rather difficult to infer. Precise comprehension depended on the knowledge of the cue verb *to exhibit*. When preparing the test, I had assumed that the students would have no difficulty in recognizing the verb because the corresponding noun *exhibition* is a common word in textbooks and elsewhere. But, contrary to expectations, all students claimed that they had not known or inferred the meaning of *exhibit*. This was confirmed when we discussed the item after the test had been returned. This indicates that the students did not process deeply enough the words that were not test items.

Another reason for the difficulty of the item was its culture-bound content: there is nothing that quite corresponds to a science fair for students in Finland, although there are science competitions and student fairs.

As far as test preparation is concerned, this is an example of poor item selection: an item should not depend on the knowledge of only one other word. One of the reasons why the word was selected was that the students knew some other meanings of *fair*, such as *light* and *free of injustice*. I often include partly known homonyms in the inference tests to teach the students not to resort to the one word-

one meaning strategy. No student, however, offered such a meaning, and seven answers showed reasonable understanding and were given one point.

> Item 4: "Knowing how to make the most of your *innate* abilities counts for more." (9-0-1).

Only one student made an unacceptable guess *decisions* (päätökset). He was the weakest one in the group and frequently misunderstood the word class of the item words. What might be the rationale behind this peculiar answer? The main idea of the paragraph is that it is not the most intelligent students who get the best grades. Maybe he tried to deduce what they might lack and came to the conclusion that the reason may be that they cannot make decisions. The verb *make* and the next paragraph lend some, if vague, support to this interpretation. This suggestion is, of course, just speculation and exemplifies the problems that appear when students have deficiencies in their receptive skills. It also illustrates the problems of interpreting the answers.

> Item 5: "For them [the high I.Q. students], learning comes too easily and they never find out how to *buckle down*." (5-2-3).

This item proved to be of moderate difficulty. The one-point answer *fail* (epäonnistua) would make sense if the student wanted to express the idea that high I.Q. students might benefit from "finding out how to fail". The main idea of the paragraph is, however, that the brightest students are not necessarily the best ones. The other one-point answer, *settle down* (asettua aloilleen), is more in line with this idea, but it does not get more support from the rest of the context. The student may have been influenced by the similar impression of *to settle down* and ignored other cues of the surrounding context. Similar lexical forms (synforms) cause problems even to native speakers, not to mention learners of the language (Laufer 1990).

One of the three no-points answers was *relax* (rentoutua) which does not get any support from either the subtitle or the context. The student was a relaxed, carefree person herself and the answer may reflect preconceived ideas what a high-achieving student is like: a "swotty uptight nerd", a common enough image of a straight-A student. If this is the case, it is an example of the dominance of everyday knowledge and prejudice over an interpretation based on the text.

Another unacceptable answer *can't make it* (ei voi pärjätä) perhaps reflects the same idea as *fail*, but it does not fit structurally in the context. The most problematic suggestion is the third incorrect answer: *to get a problem to solve* (saada pähkinä purtavaksi). Perhaps the student had in mind the often expressed criticism that bright students do not get sufficiently challenging tasks in school. If so, then he must have used only his general knowledge of the problems of bright students at school and in that way tried to compensate for his poor proficiency. Hammadou's (1991) study showed that novices use more their own schemata (i.e. illogical inference, not supported by the text) than more proficient students (p. 33).

> Item 6: Top students *brook no intrusions* on study time. Once the books are open or the computer is booted up, phone calls go unanswered, TV shows unwatched, snacks ignored." (7-3-0).

All students had a reasonably correct idea about the main point on this item. One one-point answer, however, includes only noise as a source of distraction, not snacks. It is quite common that students ignore part or parts of the information in the text if it does not fit their original inference even when there are no problems in understanding the part in question, as is the case with *snacks*, which has almost become a Finnish word.

Many of the two-point answers - although correct as to the content - reveal that *on study time* was understood as *during study time*. The confusion is not surprising because *intrusion on* was unknown to these students. This gives an idea how the prepositional system of English affects Finnish readers. The students were, however, given full two points, because their inferences did not change the basic meaning of the sentence. In general, in a lexical inference test answers to each item have to be assessed, not by rigid rules applicable to all items, but by taking into account every item's inherent properties, the difficulty of the surrounding text, and the danger of being misunderstood.

> Item 7: " ..an Arizona State University business professor assigned to tutor failing college athletes, recalls a cross-country runner who *worked out* every day. [He] persuaded him to use the time to memorize biology terms." (6-3-1).

The one-point answers *concentrate* (keskittyä) and *worked* (työskenteli) were considered too vague in this context; they don't show that the students have taken the sports terms as cues. In addition, they ignore the qualifier *failing* as well as the definite article in *the time*, referring to the time the student spent practising. Gerunds and the present participles are often confused with the homonymous verb form used in the continuous tenses, which may explain the lack of reaction to *failing*. Articles are another source of misunderstanding because Finnish learners of English often don't pay enough attention to the meaning that articles carry. An indication of Finns' different idea for a word and the difficulty of phrasal verbs is reflected in the answer *worked* (työskenteli): the student has probably interepreted *out* as *outdoors* or ignored it altogether.

The answer *work* (työskentelevät) got no points because the tense was wrong, and the verb was inflected in the third person plural form. This seems to indicate that the student took *athletes* to be the subject of the sentence and ignored the text between it and the verb, which shows a gap in basic knowledge of English syntax or a defect in the processing ability. In their study, L'Huillier & Udris (1994) found out that when confronted with an unknown word and with syntactic problems, the less-proficient L2 learners sometimes reacted by ignoring them altogether.

> Item 8: "All [the high achieving students interviewed] agreed, however, on the need for *consistency*. 'Whatever I was doing, I maintained a slot every day for studying.'" (2-7-1).

The one point answers *concentration* (keskittyminen) and *studying* (opiskelu) make sense in the general context of studying but show that the students had ignored the subtitle and the quotation following the item sentence, which elaborates on the item word. The suggestions may indicate that the students have relied on their everyday knowledge of studying more than the text. Students sometimes also seem to stop inferencing after reaching the item word and base their inference only on cues that

appear in the text before the item word. This seems to be a common enough strategy among less proficient L2 readers (Cohen 1984, 71). There also appears to be some universality in inferring on-line mainly the preceding text (Magliano et al. 1993). This tendency may be the reason for not taking the quotation into account.

The no-points answer *develop* (kehittyä) is probably based on similar common sense thinking, but the student does not seem to know one of the rules of English: after a preposition the verb takes the *-ing*-form. Neither does he recognize the fairly common noun suffix *-ency*.

> Item 9: "I not only increased my words per minute but also learned to look at a book's *table of contents*, graphs and pictures first. Then, when I began to read, I had a sense of the material, and I retained a lot more." (4-3-3).

This item was a relatively difficult one. The one-point answers *the overall picture* (kokonaisuus), *the table of concepts* (käsitetaulukko) and *explanations* (selitykset) indicate that the students have some kind of idea of what should be looked at before studying a book. The "ignorance" of the existence of a table of contents in a book is somewhat surprising. Maybe the reason is that in the Finnish schools students do not usually study whole books for their tests. On the other hand, their English courses always begin with an introduction to the table of contents so the convention of getting an overall picture should have been familiar to them.

The students who answered *purpose* (tarkoitus) and *double page* (aukeama) may have had a sensible idea but were not able to convey it. Occasionally, students have difficulties in finding the Finnish equivalent or in explaining what they mean even if they may have a right idea. The third no-point suggestion, *as a competitor on the table* (kilpailijana pöydällä), is an example of extreme text-based processing, with no interaction with top-down processing. Here the student has taken the first-learned, concrete meaning of *table* and relied solely on that meaning. Yet, the multiple meanings of English words is, however, a constant teaching point in their English classes.

> Items 10 and 11: "When a teacher *assigns* a long paper, Domenica Roman draws up a timetable, dividing the project into small pieces so it isn't so *overwhelming*." (6-4-0) (10-0-0).

Only one point was given to *deals out* and *hands* (jakaa, ojentaa) for *assigns* because they are imprecise with the connection of the cues of *paper* and *project*. Moreover, this word should have been - and was - familiar to most students because *assignment* had appeared in the material studied for the test. I often choose one or two words as test items as an incentive to study words for the test. Such words are, however, graded more strictly.

There were no deviant interpretations of *overwhelming*. The context is quite clear and there is a word in Finnish which is similar in structure (ylivoimainen), which may have helped the students process the word despite the fact that only very rarely is Finnish of any help in lexical inferencing.

> Item 12: "Of course, even the best students *procrastinate* sometimes. But when that happens, they face up to it. 'Sometimes it comes down to late nights,' admits Christi Andersson...'Still, if you want A's, you make sure to hit the deadline.'" (5-5-1).

All the one-point answers were *fail* (epäonnistua): the students had apparently ignored the last sentence. This is another typical case where subsequent evidence is ignored and only the sentence in which the item word appears is processed for meaning. Students quite often, after losing enough points for this kind of partial processing, learn "the hard way" to read on for a better inference. This point is also frequently taken up in classroom discussion.

> Item 13: "Anderson uses those few minutes [just before the bell rings] to write a two or three-sentence summary of the lesson's *principal* points, which she scans before the next day's class." (9-1-0).

In the only one-point answer *subject* (asia, pääaihe), the idea was right but the word class wrong. Such mistakes are penalized because one of the purposes of the test is to make the students sensitive to the structure of English and thereby better able to analyze structures accurately.

> Item 14: "Neat papers are likely to get higher grades than *sloppy* ones." (7-1-2).

The student who got one point for *poor* (huono) either did not know the common word *neat* or did not notice the *neat/sloppy* contrast. She also ignored the subtitle (Clean up your act) and the word *messy* - another common word - which appears later in the text to exemplify the point.

Loose, interpreted as an adverb, (hajallaan) got no points. It is rather difficult to infer what the rationale behind the answer is. If the Finnish translation had been used as an adjective, not as an adverb, it would have made some sense. Occasionally, but very rarely, students try to use Finnish to deduce the meaning of a word. Although there are only a few cognates in Finnish and English, nowadays quite a number of English words, especially those related to modern life and technology, are not translated into Finnish but rather used in their hybrid Finglish forms. Examples of such words are *kössi* (squash) and *nörtti* (nerd). It may just be that the word *neat* reminded the student of the Finnish word *niitata* (to staple) to be contrasted with *loose*. But this is, of course, just speculation.

The no-point answer *lazy* shows that the student had probably reacted only to the idea of "who gets the highest grades" and arrived at the conclusion drawn from either from his experience with student behavior, or with the general line of thought in articles of this kind. He paid no attention to the word *papers* nor did he seem to know the meaning of *neat*.

> Item 15: "In a lecture on capitalism and socialism, for example, Melendres asked the teacher how the Chinese economy could be both socialist and market-driven, without *incurring* some of the problems that befell the former Soviet Union." (3-5-2).

This item was not well selected: the context presupposes a rather sophisticated knowledge of world politics, which students of this age often lack. The word itself is also rather abstract. In my experience, abstract concepts sometimes cause students difficulties, and this may be due not so much to language proficiency but not inexperience in handling such concepts. As a result of the difficulty of the item, most students gave answers that missed the point. One point was given to *forget, miss, ignore, an encounter, take into consideration* and *show* (unohtaa, jättää väliin, ottaa

huomioon, olla ottamatta huomioon, kohtaaminen, osoittaa). Despite the wrong word class, *an encounter* was given a point because of the difficulty of the item and the common confusion with the English *-ing* form. On re-assessing the tests for intrarater reliability I would have given full two points to *show* because it would make sense in this context. This was the only change in the re-assessment.

Solution (ratkaisu) got no points because both the idea and the word class was wrong. Maybe the common co-occurence of *problem* and *solution* influenced her inference. What the thinking behind the other no-point answer *impressive* (vaikuttava) might be is impossible to infer. Maybe it is just a wild guess. Only the student himself could have explained the misunderstanding.

