What can TOLs Reveal about the Nature of ESL Reading? A Critical Evaluation of Current ESL Research utilising Think-Aloud Protocols.

Thesis

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Robyn Dixon

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Abstract

This thesis explores the efficacy of think-aloud protocols (TOLs), and the extent to which the TOL technique is able to reveal the nature of ESL reading interaction with expository prose. The investigation constituted a critical evaluation of current ESL TOL research, which was essentially a theoretical examination of emerging problems derived from an in-depth assessment of current ESL TOL studies.

The theoretical examination was supplemented by the practical implementation of the technique in a case study research, utilising three verbal protocols obtained from ESL students at the University of Fort Hare. The close observation afforded by the evaluative case study research paradigm provided the writer - as participant observer - with a further means of judging the merit of TOLs, which corroborated findings from the theoretical evaluation, and enabled a consideration of unanticipated issues which emerged from the practical implementation of the technique.

The conclusion was that TOLs seem to have a unique ability to identify aspects of the nature of ESL reading gained from an on-line assessment of reader interaction, provided that TOL research is conducted within certain methodological and analytic research constraints. The writer has proffered suggestions for future ESL TOL research, and feels that the combination of TOL research findings with other measures of reading comprehension could elucidate aspects of ESL comprehension, making a valuable contribution to ESL reading theory and practice.

Contents

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I dedicate this thesis to my mother and father, Eric and Olive Smith, whose support and high regard for academic achievement have compelled me to continue with post-graduate studies over the years.

Glossary

This gives brief explanations of acronyms which recur within this thesis.

ESL	-	refers to English spoken as a second language
L1	-	refers to a language spoken as a first language or mother tongue
L2	-	refers to a language spoken as a second language
MT	-	refers to a mother tongue
TOLs	-	is the acronym for "think-out-louds", which are also referred to as "think-alouds", or "think alouds".

Introduction

The introduction takes the following form:

1. The Need for the Study
2. The Aim of the Study, and How this is Achieved
3. The Format of the Thesis

1. The Need for the Study

The reading process is perhaps one of the most elusive processes to "get at". Theoretical input proffers models of reading which account for what goes on in the mind during textual interaction, but it is very difficult to substantiate theory with valid evidence, because of the very nature of reading as a mental activity.

Because of the centrality of reading competence to tertiary level studies, a prime concern of the writer is the nature of ESL interaction with text, specifically the black South African tertiary level student's interaction with expository text, since this constitutes the bulk of academic writing. Little is known about reading problems experienced by the black ESL reader; whether he/she has problems, and what is the nature of the problems. The writer's concern is by no means isolated, and the recognition of the need for a solid foundation of reading proficiency in tertiary level studies is evident in current ESL literature. To quote Carrell (1988):

> In second language teaching/learning situations for academic purposes, especially in higher education in English-medium universities or other programs that make extensive use of academic materials in English,

> reading is paramount. Quite simply, without solid reading proficiency, second language readers cannot perform at levels they must in order to succeed, and they cannot compete with their native English-speaking counterparts.
>
> Carrell 1988:1

A first step in addressing this problem seems to be the need for some means of identifying what the ESL reader is "doing" during textual interaction; a means of tapping into the reading process. The proponents of the think-aloud, or think-out-loud technique (the TOL technique) suggest that TOLs could be one means of identifying aspects of the reading process, of "getting at" those "inside the head factors" (Bernhardt 1984:325). The suggestion is that verbalisations which emanate from instructing the reader to "talk about what he/she is thinking about" during reading afford a glimpse of this mental activity, and represent a "window into the reader's mind" (Olson et al 1984:283). If TOLs are able to capture a part of the elusive reading process, they could make a valuable contribution to ESL reading theory, and inform teaching practice.

2. The Aim of the Study, and How this is Achieved

Having established the need for some method which could allow for the identification of aspects of the reading process, the aim of this study is to assess the effectiveness of TOLs as a means of revealing the nature of ESL reading. This requires a critical evaluation of current ESL TOL research, not only in terms of claims about ESL reading which emanate from these studies, but also an in-depth look at the technique itself, considering methodological problems, data collection, its analysis, and the very concepts utilised by researchers to describe TOL phenomena. Central to this critical evaluation are the writer's suggestions to systematically address certain issues which she feels detract from the credibility of some of the current ESL TOL studies.

Pertinent questions to this study are: what is it that TOLs reveal? How reliable

is the technique, and the findings from ESL TOL studies? Can TOLs reveal more about the reading process than other tests of reading comprehension?

The major focus of the study, therefore, is to explore the efficacy of TOLs, by means of a critical evaluation of current ESL TOL research. Supplementing the critical evaluation is the application of the technique in the writer's own case study research in order to "test out" all aspects of the technique for herself.

The case study falls within the research paradigm of evaluative case study research: a few TOLs are considered with the objective of providing information which could assist in judging the merit or worth of the TOL technique (Stenhouse 1988:50). In accordance with true case study research, the focus is on the description of a unit, which requires analyses based on close observation of every aspect of the utilisation of the TOL technique. As illuminative, qualitative research, it is essentially interpretive and descriptive, with the writer's role as that of "participant observer". The focus is on close observation of every aspect of the implementation of TOLs. The interest, therefore, is as much on methodological problems experienced in data collection and coding the data, as on problems surrounding its analysis, and conclusions which may or may not be drawn from that analysis. The prime objective is to let the issues emerge from the TOL study in its entirety, with a view to evaluating the efficacy of the TOL technique as a means of revealing aspects of the reading process.

3. The Format of the Thesis

The thesis incorporates the following chapters:

Chapter 1: Theoretical Background: Review of ESL Literature to Establish a Framework against which to Critically Evaluate TOL Research, and as a Framework for the Writer's own TOL Study

Since the focus of the study is to ascertain what TOLs can reveal about the nature of ESL reading, a critical aspect of the study is the theoretical framework against which to evaluate TOL research. If TOLs reveal aspects of the reading

process, it is vital to assess these in terms of input from current models of reading, as revealed in ESL reading theory.

Not only do models account for what happens when one reads, but they also suggest possible reasons — perhaps from different perspectives of reading models — to account for reading problems experienced by the ESL reader when there is a comprehension breakdown. Whilst current ESL TOL research has largely been concerned with the identification of reading strategies, the writer is interested in exploring — via her case study — the possible use of TOLs as a means of identifying causes of comprehension breakdowns. Whilst this is only one aspect of the case study research, the analysis of data along these lines requires "a conceptual scheme — a theoretical guide" (Sanders et al 1983:356), which is provided by the ESL literature review.

Chapter 2: A Critical Evaluation of the Use of TOLs in Current ESL Reading Research

As a prelude to the critical evaluation, the writer provides a brief background to the use of TOLs, discussing problems associated with the technique as revealed in TOL literature, and mentions the use to which TOLs have been put in ESL reading research. She then criticises current ESL TOL research on various issues, and proffers suggestions which she feels would enhance the usefulness of the technique to ESL reading research, and increase its validity within this field.

Chapter 3: Description of the Case Study and Justification of the Research Methodology

This chapter describes the administration of the TOL technique — the writer's own case study. She justifies the research methodology in terms of TOL literature, and suggestions which emanate from her critical evaluation of TOL research.

In accordance with case study research, the writer is both researcher and close observer, which requires a critical assessment of every step of the study. Since the task at hand is to gauge the efficacy of TOLs, an important aspect of the description of the case study is to highlight all the problems associated with every step of the

data collection. Whilst insights gained from some of the methodological issues which arise in the writer's case study could be generalised to other TOL studies, certain emerging problems are idiosyncratic to this specific case study. This is in accordance with what Cohen and Manion (1987) cite as an advantage of case studies:

> Their peculiar strength lies in their attention to the subtlety and complexity of the case in its own right.
>
> Cohen & Manion 1987:146

Chapter 4: Analysis of the Data and Discussion of Results

This chapter deals with the analysis of the case study data, from the coding of the protocols to its analysis from three different perspectives. The first analytic perspective analyses the data employing quantification measures utilised in current ESL TOL studies. The second analysis plots the TOL data onto graphs, whilst the third analysis introduces a new approach to TOL analysis, in an attempt to determine what TOLs might reveal about successful and unsuccessful reading interaction.

The writer has tried to retain close-observer status in every step of the analyses, attempting to critically evaluate each decision made, and be receptive to all emerging problems as and when they occurred.

Chapter 5: Conclusions and Recommendations for Future ESL TOL Research

This chapter merges the writer's critical evaluation of TOLs — which is essentially an assessment of problems which derived from a theoretical perspective — with the evaluation gained from the practical implementation of the technique in her own TOL case study, in an overriding summary of the efficacy of TOLs. This summary highlights the strengths and weaknesses of TOLs, discussing both their limitations, and what in fact they can reveal about the nature of ESL reading. Throughout these final discussions, the writer makes recommendations for future TOL research, in an endeavour to realise the possible potential of the technique in future reading research, so that it might take its place as a valuable contributor to ESL reading theory, which could — in turn — inform teaching practice.

Chapter 1

Theoretical Background: Review of ESL Literature to establish a framework against which to critically evaluate TOL research, and as a framework for the writer's own TOL study

This chapter considers theoretical issues pertaining to ESL reading theory which need to be addressed in a critical evaluation of current ESL TOL research. Current theoretical issues are also a necessary framework against which to conduct the writer's own case study. Input from the literature is discussed under the following sections:

1.1 The Contribution of Theoretical Issues to this Study

Theoretical input has provided ESL reading with very influential models of reading which have informed teaching and materials development. Substantiating theoretical input, there has been a rapid increase in the amount of L2 reading research since the late '70s. However, since reading is a cognitive process, it remains difficult to "get

at". The proponents of TOL research claim that TOLs are one means of "getting at" the processes involved in reading interaction, albeit indirectly.

The primary objective of this study is to attempt to ascertain whether TOLs in fact can tell us about the nature of ESL reading interaction, by — firstly — critically evaluating current TOL research, and — secondly — conducting a small TOL case study to put the technique into practice. ESL reading theory is a necessary framework against which to conduct both the critical evaluation, and the writer's own TOL study.

Current models of reading inform about what happens when one successfully interacts with text, perhaps placing emphasis on certain aspects of the reading process, and comprehension problems tend to be interpreted in accordance with those models of reading. If TOL data reveals what the reader is thinking about when he/she reads, this information should somehow be corroborated with what reading theories tell us about what goes on in the reader's mind — how the reader successfully interacts with text, and why there are comprehension breakdowns.

The theoretical issues of this chapter therefore cover two main areas: firstly, a brief look at the development of ESL reading theory; and secondly, a consideration of interactive models of reading, and the ESL reader's problems in terms of those models. One of the pertinent questions in current ESL literature is concerned with whether the L2 reader's problem is a "reading problem or a language problem" (Alderson 1984); is it a lack of "reading ability or language proficiency?" (Carrell 1991).

These questions raise — amongst other issues — the contribution of top-down analysis and bottom-up decoding. The emphasis on these two aspects of the reading process is considered during discussions on the historical background to ESL reading theory, and current models of reading.

1.2 Historical Background to ESL Reading Theory

1.2.1 Audiolingualism

Audiolingualism, which influenced language-teaching from the '40s until the early '60s, emphasised the teaching of aural-oral skills through drilling, pattern-practice and repetition. Reading was seen as secondary to speech, and was viewed as the mechanical decoding of written speech.

It was during the '60s that the psychological theories of behaviourism — on which audiolingualism was based — were questioned as an appropriate foundation for first language reading theory. Researchers such as Rivers (1964, 1968) and Eskey (1970, 1971) introduced a less mechanical view of reading, which was seen as deriving meaning from text. However, at this stage, the text was still the carrier of meaning, and reading problems were still essentially viewed as problems of decoding.

1.2.2 The Emergence of the Psycholinguistic Model of Reading

Psycholinguistic research in the 1960s heralded a new approach to reading. Goodman's (1967) psycholinguistic model which describes reading as a "psycholinguistic guessing game" greatly influenced first language reading theory (Goodman 1971; Smith 1973), and by the late 1970s, it had been applied to ESL reading. This model introduced, for the first time, the reader as actively involved in the reading process. The reader gains meaning from text by sampling, predicting and guessing. He/she samples only those textual bases which are required to confirm his/her predictions.

Whilst this model removes the reader from his/her role of passive decoder, to active predictor of meaning, it still considers meaning as residing in the text. The background knowledge which the reader brings to bear on the text, and forms the basis of his/her predictions, was thought to be largely linguistic knowledge. Thus, the reader responded to various linguistic cues in the text in order to gain the meaning which lay in the text.

1.2.3 Schema Theory as the Basis for the Schema Theory Model and Interactive Models

Expanding on the psycholinguistic model, schema theories of reading evolved (Rumelhart 1977, 1980; Carrell 1983; Adams & Collins 1985), from which emerged the schema theory model of reading — also referred to as the Rumelhart model (Samuels & Kamil 1988:29). The emphasis of this model is on the reader's previously acquired background knowledge which he/she brings to bear on the text, in order to construct its meaning. The text merely provides the reader with directions for constructing meaning. Thus, meaning is created through the interaction of the reader and the text — it is the combination of what the reader brings to the text with the textual information (Widdowson 1979).

The interactive nature of reading proposed by schema theory involves simultaneous top-down and bottom-up processing. However, the schema theory model stresses the role of background knowledge in textual interaction, which is essentially top-down processing.

Questions have been raised as to the applicability of a top-down model of reading for the ESL reader, and the extent to which reading has been given an unrealistic "top-down bias". The top-down processing perspective has had such a powerful impact on ESL reading that

> ... there has been a tendency to view (it) as a substitute for the bottom-up, decoding view of reading, rather than its complement.
>
> Carrell 1988:4

Alderson (1984) devotes an article to: "Reading: a reading problem or a language problem?" (Alderson 1984:1). Grabe (1988) calls to attention the unique set of constraints of the ESL reader, not the least of which is the large "English language knowledge" (Grabe 1988:58) to which the mother tongue reader has access, but may not necessarily be available to the ESL reader.

With the renewed interest on the role of decoding skills, interactive models of reading emerged. Whilst both the schema theory model and the interactive models

have schema theory as their theoretical base, the schema theory model has concentrated on the top-down perspective of reading interaction, whereas the interactive models give equal importance to all aspects of reading interaction. There are a number of interactive models, five of which Grabe (1988) cites: McClelland and Rumelhart's (1981) interactive-activation model, Stanovich's (1980) interactive-compensatory model, Taylor and Taylor's (1983) bilateral cooperative model, LaBerge and Samuel's (1974) automatic-processing model, and Perfetti's (1985, 1986a, 1986b) verbal efficiency model. The unifying factor of all interactive models, however, is their incorporation of both top-down and bottom-up strategies in reading interaction, and for the purposes of this present discussion, they will be referred to by the composite term "interactive models".

The writer has followed Grabe's (1988) lead where he distinguishes between two interpretations of the term "interactive" with regard to the interactive models of reading. Each interpretation tends to emphasise different aspects of the complex reading process, and account for reading problems from slightly different perspectives. The first interpretation highlights the interaction between the reader and the text, which is essentially a conceptually-driven, top-down model of reading. The second emphasises reading as the interaction among the component skills of reading, which highlights the importance of bottom-up decoding.

The writer's particular interest in her TOL case study is to see whether TOLs can distinguish strategies associated with top-down analysis and bottom-up decoding, and comprehension problems arising from either of these two perspectives. The coding scheme to analyse the data has been divided in an attempt to differentiate these two processing perspectives. The writer will therefore discuss theoretical issues pertaining to top-down analysis and bottom-up decoding subsumed within the interactive models, and the reading problems associated with them. Where possible, she will relate issues to the South African context, with particular reference to the black ESL tertiary level student, to assist in the creation of a theoretical framework against which to assess this particular study.

1.3 Reading as Interaction between Reader and Text: A "Top-Down" Perspective of Interactive Models of Reading

This perspective of the interactive models represents a complete swing away from the language on the page, to processes going on "within the (reader's) head"; a shift from the "language to be comprehended" to the "comprehender" (Carrell & Eisterhold 1983:553). Meaning does not reside in the text; rather, the meaning gained from any text depends on inside the head factors which the reader brings to bear on the text. The language merely provides "a skeleton, a blueprint for the creation of meaning" (Spiro 1980:244). This aspect of the interactive nature of reading views the process as a "kind of dialogue between reader and text" (Grabe 1988:56). It is essentially a conceptually-driven, top-down model in which the reader samples, predicts, tests and confirms on the basis of his/her previously-acquired background knowledge.

The reader's background knowledge, stored in schematic hierarchies in the brain, enables the reader to relate to, and interact with information contained within the text, and is crucial to discourse processing. The comprehension outcome of any textual interaction is largely dependent on the activation of relevant schemata to arrive at some representation of the writer's intended meaning.

The centrality of background knowledge in textual interaction has led to a number of studies which have demonstrated problems caused by either lack of schema availability, or lack of schema activation, which result in various degrees of non-comprehension. Studies focus either on the availability or accessibility of content schemata, which are background knowledge structures enabling the reader to interact with the content, or semantic elements of the text; or formal schemata, which represent the reader's implicit knowledge of text structure and rhetorical organisation, and therefore facilitate the organisation and structuring of the incoming text content.

1.4 Reading Problems Associated with a "Top-Down" Perspective of Reading Interaction

From the "top-down" perspective of reading interaction, the ESL reader's problems are seen to be a "reading problem" associated with top-down, higher order, schematic macrostructure processes. Each of these problems inhibit meaningful textual interaction, resulting in comprehension difficulties or comprehension breakdowns. The problems will be addressed under the following headings, with reference to current literature and studies which have specifically focussed on these aspects of the reading process:

1.4.1. Lack of Relevant Schemata

1.4.1.1. Lack of Content Schemata

1.4.1.2. Lack of Formal Schemata

1.4.2. Inaccessibility of Schemata

1.4.3. Formulating Premature Hypotheses

1.4.1 Lack of Relevant Schemata

Comprehension breakdowns may occur because of lack of relevant schemata, which may either be content schemata, or formal schemata. Each of these categories will be considered independently.

1.4.1.1 Lack of Content Schemata

A writer writes with his/her audience in mind. This involves continuously making assumptions of shared background knowledge, which will affect the redundancy or explicitness of the text. The text is presumably constructed according to shared pragmatic principles, perhaps the overriding one being Grice's cooperative maxim of quantity, which states:

i) make your contribution as informative as is required

ii) do not make your contribution more informative than is required

Grice, H.P. in Levinson:1983

Just how informative the writer will be — how much information he/she feels is required to communicate the message — is largely dependent on a judgement of the reader's shared knowledge. If there is a mismatch between what the writer assumes the reader to know, and what the reader actually knows, the text will not be comprehended as the writer intended. According to Grabe (1988) if the reader does not possess the relevant schemata for textual interaction, he/she may "overcompensate ... by reading in a slow, text-bound manner" (Grabe 1988:63) which either impedes comprehension, or may result in total non-comprehension.

At this point, Stanovich's interactive-compensatory model could apply. The reader who is unfamiliar with the topic but is "skilled at word recognition" (Samuels & Kamil 1988:32) will compensate by heavily relying on bottom-up processes. Whilst the skilled reader may successfully comprehend the text — despite lack of background knowledge — by compensating in this manner, the less skilled reader's comprehension may be impeded through over-compensation, in terms of Stanovich's model.

There are many possible reasons for the absence of a particular schema, one of which is that it may be "culturally-specific" (Carrell & Eisterhold 1983:560) and not form part of the reader's cultural background. Studies by Steffenson et al (1979), Johnson (1981), and Carrell (1983) have all demonstrated that more is comprehended and recalled from culturally familiar texts, than from texts which pertain to a different culture, with syntax and rhetorical organisation held constant across texts. In many cases, subjects were found to distort information to "fit" with pre-existing, culturally-specific background knowledge.

It might be the case that a student does not have the conceptual framework due to lack of exposure to — or interest in — the topic discussed in the text, or information contained within the text. For example, unless one is familiar with current South African party politics, much of the irony and guarded jibes of a political correspondent in a newspaper report could be lost, or misinterpreted. If

the relevant content schemata are not there — for whatever reason — the text will remain "impenetrable" to a greater or lesser degree. In other words, one may go through the motions of decoding the words on the page, without understanding the text — the words never progress beyond the local level of processing.

1.4.1.2 Lack of Formal Schemata

Equally important as content schemata for competent discourse processing, are formal schemata which facilitate textual interaction from both "bottom-up" and "top-down" perspectives. From the "bottom-up" perspective (discussed in 1.6.), formal schemata would operate below the level of text structure, and would incorporate notions such as recognition of letters and words, as well as interaction with linguistic and syntactic cues to enable the reader to predict the propositional development of the text. However, since this section is concerned with reading problems associated with the "top-down" perspective of reading interaction, the interest here is the role of formal schemata at the level of text structure, which deal with the rhetorical structures of the text; the way the text is organised. To quote Carrell (1983):

> ... part of our background knowledge includes information about, and expectations of, differences among rhetorical structures e.g. differences in genre, differences in the structure of fables, simple stories, scientific texts, newspaper articles, poetry, etc.
>
> Carrell 1983:84

The theory is that there are a number of highly conventionalised text types, the structures of which are stored in our formal schemata. These mental frameworks — described by Calfee and Curley (1984) as outlines, "the bare bones of the passage" (Calfee & Curley 1984:163) — have been acquired through instruction, experience, and exposure to different types of prose.

Formal schemata enable the reader to judge a discourse as — for example — a narrative, or a scientific report. The activation of the correct schema for a particular discourse allows the reader to predict the progression the text will take, and

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Because of the centrality of reading competence to tertiary level studies, a prime concern of the writer is the nature of ESL interaction with text, specifically the black South African tertiary level student's interaction with expository text, since this constitutes the bulk of academic writing. Little is known about reading problems experienced by the black ESL reader; whether he/she has problems, and what is the nature of the problems. The writer's concern is by no means isolated, and the recognition of the need for a solid foundation of reading proficiency in tertiary level studies is evident in current ESL literature. To quote Carrell (1988):

> In second language teaching/learning situations for academic purposes, especially in higher education in English-medium universities or other programs that make extensive use of academic materials in English,

organise the distribution of information within the text. It helps him/her to decide which information is important, which is relatively unimportant, and to organise the incoming information accordingly. In a sense, formal schemata can be thought of as a guide for the reader, to aid in his/her search for information from the text.