> Item 16: "While a graduate student [at the University of California at Berkeley], Uri Treisman observed a freshman calculus class in which Asian-Americans, on average, scored higher than other *minority* students from similar academic backgrounds." (7-3-0).

Minority is another item that should have been familiar to the students from the course material and was therefore graded rather strictly. For example, *corresponding* (vastaava) - a one point answer -, could have received two points had not the word been such a common one with a clear cue in the text. The other two one-point answers were *grade level* (luokka-aste) and *successful* (hyvin menestyneet).

> Item 17: "Later she frames *tentative* test questions based on those points and gives herself a written examination before the test day...Students who make up possible test questions often find many of the same questions on the real exam and thus score higher." (8-1-1).

Most students gave a correct answer to this item. The one-point answer *training* (harjoittavan) shows that the student understood the purpose of test questions, but had not taken the alternative *possible* into account. Although *possible* falls short of being a synonym for *tentative* it is true that frequently students do not notice synonyms or antonyms although they are common stylistic conventions in Finnish, too, which are paid attention to and practised in all the language arts in school.

Carefully (huolellisesti) got no points because the word class is incorrect and the idea very vague, if not completely impossible. Maybe this is another case of knowledge of the world overriding linguistic evidence.

> Item 18: "From infancy, the parents *imbued* them with a love for learning." (9-1-0).

This was an easy item: most students inferred the right meaning. The only one-point answer *advise* (neuvoo) does not quite match with a later proposition that parents encourage but do not work for their children; hence one point was deducted.

> Item 19: "In short, the parents impressed the lessons of responsibility on their kids, and the kids *delivered*." (10-0-0).

All students gave answers which reveal the they understood the general idea of not failing the parents' teachings, which is sufficient for this item. The word deliver was very likely to be familiar to most of the students in the meaning *deliver newspapers*,

so it was clear that the students really thought of the content of the text and did not stick to the meaning of the word they already knew.

6.3 A closer look at a lexical inference test

To look at the lexical inference task from a different angle, the items and answers of "Secrets of Straight-A Students" (Appendix 1) were examined more closely. This was the same text studied in chapter 6.2, with the exception that one item (*superachievers*, item 4) was added to get 20 items. This time the test was taken by Group B (N=16) both as a pre-test and a post-test. By the time of the testing, I had been teaching them for a year in senior high school. The students had had practice in lexical inferencing before they took the test. As a group, they were academically above average.

The class did the task as a pre-test and gave short verbal reports in which they gave reasons for their inferences during their first English lesson of the fall semester of their sophomore year (August 17, 1993). The students repeated the task at the end of their six-week course as part of their course finals. This was the post-test. This time they were not asked to report on their inferences because of the limited test time. A few students, however, did the reporting voluntarily.

In the course test, the text was one part of the three-part reading comprehension test: the other two parts were also lexical inferencing tasks. All the tests had been designed by the author and were based on authentic material.

In the following, some of the properties of the test items and some of the changes between the pre-and post-tests are discussed. Then a few students and their answers are singled out to demonstrate students' varying ways of thinking.

On the whole, the text was not difficult for this group, and therefore there were not many changes between the pre-test and the post-test. Table 2 shows the list of items, the total number of points (maximum 32) for each item in both tests, the change between the pre-test and post-test points, and the distribution of answers (two-point/one-point/no points/minus one point) in the post-test. The total score and the proportion of correct answers serve as a difficulty index for each item.

It should be born in mind that items were scored more leniently if they were considered more difficult to infer (e.g. *imbued*) and more strictly if there were several obvious knowledge sources on which to base the inference, such as the context, the word morphology, L1, or other languages (e.g. *super-achievers*). As a result, the difficulty of each item as indicated by the scores is relative rather than absolute. The scores together with the distribution, however, give some indication of the difficulty level of each item.

The items with score 21 or below can be considered difficult for this population, those with scores 22 to 24 to be moderately difficult, and those with 25 to 32 to be easy items. In the pre-test there were eight difficult items (items 3, 5, 6, 8, 9, 10, 17, and 20), whereas in the post-test the number of difficult items was reduced to five (items 3, 6, 7, 9, and 10). There were five moderately difficult items in the pre-

test (items 4, 7, 11, 13, and 17) and in the post-test four (items 11, 13, 16, and 20). The easy items both in the pre-test and the post-test were items 1, 2, 12, 14, 15, 18, and 19, whereas items 4, 5, 8, and 17 were easy only in the post-test.

TABLE 2 Item in the text "Secrets of Straight-A Students", scores in the pre-and post-tests, the difference between the two scores, the distribution of scores in the post-test and the means of the total points.

ITEMS	POINTS (max. 32)			DISTRIBUTION			
	Pre	Post	Change	2p	1p	0p	-1p
1. klutzes	30	30	0	14	2	0	0
2. maintained	25	27	2	12	3	1	0
3. fair	20	21	1	11	0	4	1
4. super-achievers	23	29	6	13	3	0	0
5. innate	14	26	12	13	0	3	0
6. buckle down	17	21	4	7	7	2	0
7. brook no intrusion	23	21	-2	7	7	2	0
8. worked out	21	25	4	13	0	2	1
9. consistency	18	19	1	7	5	4	0
10. table of contents	18	21	3	7	7	4	0
11. assigns	22	24	2	9	6	1	0
12. overwhelming	29	30	1	14	2	0	0
13. procrastinate	22	23	1	7	9	0	0
14. principal	27	28	1	13	2	1	0
15. sloppy	30	32	2	16	0	0	0
16. incurring	17	22	5	8	6	2	0
17. minority	23	29	6	14	1	1	0
18. tentative	26	28	2	13	2	1	0
19. imbued	29	29	0	14	1	1	0
20. delivered	15	23	8	9	5	2	0
TOTAL	449	508					
	M=22,5	M=25,4					

Pre-test: minimum score 14 maximum score 30 Post-test: minimum score 19 maximum score 32

A closer look at the changes in the scores draws attention to a few items. First of all, one modestly difficult item (Item 7, *brook no intrusions*) showed negative change (-2). In the pre-test, most students reported that they based their answer on the context of the whole passage, which included examples of intrusions of various kinds. In the post-test, one student, however, changed her mind and her previous correct answer completely (i.e. for two points) and answered *set no time-limits*, which is quite incompatible with the rest of the context, or, as a matter of fact, the whole article. It is difficult to infer why this happened but one guess is test stress. The pre-test had no effect on the students' grades but the post-test did. This particular above-average and ambitious student often demonstrated stress under test conditions. It is unlikely that her second answer was a lapse because she was very meticulous in her work. The student herself, however, would have been the only one to clarify her reasons for changing her mind. The other two answers to Item 7 which got fewer points in the post-test were qualitatively worse than in the pre-test. Their range had narrowed from the correct answer to *don't take study breaks.*

Another change that draws attention is the quite substantial improvement in Item 5, *innate*. Partly this can be explained by the fact that two students did not give any answers at all in the pre-test. A closer look at the verbal reports of the pre-test reveals that two other students had thought that *innate* is a verb (to *prepare*, to *accomplish*). It is true that *-ate* is quite a common verb ending in English, but in this context ("Knowing how to make the most of your innate abilities counts for more"), a verb would be totally unacceptable. The students had obviously concentrated more on the form of the word, albeit coupled with some top-down processing, and ignored the rest of the text. In the post-test they both gave the correct answers, which can be taken as an indication of improved sensitivity to syntax.

Two other students suggested a noun for *innate* in the pre-test (*right things*, *finished abilities*). Their reports showed that they had overemphasized the schema of how good students behave at the expense of accuracy and textual evidence. These two students, too, changed their minds in the post-test and gave an accurate translation for *innate*. It should be noted that this item caused no problems in Group A, who had taken the test as a course test after several weeks of studying. Obviously, their English studies had had an effect on their inferencing. A similar phenomenon can been seen also with Item 20 *delivered*, which Group A had no problems inferring.

There were two incorrect answers to *innate* which show how reasons for students' inferencing may involve factors other than language proficiency or processing preference. Both the male students were strong pesonalities; they knew what they wanted and teachers had little influence on them. Neither of them changed their incorrect answers, but stuck to their earlier way of thinking. One of them was the president of the student body as well as of the national league of high school students. He was often absent from classes because of these other duties. In his language studies he was in the mid-ability group, yet he had rather certain and strong opinions about language matters. An analysis of his tests showed that he rarely changed his mind: his post-test score differed only by one minus-point from the pre-test score. He quite often stated in his verbal report that he had known the item word even if he was mistaken. This student gave *necessary* for *innate* in both tests.

The other male student did not change his initial answer *worst* either. The answer may reflect his general attitude towards studying. This student was above average in his language abilities but, as he himself put it, "On principle, I never do my language assignments." And he never did. The only academic subject he claimed to study was history. He was, however, actively interested in many things outside school and obviously learned his English in that way. He improved his score by eight points. In the matriculation examination he did well only in Finnish, English, and history.

The answers of the two students illustrate what kind of extra-linguistic factors may be effective when students do their tasks or take tests. It also shows how students can be differently receptive to instruction.

Item 4, *super-achievers* was included in the test because it is easily analyzable. The prefix *super-* is also in use in Finnish, and the verb *achieve* had appeared in the course material and in the text itself. In the pre-test quite a number of students gave either *super-intelligent* or *super-active* as their answers. Both answers were given one

point. The first answer contradicts the main idea of the passage. i.e. that it is not always the most intelligent students who get the best grades. The second answer may reflect the fact that the words *active* and *achieve* look alike. In the post-test all these students gave the correct answer.

The reports on Item 4 showed that students considered equally the topic and the word itself when inferencing. Some cited the title, the topic, and the verb as cues to their answers. Good students occasionally cited many sources of knowledge in their reports and paid equal attention to the general context and the language. In other words, their top-down and bottom-up processing interacted in an efficient way.

Some difficult items such as Item 3 *fair*, Item 9 *consistency*, and Item 10 *table of contents* also caused students problems in the post-test. The gain was only one point. This is an indication that the items were either too difficult or unwisely selected. Particularly *fair* was not well-chosen. On the other hand, the scores did not necessarily show the qualitative changes that took place between the pre-test and the post-test.

6.4 Lexical inferencing and the language learning process

The same students (Group A) whose test answers were analyzed in section 6.2 formed another pre-test/post-test group. The first testing took place at the end of a course, which deals with society and social problems. The text used in the test was an abridged article about an American who was helping street children in South America (Time, October 1988, Appendix 2). First the students took the 10-item test as one part of their regular 30-item course test in reading comprehension. When the test was returned, it was not discussed in the class - as it normally is - but the students were allowed to see only their test score. This was the pre-test.

After six weeks of no English and six weeks of intensive English studies (six 45-minute lessons a week), they took the same test again; this time with the request to explain their answers. This was the post-test. The test was scored and the answer sets of the pre-test and post-test were compared. The complete answers of the students in both the pre- and post-tests are given in Appendix 4. When some of the items are discussed in the following account, only the immediate sentence is given. (See Appendix 2 for the whole text.)

The comparison of the pre-test and post-test scores shows that the results of all students but one had improved. The change varied from one to ten points of the maximum 20 points. The only student who did not improve her result at all was a highly proficient student (18 points out of 20). Due to the ceiling effect, there was not much room for improvement. On the other hand, the two students who were below average in this class gained only two points and the quality of their answers appeared to be only slightly better in the second testing. The change per test item varied from minus two points to ten points. The items which showed little, no or even negative gain were easy items; because of this ceiling effect, there was not much to be gained.

When all the answers had been analyzed, compared and interpreted, it could be concluded that not only quantitative but also qualitative changes had taken place. This is in accordance with Hammadou's (1991) findings that as comprehension proficiency improves, also qualitative differences appear, rather than just simply quantitative ones.

One of the qualitative differences appeared in the *improved sensitivity to the syntactic patterns of English.* The following examples seem to indicate the development of syntactic proficiency.

Firstly, in the pre-test quite a few students suggested a third-person singular present tense verb for the plural noun *urchins* in the following sentence:

> Item 1 :"Buses spew exhaust fumes along Guatemala City's Avenida Nueve, as Mark Connolly, a twenty-seven-year-old American, greets two barefoot street *urchins* outside a cheap eatery."