In addition to the organisation of the text, formal schemata trigger expectations of the linguistic style of a text, associated with the text type. For example, expectations of formal, academic, legal, or biblical style will facilitate discourse processing during interaction with any specific text.

The hypothesis is that formal schemata allow the reader — from an infinite number of possible text outlines — to generate and organise textual information into a finite set of conventionalised text types. Attempts have been made to categorise this finite set of text structures. There has been a great deal of investigation and research on narrative prose, but possibly Meyer's (1975) postulation of five rhetorical categories can be considered the major advance in the classification of expository prose. Her subsequent research (Meyer 1975, 1979; Meyer & Freedle 1984) supports her theory of five significantly distinct types of prose structure, which she calls collection, description, causation, problem/solution, and comparison (Carrell 1984:449). The writer will not discuss the specific features associated with each prose type. The postulation is, however, that expository prose has a "readily identifiable overall organisational plan" (Ibid) which will fall within the domain of one of the five categories, and that a particular rhetorical organisation interacts with the reader's formal schemata to facilitate comprehension.

Research with both native speakers and ESL readers has provided empirical evidence that knowledge and use of text structure affects comprehension of narrative and expository prose (Singer & Donlan 1982; Gordon 1980; Short 1982; Carrell 1984; Hinds 1983; Conner 1984). Other studies have demonstrated that specific instruction on the rhetorical organisation of prose facilitates comprehension. The majority of studies have concentrated on narrative prose structure. However studies such as Geva 1983, Taylor and Beach 1984, Mosenthal 1984, Reutzal 1985, and Bartlett 1978 show that explicitly teaching readers about expository text structure,

and various strategies for identifying and using that text structure during reading, facilitates comprehension and recall.

With regard to the instruction in expository prose organisation to aid comprehension for ESL readers, there is a paucity of studies in L2 reading research. Meyer (1979) studied the effects of different types of expository organisation and recall in ESL readers, using her five categories of expository types, and found that the more tightly-organised prose types (causation, problem/solution, comparison) were easier to recall for ESL readers. Carrell (1985), using four of Meyer's expository types, demonstrated that explicit, overt instruction of top-level rhetorical organisation facilitates ESL students' reading comprehension. Silburn (1991) virtually replicated Carrell's study in the South African context, using black ESL schoolgirls, and also found that teaching the use and recognition of top-level organisation as a reading strategy facilitated the students' ability to read and recall textual information.

If, as has been suggested in the literature, formal schemata are acquired through instruction, experience, and exposure to different text types, it follows that inadequate formal schematic representation would be the result of lack of instruction, experience, and insufficient exposure to different text types. The writer feels that these reasons for the lack of formal schemata could be applicable to a large proportion of black South African ESL university students, who have had an unenviable school history of grappling with print in the L2 from their earliest reading years. School textbooks across the content curriculum, which probably constitute the major — if not the only — source of exposure to expository prose, abound in examples of incompetent discourse. To quote Lanham (1986):

> My examination of the reading in English to which black South African children are exposed, particularly of the descriptive or expository kind, shows much of it to fail extensively as well constructed text.
>
> Lanham 1986:8

Lanham suggests that some of the reasons for incompetent texts for black school children are "erroneous beliefs regarding the simplification of texts for second-language readers" and the "obvious haste in preparation" of the texts themselves

(Lanham 1986:9). Lanham goes so far as to question to what extent the cognitive reading processes are able to develop in L2 readers, if the texts to which the pupils are exposed fail as competent discourse, and defy the use of normal discourse processing strategies. To arrive at some representation of meaning, the competent reader has to subconsciously reconstruct the text as best he/she can.

1.4.2 Inaccessibility of Schemata

It has been postulated that a reader may actually have the required schematic background knowledge for textual interaction, but does not access it efficiently, which also results in comprehension difficulties. The reader is thus unable to relate textual data to available — but inaccessible — schemata, or to use schemata to aid the processing of incoming information.

Spiro (1980) discusses a situation whereby a child does not access schemata due to thinking that "his or her knowledge is not relevant even in those cases where it might be" (Spiro 1980:260). Anderson et al (1977) propose that young readers "may possess relevant schemata but not know how to bring them to bear" (Anderson et al 1977:378). Although both Spiro (1980) and Anderson et al (1977) address the issue to the child mother tongue speaker, Hudson (1988) suggests that this could be applicable to the adult ESL reader. The result would be a text-based reading style, where the reader becomes ensnared at the local level of processing, rather than activating top-down processing modes. In this regard, Carrell's (1983) study is relevant. She found that ESL university students tended to concentrate on the language in the text, rather than connecting text with background knowledge. Closer to home and the South African situation is Sarah Murray's (1985) report:

> My experience of teaching South African students supports this finding: even when they do have the relevant background information, they frequently do not use it.
>
> Murray 1985:9

As Spiro (1980) points out, an inaccessible schema has the same consequences

in discourse processing as if it was not available: "If it is not readily and effortlessly accessible, the flow of other aspects of the process may be disrupted" (Spiro 1980:260) and comprehension is impaired.

1.4.3 Formulating Premature Hypotheses

Formulating premature hypotheses is the third major problem associated with top-down analysis. Spiro (1980) describes this phenomenon as occurring when readers

> ... access their schemata too early, prematurely locking themselves into interpretations that are not warranted by the data of the text.
>
> Spiro 1980:261

This signifies the over-zealous determination to try by all means to comprehend a text — at the cost of comprehension itself. The first — possibly incorrect — hypothesis is formulated too quickly on insubstantial evidence, and subsequent data is forced to "fit".

This may be the result of limited schemata, or schemata which are insufficiently general to cover a wide range of possibilities (Spiro 1980:260). In these instances, the reader may rigidly lock into an interpretation and pursue it, regardless of subsequent conflicting textual evidence.

Although formulating an hypothesis too early results in a breakdown of comprehension of the writer's message, the reader may in fact be employing what are considered "good reading strategies" as defined by interactive models of reading. In other words, in his/her quest for meaning, the reader samples selectively from the text, touching only those textual bases which will confirm his/her hypothesis. To quote Hudson (1988):

> The application of meaning may prevent the reader from responding to linguistic cues ... Only those local constraints which are necessary to fill out an internal representation will be attended to or determined to be salient ... The fact of "touching as few bases as necessary" a good reader strategy, thus may itself restrict the use of local cues. That is, the

> reader may internally establish comprehension by using good strategies and ignore local constraints which militate against his or her "comprehension".
>
> Hudson 1988:186

These three problems — the lack of content or formal schemata, inaccessibility of schemata, and accessing schemata too soon — are postulated as reasons for comprehension problems associated with top-down, knowledge-based, higher order processing. From this perspective, the focus is on the role of background schematic structures which the reader does not possess, fails to access, or accesses too soon — which cause comprehension difficulties.

1.5 Reading as Interaction Among the Various Component Skills: A "Bottom-Up" Perspective of Interactive Models of Reading

This perspective of interactive reading models emerged in answer to doubts expressed in the literature as to the appropriacy of a conceptually-driven, top-down model of reading for the L2 reader, and the need to give more attention to the role of bottom-up decoding in ESL textual interaction. To quote Grabe (1988):

> This view of reading should not be considered as an alternate version of "reading as an interactive process". The issue is not the relation of the reader to the text but the processing relations among various component skills in reading.
>
> Grabe 1988:58

The use of the term "interaction" in this context highlights the simultaneous availability of all the reading skills within the schematic hierarchy to interact between each other — and with the text — in the processing and interpretation of text. From this perspective of the interactive reading model, the importance of bottom-up

decoding is addressed. Reading ability is seen as a function of language proficiency in the L2 (reading as a "language problem" rather than a "reading problem"). The focus, therefore, is on data-driven, or text-driven schemata, and the role of a basic language proficiency required for fluent reading.

1.6 Reading Problems Associated with a "Bottom-Up" Perspective of Reading Interaction

The writer postulates two problems which result from lack of proficient decoding. These are dealt with as follows:

1.6.1. Readers Become Ensnared at Vocabulary and Word Level

1.6.1.1. Language Incompetence

1.6.1.2. Over-Emphasis on Language

1.6.2. Lack of Decoding Skills Inducing the "Short-Circuit"

1.6.1 Readers Become Ensnared at Vocabulary and Word Level

There seem to be two reasons associated with decoding skills which cause the reader to become ensnared at vocabulary and word level. The first is the result of a basic incompetence in language skills, and the second is an unwarranted over-emphasis on the language in the text. Whilst these reasons represent the two extremes of the continuum — the one highlights the neglect of basic skills, whilst the other over-emphasises them — the results are the same: schemata are rendered inaccessible as a consequence of the reader being text-bound.

1.6.1.1 Language Incompetence

There is general concurrence in the literature on ESL reading that there is a language threshold or ceiling which ESL students must attain in order to process text

competently (Devine 1988). It has been suggested that the recent interest in and concentration on top-down processing strategies — a "top-down bias" (Eskey 1988:95) — has underplayed the importance of "the simple decoding of the language of the text" (Eskey 1988:94). Grabe (1988) reasserts the central role played by vocabulary:

> (There is a) need for a massive receptive vocabulary that is rapidly, accurately, and automatically accessed — a fact that may be the greatest single impediment to fluent reading by ESL students. This concern may be particularly relevant for students in advanced level ESL courses. Students studying English for academic purposes are, for example, seldom tested specifically for their reading abilities. But many of these students are, in fact, weak in this language skill essential for academic success.
>
> Grabe 1988:63

Eskey (1988) reinforces the necessity of basic language skills:

> We must not ... lose sight of the fact that language is a major problem in second language reading, and that even educated guessing at meaning is no substitute for accurate decoding.
>
> Eskey 1988:97

Thus, from the perspective of top-down processing, the assumption is that poor readers are word-bound because of lack of schemata, or schema inaccessibility. However, viewed from the perspective of bottom-up decoding, the suggestion is that poor readers simply have not acquired automatic decoding skills — they spend too much processing time "thinking about" the words, rather than rapidly and accurately identifying lexical and grammatical forms, as well as vocabulary items.

1.6.1.2 Over-Emphasis on Language

The other side of the coin is text-boundedness as a result of an unwarranted over-emphasis on language (Carrell 1988:102). It is suggested that this could well be a consequence of the traditional methods employed to improve reading skills in the

poor reader. These methods encourage the students to expand their vocabulary, and come to terms with complex syntactic structures (Carrell & Eisterhold 1983:562). This concentration on the linear representation of language must influence the L2 reader's reading strategies, perhaps to the extent of developing a bottom-up bias.

Carrell (1988) addresses this problem:

> ... if many ESL readers do misconceive ESL reading as primarily a bottom-up process, what causes such misconceptions? Possible candidates include overemphasis on decoding skills, and on the code in general, especially in early language and reading instruction; reading passages that are insular and lacking in relevance to existing knowledge and reader interest; and tests of reading that stress literal text content rather than its integration with related prior knowledge.
>
> Carrell 1988:109

The writer wishes to address some problems related to the South African context which could induce a "bottom-up bias" in ESL readers.

The first problem is the exposure to text which fails as well-constructed discourse. Not only could exposure to incompetent text contribute to a possible lack of formal schemata (discussed in 1.4.1. above), but it could also contribute to the ESL reader's misconception of reading as essentially a bottom-up process.

The second problem faced by the South African ESL student is his/her exposure to texts which abound in unnecessary linguistic difficulties, which could induce a bottom-up bias. In this regard, Nuttall (1988) studied various Std. 9 textbooks for ESL pupils across the content subjects. He classified, with numerous examples, areas of potential linguistic difficulty which could lead to comprehension problems for black ESL pupils. Some of these were, in the realm of vocabulary choice: the use of an unfamiliar term when a more common term would suffice; the use of abstract terms in preference to concrete terms; unnecessary use of idioms and idiomatic expressions; the use of long words rather than higher frequency, more comprehensible shorter words; and the use of compound nouns which have no equivalent in many of

the African languages. Nuttall (1988) examined the way new terms, or specialised vocabulary were introduced in the texts, and found many examples which did more to confuse than explain. Frequently, texts provided no help at all to the reader.

Perhaps working on the erroneous belief that sentence length is a function of readability, many texts were found to comprise short, propositionally dense sentences which seem to hit the reader "like bullets from a gun" (Nuttall's (1988) verbal description). In these instances, Nuttall (Ibid) suggests that the option of using more language rather than less would facilitate discourse processing. On the other hand, there were many instances of unnecessarily long sentences, and potential linguistic difficulties arising from extended subjects, inversions, and ambiguous — or a complete absence of — cohesion devices.

Langhan (1990) conducted similar research on textbooks as a source of difficulty, concentrating on geography textbooks utilised by black standard three pupils. He found that pupils were not able to read the textbooks due to the difficulty of the textual language, and that tasks and exercises "are expressed in incomprehensible language" (Langhan 1990:218). Not only were the textbooks incomprehensible for the pupils, but they also presented difficulties for the teachers themselves.

In the light of the above discussions, the exposure to expository prose in the L2 for black ESL pupils at school is a dismal experience. Reading, to a great extent, seems to represent an arduous grappling for comprehension. The writer suggests that the result of this could well be a very negative attitude towards reading in the L2, and expectations of decoding difficulties from the outset. She tentatively suggests the application of Krashen's (1982) affective filter hypothesis to this situation. In this instance, the reader's expectations of text difficulty raise the affective filter which causes over-monitoring of the text, resulting in a focus on form rather than meaning. Here, the "form" relates to text-boundedness, and "meaning" to the higher level cognitive processes.

In terms of discourse processing, what is the result of a bottom-up bias, and how does it affect comprehension? Models of discourse processing (Kintsch & van Dijk 1977, 1978; van Dijk 1980; van Dijk & Kintsch 1985) postulate that the processing

capacity the system can handle at any one time is limited. Thus, an over-emphasis on decoding at the word and vocabulary level can create a "bottleneck" (Spiro 1980:263,265) which inhibits other higher order top-down processing strategies. The reader is thus interacting with individual sentences, rather than constructing a meaning representation from the connected, coherent discourse as a whole.

1.6.2 Lack of Decoding Skills Inducing the "Short-Circuit"

Lack of language competence and decoding skills can also induce the "short-circuit" which is described by Clarke (1988) as follows:

> ... limited control over the language "short-circuits" the good reader's system causing him/her to revert to poor reader strategies when confronted with a difficult or confusing task in the second language.
>
> Clarke 1988:120

Cziko (1978) suggests that whilst the competent L1 reader interacts with syntactic, semantic and discourse constraints, the L2 reader may not be receptive to those constraints due to low language proficiency. Thus, decoding difficulties induce guessing at meaning — formulating hypotheses, and adhering to these, despite textual constraints which invalidate the hypotheses. In other words, in the face of text which represents comprehension difficulties, the L2 reader will activate his/her schemata, and reconcile information within the text to "fit" the schemata, even when the reconciliation is not correct. The result of this is that the information in the text is distorted and damaged in an effort "to place the message and the schemata in correspondence" (Hudson 1988:189). Whilst the competent L1 reader will reconsider an initial hypothesis in the face of conflicting textual evidence (studies by Anderson & Ortney 1975), the L2 reader may not have the same language competence to cope with uncertainties, and therefore be unable to consider alternatives.

This phenomenon of activating higher-order knowledge structures due to a deficit in decoding skills is also accounted for in Stanovich's interactive-compensatory model. In terms of this model, top-down analysis processes attempt to compen-

sate for the lack of basic language skills. The results are the same as the short circuit — incorrect hypotheses are maintained despite conflicting textual evidence.

Correlating closely with the short-circuit hypothesis and Stanovich's interactive-compensatory model are findings from Laufer and Sim's (1985) study. They hypothesize that inadequate linguistic knowledge brought about what they refer to as "the process of detecting meaning on the basis of partial information" (Laufer & Sim 1985:9). They found that the ESL reader with inadequate linguistic knowledge "anchors himself to lexical items" (Ibid), creates some kind of meaning by adding whatever knowledge he/she has, and "almost wilfully ignore(s)" textual information which contradicts "the informant's own notion of what the text said" (Laufer & Sim 1985:10). They found that the useful strategy of bringing knowledge to the text, when there is insufficient linguistic knowledge to support it, actually distorted textual information "into a false construct to suit the reader's conviction" (Laufer & Sim 1985:9).

There is a thin "dividing line" between what the writer has categorised as "formulating premature hypotheses" and the "short-circuit". Whilst both entail the activation of schemata and the formulation of incorrect hypotheses in the face of conflicting textual evidence, the underlying reasons stem from slightly different perspectives. Formulating a premature hypothesis arises from an over-zealous attempt to apply meaning to the text at all costs, which — for the writer — indicates a problem associated with top-down analysis. On the other hand, the short-circuit is associated with decoding difficulties, which places it within the domain of bottom-up processing. Hudson (1988) incorporates both phenomena as possible causes of the short-circuit, distinguishing between causes "in the first component" and causes "in the second component" (Hudson 1988:184). The writer, however, chose to restrict the definition of the short-circuit to its traditional association with low language proficiency, and decoding problems. This choice is theoretical "hair-splitting"; in practice, one can make no categorical claim that evidence of an incorrect hypothesis and the non-use of semantic and discourse constraints by an ESL reader is the result of decoding difficulties, premature schematic activation, or a combination of both.

1.7 Summary

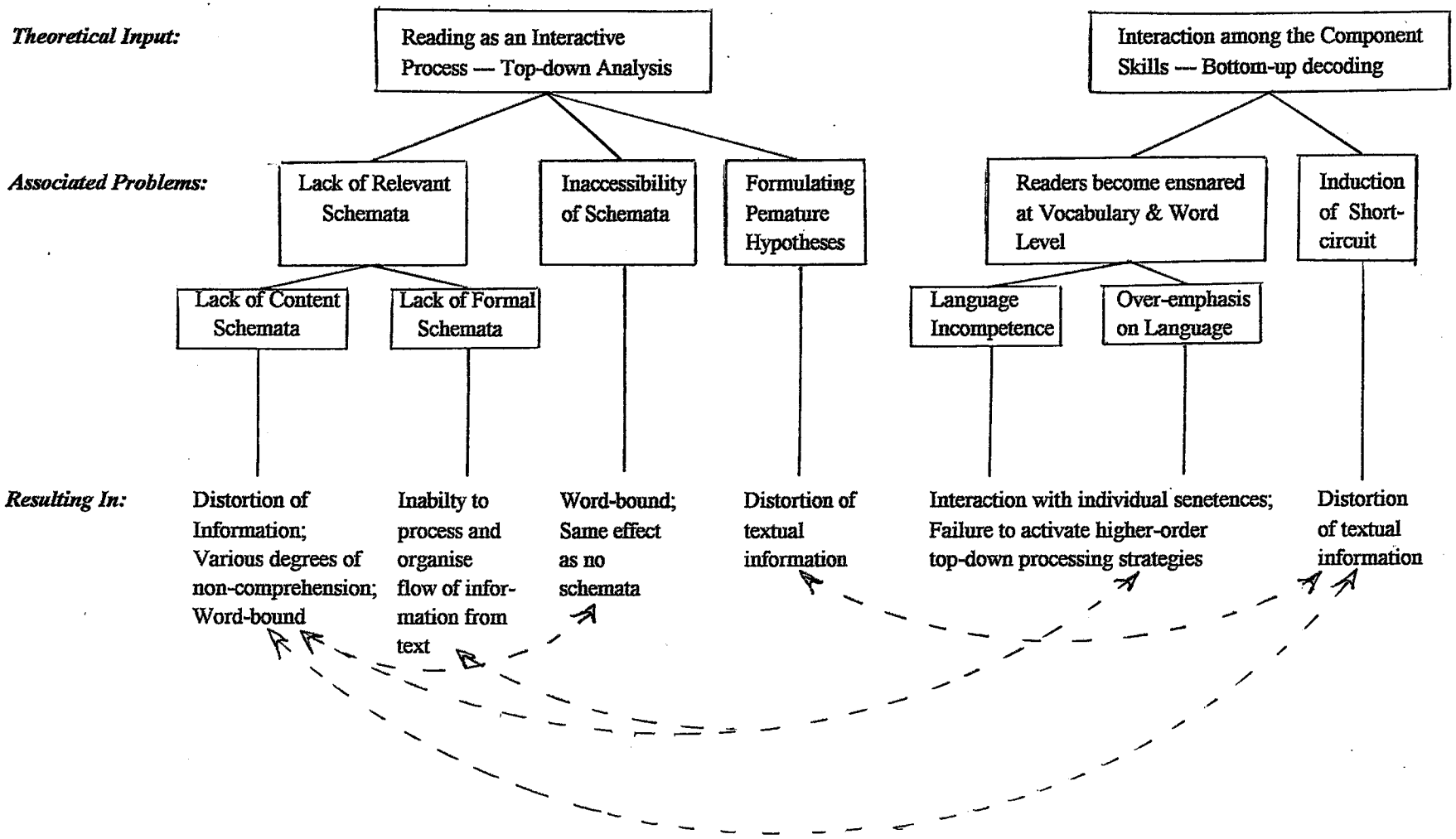
As a background for the writer's TOL case study, and as a framework against which to assess her data, theoretical issues have been addressed in this chapter. A very brief historical background to ESL reading was provided, with associated models of reading. Theoretical issues relating to the currently-popular interactive models of reading were considered from two perspectives of the models: top-down analysis and bottom-up decoding. ESL reading problems were itemised in terms of each of these perspectives.

To simplify the categorisation of reading problems proposed in this chapter, Figure 1 is a diagramised representation of the classification framework. Heading the "tree" is the theoretical input which highlights the interactive nature of reading from a top-down and bottom-up perspective. Flowing from these are the problems associated with each of the two perspectives. The results — in turn — represent the overt manifestation of covert, underlying cognitive problems. These "results" are by no means comprehensive; the writer has merely itemised a few examples pertaining to a particular problem.

It is interesting to note that the overt manifestations are by no means "category-exclusive"; in fact, the results of a problem may be indicative of a number of causes. This is evident in the arrows which link — and interlink — the overt manifestations. In other words, evidence of textual distortion, or non-comprehension may have various underlying problems as their cause. It therefore seems unlikely that any categorical claim as to the cause of a reading problem can be made from protocol evidence; the writer can only infer possible causes, offer alternative explanations, and substantiate — as best she can — any claim she makes.

FIGURE-1

Problems associated with Top-down & Bottom-up Processing



Chapter 2

A Critical Evaluation of the Use of TOLs in Current ESL Reading Research

This chapter critically evaluates the use of TOLs in current ESL reading research. Prior to the critical evaluation, the writer provides a brief background to the use of the TOL technique, discusses problems associated with it, and mentions the use of TOLs in L1 reading research. These issues are dealt with under the following sections:

2.1 Background to the Use of TOLs

TOLs — think alouds — are one of three types of verbal reports, the other two being introspection, and retrospection. Thinking aloud and introspection are labelled concurrent reporting, as subjects verbalise what is on their minds as they are engaged in a particular activity. Retrospection, however, involves the subject reporting on his/her mental processes after the completion of the task.

An important difference between TOLs and the other two types of verbal reporting is that introspection and retrospection both demand a degree of metacognition — subjects are required to infer mental processes from the contents of their mind, to

theorise about what they are doing or have done, depending on whether the task is concurrent or retrospective. The metacognitive demands of TOLs, however, are not as great: the requirement is that subjects merely verbalise what is on their minds at any particular moment, and it is up to the researcher to infer the underlying mental processes being utilised.

TOLs have traditionally been used as a research tool to investigate cognitive processes involved in problem solving in the fields of maths and science (Newell & Simon 1972; Simon & Simon 1978). Motivated by the belief that reading has certain similarities to problem solving, reading researchers more recently have utilised TOLs to study cognitive processes and strategies employed by the reader during interaction with text (Olson et al 1984; Afflerbach & Johnston 1984).

Perhaps Connor (1987) most succinctly allocates TOL research to its place within reading research methodologies. He classifies it within the descriptive research paradigm, along with other descriptive methods such as: miscue analysis, the Fillmore interview method, computerized on-line methods, longitudinal case studies, ethnographic research and metacognitive studies (Connor 1987:14). Connor thus recommends TOLs as one method in an eclectic synergy of methods of reading research to "reach a new understanding of the nature of reading" (Ibid:11).

The major criticisms against verbal reports are their unreliability, and the contention that the unnatural nature of the task itself may distort cognitive processing (Nisbett & Wilson 1977). Other TOL researchers, however, have counteracted these arguments by focussing on certain procedural steps to follow during data collection. Since the writer has referred to these extensively in the description of her research methodology as information which informed many of the procedural decisions taken (Chapter 3), only a few of the major caveats of TOL research are mentioned at this point. These are:

a) if there is no time lapse between the particular information the reader is attending to and his/her verbalisation, the reading process will not be distorted (Ericsson & Simon 1980) (see 3.6).

   Perhaps the first study to experimentally verify that the TOL procedure does

not interfere with testing and reading processes is Anderson's (1991), in which performance was compared on

> ... equated forms of an exam where one is administered under standard test conditions and the other is administered in conjunction with a verbal report
>
> Anderson 1991:20

Results indicated that there was no statistically significant difference in test scores under the two conditions. One methodological procedure which Anderson utilised during both his studies (Anderson 1991; Anderson et al 1991) was giving his subjects the option of speaking in their mother tongue, or in English. This option has not emerged in the literature as a possible contributing factor to the collection of valid TOL data, but the fact that Anderson employed this option — with good results — suggests that one cannot discount the possibility of its role in the outcome of his testing procedure.

b) instructions should not require subjects to verbalise information which is not normally attended to (Ericsson & Simon 1980);

c) protocol studies should include a no-protocol control group to ensure that the verbalisations are not distorting the subjects' thinking (Black et al 1984) (see 3.6).

The proponents of TOL recognise its potential as a "rich source of hypotheses" (Ibid:294) in that it "tap(s) the mental processes of readers" (Cohen 1986:132) by "collect(ing) systematic observations about thinking that occurs during reading" (Olson et al 1984:256) which allows key insights into

> ... higher level processes .... (such as) inferences, predictions, schema elaborations, and other complex cognitions that occur as part of skilled reading.
>
> Olson et al 1984:255

Because the data collected from TOLs are essentially indirect — they "cannot mirror exactly the unobservable mental processes under investigation" (Mann 1982:98) — they rely heavily on researcher inference. They are not "direct reflections of thought processes" but must be "correlated with underlying thought processes ... inferred from the TOL data" (Olson et al 1984:254). Informing researcher inferencing is theoretical input derived from currently popular models of reading (see Chapter 1). This reliance on researcher inference subjects TOL data to all the problems and pitfalls associated with qualitative research and its subjective interpretation.

2.2 The Use of TOL Data in L1 Reading Research

There are a wealth of TOL studies in current literature which focus on the reading strategies of mother tongue readers of English. These will be mentioned briefly, before the writer evaluates studies utilising ESL readers — far more scarce in the literature, but of paramount interest to the writer.

TOL research in L1 reading has been used to study cognitive strategies employed by competent readers on difficult texts (Johnston & Afflerbach 1983); to compare competent readers' processing of stories and essays (Olson et al 1984); to compare the performance of good and poor readers (Hosenfeld 1977; Olshavsky 1976–77; Kavale & Schreiner 1979); to compare the reading strategies of novice or immature readers with "expert reader strategies" (Scardemalia & Bereiter 1984); to compare the processing of texts when subjects are given different task instructions (Waern 1988); and to compare the processing of texts which are difficult to understand with those which do not pose comprehension difficulties (Waern 1988).

From these studies have emerged a series of strategies which purportedly are indicative of competent readers' textual interaction. Whilst no two studies seem to employ the same categories of strategies — each study varies according to explication of detail of categories, as well as in wording chosen to describe strategies —

TOL research has provided evidence of certain reading strategies employed by the competent reader to support theoretical input from currently-held reading processing models. There also seems to be evidence that good readers can be distinguished from poor readers in identifiable areas, such as: their ability to monitor their comprehension, to use strategies more flexibly, to distinguish between main information and supporting detail, and to adjust their strategies according to text type and purpose.

The rationale behind much of L1 TOL reading research appears to be that if strategies of competent readers can be identified, this will provide valuable pedagogical input to aid the poor reader. Studies which have taught the young or unskilled reader "expert" reading strategies have proved successful (Bird 1980; Day 1980; Hannigan et al 1980). More recently, Bereiter and Bird (1985) successfully used a TOL procedure to teach average readers to monitor their comprehension and to take strategic action.

This brief outline of L1 TOL research, and the directions in which it is headed, leads onto a consideration of TOL research in ESL reading.

2.3 The Use of TOL Research in ESL Reading

Before critically evaluating current ESL TOL research, the writer would briefly like to consider the use of TOLs in current ESL reading research, and what these studies have revealed. Since aspects of these studies are dealt with in more detail during the critical evaluation, this section constitutes merely a brief overview of current studies, as a prelude to the critical evaluation which follows. The use of TOLs in ESL reading is dealt with under the following subsections:

2.3.1. Using TOLs to identify ESL reading strategies

2.3.2. Using TOLs to identify strategies associated with successful and unsuccessful ESL reading

2.3.3. Using TOLs to determine the relationship between L1 and L2 reading strategies

2.3.4. Using TOLs as one "source" in a triangulation of data sources study

2.3.5. Using TOLs to examine individual differences in strategy use in ESL reading and testing

2.3.6. TOLs as a means of creating metacognitive awareness

2.3.1 Using TOLs to Identify ESL Reading Strategies

Perhaps the most obvious use of TOLs is as a descriptive research tool to ascertain what it is that ESL students "do" when they read. In this regard, Shay (1990) explored the use of TOLs as a methodology for "tapping cognitive processes in reading" (Shay 1990:8). Her study comprises the analysis of three protocols, concluding with the strengths and weaknesses of the technique, and suggestions to incorporate — in the next step of her study — retrospective verbal reports in conjunction with her TOLs, and a quantitative measure of comprehension.

2.3.2 Using TOLs to Identify Strategies Associated with Successful and Unsuccessful ESL Reading

Taking TOL data one step further, Block (1986) compared the strategies used by 6 nonproficient ESL readers with those used by 3 native speakers of English who were also designated as "nonproficient readers" (Block 1986:467) during interaction with textbook material. She found that the strategies of ESL readers and native speakers were similar. She also differentiated more successful nonproficient readers ("integrators") from less successful readers ("nonintegrators") on their ability to integrate, to use general knowledge and associations, to recognise aspects of text structure, and to respond in the "extensive mode" rather than in the "reflexive mode" (Block 1986:471).

Hosenfeld (1984) also utilised TOLs to establish relationships of reading strategies with successful and unsuccessful readers. Her successful reader kept the meaning of the passage in mind, read in broad phrases, skipped unessential words, guessed the meaning of words from context, and had a good self-concept as a reader. In

contrast, her unsuccessful reader lost the meaning of sentences after decoding them, read word by word or in short phrases, seldom skipped words, used the glossary for the meaning of new words, and had a negative self-concept as a reader (Hosenfeld 1984:233).

2.3.3 Using TOLs to Determine the Relationship between L1 and L2 Reading Strategies

Sarig (1987) utilised TOLs to conduct an "in-depth qualitative exploration of reading processes in both L1 and L2" (Sarig 1987:107). Utilising 10 subjects with Hebrew as their L1 and English as their L2, she found that all of her 4 "move types" were identified in the L1 and L2 tasks. Her readers tackled high level reading tasks in both languages in a similar manner — "the same factors explain(ed) success and failure to almost the same extent" (Sarig 1987:115). She concludes from this that reading processes appear to transfer from the L1 to the L2. The data also reveals that reading processes are highly individualised — each reader was characterised by her own combination of reading strategies, rather than by an occurrence of certain moves, or lack of others. Sarig's contribution therefore challenges the traditional idea of identifying strategies associated with successful and unsuccessful readers.

2.3.4 Using TOLs as One "Source" in a Triangulation of Data Sources Study

Anderson et al (1991) utilised TOLs as one "source" in their study involving a triangulation of data sources to examine the construct validity of a reading comprehension test. They utilised 28 Spanish mother tongue students with varying ESL abilities. Participants had to complete a comprehension test (the Descriptive Test of Language Skills — DTLS) under standardised conditions, and another utilising the TOL technique. Anderson et al (1991) differentiated reading strategies from test-taking strategies. They found that by combining TOL data with test performance data, "greater insights are gained into the reading comprehension process as well as

the test taking process" (Anderson et al 1991:61).

2.3.5 Using TOLs to Examine Individual Differences in Strategy Use in ESL Reading and Testing

In a similar study, Anderson (1991) used TOLs to examine the individual differences of second language readers' strategy use during reading comprehension tests and to ascertain to what extent reading comprehension processes during a test "reflect the comprehension processes during academic reading" (Anderson 1991:2). The 28 subjects completed two comprehension tests, under standard conditions and under TOL conditions, with data being collected during individual appointments with each subject. In order to examine the individual differences in strategy use, Anderson presents three case studies from participants "whose scores indicated interesting reading behaviours on the two reading tasks" (Ibid:10). The major findings to emerge from this study are:

1) No single set of processing strategies contributed to comprehension success; the same types of strategies were used by high- and low-scoring subjects on the comprehension tests. Anderson therefore suggests that "it is not sufficient to know about strategies; a reader must be able to apply them strategically" (Ibid:17).

2) The data revealed that the subjects employed similar strategies during a standardised comprehension test, and reading for academic purposes.

3) Whilst success on a standardised reading comprehension test can be attributed to the subject's level of language proficiency, success in reading academic texts cannot be attributed to proficiency in the L2. Anderson suggests that success on academic reading is dependent on "individual learner factors ... such as level of interest, motivation, learning style, and background" (Ibid:18).

2.3.6 TOLs as a Means of Creating Metacognitive Awareness

Hosenfeld (1984) utilised TOLs as an instructional device to help "unsuccessful readers acquire the strategies of successful readers" (Hosenfeld 1984:235). Using TOLs in the "diagnostic phase" to identify reading strategies of her ESL readers, she also employed the technique to assist her subjects in an on-line selection of "successful" strategies during their reading aloud. Whilst the metacognitive aspect of her research seems to have been "played down" in favour of the focus on successful and unsuccessful reader strategies, there can be no doubt that Hosenfeld effectively employed TOLs as a means of strategy training.

A renewed interest in metacognition has emerged in ESL reading literature, and this seems to be the direction in which TOL research is headed. Carrell (1989) investigated — by means of a questionnaire — the relationships between readers' metacognitive awareness of various reading strategies and their reading ability in their L1 and L2, and advocates that L2 reading pedagogy must include strategy training, "instruction in orchestrating, overseeing and monitoring these skills, ... (and) information about the significance and outcome of these skills and the range of their utility". Carrell et al (1989) conducted metacognitive strategy training utilising semantic mapping and the experience-text-relationship method, and found that these were both effective in enhancing L2 reading.

There are suggestions that TOL research could well contribute to the growing interest in metacognition in ESL reading. An advocate of utilising TOLs for metacognitive awareness is Casanave (1988), who states:

> ... inefficient readers who enhance their awareness of the nature of reading and of their own reading strategies will ultimately be better readers than those who do not.
>
> Casanave 1988:285

She suggests that practice and instruction in the TOL technique is one means of enhancing this awareness. Not only does it actively involve the ESL reader with

the text and give him/her the language to identify the strategies he/she is using, but appropriate training — with TOLs and reciprocal teaching as the medium of instruction — will better equip the reader to monitor his/her comprehension, and take strategic action when there is a comprehension breakdown.

Anderson's (1991) TOL research supports the notion that L2 readers must not only be taught how to use a particular strategy, but they must also be taught "how to determine if they are successful in the use of that strategy" (Anderson 1991:18). The strategy training, which he recommends on the strength of his data, emphasises "the 'when' and 'why' of strategy use at least as much as the 'what'" (Ibid).

An interesting point to emerge from Block's (1986) study was that several subjects commented on how they had learned to read better, just by virtue of participating in the research — Block claims that she provided no direct instruction at any time during the study. This lead Block to conclude:

> The task of thinking aloud appeared to focus these readers' attention on what they understood and what they needed to know. By saying aloud what they understood, they became aware of what they did not understand.
>
> Block 1986:488

2.4 Evaluating TOL Research in ESL Reading

Whilst ESL TOL research seems to be rapidly gaining a level of acceptability within ESL reading research, there seems to be a cautious reservation attached to the findings emanating from TOL studies. Before the writer expresses her thoughts on various issues which she feels need to be addressed in TOL research, she would like to consider — and briefly comment on — Carrell's (1989) reservations, which Carrell (Ibid) documents as follows.

a) The small numbers involved in case studies makes it difficult to generalise results, and the "highly individualistic nature of readers' application of stra-

tegies ... makes it very important to look at large study populations" (Carrell 1989:122).

Whilst this is a very valid criticism of TOL case study research, it must be borne in mind that TOL research has been used for quantitative analysis with fairly large samples (e.g. Sarig's (1987) study, with N=130; and Anderson's (1991) study of N=28), as well as the smaller case studies to which Carrell (above) is referring.

The writer feels, however, that if there is a place for case study research, which does not aspire to generalise findings to the broader population, the application of the TOL technique can justifiably take its place within this sphere of research.

b) The case studies may be "highly selective of just those subjects who are readily able to master the think-aloud technique and to introspect and articulate about their reading behaviour" (Ibid).

This is an obvious problem of TOL research. Some subjects find it easier to articulate their thoughts, and the richness of the data emerging from their protocols — compared to the less articulate subjects — would be the natural choice for researchers to select for case studies. However, once again, if one is not looking to generalise results, these case studies must surely have a value in themselves, even if they are "highly selective".

c) The data tend to be "implicitly and subjectively discovered in the open-ended data provided by subjects, via post hoc analysis" (Ibid).

This criticism could pertain to a large body of qualitative research which relies heavily on researcher inference. The value of qualitative research is its open-ended nature, allowing the researcher to respond to issues emerging from the data, without the constrictions imposed by experimental design, and as such, the strength of the TOL technique lies in its potential for use in discovery research. The writer deals with the problems of TOLs from this perspective in more detail below, and suggests the implementation of a few "constraining

parameters" within which TOL research could be conducted, to increase its contribution to the field of qualitative research.

d) Research has been limited to strategy use, and has not "investigated readers' awareness of strategies" (Ibid). It has largely centred around the identification of reading strategies employed by the ESL reader, and those strategies associated with successful and unsuccessful comprehension.

Whilst ESL TOL research has largely centred around the identification of reading strategies, and strategies associated with successful and unsuccessful readers, recent studies (mentioned in 2.3 above) have demonstrated its usefulness in other areas (for example, Sarig's (1987) identification of the highly individualised nature of the use of reading strategies), and its potential for use in metacognitive research.

Having commented on Carrell's "caveats" to ESL TOL research, the writer would like to consider certain issues which have emerged in current TOL studies which she feels need to be systematically and methodically addressed, in order to promote TOLs "as more useful tools in gathering process data" (Anderson 1991:20). The writer senses a need for constraining parameters; a type of identified framework within which ESL TOL research should be conducted, in order to truly establish its validity within ESL reading research.

The writer has conducted her evaluation of ESL TOL research under various categories, which she feels are potential problem areas, under the following headings:

2.4.1. Theoretical issues surrounding the utilisation of L1 TOL research in ESL reading

2.4.2. The need for a more rigid application of TOL terminology

2.4.3. Methodological problems in ESL TOL research: can these affect the findings?

2.4.4. Factors influencing the reliability of the interpretation of results

2.4.1 Theoretical Issues Surrounding the Utilisation of L1 TOL Research in ESL Reading

In the light of the findings with L1 readers, some writers in current literature have proposed that ESL readers could benefit from learning "expert" reading strategies of the L1 reader to improve their reading. Carol Hosenfeld (1984) is one of the proponents of this concept. To quote Hosenfeld:

> Once I had identified some strategies of successful readers, I asked the following research question: can unsuccessful readers acquire the strategies of successful readers?
>
> Hosenfeld 1984:234

Utilising TOLs as well as introspective and retrospective research techniques to ascertain what her students "do" when confronted with a problem in text, she worked from that evidence to teach the students strategies of successful readers to deal with those problems. Her case studies are a much-quoted testimony to the fact that L1 readers successfully improved their reading by being taught "good reader" strategies to "get at" meaning.

Her approach to the teaching of reading has been labelled "psycholinguistic" (Alderson & Urquhart 1984:246) as she appears to concentrate on reading as a problem-solving activity, and strategies to process linguistic information, rather than looking at the language itself in terms of acquiring linguistic knowledge.

At the risk of categorising, the writer feels that Hosenfeld's approach places her into the school of thought which sees ESL reading as a "reading problem" rather than a "language problem" (see theoretical discussion, Chapter 1). Whilst her successes are well-documented, the writer believes that to overlook a possible language problem faced by the ESL reader could be an important oversight.

The writer feels that the major problem emerging from the concept of teaching ESL readers "expert" reading strategies to improve their interaction with text is that it seems to be based on an underlying assumption of a similarity between L1 and L2 reading difficulties. In other words, since studies (mentioned in 2.2 above) have

demonstrated that poor L1 readers have improved with instruction in competent reading strategies, L2 readers should also improve with the same type of instruction. This is tantamount to comparing the ESL reader to the poor L1 reader.

Another apparent proponent of transferring evidence from L1 TOL research to the ESL situation is Casanave (1988). Based on competent readers' ability "to monitor what they understand and to take appropriate strategic action" (Casanave 1988:283), Casanave believes that ESL readers can benefit from instruction in comprehension-monitoring, utilising TOLs for instructional purposes (as does Hosenfeld 1984). She tentatively suggests the "leap from L1 research to L2 pedagogy" (Casanave 1988:285).

Whilst the writer believes that TOLs are potentially a very useful tool for metacognitive instruction, she feels that Casanave's "leap" is formidably large, and is based on too many unsubstantiated assumptions about the similarities between L1 and L2 reading. The writer concurs with Ellen Block's (1986) statement that

> ... the number of factors influencing reading ability increases geometrically when considering reading in a second language. Questions of the influence of the readers' first language and first language literacy as well as their second language proficiency complicate investigations of second language reading and increase the difficulty of comparing the results of studies.
>
> Block 1986:466

In his article which "provides an update of mentalistic approaches to investigating reading processes" (Cohen 1986:131) Cohen highlights an important shift in emphasis in TOL research:

> An initial focus of mentalistic studies on the reading process was to identify good and bad reading strategies so as to train readers in the use of "good" ones. It has currently become clear that such an approach was simplistic in that strategies may not be inherently good or bad for a given reader ... Hence there is a current shift in research to dealing with the

description of reading behaviour that promotes or deters comprehension rather than attempting to describe the "ideal" reader.

Cohen 1986:133

Much of this change in emphasis can be attributed to Sarig's (1987) work on TOLs. She found that the use of a "good" strategy may in fact deter comprehension if used inappropriately, with factors such as the particular reader, the text, the context of the reading, and other strategies used in conjunction with that strategy, playing a contributing role. Sarig stresses the concept of the individuality of the reader — in her study, each reader seemed to be categorised according to her own reading style, which changed from reader to reader. She therefore challenges the traditional distinction between good and poor reading behaviour:

... the findings in this study do not seem to corroborate the classical dichotomy between good and poor reading, with the implication it carries for material development and reading process tests. Success in reading was shown to be a result of the quality of the reader's unique combination of moves rather than the occurrence of certain moves or lack of others.

Sarig 1987:118

Block's (1986) study reinforces this viewpoint. She found that the "potentially helpful strategy" (Block 1986:477) of anticipation actually had a negative effect on one of her subject's interpretation of text. An incorrect prediction influenced the subject's subsequent responses to the text. Likewise, Shay (1990) suggests that the stimulation of

... certain types of experiential knowledge may be a hindrance to the comprehension process rather than an asset.

Shay 1990:7

To sum up the theoretical issues surrounding the utilisation of TOLs in ESL reading, it seems that the reading researcher is facing more than the identification

of good strategies, since the ESL reader might be employing these good reader strategies, yet still have problems with textual interaction. If, as Cohen (1986) suggests, the researcher should be looking to identify reading behaviour which promotes or deters comprehension, the writer feels that a new demand has been created in ESL TOL research which needs to be addressed by researchers. It is one thing to identify good strategies; the complications arise when one has to describe the "bad" ones — the comprehension-deterring strategies. And to complicate matters further, it seems that the comprehension-deterring strategies may in fact be good reader strategies which are used inappropriately.