To suggest a verb for *urchins* violates the English word order and syntax. The students probably reacted to the *-s*-morpheme as a sign of a third-person singular present tense verb form. In the post-test all these students except one had changed their minds and given an acceptable answer. The reason may be, as Terrell (1991) points out, that grammatical particles and inflections are frequently non-salient (low perceptual saliency, redundant). The meaning-form relationship must be made salient through many instances of the same relationship in the input (p. 59). When the inflected form serves two purposes (plurality and verb form marker) - as it does here - the saliency becomes critical.

Syntactic development is relatively slow. Bernhardt (1991) notes that syntax develops later and the development of syntactic errors form a normal curve, unlike, for example, word recognition, which is more linear. First, when students are exposed to a large number of written texts, they tend to make more syntactic mistakes, however further exposure tends to eliminate errors in syntax (p.170). This phenomenon may explain the noted improvement in sensitivity to syntactic cues. To use McLaughlin's concepts (1990b, 125) it seems that the learners had shifted strategies and restructured their internal representations of the target language. One suggested reason for the late development of syntax in L2 readers is that grammatical analysis is not always essential to comprehension, so there is no immediate need to learn it (Swain & Lapkin 1995, 384).

Another indication that the observance of some regularities of English seems to have improved was the interpretation of the *-ing*-form. In the pretest, some students suggested a noun for the verb form *befriending* in the following sentence:

> Item 8: "Connolly has been abused, even threatened at gunpoint as he has gone about *befriending* the street children."

In the post-test they changed the noun into a verb. The ability to differentiate between the various roles the *-ing*-form plays in English seems to have improved.

The perception of prepositions and recognition of phrasal verbs forms improved, too. For example, one student gave *attention* (huomio) for *strip* in the following sentence:

> Item 7: "Perhaps the best testimonial to Connolly's work is the near universal recognition he enjoys on the *strip*."

She later changed her mind and gave the preposition as the cue for her guess *street*, a sufficiently accurate answer in this context. One possible explanation is that the sensitivity to the difference of the idea of a word in English and Finnish had improved.

The ability to do grammatical analysis seems to be proficiency related in that high-proficiency students pay more attention to grammar and apply a grammatical rule rather than their sense of what "sounds right" (Swain & Lapkin 1995, 385). Conversly, as Guarino and Perkins (1986) suggest, awareness of form class helps readers in exploiting the redundancy in the text, making predictions in decoding and meaning construction, understanding word meaning and analyzing and recognizing words (p. 80). Therefore, on the basis of *more sophisticated grammatical or morphological analysis* it can be assumed that the students' proficiency and comprehension had improved.

In addition to their better grammatical analysis, the students' *vocabulary skills* had improved, especially the knowledge of some word formation rules. For example, many students realized that in the context of the sentence an *assailant* (item 10) must be a person whereas in the pre-test a few of them had suggested an inanimate noun.

There was improvement not only in the internalization of the system of the English language but also in grasping nuances. In quite a number of cases students' answers showed more refinement and precision. An example of increasing semantic sophistication is when a student changed the translation of *slip in* from the more general *ask* (kysellä, kysyä) into a more precise one (sujauttaa, livauttaa väliin) in the following sentence:

> Item 2: "Squatting on the sidewalk with Saul and Byron, the two homeless twelve-year-olds, Mark answers their questions and *slips in* a few of his own."

Changes of this kind did not show up in the numerical scores because my assessment was rather liberal, and good approximations receive full two points. One of the drawbacks of quantitative testing is that if only scores are considered, significant qualitative information about the phenomenon under study is lost (Alderson 1984, 23). For example, in Aslanian's 1985 study, differences in processing in lexical inferencing that would otherwise remained unnoticed were revealed when the participants were interviewed.

A more general qualitative change was that some answers showed *less bottom-up* and *more top-down processing*. Some students completely changed their minds as to the correct interpretation and referred to the wider context as the source of their inference. They seem to have learned to take more cues than only the most immediate ones into account. There are also signs of more interaction between the bottom-up and top-down sources: students more often supported their inferences by referring to their knowledge of the world. It has been shown that as students become more proficient, they change their strategies from bottom-up into top-down (Dollerup et al. 1994; Wolf 1993b).

In sum, the students appeared to have become more aware of the syntactic structures of English and to be better at performing grammatical and morphological analysis. The lexical skills seemd to have improved and their processing styles changed. Changes of this kind lead to better proficiency, which in turn further helps in developing better L2 reading skills.

6.5 Two unsuccessful lexical inferencers

Two of the students of Group A, Mika and Liisa (the names have been changed), did not show any improvement in their test scores. This is somewhat surprising because many studies show that it is usually the low achievers who gain most from strategy instruction and practice (see eg. Pearson & Gallagher 1983; Kristiansen 1992).

A possible explanation was sought by studying the answers of these two students more closely. The results of this scrutiny suggest that they seemed to employ very different inferencing strategies. Mika had two strategies: he either relied heavily on bottom-up processing and did not allow a schema to develop, or he used his background knowledge, paying practically no heed to the text. There appeared to be no interaction or integration between the two strategies. He was what Block (1986) calls a non-integrator, i.e. a learner who relies on personal experience, focuses on details and makes few attempts to connect information from different sources (p. 483). This behavior was observed also during a couple of remedial teaching sessions Mika and I had together in order to help him overcome his difficulties.

Liisa, on the other hand, formed a schema, but it was based on very scant textual and linguistic evidence. In other words, she used top-down processing but did not pay much attention to the constraints of the language. Neither of these strategies led to much success. In the matriculation examination in spring 1994, however, Liisa did much better than she had done before, especially her composition showed progress. Mika barely passed the examination. It may be that it is easier to develop as a language learner if one's initial approach is top-down processing than if it is almost exclusively bottom-up. But as Block's (1986) study also shows, students may use either text-based or meaning-based strategies and can be successful or fail in either (p. 477).

It is likely that overreliance on either text or prior knowledge is a function of both proficiency and individual differences. The differences between Mika and Liisa may reflect differences in preferred learning styles (field independent *versus* field dependent; holistic *versus* analytical) or personality. These factors have been shown to influence learner strategies (e.g. Chapelle & Roberts 1986; Kristiansen 1992; Oxford 1989).

Mika was shy, conscientious and introverted, and he worked slowly and meticulously. He had also been diagnosed as mildly dyslexic by the school's expert on dyslexia and remedial teaching. Mika's dyslexia was rated 3 in a scale of 0 to 5, but it appeared only in connection with foreign languages. According to the

dyslexia report, he misread words, occasionally left out letters or syllables as well as entire words. In other words, some of his problems appeared to be in the bottom-up processes, and this may explain his poor progress. It is assumed that if the poor reader's problems are in the bottom-up processes, training is expected to be less successful (van der Leij 1990, 624). Block (1986) also found that the non-integrators did not improve in language skills test (p. 483).

Another factor which very likely affected Mika's development in language proficiency was that he appeared to have a rather poor phonological memory. His pronunciation and intonation were exceptionally poor and he was unable to repeat many words or longer phrases correctly after a model. Phonological working memory and L2 performance have been shown to be related (Lehto 1995; Robinson 1995; Service 1992; Service & Kohonen 1995). In fact, Sparks and Ganschow's studies (1993) show that the most prevalent problem area for at risk L2 students appears to be poor phonological skills. Because all instruction in my classroom was conducted in English and there were abundant aural and oral exercises and tasks, Mika may have been at a disadvantage in his efforts to learn English aurally. This might have affected his reading comprehension skills as well.

Liisa, on the other hand, was a lively, talkative extrovert who did not mind making mistakes. She had some problems concentrating on school tasks and she neglected her homework quite frequently. In test situations, she tended to finish her work as quickly as possible. The lexical inferencing tasks, which require patience and self-discipline, may have gone too much against her personality and that is why she failed to progress.

Mika and Liisa are examples of how differently and for which different reasons students may interact with the text to arrive at meaning. The products may be quantitatively equally unacceptable, but the strategies and processes of different students may be quite different. Vann and Abraham (1990) and Block (1986) made similar findings when they compared unsuccessful language learners. The sole use of quantitative measures tends to hide essential and interesting features of the language learning process.

The cases of Mika and Liisa also illustrate the seemingly conflicting reading comprehension research results; some studies show that less proficient students use more prior knowledge than good students (e.g. Hammadou 1991), others that they tend not to rely on it but instead on the text (e. g. Gordon 1987, cited in Cohen 1997). This study appears to support the study results that indicate that the decisive factor is not which of the the two processing preferences (top-down or bottom-up) is more prevalent but how the reader integrates these two to arrive at meaning, i.e. interactive reading (e.g. Haastrup 1991).

However different the reasons for Mika's and Liisa's failure to improve were, the two students had something in common: serious gaps in their knowledge of English, dating back to their comprehensive school days. It may be that they had not yet reached the threshold level necessary for progress. Haastrup's (1991) results seem to support this conclusion. However, the nature of the threshold may be different for the two students. The threshold level is often believed to be largely lexical (Laufer 1992b). This may be true of Liisa, who was reluctant to study words but had a basic grasp of the structure of English. Mika, on the other hand, generally studied well for word quizzes and course tests. Yet he was unable to put his

vocabulary knowledge into correct use in conversations or compositions and often used content words contextually or syntactically incorrectly. He appeared not to have reached the syntactic threshold. Studies on dyslexia show that reading disabilities provide evidence of language-based learning problems primarily on the phonological and syntactic levels, but which do not extend to the semantic "codes" of language (Vellutino & Scanlon, cited in Sparks & Gansschow 1993). If the comprehension of low ability students is to improve, both syntax and vocabulary need to be improved (Barnett 1986).

Because unsuccessful language students such as Mika and Liisa approach the lexical inferencing task in very different ways, instruction and practice should take these differences into account, difficult as it may be. Mika should have received extra instruction in phonology and word recognition. He should also have been encouraged to rely on his knowledge of the world and common sense so that an appropriate schema would be activated. Liisa should have been instructed to stay on the task, base her decisions on textual and linguistic evidence and not to ignore it. She also should have been encouraged to devote more time to studying. Both should have been instructed on the necessity to check each answer against the context of the text. Especially Mika would have needed continuous remedial teaching for any learning gain to be stable (see e. g. Kristiansen 1992). It is one of the problems of classroom teaching that an analysis of the difficulties of non-proficient students is often performed only afterwards, as a result of a study like this, if is performed at all. Then the students in question can no longer be helped. However, increased understanding of the problems faced by students can help in remediation.

6.6 Comparison of inference tests to other measures

In order to see how the inference tests used in this study compared with some other measures of L2 proficiency, correlations were calculated and one-tailed significance tests were performed. The measurements that were chosen for comparison were the final grade in English in the national matriculation examination, its subtests of written English, and the general final grade in the matriculation examination.

The written part of the matriculation examination in English in the years 1994 and 1995 consisted of several subtests: a 20-item multiple choice reading comprehension test (MC); five open-ended questions which were to be answered in the mother tongue (open); a 35-item (1994) and a 40-item (1995) multiple choice cloze test on knowledge of vocabulary and structures (Str), and a short composition of about 150-250 words (comp.). The general grade in the matriculation examination was chosen for comparison to see whether there is a correlation between general academic aptitude and the inference tests.

The correlations between the inference tests and the general matriculation examination grade in English and the subtests of the written parts are shown in tables 3 and4.

TABLE 3 Correlations between the grade in matriculation examination in English, and the inference tests. Squares of the correlation coefficients (r^2). The terms "Street Kids" and "Straight-A" refer to the texts used (Appendices 1 and 2).