The writer feels that in order to adequately address this problem, one would have to look at both the process of reading in terms of the strategy employed by the reader, as well as the product of reading — the breakdown in comprehension which arises at any one point in the text — in order to identify reading behaviour, and reading problems which deter comprehension. This places TOL research into the realm of investigating product, alongside its present use of investigating process. It also expands the traditional use of "product" as the composite outcome of the "read", what the reader carries away with him/her, the comprehension outcome of the reader's interaction with the text as a whole. The writer suggests that product be extended to include the reader's ongoing comprehension outcome at any point in the text, which may be changed or altered with the addition of new textual information. In other words, the comprehension outcome at any point in the text — the product — has a value beyond the identification of the strategies used by the reader to arrive at his/her interpretation. To what extent TOL data is able to take account of both process and product (strategies and ongoing comprehension) and utilise these two mutually interdependent aspects of reading interaction in a significant way, is investigated by the writer in her own small study.

2.4.2 The Need for a More Rigid Application of TOL Terminology

The writer feels that if TOL studies are to gain credibility within ESL reading research, certain terminological issues should be addressed, and systematically applied to all TOL studies. One of the values of quantitative research is its exact application of precise, experimental terms which describe the research. Whilst qualitative research is not constrained by the parameters of experimental precision, the writer believes that certain terminology should be defined and utilised more precisely, so that the very strength of TOLs as qualitative research does not become the technique's greatest weakness.

This issue of terminology is addressed under the following headings:

2.4.2.1. Which method is being used? TOLs, or some other verbal report?

2.4.2.2. What are TOLs measuring? A direct/indirect view of strategies/processes?

2.4.2.1 Which Method is Being Used? TOLs, or Some Other Verbal Report?

Perhaps one of the most precise, and experimentally rigorous applications of verbal report data is Anderson's (1991) study (see 2.3 above). However, the problem the writer has with this study is Anderson's use of "think aloud protocols" to describe what the writer feels are in fact retrospective verbal reports.

The literature is very precise in its distinction between TOLs and retrospective verbal reports (see 2.1 above). TOLs represent concurrent reporting; subjects talk about what is "going on" in their minds during their textual interaction — they constitute immediate verbalisation of the "contents of (the subjects') mind — of what (they) are currently aware of" (Mann 1982:87) at any particular stage, in online textual interaction. On the other hand, retrospection, or retrospective verbal reporting, requires that subjects talk about how they engaged in a particular task, after the event.

Anderson (1991) collected his verbal report data on two comprehension tests —

the Descriptive Test of Language Skills (DTLS) and the Textbook Reading Profile (TRP) — during individual appointments with his subjects. Data from the TRP was collected — with no time restrictions — after each participant had read the passage and answered the comprehension questions. Anderson (1991) states:

> After reading each of the two passages, the participant was asked to report the strategies used while reading and understanding the passage and to report the strategies used in answering the comprehension questions at the end of the passage.
>
> Anderson 1991:7

Data was collected from the DTLS in the same way, except that the 30 minute timing restriction of the test was preserved. Participants were to complete as much of the test as possible during the time limit, reporting their strategies after completing the comprehension questions of each passage. Exam time was suspended during the reporting times.

The writer feels that because the subjects were reporting strategies used after completing the tests, the subsequent protocols constituted retrospective verbal reports, rather than TOLs. Anderson (1991), however, seems to equate the terms "verbal reports" and "think-alouds", and refers to his protocols as "think-aloud protocols". The conflation of the terms is evident in his comments:

> Verbal reports or think-aloud protocols are being increasingly implemented as a method of identifying the mental processes that readers use to understand the printed word. A verbal report or think-aloud protocol is produced when a reader verbalizes his or her thought processes while completing a given task.
>
> Anderson 1991:2

The writer in no way wishes to discredit Anderson's studies; they represent a rigorous implementation of verbal report techniques, with controls and exacting application of statistical analyses. She feels, however, that a more systematic utili-

sation of verbal report terminology would considerably strengthen research in this field.

2.4.2.2 What Are TOLs Measuring? A Direct/Indirect View of Strategies/Processes?

Other areas in which terms are loosely applied, and which the writer feels need more precise explication are issues surrounding the question: what exactly do TOLs reveal? TOL research widely employs the term "reading strategies" to describe information revealed by TOL data. The questions posed by the writer at this point are: what are reading strategies? How do they differ from processes? What are TOLs identifying — strategies, or processes? And do TOL data give a direct or indirect view of these strategies/processes? These concepts are the very foundation of TOL research, and need careful definition to avoid any ambiguities which may arise in their use.

The writer will deal with the problem of TOLs as direct/indirect data, as this issue was one of the first to arise in TOL literature, and then consider whether this data reflects mental processes or reading strategies.

There is apparently widespread agreement that TOL data are not "direct reflections of thought processes but (should be) correlated with underlying thought processes" (Olson et al 1984:254). The data is "inherently indirect as it cannot mirror exactly the unobservable mental processes under investigation" (Mann 1982:98). However, despite these observations, Block (1986) remarks: "... think-aloud protocols provide a direct view of a reader's mental activity, a kind of window into those processes which are usually hidden" (Block 1986:464). One of Suellen Shay's "key questions" in her study is: "Do (TOLs) provide a direct view of a reader's mental activity?" (Shay 1990:4) She concludes that they in fact provide an indirect sample of what goes on in a reader's mind.

The writer feels that inconsistencies emerging from the literature which pertain to basic issues of TOL research, such as "What is TOL data?" could unnecessarily discredit the technique. The writer feels the need for a more precise application

of TOL terminology which would enable the researcher to describe his/her TOL research in terms which are universally acceptable in TOL literature. She feels that this would do much to validate the TOL technique as an effective reading research instrument.

Related to the basic question of "What is TOL data?" is the apparent confusion surrounding the use of the terms "reading strategies" and "mental processes"; does TOL data identify reading strategies of the reader, or mental processes involved in textual interaction? What is the difference? These terms seem to be conflated, and used interchangeably in much of the current ESL TOL literature.

The literature states that TOLs are "best used to study the higher level processes in reading" (Olson et al 1984:255) but "they will not necessarily reveal the strategies ... actually used (which) ... must be inferred from the TOL data" (Ibid:254). They are "a valuable and thoroughly reliable source of information about cognitive processes" (Ericsson & Simon 1980:247). Smith (1979) states that until there is a clear psycholinguistic explanation of strategies, they can be regarded as problem solving processes. Sarig (1987) states in her footnote that she uses "moves" and "strategies" interchangeably. However, in her article she seems to favour "move" as the descriptive term. Despite Sarig's overt statement on her use of the terms, the writer — who is critically searching for clarification of verbal protocol terminology — is a little concerned when Sarig appears to equate a reading strategy with a combination of moves:

> One of the main dimensions of the personal reading style was the personal reading strategy (the individual combination of reading moves).
>
> Sarig 1985:118

Once again, the writer feels the need for a concise clarification of the terms, to which all TOL researchers would adhere. She suggests that a clear-cut definition of these terms, which are central to TOL studies, would considerably strengthen the technique as a research tool. This represents no easy task, however, since the very nature of reading interaction is open to so much debate.

Perhaps the most lucid distinction between strategies and processes in TOL literature is Cohen's (1986) description:

> **Reading strategies** refers to those mental processes that readers consciously choose to use in accomplishing reading tasks. Such strategies may contribute to successful comprehension or detract from it. In principle, what distinguishes strategies from other processes is the element of choice involved in their selection.
>
> Cohen 1986:133

Transferring this definition to Ericsson and Simon's (1980) information-processing model, a verbalisation is that information in short-term memory which is "heeded or attended to" (Ericsson & Simon 1988:224). The central processor "controls and regulates the nonautomatic cognitive processes" (Ibid), selecting sensory stimuli from the text, and information from long term memory, to process within short-term memory. One would not expect the short-term memory to contain information about automatised processing, associated with basic bottom-up decoding, such as perception of letters and simple word recognition. Likewise, "easy" texts would constitute fairly automatic processing, with very little information heeded in short-term memory.

The implication is that what might constitute automatised processing for one reader, might be problematic for another reader, who would have to heed it in short-term memory. It therefore seems that a "process" for one reader may in fact be a "reading strategy" for another reader. Likewise, for the same reader across different texts, a word recognition process could revert to a conscious strategy if the text deals with an unfamiliar topic, for example, the grapple for vocabulary meaning in technical texts.

If verbalisations are heeded information, which indicate conscious strategy choice, the writer would like to suggest a simple "rule of thumb" distinction between strategy and process: TOL data reveals the strategy; the researcher infers the process. This "rule" is put to the test in her own study.

2.4.3 Methodological Problems in ESL TOL Research: Can These Affect the Findings?

This section explores certain methodological issues which have emerged in current ESL TOL research, and the extent to which they could possibly affect the results of the studies.

The first issue the writer wishes to raise concerns the instructions to the ESL research groups. Block (1986) asked her participants to read silently, and to respond aloud. However, a number of researchers have suggested that reading aloud is a spontaneous "happening" in a TOL task. To quote Ericsson (1988):

> Reading aloud seems to occur spontaneously, or is at least easily evoked when subjects are requested to think aloud while reading.
>
> Ericsson 1988:307

Waern (1988) also addresses the difficulty posed by subjects reading silently and thinking aloud, and she actually instructed her subjects to read aloud, to control for this difficulty.

The writer also feels that Block's (1986) instruction to respond after each sentence, and the placing of a dot after each sentence in the text to remind the subject to respond, could place unnatural demands (over and above the unnatural demands of the TOL task itself) on the subject — in other words, the subject is to respond after every sentence at all costs. Two of Block's subjects actually complained about this instructional requirement, and preferred to respond after reading a complete paragraph. The writer feels that forcing a response could slightly change the focus of the reading task from text interpretation, to thinking of what to say. Because many of the responses were subjective, with subjects relating affectively and personally to the information in the text, Block introduced "mode of response" as either extensive or reflexive, and this emerged as a prime consideration in her discussion of patterns of performance.

The writer suggests that undue pressure to respond might well encourage a subject to read in the "reflexive mode" — which might not be his/her "normal"

textual response — in a continual effort to "say something" when there might not be anything which he/she would, under normal conditions, heed; in other words, there might not be anything available for verbalisation, yet task instructions demand a response. Could this be an example of Ericsson's (1980) caveat whereby efforts to obey an instruction are predicted to have "substantial effects on task performance"? (Ericsson 1980:227).

The writer believes that in an unnatural task such as the TOL task, every methodological effort should be attended to, in order to ensure that there is no distortion of the data — that the data is, as far as possible, indicative of textual interaction. If data is distorted, researcher inference emanating from that data lacks substantiation.

Another area of concern regarding instructions in TOL methodology is that they should be clear and simple, and leave the subject in no doubt as to what is required of him/her. With respect to Block, her instructions resemble an exercise in logical deduction, even to a skilled reader:

> ... say as much as (they could) about what (they) were thinking when (they) read and about what (they) did to understand when (they) didn't understand.
>
> Block 1986:470

In Block's defence, however, her participants were given an opportunity to practise thinking aloud with two sample passages before the study was conducted, so the participants were aware of the TOL requirements despite complex instructions.

2.4.4 Factors Influencing the Reliability of the Interpretation of Results

Up to this point, the writer has considered various theoretical problems associated with TOLs, and a few methodological problems in obtaining the data. She would now like to evaluate what the researchers do with their data — its interpretation,

and the conclusions they draw from it. This will be considered under the following headings:

2.4.4.1. The importance of a coding scheme, and the submission of both text and coded protocols

2.4.4.2. Loopholes in analysis and interpretation.

2.4.4.1 The Importance of a Coding Scheme and the Submission of Both Text and Coded Protocols

It seems to be general TOL practice to code the protocols, and the complexity of the coding schemes utilised to a great extent reflects the focus of the particular research. Examples of TOL research which focus on specific aspects of reading behaviour are: Waern's (1988) concentration on "meaning relevant units" (Waern 1988:331) and her exclusion on "non-meaning relevant comments" (Ibid) in her coding; Guindon's (1981) focus on inferences in stories; Bridge and Winograd's (1982) focus on cohesive relations within text; Scardemalia and Bereiter's (1984) interest in the detection of inconsistencies in texts.

Current ESL TOL research concerns itself with more general questions about ESL comprehension, e.g. the identification of strategies utilised by ESL readers; strategies associated with successful/unsuccessful readers; comparison of test-taking strategies and academic reading strategies (see 2.3 above). Since these studies are largely exploratory, requiring an in-depth description of strategies and inferring comprehension processes, the writer feels that all protocol data should be coded, as it is all relevant to the reading task. To exclude or ignore certain responses risks the exclusion of potentially significant information. This is in accordance with Afflerbach and Johnston's (1984) suggestion to consider all verbal reporting data.

The coding scheme is the descriptive framework against which the researchers interpret their protocols. Because this is central to data analysis, the writer feels that not only should the coding scheme be clearly described, but equally important is to see how the researcher has applied his/her coding scheme to the individual protocols. It is only then that the reader interested in the research findings, is able

to gauge his/her agreement with the researcher's categorisations, and the interpretations emanating from those categorisations.

In the light of the above, the writer will consider some of the current ESL TOL research studies. Firstly, Shay (1990) does not use a coding scheme at all. She makes a leap from transcribing the data, to analysing it. Without recourse to a coded protocol, statements such as the following either remain obscure, or force the reader to engage in a mental exercise to supply the missing links between data and analysis:

> The first TOL data ... is a case of high level processing where the student is both successful and unsuccessful at inferencing.
>
> Shay 1990:4

Because TOL research relies to a great extent on researcher inference, the writer feels that it is particularly important to show as clearly as possible from where the inferences arise. Applying a coding scheme to the protocols is an essential step in exposing the data to the scrutiny of the reader, and allowing him/her the opportunity of his/her own subjective response, which may well differ from the researcher's response.

Block (1986), Sarig (1987) and Anderson (1991) utilise coding schemes. Sarig's coding scheme — which categorises strategies under four types of reading moves — has been heralded as one of the most extensive in current mentalistic studies, and as such, has made a valuable contribution to TOL research. However, neither Block, Sarig nor Anderson demonstrate how their schemes were applied to the individual protocols. Even more baffling to the reader trying to assess the outcome of the studies is the absence of the actual protocols in these research studies, and the unavailability of the text which Sarig used (Block and Anderson both supply descriptions of their reading/testing materials). In all of these cases, the reader is given the results of the coded protocols by means of tables demonstrating the percentage incidence of strategy use, but has no way of assessing his/her agreement with the coding selected at any given point in the protocols.

The writer feels that texts used, as well as the coded protocols obtained from the text, should be available to the reader in order to substantiate the findings emanating from TOL research. Dubin (1985) raises this issue in her comments on Sarig's research:

> In order to evaluate the real significance of Sarig's findings, it would be helpful to know more about the actual texts which the subjects read.
>
> Dubin 1987:122

2.4.4.2 Loopholes in Analysis and Interpretation

The writer would now like to critically evaluate the analysis of certain ESL TOL studies, and the conclusions which these researchers have drawn from their analyses.

Block (1986) divides reading strategies into two major categories which she calls "general strategies" and "local strategies". General strategies are described as comprehension-gathering and comprehension-monitoring strategies, whilst local strategies are described as attempts to understand specific linguistic units. (Block 1986:472–473). This categorisation seems to indicate a division of strategies into those involved with global, top-down analysis, and those associated with linguistic, bottom-up decoding (see Chapter 1 for a discussion of theoretical issues).

She introduces the concept of "mode of response" as either extensive or reflexive, depending — respectively — on whether the subject focuses on understanding the ideas of the author or whether the subject relates affectively and subjectively to the text. The extensive responses were normally in the third person, whilst the reflexive responses tended to be in the first person.

Whilst "mode of response" was introduced as a "descriptive dimension" (Block 1986:471) from data in the pilot studies, it emerged as a major criterion in Block's analysis, and an important factor in her categorisation of readers. On the evidence of her research, Block posits two types of reader: the "integrators" who responded in the extensive mode, and the "nonintegrators" who responded more often in the reflexive mode. Of the nine subjects in her study, she identified three as integrators. However, of these three, one subject was classified as an integrator "because

of his consistent use of the extensive mode and the quality of some of his responses" (Block 1986:483) even although he did not often integrate, recognise text structure, or identify main ideas. Likewise, a subject who was identified as a nonintegrator "straddled the Integrator/Nonintegrator distinction" (Ibid). Block claims, however, that this particular subject — Steve — was one of the subjects who "continued to integrate" (Block 1986:480). Was Steve, then, classified as a nonintegrator on the strength of reflexive responses? What was the "quality of some of (Victor's) responses" (Block 1986:483) which was a major contributing factor to his classification as an integrator?

Without recourse to the protocols, the reader has no means of gauging the answers to these questions, and even the concept of mode of response as a major criterion in reader-type classification will remain unsubstantiated. One dimension which seemed to distinguish integrators from nonintegrators, was that the integrators did not "report (their) thoughts" (Block 1986:486) although they "referred to their knowledge base throughout their reading" (Ibid). This was judged on comments from integrators after the task, such as "... I was thinking about my nephew, but I didn't know what to say" (Ibid). One also wonders to what extent the demands of the task to speak after every sentence (discussed in 2.3 above) could have affected a subject's mode of response.

Block repeatedly refers to "text-based" strategies: "Victor's responses were text-based" (Block 1986:479); Susan "used predominantly text-based strategies" (Ibid). However, there is no explication of the concept, and the reader is forced to make calculated guesses.

Because the strategies of MT Chinese and Spanish subjects did not seem to be different from MT English subjects (only three subjects in each group) Block suggests that "strategy use is a stable phenomenon which is not tied to specific language features" (Block 1986:485). She deduces from this that "learning to read in a second language may differ from learning to read in a first" (Ibid). The gist of her argument seems to be that once one has learnt to read language in print, and the strategies required for comprehension, learning to read in the L2 is just a matter

of "understanding specific language features in print" (Ibid). Is Block implying that reading strategies are transferred to the L2, and problems experienced by the L2 reader therefore stem from language problems? She continues:

> Thus, the development of strategy use, particularly as it is applied to informative text, does not seem to depend on language-specific features.
>
> Block 1986:485

She states that her data supported the contention that "the application of cognitive strategies is not dependent on the English language proficiency of the reader" (Ibid). Is Block suggesting a type of universality of strategy use with regard to informative texts, which has little to do with the ESL reader's language proficiency? The writer is concerned that she has been unable to adequately follow Block's deductions. This may be the result of a lack of background knowledge of the writer, or a lack of propositional explicitness on Block's part.

Block suggests a relationship between her categories of integrators/nonintegrators — on the strength of her stated "consistency of the results in (her) study" (Ibid) — to the ability to learn, and writing strategies.

Block's study certainly demonstrates that TOL data is a rich source of hypotheses. The writer feels, however, that hypotheses which seem to emerge from TOL data should be clarified by a step-by-step explication of clearly formulated propositional developments which ultimately lead the reader through to each of the researcher's hypotheses. This would avoid the confusion created by the reader having to make seemingly massive deductive leaps, which are unsubstantiated, or not clearly explicated, in the research study.

Shay's (1990) study is equally full of emerging hypotheses, few of which can be substantiated by her data. The writer will consider the hypotheses Shay presents as emanating from her first TOL data, and try to link these up with the protocol, which she presents as an appendix to her study. The writer feels that this submission of protocols for the reader's scrutiny is an essential aspect of TOL research (mentioned above) as it allows the reader to dispute, or concur with the researcher's stated hypotheses.

According to Shay, the first TOL data reveals:

a) "high level processing where the student is both successful and unsuccessful at inferencing" (Shay 1990:4). Does the data reveal this, or is this inferred by Shay? There is no explication of this statement, and no cross-reference to the protocol.

b) "she may also be unsure of 'ecological balance"' (Ibid). Is the subject expressing uncertainty about "ecological balance", or about the propositional links between "natural plants ... and unemployment ... and the population increase ... and ecological balance" (TOL V)? Shay has presented one option, without considering alternatives.

c) "we infer from the repeated mispronunciation of famine that she is unfamiliar with this word (she pronounces 'famine', famene the first time and famine, the second time)" (Shay 1990:4). Is a mispronunciation indicative of unfamiliarity with a word? A competent reader/speaker frequently makes slips of the tongue, and may also mispronounce words which he/she may be familiar with in print, but not in speech.

d) "the ... link ... between indigenous plants and unemployment becomes very problematic and in fact is the major cause of breakdown" (Shay 1990:5). Is this in fact revealed by the data? The writer cannot find conclusive evidence to substantiate the claim.

The hypotheses which emerge from the first protocol data seem to be :

1. "... although the unfamiliar vocabulary may have contributed in part to the eventual breakdown ... there is something else going on" (Ibid). The reader is not informed about the "something else".

2. "... the syntactic complexity of the sentence posed a problem for the student, but the data does not really reveal this" (Ibid).

3. "Had the student been more competent at syntactic analysis we could hypothesise that this complex inference would have been ignored" (Shay 1990:5) — her reference to "complex inference" seems to refer to the link between indigenous plants and unemployment. Ignoring the complex inference is based on Shay's assumption of a competent reader's interaction with text, which lacks substantiation.

The reader is left with feelings of scepticism. Firstly, it is a lengthy and time-consuming exercise to piece together information from the TOL study — to decide what is factual, what is inferred by the researcher, what can be substantiated from protocol evidence, and what is unsupported by the protocols. The writer suggests that one of the major loopholes in analysis and interpretation of TOL studies is that the jumps from data to its analysis, and from analysis to emerging hypotheses, may be too great for credibility.

One gets the feeling that Sarig's (1987) and Anderson's (1991) approach to their data and its analysis is more tightly-controlled, and less susceptible to unsubstantiated interpretations and unqualified hypotheses. However, once again the reader lacks evidence of the texts used and the protocols produced — one has to unquestioningly rely on the researchers' judgements in order to assess the contribution of their results.

Despite the unavailability of texts and protocols, both Sarig and Anderson manage to achieve "reader confidence". Perhaps this confidence can be attributed to their detailed coding schemes, and their step-by-step explication of their analyses, leading up to conclusions, as well as an overall coherence to the studies. The reader is not left to supply his/her links to missing textual propositions: both researchers do this with a clarity and precision which is lacking in much of the current ESL TOL research.

2.5 Summary

This chapter has presented a brief background to the use of TOLs, and has mentioned the use of the technique in L1 reading research. The findings of some of the current ESL TOL studies have been discussed, followed by a justification of the technique in the light of Carrell's (1989) remarks. The writer has then critically evaluated the studies, in terms of basic criteria which she feels should be more systematically and rigorously applied to TOL research in order that TOLs take their place as a valuable methodological tool in ESL reading research.

2.6 Input from the Critical Evaluation which has Informed the Writer's Own Case Study

Having considered some of the areas which the writer feels need to be addressed in TOL research, she has conducted her own small case study to gain practical experience of implementing the technique.

Of particular interest to the writer are those reading strategies which account for failure. This involves more than the identification of strategies; it necessitates a consideration of why and how a particular strategy is comprehension-deterring at any specific point in textual interaction (2.4.1 refers). This extends the scope of TOL data to include an analysis of comprehension breakdowns. Waern (1988) has hinted at this potential use for TOLs in her suggestion to consider the reader's creation of meaning from the text using "current text and world knowledge (or) current text and prior text" (Waern 1988:335) which she labels "construction" as an area for further investigation. She states:

> We can ... consider construction processes as important sources of misunderstandings or creative comprehension ... It is then necessary to investigate under what circumstances constructions are performed.
>
> Waern 1988:348

Whether this can be systematically addressed through protocol data is one of the areas which is investigated in the writer's own study. The following two chapters deal with this case study.

Chapter 3

Description of the Case Study and Justification of the Research Methodology

Having critically evaluated current ESL TOL research (Chapter 2) the writer wished to put the technique into practice in order to assess what in fact TOLs can reveal about reading interaction. Conducting her own case study allowed her to gain first hand experience of the problems encountered in TOL research, albeit on a very small scale.

The writer emphasises that this case study falls within the research paradigm of "evaluative case study research". As such, it represents an additional means of facilitating the judgement of the efficacy of TOLs, which is the major thrust of this thesis. The case study should be seen in the light of supplementing the critical evaluation of ESL TOL research. It provides the writer with the opportunity of closely observing every aspect of the implementation of the technique, to corroborate — or otherwise — her critique of current TOL research, and to gauge the effectiveness of TOLs as a means of "getting at" aspects of a particular subject's textual interaction through analysis of his/her protocol data. The emphasis throughout the case study is on the emerging problems: problems which could pertain to all TOL research, or problems which were clearly idiosyncratic to this particular case study.

The description of this case study, and the justification of the methodology in terms of both current TOL research and case study research, is discussed in this chapter under the following headings:

3.1 The Subjects and the Setting

The study was conducted at Fort Hare University, Ciskei. The subjects were students enrolled in the Practical English course, which is a one-year credit whose primary objective is to increase English language skills of the ESL student. Whilst the majority of the students enrolled on the course are first-year students, a small percentage may be second- and third-year students.

At the time of the study, the students had just been allocated to their practical groups, of which one session per group per week was to be spent in the language laboratory. None of the students had any prior experience of working within the language laboratory, and none of them had ever been exposed to the TOL technique. Thus, both the task and the environment were new to them all. The only element of familiarity for the students was a lecturer in the Practical English department who introduced the writer to the students, and explained how to use the headsets,

and operate the tapes in the booths. He was there for the duration of the data collection, and the writer is indebted to him for his assistance.

It was imperative that the data was collected during that first week of exposure to the language laboratory, to ensure that the students' approach to the task was naive, and untainted by any perception of the writer's expectations. Subsequent sessions in the language laboratory were to be pedagogically oriented, utilising TOLs as an instructional device to develop strategies of text processing in individual students.

3.2 Selection of the Passage

Initially, five expository texts were selected from a range of reading material. They comprised two academic articles, a newspaper report, and an article from a British magazine. There were three basic criteria which determined the initial selection. Firstly, the text was to be authentic, and was not to be tampered with in any way by the writer. Many current verbal protocol studies specifically tamper with text to create passages which lack properties of well-constructed discourse, in order to ascertain subjects' knowledge of textual properties. These methods have included scrambling sentences (Scardemalia & Bereiter 1984) and eliminating words (Bridge & Winograd 1982; Waern 1982). The writer, however, wanted to consider ESL students' interaction with expository text which was representative (if any one text could be considered representative) of any authentic text the student might come across in his/her general reading. It was therefore crucial that the passages should be naturally occurring, non-edited text.

The second criterion for selection was that the semantic sense should be contained within the text, and not in any way be dependent on prior or subsequent text for its meaning. Because of time constraints, and cognitive demands imposed by a lengthy passage, the entire articles could not be used. In each case, the writer chose to use the beginning of the article, retaining its heading, and selecting a "cut-off" point so that the passage was meaningful in itself, as an independent, holistic piece of discourse. Thus, each passage was a self-contained unit.

The third criterion for selection was that the text had to be interesting. Studies using narratives have indicated that a

> ... high interest in the story was associated with a reliably higher frequency of overall strategy use than ... a low interest rate.
>
> Ericsson 1988:311

The interest factor turned out to be the overriding criterion, and the passage selected above the others after the initial day's pilot study was chosen because of the interest it generated from the students.

3.3 Description of the Selected Passage

The text (Appendix 1) consists of eight paragraphs — six of which comprise no more than three sentences — which proved to be an appropriate length for the 40 minute language laboratory sessions. The writer makes no attempt to describe the degree of difficulty of the text in terms of readability formulae. From the outset she predicted that certain vocabulary items would be unfamiliar to the students (for example "bluff", "florid" L.10; "proselytising" L.11; "multiple sclerosis" L.24). However, she felt that the overall meaning of the text would not in any way be affected by a lack of knowledge of these words.

The literature on types of materials for TOLs recommends that the choice rests on the thin dividing line between material which is not too easy, and material which is not too difficult. A difficult passage places heavy cognitive demands on the subjects, with the result that "they stop verbalizing or they provide less complete verbalizations" (Ericsson & Simon 1980:242–243). But whilst the task should not require too much concentration and effort, it should not be "so simple as to be no task at all" (White 1980:109). Waern (1988) states:

> I am not the only person to detect that people simply do not comment on texts which are easy to read.
>
> Waern 1988:330

The less complete verbalisations resulting from a simple passage are due to automatic information processing. Whilst this "automatized" processing is associated with accomplished readers (Anderson 1980; La Berge & Samuels 1974), a simple passage may create a similar phenomenon in the less skilled reader. Afflerbach and Johnston (1984) describe automatized processing as follows:

> ... certain component processes of reading may be performed without the allocation of attention by the reader. In this case, the intermediate products of the process do not become available in short-term memory and, thus, access to them for reporting is denied.
>
> Ericsson 1988:301

Olson et al (1984) recommend that the passage should be controversial to stimulate interest — they found that their "bland and boring" essays produced protocols which "were also rather boring" (Olson et al 1984:283). The writer felt that the topic of euthanasia was sufficiently controversial to avoid this particular trap. What she had not anticipated was that not only did the students not know the meaning of the word "euthanasia" but they were also unaware of the controversy surrounding the issue. She initially felt that this was an unfair disadvantage, and had intended to discard the passage after monitoring during the pilot study revealed the students' lack of background knowledge. However, the potential disadvantage proved to be a valued advantage since it revealed interesting reading strategies and guessing from context as the students grappled after the meaning. This bears out Ericsson's (1988) view that

> ... verbal reports on text comprehension are likely to be more informative when reading involves texts that are ... poorly matched with readers' prior knowledge.
>
> Ericsson 1988:301

3.4 Pre-Task Training and Instructions

3.4.1 Pre-task Training

The literature is divided on the issue of subject training before data collection. It has been suggested that training may "ease the unnaturalness in the experimental situation" (Mann 1982:91). Training may take the form of various practice sessions before data collection (Hosenfeld 1976) giving subjects a list of previously identified reading strategies by which they can identify their own strategies (Rubin & Henze 1981) or instructing the subjects on thinking aloud by means of a demonstration tape (Ballstaedt & Mandl 1984). Cohen and Hosenfeld (1981) recommend training as the means of providing subjects with the vocabulary necessary to describe their thoughts. The argument for pre-task training is that it increases reliability, orientates the subjects to the task, and avoids a loss of important data through the subjects' ignorance of what is required.

But whilst training may increase reliability, it may decrease validity (Afflerbach & Johnston 1984). There is the danger of "demand characteristics" (Orne 1962) of an experiment whereby subjects — in an effort to be "good subjects" — try to respond in accordance with their perception of the researcher's expectations. These external elicitations from the researcher risk an interference of "the outside investigator's ideas in the subjects' minds" (Cohen & Hosenfeld 1981:291). Similarly, but from the researcher's perspective, is the influence of the experimenter's orientation to the outcome of the research. This "expectancy effect" (Kintz et al 1965) may bias the results by imposing researcher expectations on the subjects.

The writer decided that — for the purposes of her own case study — the disadvantages of training outweighed the advantages, and opted for a raw, naive, and totally natural approach to the task, untainted by researcher or subject expectations of any kind. In accordance with discovery research, she did not wish to influence in any way the subjects' interaction with the text. Therefore, to maintain subject naïvety to theoretical issues underlying the task, no training was given.

3.4.2 Pre-task Instructions

The writer's desire for totally natural interaction with text also informed her decisions on the pre-task instructions. Different instructions affect the subjects' pattern and style of reading, and thus produce different verbalisations. Common instructions to subjects in order to assess their comprehension of text involve a post-reading task. In these cases, subjects are instructed to read in order to summarise, recall, or answer questions on the passage. When subjects are warned in advance of the requirements of a post-reading task, their reading is oriented towards fulfilling those task requirements. The objective of placing these orientation demands on subjects is to obtain richer protocols, and to test comprehension. To quote Ericsson (1988):

> Simply instructing subjects to read a text for normal comprehension does not even assure that comprehension has taken place.
>
> Ericsson 1988:302

The writer, however, chose not to utilise post-reading task instructions. The primary motivation for this decision was that she desired to assess what TOLs can reveal about students' natural interaction with text, rather than pre-empting an orientation to reading via the instructions. Secondary considerations which prompted the decision were affective considerations. Because the students were uninitiated into — firstly — think aloud techniques, and — secondly — the language laboratory itself, she felt that informing the students of a post-reading task might unnecessarily raise the students' anxiety levels. She desired a spontaneous interaction from the students, without the possible threat of being tested or evaluated in any way. The fact that the task was not a test was stressed during the pre-task instructions.

Other instructions utilised in TOL research concern the manner in which the actual thinking aloud is conducted: when do subjects talk, and what do they talk about? With regard to the frequency of talking, the most common method is to instruct the subjects to talk after reading each sentence. Variations of this include how much of the preceding or subsequent text the subjects are permitted to see, the most restrictive method making only the current sentence available. The motivation

for this has been to explicate "as fully as possible the role of the current sentence in comprehension" (Olson et al 1984:258). Another variation in the instruction to talk is "selective talking", where subjects are told to speak at predetermined points within a text. These points are usually marked with a full-stop.

Once again, the writer chose not to restrict the subjects' normal reading style with instructions to talk at specific places, whether it be after each sentence, paragraph, or chunk of text. The subjects had free reign to talk when they chose to talk — the only instruction determining the output being that they try to talk as much as possible.

With regard to the content of talking — the instructions to subjects on what to talk about — there are a number of variations suggested in the literature. Olson et al (1984) distinguish between "general" and "focussed" instructions. Examples of general instructions would be to instruct the subjects to talk about inferences, elaborations, connections between sentences, predictions of what may follow in the text. Focussed instructions involve selecting one item and instructing subjects to focus on, and talk about only that item (Olson et al's (1984) studies on prediction in stories and essays). Other variants of this may be to instruct subjects to answer questions after each sentence, or chunk of text (Rumelhart's (1982) study with five WH- questions after each sentence).

Again, the writer sought not to influence the subjects' interaction with text. They were simply told to talk about what was going through their minds as they read. The writer feels that to highlight specific areas for talking is to assume that these processes are actually occurring during reading interaction. Discovery research should be as receptive to the unexpected as to the expected issues which emerge from the data. Restricting the focus may restrict the unexpected issues and falsely highlight the researcher's preconceived, theoretical beliefs. Similarly, restricting the subjects to sentence by sentence talking is counter to normal reading performance — the competent reader frequently refers to previous sentences during reading interaction (indicated by regressions in eye movement studies). The writer did not wish to interfere with any normal reading patterns the students might have. Ericsson's

(1988) caveat is pertinent to this decision:

> If ... the instructions to alter the reading task in fact change the reading process, then the resulting verbal reports may only obscure our understanding of "normal" reading processes.
>
> Ericsson 1988:302

Whilst Ericsson (1988) himself does not advocate no training or specific instructions, the writer opted for as little interference as possible with the subjects' interaction with text, in accordance with her desire to see what emerged from protocol data without any pre-emption.

Having justified the lack of subject training and the lack of specific instructions, it remains to report what the writer actually said during the pre-task instruction period. The following points were covered:

a) When we read, many thoughts pass through our minds all the time.

b) These thoughts help us to make sense of what we read; they enable us to get meaning from a passage.

c) Today I'm going to ask you to talk about what you're thinking — talk about what's going on in your mind as you're reading.

d) This is NOT a test. I'm not interested in HOW you're reading; I want to know what you're thinking about when you read this passage.

e) Read the article as you would normally read any article, and talk as much as you can about what's going through your mind.

3.5 Probing

Because concurrent verbal reporting places extra cognitive demands on the information-processing system, many experimenters make allowances for probing during data collection. This is to ensure the continual flow of reporting. Afflerbach and Johnston (1984) state:

> ... it is not uncommon for subjects to cease reporting because no workspace remains to perform that function, or because the subject has simply forgotten to report.
>
> Afflerbach & Johnston 1984:312

Probes may take the form of markers within the text, which prompt subjects to speak at specified intervals (discussed in 3.4.2 above), or they may be verbal probes to elicit talk from subjects who have remained silent for a period of time. However,

> All probes can be considered disruptive to the reading task at hand ... (They may) insure frequency of report, but they may also interfere with the processes being performed.
>
> Ibid

Whilst the students in the present study were monitored to gauge individual progress, this was done without their knowledge, and the writer made no verbal contact with the subjects on a one-to-one basis, in keeping with her rationale to interfere as little as possible with their textual interaction.

3.6 Methods advocated by the Literature to Validate Verbal Reports

The literature suggests two major methods of validating verbal report findings: the first is the collection of secondary data, and the second is the use of control groups.

Secondary data may take the form of summaries of the text (Mann 1982), retellings and multiple choice questions (Block 1986), observations of the subjects during the reading task (Mann 1982), retrospective interviews or reports (Afflerbach & Johnston 1984). Any one — or combination of a number — of these secondary data may be used along with data from concurrent reports as indicators of text processing.

The collection of certain types of secondary data allows for the implementation of the second method of validating verbal reports — the use of control groups. The

literature is divided on the importance of a control group. Black et al (1984) take a strong stance:

> To insure that giving protocols is not distorting subjects' thinking, protocol studies should include a no-protocol control group.
>
> Black et al 1984:295

Afflerbach and Johnston (1984) suggest that control group data may increase our understanding of the effects of the task demands required by verbal reporting, and to what extent these distort the reading process. However, they caution the collection of secondary data when the subjects are forewarned of a post-reading task (discussed under 3.4.2 above), as well as when the subjects are not informed:

> ... if verbal report subjects are aware that they will be accountable for the information in the text, they may, because of stress, have difficulty with the reporting. They may be reluctant to allocate resources to the reporting side of the task. Furthermore, imposing product tests in a deceptive manner may cause greater problems with the validity of such outcome measures, particularly because of subjects' affective reactions.
>
> Afflerbach & Johnston 1984:319

The writer chose not to collect secondary data, and therefore made no use of a no-protocol control group. Research findings in current literature have adequately demonstrated the usefulness of verbal reports in the study of text comprehension (Ericsson 1988; Schmalhofer & Boschert 1988) without the back-up of secondary data or control groups to validate findings.

3.7 The Collection of Data, and Problems Encountered

Data was collected over a period of three days. The first day constituted the pilot study, after which the passage for the case study was selected. Each day, there were

from three to five language laboratory sessions, comprising groups ranging from 20 to 40 students in any one session. Thus, the data collection was potentially enormous — in excess of 250 TOLs. However, in the face of numerous technical hitches, the number of TOLs available for transcription was minimal.

The first day's data was lost through the laboratory operator omitting to switch on a button which allowed each student's voice to be recorded — exclusively — on his/her own tape within each booth. The result was that, as the writer monitored different students during any one session from the controls desk, so those students' voices were being recorded on each and every tape. Thus, every tape was contaminated with data from other students, and not one TOL emerged from that first day without interference from another source. A further unanticipated problem which arose during that critical three-day period allocated for data collection was a constant interruption of the power supply, due to electrical repairs which were underway in close proximity to the language laboratory.

The result of these technical problems was that a considerably smaller volume of recordings were obtained, from which a few were to be randomly selected. The sample size reduced yet again with the discovery that — whilst the tapes played back perfectly in the language laboratory — on a normal hi-fi system they sounded like "gibberish". Apparently the language laboratory is programmed for two channels, and once again the writer had to elicit technical assistance to suppress the one channel so that the recordings were intelligible on any hi-fi system. The result was that each tape had to be recorded onto a secondary tape in the language laboratory, via a filtering cord.

Constraints which further diminished the usable TOLs were access to the language laboratory, and additional demands on time required for the re-recordings. The protocols used in the case study were in fact the first three which were re-recorded.

The above technical problems are clearly idiosyncratic to this particular study, and in no way detract from the TOL technique itself. However, since one of the strengths of case study research is the attention to the complexities of each case,

the writer has recorded every problem which emerged.

Since evaluative case study research requires an in-depth probing and an intense analysis of "an individual unit" (Cohen & Manion 1987:120) — in this case, the judgement of the efficacy of TOLs as a research technique to gauge the nature of ESL reading — the writer felt that the analysis of three TOLs would meet the requirements of the research paradigm. The case study must also be seen in its role as supplementing — and subsidiary to — the critical evaluation of current ESL TOL research, which is the major thrust of this thesis.

3.8 Points of Interest During Data Collection

A number of interesting features emerged during the three-day data collection. One of the writer's concerns was that, since the data was being collected during the students' first exposure to the language laboratory, this could constitute an inhibiting factor on the students' performance. However, far from being intimidated by educational "high-technology", the students seemed generally excited and enthusiastic about their first encounter with the language laboratory equipment. Enthusiasm, in some cases, resulted in the students rewinding their own tapes to listen to the play-back of their recorded voices. The writer had to add a further request, during the instructional phase, that students avoid tampering with their tapes, and try to concentrate fully on the task.

An interesting concept of group dynamics seemed to operate during the three-day data collection period. Whilst the students' response was generally enthusiastic, the writer noticed trends which could be identified as "good groups" and "poor groups". Characteristics of a "good group" would be the tendency to talk during initial interaction with text, a good deal of hand gesticulation, voice intensity, and a continual hum of talk. On the other hand, a "poor group" was characterised by a delayed response to the task, and a greater self-consciousness to speak into the headset microphone. Thus, talk seemed to stimulate talk within the group as a whole, whilst silence bred a general reluctance to speak. The writer wishes to clarify

that "good" and "poor" — used in this description — in no way refer to the quality of individual protocols within any particular group.

A number of external factors appeared to have a bearing on whether the group was talkative, or reticent. The "poor groups" were very often those whose language laboratory sessions were scheduled for the last period after a full morning's lectures. TOLs do make specific demands on concentration, and fatigue could certainly influence students' responses to the task. Another factor which seemed to influence the group's response was the attitude of the writer as she gave the initial instructions. It was found that a light-hearted, warm and friendly approach seemed to break down inhibiting barriers in the face of a somewhat daunting and unfamiliar task. When this was discovered, the writer went to great lengths to implement its control. In some cases, this meant foregoing the individual monitoring of students, and the writer and her colleague engaging in amicable chat between themselves in an effort to decrease the intensity generated by any particular group.

Another interesting feature to emerge during the collection of data was that the majority of the students read aloud. This finding is in accordance with current literature. Ericsson (1988) states:

> ... reading aloud seems to occur spontaneously, or is at least easily evoked when subjects are requested to think aloud while reading.
>
> Ericsson 1988:306

Waern (1988) found that her subjects had difficulty in reading silently and thinking aloud, and she actually instructed the subjects in her study to read aloud. The literature supports the fact that the only difference between oral and silent reading is the speed with which the text is read. Comprehension of the text is the same (Ericsson 1988; Fletcher 1986) and memory for various types of text is the same (Salasoo 1988). Schmalhofer & Boschert (1988) reason that the same cognitive processes are involved since silent reading develops from reading aloud. Ericsson and Simon's studies (1980, 1984) confirm that cognitive processes are the same on a wide range of tasks when subjects are instructed to think aloud.

The fact that the subjects in this study spontaneously read aloud is an interesting corroboration of previous studies. Although the writer would have preferred silent reading as being more in accordance with "natural" textual interaction, the evidence in the literature seems to be conclusive that reading aloud does not distort the cognitive processes under study.

3.9 Summary

This chapter has discussed the writer's case study in terms of describing the subjects and the setting, the text utilised, and the pre-task instructions. She has tried to justify — as far as possible — every methodological decision which informed her data collection with reference to current ESL TOL research, and TOL literature. She has outlined problems which she encountered, and has mentioned points of interest which emerged.

Chapter 4, which follows, deals with the analysis of the data, and the discussion of the results emanating from the analysis.

Chapter 4

Analysis of the Data and Discussion of Results

The focus of this thesis is the critical evaluation of current ESL TOL research, which has been dealt with theoretically in Chapter 2. The writer's case study affords the opportunity of putting the technique into practice to give the writer first hand experience of the problems of TOL studies, and to try to implement suggestions of TOL methodology gained not only from TOL literature, but also from the writer's own critical evaluation of current ESL TOL research. Methodological justification of the case study in terms of current TOL research and issues emanating from the writer's critical evaluation was described in Chapter 3, as well as the problems the writer experienced during data collection.

The analysis of the case study data is the focus of this chapter. The writer has been very critical about ESL TOL analysis and its interpretation (2.4.4), highlighting factors which she considered affected the reliability of results of current ESL TOL studies. In each step of the analysis of her own case study, therefore, she attempts to retain her role of critical, close observer, in an effort to be receptive to weaknesses within the technique itself which emerge from analysing TOL data.