Group A N=10	Matriculation grade in English	r^2
Street Kids, pre-test	.85**	.72
Street Kids, post-test	.78*	.61
Straight A	.94**	.88
Group B N= 16		
Straight A, pre-test	.61*	.37
Straight A, post-test	.77**	.59
Street Kids	.67*	.45
One-tailed significance	* -.01 **.001	

The matriculation examination tests in English are designed to measure general foreign language proficiency. The correlations between this measure and all the inference test measures were high in both groups and therefore it can be assumed that inferencing the meanings of unknown words and general language proficiency are connected. However, any strong and straightforward interpretation on the basis of the correlations should be avoided because of the small number and homogenous nature of the subjects. On the other hand, longterm practical experience with inference tests and tasks has proved them to be good predictors and indicators of language proficiency, provided that they are designed properly, i.e. the item words are inferrable and require larger contexts to be analyzed and understood.

When a comparison is made between the inference tests and the written subtests of the matriculation examination in English, a more complex picture appears. The results can be seen in Table 4.

TABLE 4 Correlations between the inference tests and the subtests of the English matriculation examination tests, written part. Squares of the correlation coefficients (r^2). MC=multiple choice reading comprehension; Open= open-ended questions; Str= multiple choice on structures and vocabulary; Comp. = Composition. The terms "Straight-A" and "Street Kids" refer to the texts used (see Appendices 1 and 2).

Group A N=10 1994	MC	r^2	Open	r^2	Str	r^2	Comp.	r^2
Street Kids, pre-test	.33	.11	.82*	.67	.87**	.76	.74*	.55
Street Kids, post-test	.50	.25	.75*	.56	.75*	.56	.69	.48
Straight-A	.59	.35	.67	.45	.84*	.71	.90**	.81
Group B N=16 1995								
Straight-A, pre-test	.41	.17	.19	.04	.52	.27	.34	.12
Straight-A, post-test	.33	.11	.12	.01	.77**	.59	.61*	.37
Street Kids	.33	.11	-.14	.02	.70*	.49	.59*	.35

When interpreting these correlations it should be borne in mind that the two groups graduated in different years, and therefore the tests were different as to the topics and the emphasis placed on the various subtests.

One of the factors influencing the differences in the correlations between the two groups may lie in the subtests and the different coefficients used in different years. This did not, however, have much effect on the correlations between the final grades in English and the inference test results. The final grades are normally statistically adjusted to fit the normal curve so that each year about the same percentage of the students gets the highest grade, and the same percentage the second highest and so on.

On the other hand, in the individual subtests some unique factors not related to the tests may be at play. For example, 1994 was the first year when open-ended questions were included in the examination. Therefore, in order not to place too much weight on the new type of subtest, the coeffiecient was only one. For the same reason, the subtest was also more leniently graded by the members of the examination board (oral communication by Sauli Takala, a member of the Matriculation Examination Board). Moreover, one of the main topics taken up during the last course of Group A was ethnic and immigration questions, which was also the subject of the open-ended part of the reading comprehension test. Even the least proficient student of the group received a good result in this subtest. Such factors no doubt had an effect on the correlations.

The strongest and most systematic correlations between the inference tests are with the vocabulary-structure tests. This is not surprising, since the two types of tests tap mostly the same kind of knowledge sources. There are also high correlations with the composition sub-test. Generally, composition as a test form is thought to be a more holistic, global, and integrative measure of language proficiency than, for example, the discrete point tests often found in test batteries. In order to be able to write understandable language the learner needs to have at least a firmly established view of the main structures of the L2 and a sound basic vocabulary. In other words, inference tests appear to be connected with two test types that require a solid basic knowledge of vocabulary and language structure.

It is difficult to see why, generally speaking, the reading comprehension subtests of the matriculation examinations, the multiple-choice test, and the open-ended questions correlated rather weakly with the lexical inferencing tests. Among the possible reasons are the topics of the tests; the relatively small number of items in the multiple-choice tests (20), which increases the possible effect of random guessing; the language of the answers in the open-ended questions; and the scoring procedures. Low correlations between the multiple-choice reading comprehension subtest of the matriculation examination and tests of oral proficiency have also been found (Saleva 1997) and this format of reading comprehension test may therefore not measure the same aspects of language proficiency as the inference tests or Saleva's oral tests.

To see whether general academic aptitude and the inference tests were connected, the correlations between the general final grade of the matriculation examination and the inference tests were calculated. The final grade in 1994 and 1995 was the mean of the separate grades in four common compulsory subjects, three of which were Finnish, Swedish, and English.

TABLE 5 Correlations between the inference tests and the general grade in the matriculation examination. The terms "Straight-A" and "Street Kids" refer to the texts used (see Appendices 1 and 2). Squares of the correlation coefficients r^2

Group A N=10 1994	General grade	r^2
Street Kids, pre-test	.84*	.71
Street Kids, post-test	.88**	.77
Straight-A	.95**	.90
Group B N=16 1995		
Straight-A, pre-test	.37	.14
Straight-A, post-test	.43	.18
Street Kids	.11	.01

Table 5 shows the connections between the inference tests and the general grade in the matriculation examination. The squares of the correlation coefficients are included to show how much the two measures overlap, in other words how much they measure the same area of language proficiency (Hatch & Lazaraton 1991, 441).

The smaller group A showed several high correlations between the inference tests and the general final grade of the matriculation examination, an indicator of general academic aptitude, whereas the larger group B showed none. Moreover, the general final grade and the English grade of Group A were highly correlated (.95**), whereas in Group B the correlation coefficient was only .48. All in all, there appears to be a general tendency for the correlations for Group A to be consistently stronger than for Group B. Because the tests were the same and the students fairly similar to one another, explanation for this quite remarkable discrepancy maybe should not be sought in the grades and scores but in the different composition of the two groups. Group A was more heterogenous and the grades were more evenly distributed, whereas Group B was much more homogenous, with a concentration of high grades, as can be seen in Tables 6 and 7.

Number 1 stands for the lowest, number 5 for the highest grade.

Table 6 presents are the frequencies, means and standard deviations of general grades in the matriculation examination of the two groups in order to give an indication of their general academic aptitude and to show the differences between the groups. The number of students in Group B is here 17, not 16, because one of the students who was absent from one of the inference tests was included in this analysis. This does not, however, change the general character of the class.

TABLE 6 The frequencies, means and standard deviation of *general grades* in the matriculation examination of the two groups indicating general academic aptitude.

		frequency of grades						
	N	1	2	3	4	5	M	SD
Group A	10	-	2	-	4	4	4.00	1.15
Group B	17	-	-	3	10	4	4.16	.62

In Table 7 the same parameters of the matriculation examination in *English* are given to show the differences between the groups as to their general proficiency in English.

TABLE 7 The frequencies, means and standard deviation of English grades in the matriculation examination of the two groups indicating general language proficiency.

		frequency of grades						
	N	1	2	3	4	5	M	SD
Group A	10	1	1	2	2	4	3.70	1.42
Group B	17	-	2	5	5	5	3.88	.96

If a group is of the same ability and the scores are not evenly distributed, correlations become small and meaningless. This does not, however, reveal anything about the reliability of the data (Hatch & Lazaraton 1991, 531). Because of the nature of Group B, interpretation of its results becomes next to impossible. This also explains the rather surprising differences in correlations between two groups consisting of fairly similar students and taking almost identical inferencing tests and fairly similar matriculation examination tests.

To sum up, a cautious interpretation of the results of Group A seems to indicate a connection between the inference tests and English proficiency and general academic aptitude in general, as measured by the Finnish matriculation examination, and more specifically, between the subtests of open-ended reading comprehension test, the structure-vocabulary test, and the composition.

7 DISCUSSION

There are a few issues concerning this study which need to be taken up before discussing the results. Firstly, to try to implement a long-term instructional program and to collect data systematically in natural school circumstances is problematic because school life has much of the unpredictability of real life. Among the factors that cannot be controlled are changes in school schedules, absent students, natural maturation, the character and ability-level of different students and classes, and the teacher's personality.

Secondly, the teacher-researcher must ensure that the students' interests are not violated because of the research interest. For example, the students may need some extra practice in some other L2 skill than the one under study; they may have a test coming in another subject and be too anxious about it to do tasks that require concentration and thinking; they may have just returned from a strenuous sports class and have no energy left for effective work; or they may be excited about a coming student event. Under such circumstances the teacher cannot impose her pre-prepared program on the students but has to change the instruction to fit the students' needs. In practice this means that no rigorous long-term program can be carried out as systematically as would be desirable to bring out clearly the possible results of instruction. For these reasons, the students in this study received instruction and practiced lexical inferencing only when it was appropriate and possible.

Another problematic aspect in carrying out the present study was the method of eliciting the lexical inferences. The subjects were asked to translate the item words into Finnish and give their reasons in writing. The interepretations and conclusions were mainly based on these written answers. To infer what goes on in a person's mind on the basis of a product is in itself full of dangers of misinterpretation. Written protocols present an additional problem. The students' ability to express their thinking in writing varies considerably and so does the seriousness with which students attend to this kind of task. The think-aloud task - used in many studies - allows the student to elaborate more. It also gives the researcher an opportunity to ask for clarifications. On the other hand, the think-

aloud task has its drawbacks, as it interfers with comprehension and is quite unnatural (see e.g. Pressley & Afflerbach 1995; Valtanen 1994).

For practical reasons only the written version, with no possibility for clarification, was possible in this study (see also van Krieken 1986). Therefore, because much information remained hidden, the author's interpretations of the answers should be seen as a cautious effort to explore how students understand and misunderstand English. The interpretations are, however, guided not only by related research, but also by the experience gained by going through hundreds of lexical inference tasks, by having numerous class discussions, and by giving a few remedial classes to individual students with problems in lexical inferencing.

In addition, thinking about language and one's own thinking, i.e. metacognition, appears to be difficult for some quite different kinds of students for different reasons. Some students find this kind of thinking unpleasant because it requires brain work and effort. Others, on the other hand, may be able to acquire the foreign language so automatically that it is very difficult - or even impossible - for them to account for the process. Yet, both types of students may give as an explanation for their lexical inference: "I deduced the meaning from the context." The first type of student may give this explanation because it is an acceptable general answer and requires no further analysis; the second type of student may no longer have access to his knowledge sources. The quality of their inferences differs, however: the answers of the first type of student are far more often wrong than those of the second type.

There is another danger in drawing conclusions on the basis of students' written explanations. While many students cited a near-by word or words as their cues, this may only have been the most immediate source that came into their minds. The students may, at the same time, have had a full schema for the text in their minds against which they tested their inferences, but they were either unable to express this or simply did not do it even if they could have. To conclude that such students preferred local processing would be to underestimate them. There were, of course, students who lost the thread of the story and resorted to only local processing. The answers of such students were very often incorrect.

Introspective methods, such as the think-aloud task and the written task employed here, share a feature that may be an asset for pedagogical reasons but is a drawback in research: they may skew the results. Both methods force students to think about the language and their own thinking more than they might otherwise do in a testing or practice situation. As a result, they may appear better in such a test than they would normally be. Pedagogically, it is most desirable that students should activate their inferencing abilities, but whether they would do so outside the inference test situation cannot be guaranteed.

It is difficult to categorize intangible human phenomena, such as strategies and knowledge sources. In the present study such an attempt was made in order to impose some organization on the data (cf. p. 75). The list of categories is by no means exhaustive, and many of the categories overlap. The grouping could have been made with more precision and from a different angle. The naming of the categories, too, can be subject to criticism. Despite these inadequacies, the categories seem to share features with other classifications, even though these may have a different point of departure (see e.g. Bensoussan 1992, 105-106). In a review of the

inferencing strategies in L2 readers reported in various studies, Moran (1991) cited the following as the most common unsuccessful strategies: making wrong guesses on the basis of morphology or false cognates, confusing words which either look or sound the same; choosing the wrong meaning of polysemic words, failing to identify the grammatical function of words, having difficulties in exploiting cues beyond the immediate context of the unknown word, distorting text meanings to fit a wrong guess, and failing to evaluate the correctness of the initial guess (p. 392). All these strategies surfaced in the present study - with the possible exception of false cognates - and they coincide with the categories proposed.