This chapter incorporates four main sections. The first section considers the coding scheme in terms of how it was chosen, and how it was applied to the protocols, highlighting all problems associated with this aspect of TOL analysis. The

following three sections deal with the analysis of the data from three different perspectives. These three analytic perspectives represent the writer's ongoing attempts to discover what in fact TOL data can reveal. To closely observe is a major feature of the case study research paradigm, and in these sections the close observation is focussed on the strengths and weaknesses of different types of protocol analysis. Analysis 1 comprises a tabulated analysis, which is the usual method of quantifying protocol data; Analysis 2 constitutes a graphic analysis of the data, whilst Analysis 3 introduces the concept of analysing underlying processes inferred from the identified strategies, which represents a new approach to the analysis of TOL data. Each of the analyses are critically evaluated in terms of their effectiveness in revealing aspects of the nature of ESL reading interaction, and problems associated with each perspective. The major headings in this chapter are:

4.1 The Coding Scheme Utilised in the Analysis

The coding scheme is discussed under the following sub-headings:

4.1.1 Problems of Selecting a Coding Scheme: a Weakness or Strength of TOLs?

The establishing of the coding scheme glaringly revealed what might be considered as one of the greatest weaknesses in the utilisation of the TOL technique — that no existing coding scheme in TOL literature seems to meet the requirements of particular TOL studies. Each study seems to contain verbalisations which do not readily "fit" a pre-existing coding scheme. This brings to mind Carrell's (1989) reminder of the "highly individualistic nature of readers' application of strategies" (Carrell 1989:122), as well as the inherent intricacy of the reading process which one is trying to "get at", and one wonders at the magnitude of a possible coding scheme which could account for every verbalisation emerging from a wide range of protocol data. One would surely be faced with a similar controversy which surrounded the

identification of the subskills of reading within lengthy taxonomies (Barrett 1968; Munby 1978; Grellet 1982).

However, the writer feels that if one is to place the utilisation of the TOL technique firmly into the research paradigm of case study research, this apparent "weakness" of no single coding scheme actually becomes one of its "strengths". According to case study paradigms, it is necessary to have "some initial conceptual scheme" (Sanders & Pinhey 1983:356), which in this instance is the variety of coding schemes which have emerged in the existing ESL TOL literature. The researcher then analyses the data to ascertain whether "the conceptual scheme can account for what is observed" (Ibid). If there is no fit between the data and the conceptual scheme, the conceptual framework may be inappropriate, which calls for redefining conceptual categories.

The writer intuitively feels that at this early stage of ESL TOL research, it is imperative that the researcher has the flexibility to redefine the conceptual categories of existing coding schemes in order to be alerted to what in fact the TOL data is, or is not revealing.

4.1.2 Establishing the Coding Scheme: Criteria which Informed the Writer's Decisions

The first aspect of the case study data analysis was establishing a coding scheme. This was probably the most difficult stage of the study, and involved many "trials and errors" on the part of the writer. Whilst Sarig's (1987) coding scheme formed the major framework against which to select her categories, she was unable to apply it in its entirety, which is a problem that repeatedly occurs in current ESL TOL research (Anderson 1991) — no single coding scheme seems to meet the requirements of TOL studies (see 4.1.1 above). The writer has continually referred to Sarig's classification throughout the justification of her own coding scheme, as it is probably the most widely recognised and most extensive categorisation scheme to appear in current TOL literature.

Because of the extensive reference to Sarig's coding scheme, the writer will pro-

vide a brief explication of the scheme. Having identified a number of reading strategies, Sarig organised these into four major "moves". "Technical aid moves" involve reading acts such as skimming, scanning, "jumping around", using the glossary; "clarification and simplification moves" categorise various itemised paraphrases, syntactic simplification, or decoding of words; "coherence-detecting moves" incorporate coherence and cohesion detection, and identification of key information; and "monitoring moves" identify active monitoring of text processing, such as identification of misunderstanding, awareness of failures in comprehension, flexibility of reading rate, mistake correction (Sarig 1987:111–113).

Utilising Sarig's categorisation as a useful guide, the writer was informed by four major criteria which emanate from her discussion on the use of TOLs (Chapter 2) and certain theoretical issues in current ESL literature which are of particular interest to the writer (Chapter 1).

1. The overriding consideration was to keep the coding scheme simple and unambiguous, in an attempt to limit researcher inference, and to establish as far as possible a degree of inter-reader agreement of its application.

2. The second criterion was that every utterance in the protocols was to be coded (Afflerbach & Johnston 1984).

3. The third criterion was to facilitate the identification of strategies which were comprehension-promoting and comprehension-deterring (Sarig's terminology) at source. This arose from the writer's desire to assess the TOL technique's ability to identify so-called good reader strategies, which actually militate against comprehension when used inappropriately.

4. The fourth criterion was to attempt to distinguish — in the coding scheme — those strategies associated with bottom-up decoding, and those associated with top-down analysis (Chapter 1). This arose from the desire to ascertain TOLs' ability to distinguish the proportionate time the readers engaged in decoding and analysis. When this information is combined with the identification of whether these strategies aided comprehension or detracted from it (3 above), the writer wished to discover how effectively TOLs could assess the relative contribution of successful/unsuccessful

strategies associated with decoding and analysis.

4.1.3 The Coding Scheme

Detail Interpretations

- PARAPHRASE^{+}
- PARAPHRASE^{-}
- PARAPHRASE UNCLEAR
- QUESTION ITEMS^{-} (expressions of misunderstanding)

Macro Interpretations

- QUESTION ITEMS^{+} (expressions of understanding)
- COHERENCE-DETECTION^{+} (subject identifies key information; formulates accurate hypothesis of text meaning utilising current text and background knowledge, or current text and prior text; accurate identification of cohesion devices to "get at" meaning)
- COHERENCE-DETECTION^{-} (subject formulates new idea which cannot be substantiated by the text — constructs an incorrect hypothesis)
- COHERENCE-DETECTION UNCLEAR (subject seems to be constructing an hypothesis, but verbalisation is not clear enough to ascertain the meaning of his/her hypothesis)
- EVALUATION (using general knowledge and associations, subject evaluates veracity of his/her hypothesis, or questions the veracity of the text content)
- EXTRAPOLATION (subject extends, clarifies, questions content beyond the text itself; evidence of the use of background knowledge to impose own interpretation of text content)

Neutral Responses

- REPRODUCTION^{+} (subject repeats a word, or rereads a chunk of text verbatim)
- REPRODUCTION^{-} (subject reproduces a portion of text, but with slight modifications)
- STUMBLE (subject stumbles over a word)
- SUBJECTIVE REACTION (subject expresses personal feelings about task and self)

4.1.4 Justification of the Coding Scheme in terms of Models of Reading, Current TOL Research, and Protocol Data

Because of the writer's interest in evaluating TOLs as a means of identifying the reader's use of strategies associated with bottom-up decoding and top-down analysis, she attempted to distinguish between these types of strategies in her coding scheme. Similar distinctions have been made in current ESL TOL literature, to which the writer refers throughout the justification of her own coding scheme. She is essentially utilising an amalgamation of conceptual frameworks from current literature, and exploring how these "work" within her own case study.

In an attempt to differentiate between strategies associated with bottom-up decoding and top-down analysis, the coding scheme was divided into three major classifications: detail interpretations, macro interpretations, and neutral responses. The categories of "detail" and "macro interpretations" are taken from Scardemalia and Bereiter's (1984) study, and seem to correspond to Block's (1986) overriding categories of "local" and "general" strategies. Each of the major categories are discussed below, with examples of how they have been applied to the protocol data.

4.1.4.1 Detail Interpretations

"Detail interpretations" was used to classify those strategies which signified textual interaction at the word and sentence level, which the writer judged as being in-

dicative of bottom-up decoding. The only bottom-up decoding strategies to emerge from the protocols were various paraphrases, and what the writer termed "QUESTION ITEMS$^-$", which identified the subject's misunderstanding of particular items of text content.

Paraphrase is incorporated within Sarig's "clarification and simplification moves" which details various types of paraphrase. However, in accordance with the writer's criterion to keep the coding scheme simple, she chose to use the overriding term to account for all types of paraphrasing. A deviation from Sarig's taxonomy — but in accordance with Scardemalia and Bereiter's (1984) classification — is the inclusion of "QUESTION ITEMS$^-$" within detail interpretations. Sarig classifies "identification of misunderstanding" as a "monitoring move", but since all examples of this strategy to emerge from the present study pertained to questioning specific vocabulary items, e.g. "... what is a euthanasia?" (Protocol 3:8), the writer justified its inclusion within bottom-up decoding strategies.

To comply with the writer's desire to code the responses as comprehension-deterring or comprehension-promoting at source (see 4.1.2, Criteria which Informed the Writer's Decisions:3), she further distinguished "paraphrase" as "+" which indicated an accurate, or reasonably accurate paraphrase e.g. "... the enthanasia professional in Holland, which means ... he may ... may be he was ... he specialised in enthanasia ..." (Protocol 1:6); "$^-$" which identified an inaccurate paraphrase e.g. "... and he can usually said that ... if a patient can die, he usually says that he is satisfied because he has done her best in order to survive that patient ..." (Protocol 1:15), and "unclear" when the paraphrase lacked sufficient clarity to judge it as either accurate or inaccurate e.g. "Mostly he treated his patients who have suffered" (Protocol 1:12). "PARAPHRASE$^+$" was considered to be a comprehension-promoting strategy, whilst "PARAPHRASE$^-$" and "QUESTION ITEMS$^-$" were considered comprehension-deterring. "PARAPHRASE UNCLEAR" belonged to an area of uncertainty, which defied accurate categorisation as comprehension-promoting or comprehension-deterring.

4.1.4.2 Macro Interpretations

"Macro interpretations" was the overriding category to describe strategies associated with top-down analysis, and corresponds to Sarig's "coherence-detecting moves". Included under "macro interpretations" is "QUESTION ITEMS$^+$" which signified expressions of understanding the text content. Practically all responses coded as "QUESTION ITEMS$^+$" were coded in conjunction with some other comprehension-promoting strategy such as "PARAPHRASE$^+$", "EVALUATION" and "COHERENCE-DETECTION$^+$". Examples of this duplicate coding follow:

Protocol 3:5 "Oh — he is a doctor"
QUESTION ITEMS$^+$
COHERENCE-DETECTION$^+$

Protocol 3:21 "Oh. Sometimes doctors kill people?"
QUESTION ITEMS$^+$
EVALUATION

Protocol 3:23 "Oh. This woman was totally suffering from this pain and then ... Dr. Admiraal killed her."
PARAPHRASE$^+$
QUESTION ITEMS$^+$

"Okay" (Protocol 3:35) was the only "QUESTION ITEMS$^+$" response with a single coding. Sarig classifies these responses as "monitoring moves", but because they were closely linked to the identification of the ongoing discourse thread, and were all comprehension-promoting, whilst Sarig's "monitoring moves" actually include strategies which could be judged as comprehension-deterring (such as "desertion of a "hopeless" segment of text") the writer felt that the code "QUESTION ITEMS$^+$" falling under the category of macro interpretations was more appropriate for this analysis.

The writer utilised "COHERENCE-DETECTION$^+$" to code any response which indicated that the subject was forming an accurate hypothesis of the text content. This included the recognition of key information e.g."So this killing is euthanasia, and it's discovered by Dr. Admiraal, a Dutch doctor" (Protocol 3:38); and the detection

of cohesive links e.g. "Those patients ... dying patients" (Protocol 3:18) and "A pioneer of what?" (Protocol 3:3).

A response was coded "COHERENCE-DETECTION$^-$" when a subject formulated a new idea which could not be substantiated by the text, in other words, an incorrect hypothesis e.g. "And ... death in most of the Dutch was a common thing because of that ... of that disease" (Protocol 1:23).

"COHERENCE-DETECTION UNCLEAR" was used only once in the protocols to code a response which seemed to indicate that the subject was constructing some sort of an hypothesis from the textual information, or identifying key information, but there was no means of gauging what the subject meant from the verbalisation. The response coded as "COHERENCE-DETECTION UNCLEAR" was "Mmm. A chronic doctor." (Protocol 3:14).

The code "EVALUATION" indicated a response where there was evidence that the subject was either evaluating the veracity of his/her hypothesis, or questioning the veracity of the text content in terms of his/her previously acquired background knowledge e.g."Sad and satisfied?" (Protocol 3:16); "Oh. Sometimes doctors kill people?" (Protocol 3:21). These responses seemed to suggest that the subject was conscious of an inconsistency between the text content and her background knowledge, or the text and the subject's ongoing hypothesis of its meaning. "EVALUATION" was also used to code a response which suggested that the subject was evaluating, justifying, or analysing the information contained within the text e.g. "That is better. Because if you are still suffering and you are hopeless and that pain — there is no other way just the pain to be taken off, and then you can die a painless death" (Protocol 3:40).

When there was evidence that the subject was extending, clarifying, or questioning the text content beyond the text itself, this was coded "EXTRAPOLATION". "EXTRAPOLATION" indicated the subject's interaction with background knowledge and text content to impose her own interpretation onto the text, an interpretation which was not implicit in the text itself. Examples of this are: having ascertained that Dr. Admiraal killed his patient, the subject extended the information to ask

"And the law?" (Protocol 3:24); and having rationalised the advantages of a painless death for a terminally ill patient, the subject extended her rationalisation to remark: "But what makes me think more is that people are not animals"; (Protocol 3:24) "You can kill an animal when he is suffering but it is differ from a human being" (Protocol 3:42).

The terms evaluation and extrapolation both come from Lanham's (1987) description of skills in reading, and are associated with what he calls higher order reading skills.

Under macro interpretations, the comprehension-promoting strategies were "QUESTION ITEMS^{+}", "COHERENCE-DETECTION^{+}", "EVALUATION" and "EXTRAPOLATION", whilst "COHERENCE-DETECTION^{-}" was considered comprehension-deterring. "COHERENCE-DETECTION UNCLEAR" could not be labelled as either comprehension-promoting or comprehension-deterring because of the lack of clarity of the meaning of the subject's response.

4.1.4.3 Neutral Responses

The third major category was classified as "neutral responses" because the verbalisations could not be identified by the writer as responses associated with bottom-up decoding/top-down analysis, or responses which were indicative of comprehension-promoting/deterring strategies. Included under "neutral responses" was "reproduction". A response was coded "REPRODUCTION^{+}" when the subject read the text verbatim e.g. "The Dutch medical profession regards Dr. Pieter Admiraal as a pioneer" (Protocol 3:1); read a chunk of text e.g. "In a country with a population" (Protocol 2:12); or repeated a word or phrase from the text e.g. "Illegal." (Protocol 3:26); "A block of flats." (Protocol 3:10). Whilst these responses could well have indicated the identification of key information, the writer was cautious not to infer too much from the data, in accordance with her criterion of establishing a degree of inter-reader agreement through unambiguous coding. However, when it was apparent that the repeat of a word or phrase represented more than a "neutral response", the writer double-coded the response, and justified the double-coding as follows:

Protocol 3:16 "Sad and satisfied?"

REPRODUCTION^{+}

EVALUATION

In this case, the distinct questioning of the subject's verbal response justified the code "EVALUATION";

Protocol 3:30 "... voluntarily ..."

REPRODUCTION^{+}

COHERENCE-DETECTION^{+}

Seen in the context of the protocol, the repeat of the crucial word "voluntarily" immediately preceded the subject's accurate paraphrase of euthanasia as voluntary death, and therefore justified the inference that this indicated the recognition of key information in the subject's ongoing hypothesis.

"REPRODUCTION^{-}" indicated the reading or repeating of a portion of text, but with slight modifications e.g. "He established radical methods of treating the dying and the ending of suffering" (Protocol 1:3).

The writer felt that because the subject was reading the text — verbatim, or with modifications — to infer that the text was being comprehended, or not comprehended, was to make unsubstantiated assumptions. "REPRODUCTION^{+}" and "$^{-}$" could therefore not be classified as comprehension-deterring or comprehension-promoting responses.

"STUMBLE" was also categorised as a neutral response, since stumbling over text could occur as "normal" textual interaction during reading, or could indicate difficulties with vocabulary. Examples from the protocols of responses coded as "STUMBLE" are: "... water ... watercolourist's ..." (Protocol 1:8) and "As Dr. Admiraal was an ... anae ... anaesth ..." (Protocol 1:11). Whilst it is very likely that these responses were indicative of vocabulary difficulties the writer felt that to judge them as such would be to make unsubstantiated assumptions about what might possibly have been natural reading hesitancy.

There was evidence in protocol 2 that the subject was responding subjectively, or expressing personal feelings about the task or herself. These responses were coded

"SUBJECTIVE REACTION" e.g. "When I'm reading this passage, my mind is thinking about the test I have recently written now" (Protocol 2:19). Whilst the "SUBJECTIVE REACTIONS" have a value in the assessment of the subject's motivation to the task, and how it affected performance, this type of analysis is outside the scope of this particular case study. The writer felt that these responses were not an integral part of the subject's strategic interaction with the text; they were almost indicative of metacognitive comments of the subject's own feelings, or reactions to the task, which are not under consideration in this study.

4.1.5 Problems which Emerged from Coding the Protocols

Various problems emerged from coding the protocols which arise from certain weaknesses within the coding scheme itself. The writer alluded to these weaknesses in her description of the various coding categories (4.1.4), but will summarise them briefly below.

Certain responses could not neatly fit into a single coding category, which necessitated dual coding — an "either/or" judgement on the part of the researcher. Similarly, the category of "reproduction" could indicate the simple response of rereading the text, or the identification of key information by repetition; and "STUMBLE" could either be interpreted as indicative of vocabulary uncertainty, or "normal" reading hesitancy.

The above discrepancies in the application of the coding scheme to the protocols alerts the writer to current TOL research, which has little or nothing to report on difficulties of applying coding schemes to data. At best, the reader is given one example from the protocols to illustrate a particular coding category which aptly identifies the verbalisation. The verbalisations which defy unambiguous coding — and there surely must be examples of these in every TOL study — are never brought to the reader's attention.

The second weakness within the writer's coding scheme is the category of "neutral responses". The writer is doubtful as to the extent one can identify "neutral responses" as reading strategies. However, they were responses which occurred dur-

ing textual interaction, and as such, required coding, in keeping with the writer's criterion to code all verbalisations.

Each protocol was coded in accordance with the coding scheme, and appear at Appendix 2. To facilitate the reader's assessment of the application of the coding scheme, Appendix 3 contains all responses from the protocols categorised according to the different codes. The writer feels that the inclusion of coded protocols in the appendix is a vital aspect of TOL research and she has been very critical of studies which fail to do so (2.3.4). Accessibility to the coded data allows the reader to ratify or otherwise any researcher's application of his/her coding scheme to the protocol data.

The accessibility of the data is one of the prerequisites of case study research. The data should "form an archive of descriptive material sufficiently rich to admit subsequent reinterpretation" (Cohen & Manion 1987:146). It is this very accessibility which "allow(s) the reader to judge the implications of a study for himself" (Ibid).

4.2 Analysis 1: The Identification of Reading Strategies, and the Contribution of these Strategies to Comprehension Success/Failure

The identification of reading strategies and the contribution of these identified strategies to comprehension success or failure is the focus of much of the current ESL TOL research (Block 1986; Hosenfeld 1984; Sarig 1987. See Chapter 2). The purpose of Analysis 1, therefore, is to conduct an analysis of the writer's own case study along similar lines, in an attempt to highlight the problems associated with analyses of this type. The primary objective is to ascertain how effectively the writer's own TOL data answers the following questions, utilising a tabulated analysis of the data:

- What are TOLs able to reveal about the reading strategies these ESL subjects used during their textual interaction?

- To what extent did these identified strategies contribute to comprehension success or failure?

The analysis is dealt with under the following sub-headings:

4.2.1. Tabulating the Data

4.2.2. Results of Analysis 1

4.2.3. Conclusions Drawn from Analysis 1

4.2.4. Critical Evaluation of Analysis 1, and the Implications for Current ESL TOL Research

4.2.1 Tabulating the Data

Utilising Sarig's analysis as a guideline, the writer drew up a similar table (shown at Appendix 4), reflecting the frequency of strategy usage — per protocol — associated with detail interpretations and macro interpretations, as well as the frequency of responses identified as neutral responses. Each strategy under detail interpretations and macro interpretations was classified as either comprehension-promoting (C-P) or comprehension-deterring (C-D). Those strategies which could not be judged as contributing to comprehension or lack of comprehension — including the neutral responses — were identified by "*X*".

Utilising the information from Table 1, Table 2 (below) was drawn up to identify the percentage use of detail interpretations and macro interpretations across all three protocols; the percentage of each of these major categories which contributed to comprehension success or failure, and the percentage of these categories which could not be judged as either.

Table 2

Frequency of use of detail interpretations and macro interpretations, and contribution of strategy type to comprehension success or failure.

		C-P	C-D	Unclear
Detail Interpretations	51%	35%	39%	26%
Macro Interpretations	49%	53%	45%	2%

4.2.2 Results of Analysis 1

The results emanating from this tabulated analysis seem to indicate that the subjects engaged in bottom-up decoding strategies for just over half of their reported textual interaction. 39% of their decoding strategies seemed to deter comprehension, whilst 35% contributed towards successful comprehension. 26% of the bottom-up decoding strategies could not be judged as contributing towards comprehension success or failure.

Similarly, the table indicates that top-down analysis accounted for 49% of their top-down/bottom-up strategies. 53% of these top-down strategies were associated with successful comprehension, whilst 45% seemed to contribute towards comprehension breakdowns. 2% of the top-down strategies could not be attributed to comprehension success or failure.

4.2.3 Conclusions Drawn from Analysis 1

To what extent have the two research questions posed been answered by this analysis? The writer will consider each question, and attempt to supply answers to them, as indicated by the analysis:

1. What are TOLs able to reveal about the reading strategies these ESL readers used during their textual interaction?

   - the subjects seemed to engage equally in bottom-up and top-down analysis during their textual interaction.

2. To what extent did these identified strategies contribute to comprehension success or failure?

   - top-down strategies contributed almost equally to comprehension success and comprehension breakdown, but there was a slightly higher incidence of top-down strategies which contributed to successful comprehension (8%), than those which contributed to comprehension failure;
   - bottom-up strategies contributed almost equally to comprehension success and comprehension breakdown, but there was a slightly higher incidence of failure than success at the word and sentence level (4%).

Given these observations, one could be tempted to conclude from this study that these ESL students' interaction with text indicates — equally — a problem of bottom-up decoding and top-down analysis. The caveats of such a conclusion is discussed below.