As to the lexical inference task answers themselves, there are a few points to make. First, because the students took the inference tasks as tests and the outcome affected their course grade, there is good reason to assume that they took the task more seriously than they would have, had they taken the test for research purposes only. In this respect, their answers can be considered to reflect their true processing and language proficiency. However, in some cases, the students must have resorted to wild guessing just because they would have been penalized for not answering.

Secondly, some students also had problems in conveying the sources of their inferences in Finnish. Occasionally, also the structural differences between the two languages cause problems in the translation of separate words. This was, for example, evident in the students' translations of the passive form *accosted* (see Appendix 2, item 9).

Another problematic issue is the generalizability of the results. The present study is an example of research in a natural school context. No rigorous experimentation, control, or statistical analysis was intended or attempted: the circumstances simply did not allow such rigorous quantitative methods. A qualitative approach was considered more appropriate. A case in point is the correlational results of Group B: because of the homogeniety of this group, the correlations between the lexical inference test results and the results of the matriculation examination were rather small. To suggest that the two test results were in contradiction would be making an inappropriate interpretation. Consequently, any generalizations can be made only cautiously on the basis of the results. The small population in this study also makes any strong generalized claims presumptuous. However, there are some facts that may permit some general observations to be made about the lexical inferencing of Finnish high school students.

Firstly, compared to many other cultures in Europe and elsewhere, the Finnish culture is much more homogeneous, and so was the Finnish school system and instruction at the time of the study in the 1980s and early 1990s. At that time, the schools still had to use state-approved textbooks based on the national syllabus, which made the content of instruction in all schools relatively similar. The compulsory nationwide matriculation examination at the end of senior high school also has a leveling effect on instruction and testing in schools (Pasanen 1977). Moreover, foreign language teachers' education in Finland is fairly uniform. This is reflected, for example, in the similar conceptions of the foreign language teacher trainers about the art of language teaching and learning in certain matters, for example in grammar (Jaakkola 1997).

Secondly, although the subjects of this study were few and academically above the national average, the age and amount of life experience of Finnish high school students are about the same. The contents of world experience may differ, of course, from individual to individual, but all high school students spend a substantial part of their time at school or working on school assignments. This makes them a rather homogenous group. Students also have about the same amount of exposure to English at school, although there is much variation in their contacts with English outside school.

Thirdly, a strong unifying factor is the common mother tongue of the students. The subjects of this study were all native speakers of Finnish; had they been Swedish-speaking Finns, the results would have been different (see e.g. Ringbom 1979; Ringbom 1987).

These background factors allow some general remarks to be made on the basis of the results of this study. Firstly, there was clear improvement in the students' ability to see systematicity in the target language: order was created out of chaos. This and another result - the more refined answers - are typical of novices on their way to become experts. It is impossible to find out how much this improvement was due to natural maturation, how much to improved L2 proficiency, and how much to instruction and practice. The teacher can have a direct influence on only the amount of exposure, the instruction, and the quality and quantity of practice. The possible effect on maturational development can only be indirect.

Would the students' language proficiency have improved without the emphasis of instruction on the inferencing procedures? There can be no definite answer to this question. It can be assumed, however, that the long-term instruction and practise in lexical inferencing must have had a positive effect on some students. This is supported by some similar studies (Kern 1989; Mulder forthcoming).

Why, on the other hand, did two students fail to show much improvement? One of them was dyslexic, which affected his ability to learn foreign languages. This factor apart, both of these students had a much poorer knowledge of English than their classmates when they started high school, and they were not able to catch up with the rest of the class during the two and a half years. This seems to speak for the existence and relevance of the threshold level which must be reached before any further development in lexical inferencing can take place. This view is supported by Haastrup's (1991) results.

Most of the students studied here did not have any problems with inferencing: they had already developed effective strategies to infer the meanings of unknown words. However, even those students occasionally made wrong inferences. Then there were those who had problems. The most common drawback was a poor knowledge of English. In many other studies of lexical inferencing, proficiency has been shown to be a decisive factor (e.g. Haastrup 1991; Schouten-van Parreren 1992; Wolf 1993b).

Apart from a poor knowledge of the target language, the students had some other problems. A very common one, which explains some of the irrational errors, was the failure to evaluate the initial guess against the context. Other studies, too, show that the phenomenon is common among L2 readers (e.g. Haynes 1984; van Parreren & Schouten-van Parreren 1981).

A third problem was surface processing, which manifested itself in the inferences made on the basis of too little linguistic or other evidence. This result has also been supported by some other studies (e.g. Schouten-van Parreren 1992; dos Santos & Sanpedro Ramos 1993).

On the whole, the results of this study seem to support the findings of other studies having the same focus of interest. They are in agreement with the findings that lexical inferencing ability and language proficiency are related (Chern 1993; Haastrup 1991; van Parreren and Shouten-van Parreren 1981; Schouten-van Parreren; Wolf 1993b). This is not surprising, as lexical inferencing is very much based on the knowledge of the cues that the text surrounding the inferrable word provides. In some special cases, however, proficiency need not play an important role. For example, when I showed a short, simple Spanish text to a group of English teachers who had no previous knowledge of Spanish, and asked them to decipher the meanings of a few words, almost all of them could do it. They used their knowledge of the world and other languages in their inferencing. Similarly, Palmberg's (1987) beginners used their mother tongue Swedish and a familiar fairytale schema to infer the meanings of unknown words. This shows that top-down processing and the availability of a relevant background knowledge or schema are important for comprehension.

The present study also seems to support the results of the research which emphasizes the need to pass a certain threshold level before language processing abilities can develop (Haastrup 1991; Wolf 1993b). The present study adds to this knowledge by showing that the reasons for not reaching the threshold level may differ. In the two case studies examined here, the reasons were an impulsive temperament and dyslexia, coupled with initial below-average knowledge of English. Other reasons that I have encountered for not being able to develop in language studies are motivational factors such as dislike of language work or school work in general. Low language ability naturally affects the rate at which some students can learn more language, which in a formal learning context may be crucial. The cumulative nature of language learning and the necessity to tailor the instruction at least to the mid-ability level undoubtedly prevents the low-ability students from achieving the threshold level they would need to reach in order to improve.

The results of other studies that are in agreement with the results of this study concern the types of failure in lexical inferencing, e.g. a wrong choice of the multiple meanings of a homonym, mistaken identity of a word, and incorrect morphological analysis. More general major sources of failure also found in other studies were the failure to use the context or to check the guess against the context (Huckin & Bloch 1993; Laufer & Bensoussan 1982; Schouten-van Parreren 1992).

The above results were gained when using different languages, different kinds of subjects and different research designs. The similarity of the results may be an indication of a possible universality of the lexical inferencing process (see also Chern 1993).

What sets the present study apart from other studies of lexical inferencing discussed here is, first of all, the fact that the native tongue of the subjects was Finnish, a language very much different from English. Many of the previous studies were concerned with different kinds of languages - mostly Indo-European - and

they were conducted under different circumstances. Speakers of a synthetic language such as Finnish clearly encounter unique problems when reading in an analytic language such as English. This study sheds light on these language-specific problems and thus helps understand L2 learning, and it paves way to more insightful instruction.

Another result of the present study that was not evident in other research in lexical inferencing was the development of the same students over a period of time. The increased awareness of the systematicity of the English language and the increasing preciseness of some of the answers illustrate the maturation and gradual development that takes place in L2 students as they learn the target language. This result helps the L2 teacher have a more insightful view of the second language learning process.

There are other ways the results of this study can help Finnish L2 teachers improve their instruction. In the first place, a balanced emphasis on both accuracy and fluency in reading instruction should bring about better results. On one hand, without abundant reading material students' grasp of the systematicity in English will not develop. On the other hand, accurate word-recognition skills are vital for fluent reading and these skills should be practiced. Poor word recognition skills slow down processing and easily lead to miscomprehension. The call for a sound balance between fluency and accuracy is by no means new but still worth repeating because the accuracy-fluency pendulum has swung so many times in the history of language learning and teaching (Laihiala-Kankainen 1993), and there are always language teaching trends and language teachers who tend to emphasize one aspect over the other.

Secondly, the more aware a Finnish teacher of English is of the differences between the two languages, especially those which affect reading, the easier it is to understand students' difficulties and to plan instruction accordingly. It would also save the teacher unecessary frustration if the starting point of the instruction were a firm knowledge of the linguistic differences and a realistic view of what the proficiency level of the students is and can be at the various stages of foreign language learning, rather than what it should be.

Thirdly, in order to base one's teaching on realistic expectations, it would be wise if the teacher bore in mind that language learning is a very long and slowly evolving process. While it can partly be influenced by instruction, much develops only through sufficient exposure to the language and gradual maturation.

Fourthly, the teacher can make students aware of some of the pitfalls and sources of failure in L2 reading and teach them how to avoid them. This can be done, for example, through modelling, explanation, and practice. My experience was that the instruction and tasks employed when teaching lexical inferencing interested the students, undoubtedly partly because of their novelty. This tended to improve motivation, too.

Finally, if teachers test what they teach rather than teach what is tested by national or other standard tests, their instruction will gain in credibility and the students will take the instruction seriously. Teachers, of course, will first have to analyze their own objectives and set their priorities.

Many questions remain to be explored and answered by further research. The results of this study should be confirmed, elaborated on, or disproved by using

different subjects, different texts, and complementary methods such as think-aloud protocols, interviews, introspection, free reflection, and group discussions. It would be interesting to see at what age and proficiency level students start to use lexical inferencing, or whether adult learners have the same inferencing strategies as younger learners. I have tested some younger students as well as educated adults. With younger students, qualitative changes seem to occur between the eigth grade (13-14 years) and the ninth grade (14-15 year-old students). It is possible that these changes are connected with language proficiency, maturation, and increased knowledge of the world. Educated adults, on the other hand, appear to rely much more on their world experience and knowledge of other languages than school-aged students.

Another direction would be to study instruction in lexical inferencing more closely. What kind of direct instruction would be effective? What kind of exercises would contribute most to the improvement of inferencing skills? How long should a program last? Such questions were not answered in this study but would be important to explore.

In the present study, lexical inference tasks were used as tests. Yet, their testing properties were very little touched upon. What does the lexical inference test actually measure? How does it compare with other test of reading competence? Could it be used as a general test of proficiency and reading comprehension rather than as a customized test to a particular target group, as it was employed in this study? All these and other questions remain to be answered by future research.

YHTEENVETO

Tässä tutkimuksessa tarkasteltiin suomenkielisten lukiolaisten sanapäättelyä englanninkielistä tekstiä luettaessa. Tutkimusonglemat olivat seuraavat: 1) Millaisia strategioita suomalaiset lukiolaiset käyttävät päätellessään tuntemattomien sanojen merkityksiä englanninkielistä tekstiä lukiessaan ja mihin he perustavat päättelynsä? 2) Minkälaiset syyt saattavat aiheuttavat sanapäättelyn epäonnistumisen? 3) Tapahtuuko sanapäättelyssä määrällistä ja laadullista parannusta oppilaiden kielitaidon kasvaessa? 4) Millainen yhteys on sanapäättelytehtävien tulosten ja englannin ylioppilaskokeen tulosten välillä?

Tutkittavista pääosa oli helsinkiläisiä lukiolaisia ja tutkimuksen suoritti heidän englannin opettajansa normaalin koulutyön yhteydessä. Koehenkilöinä oli kaksi lukioluokkaa (N=26), jotka opiskelivat englantia toisena vieraana kielenä. Englannin opinnot he olivat aloittaneet peruskoulun seitsemännellä luokalla, ruotsin opinnot peruskoulun kolmannella luokalla. Lisäksi tutkimuksessa käytettiin hyväksi materiaalia, jota oli kerätty muilta luokilta ja eräästä toisesta koulusta. Tutkimuksen kohteena olevat luokat olivat saaneet opetusta ja harjoitusta sanapäättelyssä normaalin luokkaopetuksen ohessa.