4.2.4 Critical Evaluation of Analysis 1, and the Implications for Current ESL TOL Research

The writer is very wary of any claims emanating from an analysis such as this, and the graphic analysis (Analysis 2, which follows) corroborates the problems of quantifying protocol data from a small sample. Quantifying and tabling the data gives to any study a degree of acceptability, which the writer feels is unjustified in a small study. The major problem with this approach to protocol data is that one is decontextualising the responses — removing the individually coded responses from each protocol, and amalgamating them into tables which allow accessibility for analysis. The writer feels, however, that the process of quantification may misrepresent the data, lose potentially valuable information, and encourage any researcher to draw rash conclusions from the data which are unsubstantiated. In other words, tabular quantification may gain accessibility at the expense of validity.

The above analysis demonstrates that conclusions based on small protocol samples should be treated with caution, as one runs the risk of "far-reaching interpre-

tations of strategic activity (which) may be too hastily drawn" (Garner 1987:69). This finding throws doubt on current ESL TOL research which utilises small samples. Sarig (1987) utilises 10 subjects in her study, which she calls a "qualitative" study, presumably on the grounds of her small sample. However, one aspect of her study which focused on "the group perspective" (Sarig 1987:114) involved quantifying and tabulating the data, and in this analysis, she found that her readers tackled high level reading tasks in both Hebrew (the subjects' L1) and English (their L2) in a similar manner — "the same factors explain(ed) success and failure to almost the same extent" (Sarig 1987:115). She concludes from this quantified data from her "group" of 10 subjects, that reading processes appear to transfer from the L1 to the L2.

Block (1986) compared the strategies utilised by 6 nonproficient ESL readers with those utilised by 3 native speakers of English who were designated "nonproficient readers" (Block 1986:467) during interaction with textbook material. Her findings are therefore based on a comparison of 6 ESL subjects with 3 native speakers, and on these sample sizes, she distinguishes two groups of readers: "integrators" and "nonintegrators". Of her 3 identified integrators, 1 subject did not conform to the integrator "patterns", and of the 6 nonintegrators, one subject straddled Block's integrator/nonintegrator distinction. This lack of conformity of two subjects within a small sample reduces the credibility of Block's "two consistent and distinctive patterns of strategy use" (Block 1986:482).

The largest samples (of which the writer is aware) used in ESL TOL studies are Sarig's (1987) "quantitative" TOL study of 130 subjects, and Anderson's (1991) use of a sample of 28 subjects. In the light of the above discussions, the writer feels the need for input from statisticians to determine the size of a sample which could be considered large enough for reliable quantification.

4.3 Analysis 2: Plotting Reading Strategies onto Graphs

This analysis incorporates the following sub-sections:

4.3.1. Rationale Behind the Utilisation of Graphs

4.3.2. Differences Between a Tabulated and Graphic Analysis of Data

4.3.3. Analysis of Strategies/Responses Across Protocols

4.3.4. Analysis of Strategies/Responses Within Individual Protocols

4.3.5. Critical Evaluation of Analysis 2

4.3.6. Summary, and Conclusions from Analyses 1 and 2

4.3.1 Rationale Behind the Utilisation of Graphs

This analysis emanated from Afflerbach and Johnston's (1984) suggestion to incorporate TOL data into flow charts:

> One possible way of analyzing the complexities that can be encountered in verbal report protocols is to develop flow charts of reported strategies.
>
> Afflerbach & Johnston 1984:317

Adapting this concept of flow charts, the writer plotted the coded responses from each protocol onto a graph (Appendix 5). The comprehension-deterring strategies associated with detail interpretations, followed by comprehension-deterring strategies associated with macro interpretations, were placed at the bottom of the Y axis. Neutral responses were located centrally, as well as the "unclear" verbalisations which could not be judged as comprehension-deterring or comprehension-promoting. Comprehension-promoting strategies associated with detail interpretations, followed by those associated with macro interpretations, were located at the top end of the Y axis.

The grouping of strategies as comprehension-promoting, comprehension-deterring, and neutral responses along the Y axis enables the immediate identification of each

subject's use of strategies which assist in comprehension, or impede it. The arrangement of strategies within each category (with strategies associated with bottom-up decoding placed nearer the central position, and strategies associated with top-down analysis located towards the top and bottom parameters) facilitates the identification of each subject's use of lower level decoding strategies, and higher order analysis strategies.

4.3.2 Differences between a Tabulated and Graphic Analysis of Data

Whilst these graphs graphically represent the same information as contained in the tables, they allow for an analysis from a different perspective, which brings to light the shortcomings of a quantitative, tabulated analysis. Graphs essentially locate strategies/responses within their context, and place emphasis on the individual's personal reading style. These are discussed below.

a) Decontextualising vs. Contextualising Protocol Data

A tabulated analysis decontextualises strategies or responses from the individual protocols, whilst a graphic analysis places each strategy or response within the context of the individual's protocol. A graph has the advantage of displaying each subject's responses sequentially, as they occur in the protocols.

b) Graphs Emphasise Personal Reading Strategies/Responses

Sarig highlights the importance of "personal reading strategies" (Sarig 1987:118) saying that

> ... a most important feature of the nature of the reading process ... was found to be its high degree of individuality.
>
> Ibid.

Graphs afford the reader a diagrammatic representation of the individual's reading responses/strategies, which allows for analysis of the individual's reading style, as well as a comparison of reading styles across individuals.

With the above in mind, the information from the graphs will be analysed from two perspectives: analysis of strategies/responses across protocols, and analysis of strategies/responses within individual protocols.

4.3.3 Analysis of Strategies/Responses Across Protocols

The graphs clearly indicate that the majority of comprehension-promoting strategies occurred within one protocol — protocol 3. And all but two of the comprehension-promoting strategies associated with top-down analysis were contained within the same protocol — protocol 3. This high incidence of strategy type within one protocol has the effect of unrealistically loading the responses, in a tabulated representation, to give the impression that the subjects engaged almost equally in comprehension-deterring and comprehension-promoting macro interpretations. Similarly, two of the protocols — protocols 1 and 2 — contain all but two of the comprehension-deterring strategies, and the same protocols contain every comprehension-deterring strategy associated with top-down analysis.

An analysis of strategies/responses across protocols — aided by a graphic representation — enables the reader to see at a glance the differences in reading styles across protocols. Whilst quantitative, tabulated data presents one picture of protocol analysis, it is not the total picture, and as such can be misleading, resulting in researcher inferences which are unjustified.

4.3.4 Analysis of Strategies/Responses Within Individual Protocols

This type of analysis considers the patterns of strategies and responses of each subject, by analysing the graphs independently. An assessment of each graph follows.

- **Protocol 1**

  The graph indicates that the only comprehension-promoting strategy which this subject utilised was paraphrasing (PARAPHRASE$^+$), which suggests that

she interacted successfully only at the sentence and word level. She questioned word meanings (QUESTION ITEMS$^-$), and failed to accurately paraphrase (PARAPHRASE$^-$). The majority of her responses which led to comprehension breakdown was the constructing of incorrect hypotheses, or new ideas which were not supported by information contained within the text (COHERENCE-DETECTION$^-$).

A number of her paraphrases were judged "unclear" (PARAPHRASE UNCLEAR) which increased the incidence of overall neutral responses, thus lowering the percentage of strategies coded as comprehension-deterring and comprehension-promoting. Once again, this questions the validity of findings from the tabulated data.

- **Protocol 2**

  The graph of protocol 2 indicates that the subject interacted effectively at the sentence level by paraphrasing correctly (PARAPHRASE$^+$); she also failed to paraphrase correctly (PARAPHRASE$^-$) on one occasion, and verbalised problems with vocabulary and understanding of the text (QUESTION ITEMS$^-$). What is surprising from the graphic analysis is that she demonstrates detection of coherence on two occasions (COHERENCE-DETECTION$^+$), making accurate links within the text, yet the majority of her coherence-detecting strategies are comprehension-deterring (COHERENCE-DETECTION$^-$), indicating that she is constructing new ideas unsubstantiated by the text. Equally confusing are the many oscillations between accuracy in decoding or analysis, to inaccuracy in decoding or analysis. This will be pursued in the critical evaluation, which follows this analysis.

- **Protocol 3**

  The graph indicates that the majority of this subject's responses consisted of accurate top-down analysis, interspersed with reading the text aloud (REPRODUCTION$^+$). Her comprehension-promoting strategies indicate a small proportion of accurate decoding (PARAPHRASE$^+$), and a far greater number of expressions of under-

standing (QUESTION ITEMS$^+$), and identification of key information (COHERENCE-DETECTION$^+$). The subject engaged in higher order reading strategies, evaluating the veracity of her hypotheses, or questioning the veracity of the text content (EVALUATION) and even extended the textual information beyond the text itself (EXTRAPOLATION).

The graph demonstrates competent interaction with the text, and a high incidence of accurate top-down analysis. What is surprising is the two expressions of misunderstanding at the decoding level (QUESTION ITEMS$^-$), in the light of such competent textual interaction. This type of question cannot be addressed in an analysis such as this; it requires a further in-depth look at the individual protocols, which is addressed in the third analysis.

4.3.5 Critical Evaluation of Analysis 2

Plotting the protocol responses onto graphs extends the tabulated data to an assessment of strategies and responses across protocols, and within individual protocols. This effectively places the focus of TOL analysis onto the individual subject's use of strategies, which corroborates what the writer feels to be the most significant finding to emerge from Sarig's (1987) study. In her assessment of "individual reading styles" (Sarig 1987:116) which focuses on "the reader" as opposed to "the group" (Ibid), Sarig found that reading processes are highly individualised — each reader was characterised by her own combination of reading strategies, rather than by an occurrence of certain moves.

This emphasis on the individual's personal reading style which is captured by a graphic analysis highlights the potential pitfalls of a purely quantitative analysis. The graphic analysis clearly demonstrated how a high incidence of strategy usage in one protocol could "load" the usage of that strategy type in a quantified analysis, misrepresenting the results, and encouraging researcher inferences which are unjustified. This loading of strategies was very evident in the writer's case study, and adds weight to Carrell's (1989) reservations about findings from TOL case studies on the grounds of the "highly individualistic nature of readers' application of strategies"

(Carrell 1989:122).

4.3.6 Summary, and Conclusions from Analyses 1 and 2

The findings from Analyses 1 and 2 are summarised below. Some conclusions which can be drawn from the analyses corroborate other ESL TOL research findings, whilst other conclusions contribute to the broader critical evaluation of TOL research findings.

1. The finding which supports current ESL TOL research is that similar strategies were used by all three subjects — whether the strategies promoted or deterred comprehension. This is in keeping with Sarig (1987) who states that "the same factors explain success and failure to almost the same extent" (Sarig 1987:115); and with Anderson (1991) who found that "no single set of processing strategies" (Anderson 1991:16) contributed to comprehension success or failure.

2. A second finding to emerge from the analyses is that whilst the strategies utilised by the subjects were similar, the incidence of the use — and lack of use — of certain strategies which deterred or promoted comprehension varied considerably across the different protocols. This supports Sarig's (1987) findings of the "high degree of individuality" (Sarig 1987:118) of the reading process.

3. A direct result of the "highly individualistic nature of readers' application of strategies" (Carrell 1989:122) was the misrepresentation of results in the quantified, tabulated analysis. The writer has therefore suggested that this means of analysing TOL data is inappropriate for use in small TOL case studies. These findings throw doubt on conclusions which have emerged from current TOL research utilising quantified, tabulated data of small TOL samples. In the light of these discussions, the writer feels the need for input from statisticians to determine the size of the sample required for reliable quantification of TOL data.

The analyses thus far have contributed little to promote TOLs as an effective means of gauging the nature of ESL reading. The writer feels that the problem with both analyses — which is a problem of the focus of current ESL TOL research — is the exclusive concentration on strategy/response type, incidence of strat-

egy/response, and whether a specific strategy is judged comprehension-promoting or comprehension-deterring. She suggests that this information is only one part of the total picture which might be obtained from TOL studies.

The third analysis, which follows, attempts to take the TOL data one step further, in an attempt to establish the TOL's validity as an effective research technique to gauge the nature of ESL reading, and the causes of ESL reading problems.

4.4 Analysis 3: Analysing the Data from the Perspective of Underlying Processes Inferred from Reading Strategies

The third analysis of the protocols is dealt with as follows:

4.4.1 Rationale Behind Analysis 3, and Justification of Approach to TOL Data

This analytic perspective introduces a new approach to TOL analysis. It represents an attempt by the writer to ascertain whether TOLs can reveal anything more about the nature of reading than the identification of strategies which promote or deter comprehension. It is an attempt to assess to what extent TOLs might reveal the possible causes of comprehension problems as and when they occur during textual interaction.

This analytic perspective is supported by Aslanian's (1985) study. He describes a technique for determining reading difficulties of ESL students whereby the students supply missing words from a passage. In a follow-up interview, Aslanian discusses with each student his/her choice of words, and the reasons for inserting the chosen word. Aslanian concludes that this method more accurately reflects what is going on in the mind of the reader, "how the reader has arrived at certain decisions" (Aslanian 1985:21), and "what it is that the reader has or has not gained from the reading" (Ibid) than in more standardised comprehension measures. Aslanian found that "conversation" (via interviews) whereby the students could "express what they have read and understood ... finally reveals the truth" (Ibid:26). Whilst verbalisations emanating from TOLs do not constitute "conversation", the purpose of analysis 3 is to discover to what extent TOLs may reveal similar "truths" about

a subject's interaction with text.

If one uses the product/process distinction (Alderson & Urquhart 1984) as two separate and distinct approaches to reading research, current TOL research would be categorised as focussing on process. The writer suggests that this concentration on process might limit the potential of TOLs. In her attempt to evaluate all aspects of the technique, the writer — in this third analysis — seeks to extend the TOL data beyond the identification of strategies/responses which promote/deter comprehension, to a consideration of the reading processes which must be inferred from identified strategies, in an attempt to ascertain why the reader was successful/unsuccessful. This perspective changes the focus of TOL analysis from merely identifying reading strategies, to inferring underlying processes from those strategies, in an attempt to ascertain whether TOLs could perhaps reveal the causes of comprehension success/failure.

Inferring processes from strategies involves an assessment of the strategy used at a specific point in the text, in conjunction with an in-depth examination of the reader's comprehension outcome at that specific moment of textual interaction. This emphasis on the subject's interpretation of the text extends TOL research beyond a consideration of the process of reading in terms of strategies employed, into the realm of investigating product alongside strategies, in an effort to discover why the reader is successful or unsuccessful.

The writer wishes to use the term "product of reading" not only to refer to the total comprehension outcome, but also to include an assessment of the reader's ongoing comprehension outcome at any one point in the text.

In the light of the above, two overriding questions need to be addressed in an analysis such as this. Firstly, did the subject successfully comprehend the text? This considers the subject's total comprehension outcome. Secondly, how/why was the comprehension outcome successful/unsuccessful? This considers the subject's ongoing comprehension outcome, along with the strategy used, in order to infer the reading process responsible for comprehension success/breakdown. Further questions emanate from these two fundamental issues as follows:

A. If the answer to the first question is "yes" (i.e. the subject's comprehension outcome was successful):

   - how has the subject arrived at his/her successful interpretation?
   - what has aided or assisted the successful comprehension?
   - were there any emerging patterns of strategy use which facilitated the overall successful comprehension outcome? In Sarig's terminology, was there evidence of a "personal reading style" (Sarig 1987:118)?
   - if the subject employed comprehension-deterring strategies in his/her protocol, to what extent could an explanation be offered as to why they did not constitute a breakdown in overall comprehension?

B. If the answer to the first question is "no" (i.e. the subject's comprehension outcome was unsuccessful):

   - where did the breakdowns in comprehension occur?
   - what caused the breakdown in comprehension at a specific point in the text?
   - if the subject employed comprehension-promoting strategies in his/her protocol, to what extent could an explanation be offered as to why these did not affect the overall breakdown in comprehension?

This analysis tries to determine whether TOLs can reveal the possible reasons behind a comprehension breakdown, and reasons for successful comprehension. It attempts to go beyond strategies which promote or deter comprehension, to identify the causes of the two possible outcomes. To what extent TOL data is able to establish these causes is addressed in this analysis.

The three protocols were reconsidered in the light of reading processes inferred from the identified strategies, and appear at Appendix 6. Because this type of analysis relies heavily on researcher inference, which is one of the major criticisms levied against TOL research, the writer has included a section headed "writer's comment", when she felt it was necessary to substantiate or justify an inferred process. Once

again, the inclusion of the coded protocol data fulfils the requirements of the case study research paradigm: that of making available all descriptive material. Because this analysis represents a new approach to TOL data, it becomes even more imperative to present all relevant data for scrutiny, to allow the reader to judge the implications and inferences for himself/herself.

The analysis of the protocols follows.

4.4.2 Application of Overriding Research Questions to Protocols

The two overriding questions were applied to the protocols as a framework for this analysis, in an attempt to discover what — if anything — TOLs can reveal about comprehension success, and comprehension breakdown. The first question considers whether the technique is able to determine whether the subjects successfully comprehended the text, and the second considers whether the technique is able to reveal why/how the comprehension outcome was successful/unsuccessful.

In terms of the first question, there was adequate evidence from the TOL data that the subject of protocol 3 successfully comprehended the text, whilst the subjects of protocols 1 and 2 were unsuccessful. All three subjects lacked the crucial content schemata (cited in ESL reading literature as a possible cause of comprehension breakdown; see 1.4.1) to understand the term euthanasia, but whilst protocol 3 managed to arrive at an accurate interpretation of the word, the other two failed to derive an appropriate meaning from the text. Protocols 1 and 2 will therefore be analysed together as unsuccessful textual interaction, whilst protocol 3 will be considered on its own as successful textual interaction.

4.4.3 Why/How were the Comprehension Outcomes of Protocols 1 and 2 Unsuccessful?

In order to attempt to answer why the subjects were unable to successfully comprehend the text, it is first necessary to establish what in fact they did comprehend

from their textual interaction — the concepts contained within their hypotheses, and from where these concepts originated. Once these have been established, the writer will consider how the subjects appeared to maintain their inaccurate hypotheses in the face of contradictory textual evidence.

Other issues which are addressed in this analysis are evidence of decoding difficulties, and the subjects' use of comprehension-promoting strategies in the light of overall comprehension breakdowns. Because the same protocol data is analysed from different perspectives — each perspective highlighting a different aspect of the subjects' unsuccessful reading interaction, but drawing from the same coded processes — duplication and repetition of material is unavoidable for the maintenance of clarity within each discussion.

4.4.3.1 Origins of, and Concepts Contained Within, Hypotheses

Both subjects were unable to interact with the semantic, syntactic and lexical clues in the text to formulate an accurate meaning representation of the word "euthanasia". There is evidence in protocol 1 that the subject formulated a premature hypothesis; before she had arrived at any clues in the text which might have aided her interpretation of euthanasia, she made the assumption that euthanasia is a disease, which Dr. Admiraal treats (Protocol 1:10,11,12). In accordance with this hypothesis, she interprets his method of treatment as having a team of doctors, nurses and priests to instil faith of survival into the patient (Protocol 1:27–31).

The analysis of protocol 2 reveals that the subject makes the assumption that Dr. Admiraal cures people by using "certain injections" (Protocol 2:4). The cause of this inaccurate hypothesis has been labelled "*Inappropriate Accessing of Schemata*" because the writer feels that it arises from some overriding background knowledge concept of doctors curing, and using injections to cure, which she forces onto the text despite textual evidence which refutes this.

Having questioned the meaning of euthanasia, the subject resolves her conflict — and completes her hypothesis — by interpreting euthanasia as an "unknown disease" (Protocol 2:13) which Dr. Admiraal had established a method of treating (Protocol

2:14). It is interesting to note that the subject links euthanasia to death: "... the result this disease has caused many people to be the victim of death" (Protocol 2:13); "Although he killed those person or those people ..." (Protocol 2:16). However, her overriding hypothesis of Dr. Admiraal in his capacity of curing seems to block out the inconsistency of Dr. Admiraal killing.

A factor which emerges from this discussion of the origins of the hypotheses is the "thin line" which divides the reasons for the initial formulation of the inaccurate hypotheses in the two protocols: protocol 1 seems to be a clear indication of the formulation of a premature hypothesis — the subject seems to have formulated her hypothesis on the basis of Dr. Admiraal "treating the dying" (Protocol 1:3) and specialising "in enthanasia" (Protocol 1:6) — before interacting with text which would refute this hypothesis. This seems to support ESL reading theory, which describes the phenomenon of formulating a premature hypothesis (1.4.3) as the over-zealous determination to comprehend text; an hypothesis is formulated too quickly on insubstantial evidence, or partial information (Spiro 1980; Laufer & Sim 1985). The literature cites one of the possible reasons for this as the lack of crucial schemata, which is evident in this case (see 4.4.2 above).

In contrast, protocol 2's hypothesis occurs during interaction with text (Text, paragraph 3) which actually states Dr. Admiraal's views of a "painless death". This seems to indicate that the subject's activation of existing schemata has distorted her textual interaction, so that she interprets textual information in accordance with that schemata, rather than allowing the meaning representation to emerge from the clues within the text. Support from ESL reading theory is probably best described by Laufer and Sim's (1985) findings (1.6.2). They suggest that an existing schematic representation may be so strong that the reader will impose interpretations onto the text in terms of those meaning concepts, ignoring textual information which refute them.

It is interesting to note that both readers are bringing knowledge to the text by activating existing schematic structures, which is essentially a "good reader strategy". This seems to be a clear example of how good reading strategies may actually

have a negative effect on comprehension (Hudson 1988). Current TOL research (2.4.1) has also recognised this phenomenon, emphasising the importance of using strategies "strategically" (Anderson 1991). To quote Anderson (1991):

> ... strategies per se are not intrinsically either successful or unsuccessful but rather, it is the effective use of a strategy that makes it successful.
>
> Anderson 1991:14–15

Thus, the misapplication of an apparently good reader strategy actually militates against successful comprehension. There is therefore a shift in focus of TOL research from the identification of good reading strategies, to strategies which promote or deter comprehension (Sarig 1987; Cohen 1986).