Tutkimusmateriaalina oli kaksi autenttista, lukion toisen luokan koetekstiä, joista toinen käsitteli menestyvien opiskelijoiden työtapoja ja toinen Guatemalan katulapsia. Teksteistä oli valittu suomeksi käännettäviksi sellaisia sanoja, joiden oletettiin olevan oppilaille tuntemattomia ja joiden merkitys olisi pääteltävissä asiayhteyden, yleistietouden tai sana-analyysin perusteella. Kumpikin luokka teki toisen päättelytehtävistä kahdesti: yhden kerran kurssikokeen osana ja toisen kerran tavallisena tuntitehtävänä, jolloin he myös kirjallisesti perustelivat tekemänsä päätelmät. Tehtävien välinen aika oli joko kuusi tai 12 viikkoa. Kumpikin ryhmä teki molemmat tehtävät ainakin kerran.

Tulokset analysoitiin ja luokiteltiin sekä kahden testauskerran tuloksia verrattiin, jotta saataisiin selville mitä määrällisiä ja laadullisia muutoksia oli tapahtunut oppilaiden kielitaidon kehittyessä. Koska kahden koehenkilön koetulosten pistemäärät eivät muuttuneet juuri lainkaan, näiden kahden kieliopinnoissaan heikosti menestyneen oppilaan tuloksia tarkasteltiin erikseen. Tarkastelu pyrki selittämään miksi he eivät olleet menestyneet englannin opinnoissaan. Lisäksi koetuloksia verrattiin koehenkilöinä olleiden oppilaiden ylioppilaskoetuloksiin, jotta saataisiin selville, mittaako sanapäättelykoe samanlaista kielitaitoa kuin lukion päättökoe ja mitkä päättökokeen tehtävät korreloisivat korkeimmin päättelytehtävien kanssa.

Kun tuloksia tarkasteltiin strategioiden kannalta, voitiin päätellä, että oppilaat käyttivät sekä tekstiin että aikaisempaan tietoonsa perustuvia strategioita. Tekstilähtöiset päättelystrategiat perustuivat 1) morfologiseen sananosien analysointiin 2) sanan lähikontekstiin ja 3) laajahkoon tekstikontekstiin tai koko tekstiin. Tietoon perustuvat strategiat olivat 4) yleistietous tai aikaisempi tietous aihepiiristä 5) tieto siitä, miten kirjallinen teksti rakentuu ja 6) tieto muista kielistä. Tärkein tiedonlähde oli oppilaan aikaisempi kielitaito, jota ilman päättely ei onnistu.

Oppilaiden tekemät virheet johtuivat useista syistä. Näitä olivat: 1) huonot sanatunnistamistaidot, jolloin oppilas saattoi esimerkiksi lukea sanan väärin ja tehdä päätelmänsä siltä pohjalta, 2) heikot taidot englannin syntaksin tuntemuksessa, jolloin esimerkiksi oppilas ei tunnistanut sanan sanaluokkaa tai ei pystynyt hyödyntämään kielen sisäisiä vihjeitä sanapäättelyssä, 3) oppilas pitäytyi vain siihen sanan merkitykseen, jonka jo tunsi eikä ottanut huomioon kontekstia eikä sitä, että kielen sanoilla saattaa olla useita eri merkityksiä, 4) oppilas jätti huomioimatta osan tekstiä ja teki päätelmänsä vain valikoimiensa sanojen ja rakenteiden perusteella, 5) oppilas luotti ensivaikutelmaansa eikä muuttanut mieltään, vaikka muu teksti ei tätä vaikutelmaa tukenut ja 6) summittainen arvaaminen, jolloin oppilas ei ollut hyödyntänyt muuta tekstiä lainkaan.

Kun verrattiin oppilaiden kahta samasta päättelytehtävästä saamia tuloksia toisiinsa huomattiin, että enemmistön koetulokset olivat parantuneet kahden mittauskerran välillä. Tämän katsottiin osoittavan, että oppilaiden kielitaito oli kehittynyt. Kun vastauksia tarkasteltiin osio osiolta, havaittiin oppilaiden vastauksissa myös laadullisia muutoksia. Englannin kielen syntaksin ja säännönmukaisuuksien tuntemus oli parantunut ja sitä pystyttiin paremmin hyödyntämään sanapäättelyssä. Myös sananmuodostuksen säännönmukaisuudet olivat tulleet tutummiksi ja sanojen morfologinen analyysi onnistui paremmin. Jotkut oppilaat ehdottivat yleistermien sijasta osuvampia ja kuvailevampia käännöksiä. Tämän voi tulkita osoittavan sävyjen ja tyylin hienovaraisempaa ymmärtämistä. Tuloksiaan parantaneet oppilaat tuntuivat myös käyttävän enemmän hyödykseen omia tietojaan (top-down processing) tekstitiedon ohella (bottom-up processing) tuntemattomia sanoja päätellessään.

Kahden oppilaan tulokset eivät parantuneet laisinkaan. Kun heidän tuotoksiaan tarkasteltiin lähemmin ja samalla käytettiin hyväksi opettaja-tutkijan oppilaantuntemusta voitiin havaita, että epäonnistumisen syitä oli monenlaisia. Yhteisenä syynä kummallekin oppilaalle olivat heikot pohjatiedot- ja taidot englannin kielessä, jolloin he eivät koko lukioaikanaan pystyneet saavuttamaan muiden oppilaiden tasoa eivätkä hyötymään vain englanniksi käydystä opetuksesta. Muutoin näiden kahden oppilaan oppijaprofiilit olivat täysin erilaisia. Toinen heistä oli tunnollinen, keskittymiskykyinen ja lukihäiriöinen, jolle etenkin vieraat kielet tuottivat vaikeuksia. Hän ei lukiessaan huomannut osaa sanoista tai luki sanoja väärin. Hän myös hahmotti tavallista heikommin puhuttua kieltä, mikä vaikutti myös hänen ääntämiseensä. Toinen epäonnistuja oli puolestaan vilkas, sosiaalinen ja malttamaton, joka usein suoritti tehtävänsä nopeasti ja epätarkasti eikä halunnut tarkistaa tuotoksiaan. Hänen suullinen kielitaitonsa oli sujuvaa, joskin erittäin virheellistä. Näiden kahden oppilaan tulosten tarkastelu osoitti, miten erilaisista syistä oppilaat saattavat epäonnistua kieliopinnoissaan.

Sanapäättelykokeiden tuloksia verrattiin myös ylioppilaskokeiden tuloksiin. Näiden kahden koetyypin väliset korrelaatiot olivat melko korkeita. Tätä pidettiin osoituksena siitä, että päättelykoe mittaa sellaista kielitaitoa kuin ylioppilaskokeessa mitataan. Kun verrattiin päättelytehtäviä ja englannin ylioppilaskokeiden eri osatehtäviä, havaittiin, että korkeimmat korrelaatiot olivat sanastoa ja rakenteita mittaavan osatehtävän kanssa. Myös päättelytehtävien ja ainekirjoituksen sekä avoimilla kysymyksillä testatun tekstinymmärtämisen väliset korrelaatiot olivat melko korkeita. Lisäksi havaittiin, että sanapäättelytehtävien ja yleisen

koulumenestyksen - sitä kuvasi ylioppilastutkinnon yleisarvosana - välillä on yhteyttä. Päätelmiä voitiin tehdä vain yhden luokan tulosten perusteella, koska toinen luokka oli niin homogeeninen, etteivät tilastolliset menetelmät toimineet.

Sanapäättelytehtäviä voi siis käyttää sekä testaamaan kielitaitoa että analysoimaan oppilaiden kielitaitoa ja sen kehittymistä, jolloin saadaan sellaista tietoa, jota voidaan opetuksessa hyödyntää. Toiseksi tämä tutkimus näytti tukevan sitä muissakin tutkimuksissa saavutettua tulosta, että oppilaalla on oltava tietty kynnystaso, jotta kielitaito voisi kehittyä. Muut tutkimukset tukevat myös niitä päätelmiä, joita tehtiin oppilaiden virheellisten sanapäättelyiden syistä. Koska tämä tutkimus tehtiin indoeurooppalaisista kielistä poikkeavan kielen puhujilla, täydentävät tämän tutkimuksen tulokset melko laajaa sanapäättelytutkimusta. Se, että tässä tutkimuksessa seurattiin samoja oppilaita pitkän ajanjakson kuluessa ja tarkkailtiin heidän kielitaitonsa kehittymistä, tuo myös oman panoksensa sanapäättelytutkimukseen.

Hakusanat: sanapäättely, vieraalla kielellä lukeminen, luetunymmärtäminen, vieraan kielen oppiminen, englanti vieraana kielenä

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APPENDIX 1

Secrets of Straight-A Students

They aren't always more intelligent, but the do work smarter. Here's how
By Edwin Kiester, Jr. and Sally Valente Kiester (Reader's Digest, September 1992)

Everyone knows about straight-A students. We see them frequently in TV sitcoms and in movies like *Revenge of the Nerds*. They get high grades, all right, but only by becoming dull grinds, their noses always stuck in a book. They're 1) **klutzes** at sports and dweebs when it comes to the opposite sex.

How, then. Do we account for Domenica Roman or Paul Melendres?

Roman is on the tennis team at Fairmont (W.Va,) Senior High School. She also sings in the choral ensemble, serves on the student council and is a member of the mathematics society. For two years she has 2) **maintained** a 4.0 grade-point average (GPA), meaning A's in every subject.

Melendres, now a freshman at the University of New Mexico, was student-body president at Valley High School in Albuquerque. He played varsity soccer and junior-varsity basketball, exhibited at the science 3) **fair**, was chosen for the National Honor Society and National Association of Student Councils and did student commentaries on a local television station. Valedictorian of his class, he acheived a GPA of 4.4 - straight A's in his regular classes, plus bonus points for A's in two college-level honors courses.

How do super-achievers like Roman and Melendres do it? Brains aren't the only answer. "Top grades don't always go to the brightest students," declares Herbert Walberg, professor of education at the University of Illinois at Chicago, who has conducted major studies of super-achieving students. "Knowing how to make the most of your 4) **innate** abilities counts for more. Infinitely more."

In fact, Walberg says, students with high I.Q.s sometimes don't do as well as classmates with lower I.Q.s. For them learning comes too easily and they never find out how to 5) **buckle down**.

Hard work isn't the whole story, either. "It's not how long you sit there with the books open," said one of the many A students we interviewed. "It's what you do while you're sitting."Indeed, some of these students actually put in fewer hours of homework time than their lower-scoring classmates.

The kids at the top of the class get there by mastering a few basic techniques that others can readily learn. Here, according to education experts and students themselves, are the secrets of straight-A students.

1. Set priorities. Top students 6) **brook no intrusions** on study time. Once the books are open or the computer is booted up, phone calls go unanswered, TV shows unwatched, snacks ignored. Study is business; business comes before recreation.

2. Study anywhere - or everywhere. Claude Olney, an Arizona State University business professor assigned to tutor failing college athletes, recalls a cross-country runner who 8) **worked out** every day. Olney persuaded him to use the time to memorize biology terms. Another student posted a vocabulary list by the medicine cabinet. He learned a new word every day while brushing his teeth.

Among the students we interviewed, study times were strictly a matter of personal preference. Some worked late at night when the house was quiet. Others awoke early. Still others studied as soon as they came home from school when the work was fresh in their minds. All agreed, however, on the need for 9) **consistency**. "Whatever I was doing, I maintained a slot every day for studying, " Says Ian McCary, a Middlebury College

students from New Jersey.

3. *Get organized.* In high shcool, McCary ran track, played rugby and was in the band and orchestra. "I was so busy, I couldn't waste time looking for a pencil or missing paper. I kept everything right where I could put my hands on it," he says.

Paul Melenders maintains two folders - one for the day's assignemnts, another for papers completed and graded. Traci Tsuchiguchi, a top student at Clovis West High School in Fresno, Calif., has another system. She immediately files the day's papers in color-coded folders by subject so they'll be available for review at exam time.

Even students who don't have a private study area remain organized. A backpack or drawer keeps essential supplies together and cuts down on time-wasting searches.

4. *Learn how to read.* "The best class I ever took, " says Christopher Cambell, who graduated from Moore (Okla.) High School last spring, "was speed-reading. I not only increased my words per minute but also learned to look at a book's 10) **table of contents**, graphs and pictures first. Then, when I began to read, I had a sense of the material, and I retained a lot more."

In his book *Getting Straight A's,* Gordon W. Green, Jr., says the secret of good reading is to be "an active reader - one who continually asks questions that lead to a full understanding of the author's message."

5. *Schedule your time.* When a teacher 11) **assigns** a long paper, Domenica Roman draws up a time-table, dividing the project into small pieces so it isn't so 12) **overwhelming.**" It's like eating a steak, " she says, "You chew it one bite a a time."

Melendres researches and outlines a report first, then tries to complete the writing in one long push over a weekend. " I like to get it down on paper early, so I have time to polish and review."

Of course, even the best students 13) **procrastinate** sometimes. But when that happens, they face up to it. "Sometimes it comes down to late nights," admits Christi Anderson, an athlete, student-council member and top student at Lyman High School in Presho, S.D. "Still, if you want A's, you make sure to hit the deadline."

6. *Take good notes - and use them.* "Reading the textbook is important, "says Melendres, But the teacher is going to test you on what he or she emphasized. That's what you find in your notes."

The top students also take notes while reading the text assignment. In fact, David Cieri of Holy Cross High School in Delran, N.J., uses "my homemade" system in which he draws a line down the center of a notebook, writes notes from the text on one side and those from the teacher's lecture on the other. Then he is able to review both aspects of the assignment at once.

Just before the bell rings, most students close their books, put away papers, whisper to friends and get ready to rush out. Anderson uses those few minutes to write a two- or three-sentence summary of the lesson's 14) **principal** points, which she scans before the next day's class.

7. *Clean up your act.* Neat papers are likely to get highr grades than 15) **sloppy** ones. "The student who turns in a neat paper, " says Professor Olney, "is already on the way to an A. It's like being served a cheeseburger. No matter how good it really is, you can't believe it tastes good if it's presented on a messy plate."

8. *Speak up.* "If I don't understand the principle my teacher is explaining in economics, I ask him to repeat it," says Christopher Cambell. Class participation goes beyond merely asking questions, though. It's a matter of showing intellectual curiosity.

In a lecture on capitalism and socialism, for example. Melendres asked the teacher how the Chinese economy could be both socialist and market-driven, without 16) **incurring** some of the problems that befell the former Soviet Union. "I don't want to memorize information for tests only," says Melendred. "Better grades come from better understanding."

9. Study together. The value of hitting the books together was demonstrated in an experiment at the University of California at Berkeley. While a graduate student there, Uri Treisman observed a freshman calculus class in which Asian-Americans, on average, scored higher than other 17) **minority** students from similar backgrounds. Treisman found that the Asian Americans discussed homework problems together, tried different approaches and explained their solutions to one another.

The others, by contrast, studied alone, spent most of their time reading and rereading the text, and tried the same approach time after time even if it was unsuccessful. On the basis of his findings, Treisman suggested teaching group-study methods in the course. Once that was done, the groups performed equally well.

10. Test yourself. As part of her note-taking, Domenica Roman highlights points she thinks may be covered during exams. Later she frames 18) **tentative** test questions based on those points and gives herself a written examination before test day. " If I can't answer the question satifactorily, I go back and review, " she says.

Experts confirm what Roman has figured out for herself. Students who make up possible test questions often find many of the same questions on the real exam and thus score higher.

11. Do more than you're asked. If her math teacher assigns five problems, Christi Anderson does ten. If the world-history teacher assigns eight pages of reading, she reads 12. "Part of learning is practicing,"says Anderson. "And the more you practice, the more you learn."

THE MOST IMPORTANT "SECRET" of the super-achievers is not so secret. For almost all straight-A students, the contribution of their parents was crucial. From infancy, the parents 19) **imbued** them with a love for learning. They set high standard for their kids, and held them to those standards. They encouraged their sons and daughters in their studies but did not do the work for them. In short, the parents impressed the lessons of responsibility on their kids, and the kids 20) **delivered**.

2ABCD/ Course 3/ November 11, 1992
Secrets of Straight-A Students (Reader's Digest, September 1992)

Give as clos a translation as possible of the following words.
Correct or approximately correct answer= two points; a good guess= one point; wrong answer= no points; no answer= minus one point

1. klutzes = _____
2. maintained = _____
3. fair = _____
4. innate = _____
5. buckle down = _____
6. brook no intrusion = _____
7. worked out = _____
8. consistency = _____
9. table of contents = _____
10. assigns = _____
11. overwhelming = _____
12. procrastinate = _____
13. principal = _____
14. sloppy = _____
15. incurring = _____
16. minority = _____
17. tentative = _____
18. imbued = _____
19. delivered = _____

_____

APPENDIX 2

STREET KIDS FIND A FRIEND

Buses spew exhaust fumes along Guatemala City's Avenida Nueve, as Mark Connolly,a twenty-seven-year-old American, greets two barefoot 1) **urchins** outside a cheap eatery. "Marco!Marco!" the boys shout gleefully. One flings his thin arms around the man's neck and wraps his legs around the man's waist. "Marco," he asks, "where have you been?"

Squatting on the sidewalk with Saul and Byron, the two homeless twelve-year-olds, Mark answers their questions and 2) **slips in** a few of his own. From a shoulder bag that contains first-aid equipment, he draws two color photographs taken on a previous encounter with the boys. "Look," says Byron. "There I am. But my eyes are closed."

Connolly knows scores of Guatemala City's (population 2 million) 1,00 to 1,500 hardcore streetchildren. For five years, he has been pounding downtown pavements by night, offering help, encouragement and, for those who want it, another way to live. His first contact with the world of street children was in Bogota, Colombia, when he was doing fieldwork for a degree in Latin American studies. In Guatemala City Connolly has helped set up a shelter for street children and has become program and policy coordinator for Childhope, a locally based international organization 3) **devoted to** helping the 100 million children worldwide that UNICEF estimates are street children. Tha vast majority live in the Third World, cast out into the streets by the same forces of industrialization and urbanization that produced the Oliver Twists of Dickensian England. "The number can only grow." says Connolly. "And the growth will be in those societies that can least afford to do something about it."

Despite the heavy schedule for the organization here, Connolly still works in the streets. "By getting out here, I'm constantly reminded of the conditions these children live under, "he says, as Saul and Byron follow him to a quiet spot in the railroad station. Under a dim light, Connolly 4) **daubs** iodine on cuts on Saul's hand while gently chastisising him for inhaling paint 5) **thinner**, evidence of which hangs on the boy's breath. As many as nine out of ten of Guatemala City's street children are thought to be addicted to paint thinner, cheap glue or more potent drugs. Thinner, the most commonly abused substance, numbs the senses and diminishes the hunger pangs. "I don't moralize with them about this or anything else," says Connolly. "But they know they can't take drugs with them if they go to the shelter. Which is why some of them don't want to go or won't stay."

In fact, many children prefer the freedom of street life, particularly those who have fled 6) **abuse** at home. Some of the older ones drift into picking pockets or prostitution; the younger children live by begging and, sometimes, stealing. Whatever their age, there is a camaraderie, a willingness to share. Connolly has helped enough of the youngsters make good - 60 or 70, he guesses - to know his effort is worthwhile. Luis Ramos Castro, a neatly dressed 16-year-old, greets him. Luis once passed through La Novena, Connolly's shelter, and is now off drugs and working. "You helped me, Marco, and I want to thank you," he tells the American, obviously proud of his newly found place in the mainstream.

Perhaps the best testimonial to Connolly's work is the near universal recognition he enjoys on the 7) **strip**: 17-year-old Billi, a shoeshine boy, gives him an elaborate handshake; Jorge, 15, a sheet of green plastic hiding his bare shoulders but not his glazed eyes, flashes a grin as Connolly passes by. "The important thing, "says Connolly, "is to be out here and available.They need to know that there is someone who cares about them, that they have a place to go whenever they want. "The work is not without danger.

Connolly has been abused, even threatened at gunpoint as he has gone about 8) **befriending** the street children. This night is no exception. Outside a Chinese restaurant, he is 9) **accosted** by three drunks who accuse him of trying to show Guatemala in a bad light. "It's an imperialistic plot," one keeps repeating. "Yankee scum," yells another, prodding Connolly's chest. When the American steps off the sidewalk to pass, the accuser kicks him. Connolly carries a canister of Mace for such encounters, but the 10) **assailant** is refrained by a friend, and Connolly manages to calm the other two. So successfully, in fact, that the man who kicked him eventually apologizes.

Time, October 1988, by John Borrell

2ABC/June 1, 1993 (Course 4, Feb 17, 1993)

Infer the meaning of the following words and translate them into Finnish. Give reasons in Finnish for your answers.

1. urchins = _____

_____

2. slips in = _____

_____

3. devoted to = _____

_____

4. daubs = _____

_____

5. thinner = _____

_____

6. abuse = _____

_____

7. strip = _____

_____

8. befriending = _____

_____

9. accosted = _____

_____

10. assailant = _____

_____

APPENDIX 3

MAKING THE BEST OF IT: TRIALS AND TRIUMPS OF BEING LEARNING-DISABLED

Abridged from Psychology Today, 1986

Learning disabilities don't automatically lead to low achievement in life. Many accomplished scholars, politicians, entertainers, entrepreneurs, athletes and professionals have had to struggle with learning disabilities. Serious weaknesses in one area seem to 1) **spur** some people on to develop exceptional strenghts in other areas. The extra energy of hyperactive individuals, for example, can come in handy once it is put under control.

Albert Einstein would probably be diagnosed as 2) **learning-disabled** if he were growing up today. He showed no signs of genius in his early years; his parents and teachers feared he was less than normal intellectually. It has been reported that he did not learn to talk until he was four years old nor read until he was 9, and he failed his entrance exam the first time he applied to the Federal Institute of Technology. In his own words, "As a pupil I was neither particularly good not bad. My 3) **principal** weakness was a poor memory and specially a poor memory for words and texts." One of his problems - and, ironically, his later claim to fame - was that he either could not or would not solve scientific and matematical problems in the usual ways. Instead he invented his own unique, creative ways of conceptualizing problems.

Today the young Thomas Edison probably would be recognized as dyslexic, but during his childhood he was simply thought of as stupid. "I remember I never used to be able to get along at school. I was always at the foot of my class...My father thought I was stupid, and I almost decided that I was a 4) **dunce**." Eventually he was withdrawn from normal schools and tutored at home by his mother. He never learned to spell or write grammatically.

Sculptor Auguste Rodin had difficulty learning to read and write. His father said, " I have an idiot for a son. " and his uncle agreed. "He is 5) **ineducable**." President Woodrow Wilson didn't learn his letters until he was 9 years old or learn to read until he was 11. Other historical 6) **notables** now thought to have been learning-diabled include General George Patton, Vice President Nelson Rockefeller, Leonardo da Vinci and Hans Christian Andersen.

Many current public figures who are learning-disabled have spoken openly about their disabilities, 7) **urging** others to feel more hopeful about the opportunities life offers them. Actor Tom Cruise, for example, is dyslexic, as are his mother and three sisters. "I was put in 8) **remedial reading classes**. It was a drag. It separarted you and singled you out." He compensated for his poor school performance 9) **by excelling** first at all forms of sports and, after graduating, by becoming an actor with exceptional self-discipline. "I enjoy the pressure of making a movie. It's like getting psyched up for a wrestling match - but with higher stakes. I thrive on it".

Child psychiatrist Larry Silver is a dyslexic, too. He wrote a book for parents of learning-disabled children, *The Misunderstood Child*, in which he says:

"You should have seen the first draft of this book - spelling errors, letter reversals, 10) **illegible** handwriting. But I have something now that I didn't have when I was in school. I have a secretary who has learned to read my handwriting, who can spell, and who no longer laughs at my errors..."

"My grades in elementary and junior high school were less than good... Somehow

I got my act together in high school. I taught myself how to learn and how to pass exams. That, for me, was the beginning. The ending never comes. I still face new frustrations and challenges. Recently I was at a Congressional hearing. I needed to pass information to someone who was answering a senator's questions. When I go my note back, on top it said 'Thanks' - then he proceeded to correct two spelling errors and one reversal."

MAKING THE BEST OF IT: TRIALS AND TRIUMPHS OF BEING LEARNING - DISABLED

Read the text and try to deduce from the context what the following words mean. Translate them into Finnish.

1. spur = _____

_____

2. learning-disabled = _____

_____

3. principal = _____

_____

4. dunce = _____

_____

5. ineducable = _____

_____

6. notables = _____

_____

7. urging = _____

_____

8. remedial reading classes = _____

_____

9. by excelling = _____

_____

10. illegible = _____

_____

APPENDIX 4

The answers of students in the pre-test and post-test of "Street Kids Find a Friend".

The answers are given in Finnish, with an approximate translation into English. The figure after each answer refers to the student's score in the answer. The scale is 0 to 2.

The students are numbered in alphabetical order.

Student number	**Pre-test**	**Post-test**
	Item word 1: **urchins**	
1.	tarkkailee (0) *observes*	katulapset (2) *street kids*
2.	kadun laita (0) *curb*	katulapsi (2) *street kid*
3.	urkkimassa (0) *spying*	kadun asukkaita (2) *street dwellers*
4.	vaihtua (0) *change* (v.)	vierekkäin (0) *side by side*
5.	kasvattia (2) *kid*	kasvattia (2) *kid*
6.	katsellen (0) *watching*	kasvatti (2) *kid*
7.	kerjäläiset (2) *beggars*	kerjäläiset (2) *beggars*
8.	(kadun) kasvatti (2) *(street) kid*	(kadun)kasvatti (2) *(street) kid*
9.	kerjäläistä (2) *beggars*	katulasta, kerjäläistä (2) *street kids, beggars*
10.	kerjäläislapsi (0) *beggar child*	katulapsi (2) *streetkid*

Item word 2: **slips in**

1.	sujauttaa mukaan (2) *slip in*	lisätä väliin (2) *add in*
2.	lisää väliin (2) *slips in*	lisää väliin (2) *slips in*
3.	maiskutella huuliaan (0) *smacks his lips*	kysyy (2) *asks*
4.	kyselee (2) *asks*	sujauttaa, lisää (2) *slips in*
5.	lisätä (2) *add*	sujauttaa mukaan (2) *slip in*
6.	tehdä pari omaa kysymystä *ask a few questions of his own*	kysyy itsekin, asettaa omat kysymykset *asks himself, too;asks his own questions*
7.	sujauttaa väliin (2) *slips in*	sujauttaa väliin (2) *slips in*
8.	kysäisee (2) *asks*	livauttaa väliin (2) *slips in*
9.	sujauttaa (2) *slips in*	sujauttaa (2) *slips in*
10.	kysäisee (2) *asks*	esittää (2) *poses*

Item 3: **devoted to**

1.	keskittyy (2) *concentrates*	perustettu (2) *established*
2.	perustettu jtkn varten (2) *established for*	perustettu auttamista varten (2) *established to help*
3.	kehittyi, keskittyi (2) *developed, concentrated*	kehittää, aloitti (1) *develop, started*
4.	keskittyä (2) *concentrate*	ryhtyä (1) start
5.	omistautunut (2) *devoted to*	omistautua (2) *devote to*
6.	yrittää (2) *try (v.)*	pyrkiä, tarkoituksena (2) *strive, with the purpose of*
7.	suunnattu (2) *directed*	suunnattu, tarkoitettu (2) *directed, meant*
8.	tarkoitettu (2) *meant*	valtuutettu, tarkoitettu jhkn (2) *licenced, meant*
9.	tehtävänään (2) *with the purpose of*	perustettu (2) *established*
10.	tarkoituksena (2) *with the purpose to*	tarkoituksena (2) *with the purpose to*

Item 4: **daubs**

1.	laittaa (2) *put*	ojentaa (1) *to hand*
2.	tipauttaa (2) *drop (v.)*	laittaa (2) *to put*
3.	polkaisee (0) *kicks*	epäilee, pelkää (0) *doubts, fears*
4.	turvautua (0) *resort to*	ruhjoa (0) *to mutilate*
5.	sivelee (2) *applies*	laittaa (2) *puts*
6.	huomata (0) *notice*	levittää (2) *to apply*
7.	sivelee (2) *applies*	painelee, pyyhkii (2) *presses, wipes*
8.	sivelee (2) *applies*	levittää (2) *spreads*
9.	sivelee (2) *applies*	painella pumpulitukolla (2) *daub with cotton wool*
10.	osoittaa (0) *show*	kaataa (2) *to pour*

Item word 5: **thinner**

1.	tinneri (2) *thinner* (n.)	tinneri (2) *thinner*
2	tärpätti (1) *turpentine*	tärpätti, tinneri (2) *turpentine, thinner*
3.	purkki (0) *can* (n.)	purkki, tölkki (0) *can, jar*
4.	kosketus (0) *touch (n.)*	seinämaalaukset (0) *graffiti*
5.	liuotin (2) *dissolvent*	tinneri, liuotin (2) *thinner, dissolvent*
6.	täynnä mustelmia hakkausjäljiltä (0) *full of black and blue marks* *caused by beating*	tinneri (2) *thinner*
7.	tinneri, liima (2) *thinner, glue*	tinneri, liima (2) *thinner, glue*
8.	tinneri (2) *thinner*	tinneri (2) *thinner*
9.	tinneri (2) *thinner*	tinneri (2) *thinner*
10.	tärpätti (1) *turpentine*	tinneri tai joku huumeena käytetty aine (2) *thinner or some other drug*

Item 6: **abuse**

1.	väärinkäyttö (2) *abuse (n.)*	väärinkäytetty, käyttää väärin (1) *abused , to abuse*
2.	väkivaltainen (1) *violent*	pahoinpitely (2) *assault (n.)*
3.	joutua mukiloiduksi (1) *to be beaten*	säännöllisen, vakituisen (0) *regular*
4.	karkotettu (0) *expelled*	nuorena (0) *when young*
5.	pahoinpitely (2) *assault*	pahoinpitely (2) *assault*
6.	hyväksikäyttö, kotiväkivalta, hakkaaminen(2) *abuse, domestic violence, beating*	hyväksikäyttö (2) *abuse (n.)*
7.	pahoinpitely (2) *assault*	uhkailu (2) *bullying*
8.	ajettu, karkoitettu (0) *chased, expelled under threat, forced*	uhan alla, pakotettu (1)
9.	pahoinpitely (2) *assault*	hyväksikäyttö, pahoinpitely (2) *abuse, assault*
10.	hyväksikäyttö, huono kohtelu (2) *abuse, maltreatment*	pahoinpitely (2) *assault*

Item 7: **strip**

1.	huomio (0) *attention*	katu (2) *street*
2.	työskennellessään (1) *while working*	työssään kadulla (2) *in his work in the street*
3.	työ (1) *job*	matkalla, uransa varrella (1) *on the way, during his career*
4.	tutkimus (0) *study (n.)*	seuraavista (0) *the following*
5.	matka (2) *the way*	matka (2) *the way*
6.	näkymä (0) *view* (n.)	kierros, rundi (2) round (n.)
7.	kävely (2) *walk (n.)*	kävely (2) *walk (n.)*
8.	kadulla (2) *in the street*	matka, kierros (2) *way , round (n.)*
9.	työssään (1) *in his work*	työympäristössään, kadulla (2) *in the street, in his work environment*

10.	työ(kenttä) (1) *field of work*	työ(paikka) (1) *job*

Item 8: **befriending**

1.	ystävällisyyttä (0) *kindness*	auttavainen, ystävällinen (1) *helpful, friendly*
2.	auttamaan (1) *to help (v.)*	tutustua (2) *to become acquainted*
3.	olla ystävällinen (2) *to be friendly*	ystävällinen (1) *friendly*
4.	vapautunut (0) *liberated*	puolustaa (2) *to defend*
5.	tutustuminen (0) *familiarization*	auttaa, olla ystävä (2) *to help, to be friend to*
6.	moikata, mennä juttelemaan (2) *to greet, to go to talk to*	tutustumassa., tapaamassa (2) *getting to know, meeting*
7.	auttaminen (0) *helping*	seurustella (2) *to have a talk*
8.	treffailla, kaveerata (2) *to meet, make friends*	tutustumassa, tekemässä tuttavuutta (2) *getting to know*
9.	vapauttaakseen (0) *in order to free*	puolustatessaan (2) *defending*
10.	avustaminen (0) *assistance*	puolustaakseen (1) *in order to defend*

Item 9: **accosted**

1.	suututtaa (1) *to anger (v.)*	ahdistettuna, uhkailtuna (2) *harrassed, threatened*
2.	kohtaa, törmää (2) *to bounce into*	syyttää (1) *to accuse*
3.	havainnut (2) *noticed*	uhattuna (2) *threatened*
4.	törmännyt (2) *bumped into*	tulla häirityksi (2) *get harrassed*
5.	ahdisteltu (2) *harrassed*	liittyä seuraan (2) *to join*
6.	ahdistella (2) *to harrass*	ahdistella (2) *to harrass*
7.	piiritetty (2) *surrounded*	piiritetty (2) *surrounded*

8.	joutua uhkailun kohteeksi (2) *being threatened*	uhattuna (2) *threatened*
9.	saarrettuna (2) *surrounded*	piiritetty (2) *surrounded*
10.	uhattuna (2) *threatened*	ahdistella (2) *to harrass*

Item 10: **assailant**

1.	riita (0) *quarrel (n.)*	hyökkääjä (2) *assailant*
2.	hyökkääjä, riitelijä (2) *assailant, troublemaker*	räyhääjä (2) *troublemaker*
3.	henkilö (2) *person*	yksi uhkaajista (2) *one of the bullies*
4.	purkki (0) *can (n.)*	avustaja (1) *assistant (1)*
5.	hyökkääjä (2) *assailant*	häirikkö, päällekävijä (2) *bully, assailant*
6.	maine (0) *reputation*	hyökkääjä (2) *assailant*
7.	tilanne (0) *situation*	hyökkääjä (2) *assailant*
8.	tilanne (0) *situation*	suunsoittaja, hyökkääjä (2) *loudmouth, assailant*
9.	päällekävijä (2) *assailant*	päällekävijä (2) *assailant*
10.	vastustaja (2) *opponent*	syyllinen (2) *offender*

APPENDIX 5

Examples of the tasks and procedures used in the classroom

A. General inferencing

1. Various and frequent pre-reading exercises to activate relevant schemata and vocabulary which aid lexical inferencing.

2. Modelling and practicing in hypothesis testing. The purpose was to encourage the students to make inferences, modify them, and elaborate on texts.

3. Examples of the ten major inference types suggested by Johnson and Johnson (1986). Practice on examples from Reutzel and Hollingsworth (1988).
   The purpose was to encourage students to engage in deep processing, to activate schemata, to rely on their own knowledge of the world, and to exploit the thext precisely and to the full.

4. Students created similar passages as Reutzel and Hollingsworth (1988).

5. The passages generated by students were used for further practice.

6. Students elaborated on an inference passage by creating stories either orally or in writing.

B. Lexical inferencing

1. Teaching and modeling through examples. Special attention was paid to the various clues and restrictions in the language.

2. Frequent lexical inference practice with texts from the textbooks or elsewhere. Item words were selected by the teacher. Important points were highlighted and discussed.

3. Students read passages and selected the unknown words that they thought were important for global comprehension. Then they tried to infer the meanings on their own and check their inferences in the glossary or dictionary. The purpose of this practice was to make the students concentrate on essential words and ignore unimportant ones.

4. Cloze exercises with rich context. The purpose was to learn to take as many clues as possible into account.

5. Examples and practice in homonyms, word formation, affixes, word order, etc. with special emphasis on their importance in lexical inferencing and reading comprehension.

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