4.4.3.2 Maintenance of Hypotheses

Having formulated their inaccurate hypotheses in various ways, the two subjects managed to maintain these hypotheses despite contradictory textual evidence. An interesting aspect of this analysis are the reading processes — inferred by the researcher — which have emerged from the protocols, which seem to have enabled the subjects to rationalise conflicting textual information with their inaccurate hypotheses. The writer has identified a number of these processes, which will be considered in respect of each of the two protocols, as follows:

a) Interpretation of textual information in accordance with hypothesis

b) Selectively sampling from the text to confirm hypothesis

c) Ignoring textual evidence which contradicts hypothesis/Interaction with sentence in isolation.

d) Reinforcement of hypothesis without any textual support.

a) Interpretation of Textual Information in Accordance with Hypothesis

ESL reading theory states that once an inaccurate hypothesis is formulated, the subject may interpret textual information in accordance with that hypothesis, despite conflicting textual evidence. Subjects "lock ... into interpretations"

(Spiro 1980:26) and force subsequent textual data to "fit". The information in the text is distorted and damaged in an effort "to place the message and the schemata in correspondence" (Hudson 1988:189); it is "distorted into a false construct" to suit the reader's "extratextual knowledge of the world" (Laufer & Sim 1985:9). The overall outcome is a failure to "hold in at the bottom" (Eskey 1988).

- **Protocol 1**

  The subject's responses in protocol 1 suggest that an important aspect of the maintenance of her inaccurate hypothesis is interpreting the textual information in accordance with her hypothesis, despite contradictory textual evidence. Some examples of this follow.

  i) She paraphrases Dr. Admiraal's involvement in the treatment of chronic pain as "... which means most of the people who were being helped ... who were suffering for enthanasia" (Protocol 1:11).

  ii) She interprets Dr. Admiraal's satisfaction as emanating from his efforts to cure his patients: "... he is satisfied because he has done her best in order to survive that patient" (Protocol 1:15) when the text actually says that he is satisfied because he knew the patient had "died with dignity and without pain" (Text L.18).

- **Protocol 2**

  There is also evidence in protocol 2 of the subject maintaining her inaccurate hypothesis by interpreting the text in accordance with that hypothesis:

  i) Her paraphrase of "Here we find that this doctor ... had been trying by all means to save that woman from death" (Protocol 2:7) fits with her recently-established hypothesis of Dr. Admiraal "using certain injections" to cure people, but is in direct contradiction to the textual information which states that Dr. Admiraal administered "lethal drugs to a woman ... (who) was not actually close to death"

(Text L.23–25).

ii) In accordance with her hypothesis of Dr. Admiraal's role of curing people, she interprets Dr. Admiraal's method of upholding the moral debate of killing (Text paragraph 7) as a method "for curing the people that were suffering from that ... that disease euthanasia" (Protocol 2:14).

b) Selectively Sampling from the Text to Confirm Hypothesis

Selectively sampling from the text, or touching as few bases as necessary, is considered to be a good reader strategy. In the effort to maintain an inaccurate hypothesis, the reader may apply meaning to the text "on the basis of partial information" (Laufer & Sim 1985:9), and touch only those textual bases which confirm his/her hypothesis, ignoring local constraints which "militate against his or her comprehension" (Hudson 1988:186).

- **Protocol 1**

There is evidence, in protocol 1, of the subject maintaining her hypothesis by selectively sampling from the text only those propositions which will support that hypothesis. It is almost as if the subject selects certain propositions from their textual context, and creates a context for the decontextualised propositions within the subject's own hypothesis. Examples of this are:

i) The subject seems to have extracted the newspaper headlines of "Doctor Kills So Many People" (Text L.21) from the text and created her own context in support of her hypothesis, claiming that most doctors killed "many people because ... (they) didn't have the knowledge of treating enthanasia" (Protocol 1:18).

ii) In response to textual information which states that Dr. Admiraal killed a woman who was "not actually close to death" (Text L.24–25), the subject states: "that woman was dying" (Protocol 1:22). The text states that the importance of the case centred around the

patient's lack of proximity to death; the subject attributes its importance to Dr. Admiraal helping a dying woman (Ibid).

- **Protocol 2**

  There seems to be no overt evidence in protocol 2 of the subject selectively sampling from the text in order to maintain her hypothesis.

c) Ignoring Textual Evidence which Contradicts Hypothesis/Interaction with Sentence in Isolation.

Laufer & Sim (1985) found that ESL readers "almost wilfully ignored" textual information which contradicted "the informant's own notion of what the text said" (Laufer & Sim 1985:10). The writer has judged this ignoring of contradictory textual information as one reason for the maintenance of an inaccurate hypothesis. However, another explanation for an accurate, or partially accurate verbalisation which would refute the reader's ongoing inaccurate hypothesis, is that the reader is interacting with a sentence in isolation — perhaps because it conflicts with the hypothesis — and not making the links between bottom-up decoding and top-down analysis. At the risk of modifying Stanovich's interactive-compensatory model (1.4.1), one could perhaps account for this interaction of sentences in isolation in terms of his model. The model states that because the reader lacks background knowledge, he/she may over-compensate by relying on bottom-up processing; in this case, one could postulate that readers may revert to interaction with individual sentences to compensate for textual interaction that refutes an inaccurate hypothesis; they are compensating for conflicting evidence by blocking the link between sentence meaning and overall text meaning.

However, the opposing view of the reason for not making the necessary links between sentences and overall textual meaning — for interacting with sentences in isolation — is that the reader simply does not have the necessary language skills to effectively interact with the text. Perhaps the presence of too many unfamiliar words impede the reader's ability to attend to the text.

An interesting point to note, at this stage, is that whilst there seems to be evidence in the TOL data of the reader "*Interacting with Sentence in Isolation/Ignoring Textual Evidence which Contradicts Hypothesis*", the causes of this phenomenon could stem from either of the two extremes of the ESL reading issue: reading as a "language problem", or a "reading problem".

Four verbalisations from protocols 1 and 2 have been labelled as "*Ignoring Textual Evidence which Contradicts Hypothesis*" or "*Interaction with Sentence in Isolation*". In all cases, the subjects' verbalisations seem to indicate accurate, or partially accurate interaction at sentence level. However, this accurate interaction does not interfere with their ongoing inaccurate hypotheses. The writer has inferred, therefore, that this lack of interference with the hypotheses is the result of two underlying processes: either the subjects are disregarding textual information which contradicts their hypotheses, or they are interacting at sentence level — the level of decoding — without making the necessary links with the composite understanding of the text — top-down analysis.

A third possibility emerges in two of the verbalisations: the paraphrase might be overtly indicative of accurate decoding, yet the subject may not have grasped the meaning of the sentence; in other words, what appears to be an accurate paraphrase is in fact an example of decoding difficulty. If this is the case, a paraphrase identified as "accurate", when in fact the subject has not grasped the meaning representation, would not interfere with an ongoing inaccurate hypothesis. These concepts will be clarified in the examples from the protocols which follow. However, an important aspect of TOL data emerges from the above discussion. The fact that one verbalisation may be interpreted in three different ways, demonstrates the shortcomings of researcher inference in the interpretation of TOL data, and that in fact the TOL data is merely a partial representation of the elusive reading process.

- **Protocol 1**

Evidence from protocol 1 of ignoring textual evidence which contradicts the hypothesis, or interacting with sentences in isolation suggests that these inferred processes are another reason for the subject maintaining an incorrect hypothesis in the face of contradictory textual evidence. Examples from the protocol are:

i) The subject accurately paraphrases that Dr. Admiraal administered lethal drugs to a paralysed woman (Protocol 1:20) which directly contradicts her hypothesis that he cures people suffering from euthanasia. The subject gives no indication of an awareness of this contradiction. This could suggest either a "blocking mechanism" which effectively screens out textual information which contradicts the hypothesis, or an interaction with the sentence in isolation, without making the necessary connections between bottom-up decoding and top-down analysis.

   An alternative explanation, however, is that the subject does not know the meaning of "lethal" and her paraphrase therefore does not conflict with her hypothesis. If this is the case, her verbalisation which was coded as "PARAPHRASE^{+}" is actually an example of decoding difficulty.

   The fact that an alternative explanation may be proffered for the same verbalisation again demonstrates the incompleteness of TOL data alone. One feels the need for combining TOL evidence with tests of comprehension and vocabulary in order to get a better indication of the cause of a reader's difficulties.

ii) She correctly paraphrases "and enthanasia in Holland remains illegal which means it is not legal under the criminal code" (Protocol 1:24), yet is apparently unaware of any inconsistency with the paraphrase and her hypothesis. If, according to her hypothesis, euthanasia is a disease, and if, according to her paraphrase, euthanasia is illegal, then there should be some sort of rationalisation of an "illegal dis-

ease". The fact that there is no such rationalisation, or awareness of inconsistency between text and hypothesis could either indicate that she is i) effectively ignoring textual evidence which contradicts her hypothesis, or ii) accurately decoding at sentence level without making the necessary connections between sentence and ongoing hypothesis — the links between decoding and analysis.

- **Protocol 2**

  There are two instances, in protocol 2, where the subject interacts with a sentence/concept in isolation, or ignores textual information which contradicts her hypothesis, as a possible means of maintaining her inaccurate hypothesis.

  i) The subject recognises the fact that euthanasia is illegal in her paraphrase: "But we find that this euthanasia in Holland was taken illegal" (Protocol 2:11). At this point, she has just questioned the meaning of euthanasia (Protocol 2:9,10); she then establishes its illegality, and immediately identifies it as an "unknown disease". Her lack of awareness of the incongruity of an illegal disease suggests that although she has accurately decoded the sentence, she has not linked it to the hypothesis she is in the process of formulating. She has therefore not made the necessary links between bottom-up decoding and top-down analysis to formulate a coherent meaning representation of the text as a whole. In effect she seems to have decontextualised the sentence from its textual context, and not included it in the formulation of her hypothesis.

  ii) The subject states: "Although he killed those person or those people ..." (Protocol 2:16). This represents an accurate identification of the concept of Dr. Admiraal killing people, which is in direct contradiction to a previous verbalisation in which she states that Dr. Admiraal "had established methods for curing the people that were suffering from that ... that disease euthanasia" (Protocol 2:14). There is no

indication that the subject is aware of this contradiction and there is no attempt to reconcile it with her ongoing hypothesis. She seems to be therefore either ignoring a concept which contradicts her hypothesis, or interacting at sentence level without building up a composite meaning representation of the text as a whole.

Both explanations represent a means of maintaining an inaccurate hypothesis in the face of conflicting textual evidence.

d) Reinforcement of Hypothesis without any Textual Support

In both protocols, there is evidence of the subjects imposing their own interpretations onto the text without any textual support. This process has been coded as "*Imposing Unsubstantiated Interpretation*", and seems to serve the function of reinforcing an inaccurate hypothesis. Perhaps Laufer and Sim's (1985) explanation best describes a reader's imposed interpretation without textual support. They found that once the reader had "anchored himself firmly in his own lexical and ideational interpretation" (Laufer & Sim 1985:9) and committed himself to that interpretation, he adds extratextual knowledge to that meaning representation, regardless of whether it is supported by the text.

- **Protocol 1**

  i) The subject claims that Dr. Admiraal "was one of the doctors who have ... who have tried to treat enthanasia" (Protocol 1:17). She seems to be strengthening her hypothesis without any textual evidence to support it.

  ii) The subject's verbalisation: "And ... death in most of the Dutch was a common thing because of that ... of that disease" (Protocol 1:23) has no textual base. At this point, the subject had not yet read paragraph 6 of the text, which deals with the euthanasia statistics in Holland. There is no evidence from the text which might have elicited this response — she therefore seems to be imposing her own

interpretation onto the text without textual substantiation, in order to reinforce her inaccurate hypothesis.

- **Protocol 2**

  The subject's verbalisation: "Although he killed those person or those people he was not in himself sure of what was the cause of that disease" (Protocol 2:16) contains two major propositions:

  1) Dr. Admiraal killed people, which signifies accurate comprehension, discussed in c) above as one means of maintaining an inaccurate hypothesis by ignoring textual evidence which contradicts the hypothesis, or interacting with a concept in isolation; and
  2) Dr. Admiraal was not sure of the cause of the disease, euthanasia.

  This latter proposition has no textual support whatsoever; it signifies an interpretation imposed onto the text by the subject without any textual substantiation. She seems to be reinforcing her hypothesis of euthanasia as a disease, and at the same time extending her hypothesis by introducing the concept of a cause for the disease.

4.4.3.3 Evidence of Decoding Difficulties in Textual Interaction

This section considers evidence of decoding difficulties emerging from the protocols which might suggest that comprehension breakdowns could be caused by problems associated with bottom-up decoding rather than top-down analysis; that — in these specific protocols — comprehension breakdown may be the result of a "language" rather than a "reading" problem (see Chapter 1). Having demonstrated that two subjects (Protocols 1 and 2) formulated inaccurate hypotheses, and maintained these hypotheses in various ways (Sections 4.4.3.1 and 4.4.3.2 above), the focus in this section is the extent to which the TOL data can reveal whether the formulation of the inaccurate hypotheses is the result of language problems.

The short-circuit hypothesis (Clarke 1988; Cziko 1978; see 1.6.2.) accounts for decoding difficulties which induce guessing at meaning, formulating inaccurate hy-

potheses, and adhering to these despite textual constraints which invalidate the hypotheses. If this TOL case study were able to demonstrate that these two subjects' textual misinterpretations were caused by language problems, and that the formulation of inaccurate hypotheses actually is the induction of the "short-circuit", one would expect to find evidence from the protocols of decoding difficulties.

The question of the extent to which decoding problems might have caused a breakdown in comprehension is addressed in this section, in an attempt to discover whether this analysis can account for the contribution of language difficulties to comprehension breakdown, or misinterpretation of the text.

In the previous analyses (Analyses 1 and 2) which were based on the coding of strategies, a verbalisation coded "PARAPHRASE$^-$" or "QUESTION ITEMS$^-$" indicated a decoding difficulty. This analysis, however, allows for further researcher inferencing based on the researcher's judgement of the salience of the section of text which caused the difficulty, in terms of its contribution to the main information within the text. Thus, if the section of text was considered to be supporting information, the comprehension of which was not crucial to the understanding of the main gist of the text, the inferred reading process was coded "*Decoding Difficulty of Supporting Textual Information*". Examples of this are:

— "He was a bluff, florid, bearded, but I don't know what's the meaning of bluff, florid and bearded" (Protocol 1:9);

— "... I don't know what's the meaning of sclerosis" (Protocol 1:21);

— "Pertaining to the passage again, I find difficult words and some of them ... I'm not familiar with them, e.g. watercolourist, proselytising ..." (Protocol 2:23).

If however the decoding problems were judged as inhibiting or interfering with the subject's understanding of the main information within the text, the inferred process was coded "*Decoding Difficulty*". It is these examples which are of interest in terms of the extent to which they might have affected the breakdown in comprehension.

- **Protocol 1**

A discussion of the three verbalisations in protocol 1 which were coded "*Decoding Difficulty*" follows.

i) The subject was not alerted to the irony contained in "Such words come neatly from Dr. Admiraal" (Text L.19), paraphrasing it as "These words were coming from Dr. Admiraal" (Protocol 1:16).

ii) The strategy of the verbalisation "In 1985 he admitted some ... some lethal drugs to a woman who was suffering ... who was paralysed as a result of multiple sclerosis" (Protocol 1:20) was identified as "PARAPHRASE^{+}" on the basis of the subject's apparent understanding of the sentence. However, because this information contradicts her hypothesis of Dr. Admiraal curing his patients, and she does not amend her hypothesis, the inferred process was judged as either "*Ignoring Textual Evidence which Contradicts Hypothesis/Interaction with Sentence in Isolation*" or "*Decoding Difficulty*". The justification of inferring that the underlying process in fact constituted a "*Decoding Difficulty*" is that the subject may not have known the meaning of "lethal" which suggests that she might not have understood the sentence despite an overtly accurate paraphrase. If this is the case, an overtly accurate paraphrase signifies a covert decoding problem and, as such, might not conflict with the subject's ongoing hypothesis.

iii) The subject's verbalisation "If a patient have, or have reported to have enthanasia ..." (Protocol 1:29) appears to be the subject's interpretation of "Once a patient has repeatedly and lucidly requested euthanasia" (Text L.36) was coded as either "*Interpretation of Text in Accordance with Hypothesis*" or "*Decoding Difficulty*". At this point, the text directly contradicts the subject's hypothesis of euthanasia as a disease: in terms of her hypothesis, the patient would repeatedly request a disease. She therefore is either twisting the words of the text to fit her ongoing hypothesis, or has interpreted "request" as "report", which is indicative of a problem

with the language at decoding level.

- **Protocol 2**

  The writer has judged two verbalisations from protocol 2 as decoding problems of textual information which is crucial to the main gist of the passage.

  i) In response to textual information which states that Dr. Admiraal administered "lethal drugs to a woman (who) ... was not actually close to death" (Text L.23–25), the subject verbalises: "Here we find that this doctor, Dr. Admiraal, had been trying by all means to save that woman from death" (Protocol 2:7). This was coded as either "*Interpretation of Text in Accordance with Hypothesis*" (discussed in a) above) or "*Decoding Difficulty*". The rationale behind the judgement of "*Decoding Difficulty*" is that the subject's interpretation is in direct contradiction to the textual information, which suggests a problem with the language of the text.

  ii) The text states: "Once a patient has repeatedly and lucidly requested euthanasia ..." (Text L.36); the patient verbalises: "Then he would repeatedly ... he would repeatedly ask the patient ..." (Protocol 2:17). The subject is essentially making the doctor the "doer" of the requesting, whilst the text states that the patient is the "doer". This suggests decoding problems with the language of the text.

In the light of the above discussions, one cannot claim that decoding difficulties brought about the formulation of inaccurate hypotheses; three of the five verbalisations which were judged as possible evidence of decoding difficulties could be accounted for with alternate explanations. Once again, this finding reinforces the limitations of TOL data; it may be one window into the reader's mind, but it is certainly not the whole picture of the elusive reading process.

4.4.3.4 A Consideration of the Subjects' Use of Comprehension-Promoting Strategies in the Light of the Overall Breakdown in Comprehension

Up to this point in analysis 3, the writer has considered breakdowns in comprehension, the formulation of inaccurate hypotheses, the maintenance of these inaccurate hypotheses, and the evidence of decoding problems. These have all been comprehension-deterring strategies. The writer now wishes to look at the evidence in the two protocols of the subjects' use of comprehension-promoting strategies, and the underlying processes inferred from these strategies. Two major points of interest emerged from a consideration of the subjects' use of comprehension-promoting strategies:

a) why the identified comprehension-promoting strategies did not affect the overall comprehension breakdown;

b) how a verbalisation could be coded as a comprehension-promoting strategy in Analysis 1, and yet on a closer look at the underlying reading process (Analysis 3) one could infer that the process in fact inhibited comprehension rather than promoted it.

Protocols 1 and 2 will be considered in the light of the above concepts.

- **Protocol 1**

  There is evidence of seven verbalisations in protocol 1 where the subject employs comprehension-promoting strategies, each of which was identified as "PARAPHRASE^{+}" (see Analyses 1 and 2). However, analysis 3 reveals that five of these accurate paraphrases are indicative of competent decoding, whilst the inferred reading processes of two responses suggest that the verbalisations are only overtly accurate, and in fact are indicative of other underlying reading processes which inhibit comprehension.

  a) The Use of Comprehension-Promoting Strategies and their Effect on Overall Comprehension

The inferred processes coded as "*Competent Decoding*" are indicative of competent interaction with the language at sentence level, for example:

i) "He was valued as a pioneer" (Protocol 1:2);
"He was the author of Justifiable Enthanasia, a manual for the medical profession, which means ... he may ... may be he was a doctor" (Protocol 1:4);
"... the enthanasia professional in Holland, which means he was ... he specialised in enthanasia ..." (Protocol 1:6)

These first three examples of competent decoding occurred at the beginning of the subject's interaction with text, when she had not yet formulated her hypothesis.

ii) "If a patient was not well, he can't go on, overcome that pain, he usually becomes sad, because he said he's losing a friend ... because he usually knows them best for some weeks ..." (Protocol 1:14);

At this point, the subject had formulated her hypothesis that Dr. Admiraal cured patients suffering from the disease "enthanasia". Her paraphrase, therefore, does not conflict with her hypothesis.

iii) "Eh ... it shows here that there are about 14 million people in ... 14 million people of Dutch, so between 6,000 and 10,000 per year perhaps 8 per cent of the total number of deaths are being reported, and most of them are ... they die in the hands of their doctors" (Protocol 1:26).

This paraphrase fits into the subject's hypothesis that most patients died "in the hands of their doctors" (Protocol 1:33) because "most of the doctors didn't have the best treatment of treating the patients" (Protocol 1:32).

The above examples from protocol 1 indicate that the subject is capable of interacting competently at sentence level, provided the textual evidence does not conflict with her hypothesis.

b) Overtly Comprehension-Promoting Strategies which did not Promote Comprehension

The following verbalisations were overtly accurate paraphrases, but did not aid the subject's overall comprehension. The inferred processes suggest possible reasons why a potentially comprehension-promoting strategy actually does not aid comprehension.

i) "In 1985 he admitted some ... some lethal drugs to a woman who was suffering ... who was paralysed as a result of multiple sclerosis" (Protocol 1:20).

Whilst this correct paraphrase indicates accuracy at sentential level, the subject does not amend her hypothesis of Dr. Admiraal curing, in the face of textual evidence which states that Dr. Admiraal kills. This response was therefore judged as either:

- "*Ignoring Textual Evidence which Contradicts Hypothesis*", on the grounds that she does not recognise, or is effectively "blocking out" information which contradicts her hypothesis; or
- "*Decoding Difficulty*", on the grounds that she actually has not gained an accurate interpretation despite her overtly accurate paraphrase. If she has not understood the sentence, there would not be a problem of reconciling it with her own hypothesis.

ii) "And enthanasia in Holland remains illegal which means it is not legal under the criminal code" (Protocol 1:24).

This signifies an accurate paraphrase which is indicative of a comprehension-promoting strategy. However, if the subject were to make the necessary links between her hypothesis and textual information, this latest information would make a mockery of her hypothesis. In terms of her hypothesis, the text is stating that the disease — "enthanasia" — is illegal. The fact that the subject is unaware of any incongruity between her hypothesis and her paraphrase suggests one of two underlying processes. Either

- she is ignoring textual information which contradicts her hypothesis; or
- she is interacting with the sentence in isolation, without making the necessary links between bottom-up decoding and top-down analysis. If this is the case, she is virtually decontextualising the individual sentence, instead of utilising it to construct a meaning representation of the text as a whole.

- **Protocol 2**

There is evidence of five instances in protocol 2 where the subject seems to utilise comprehension-promoting strategies: three were coded "PARAPHRASE^{+}" whilst two were coded "COHERENCE-DETECTION^{+}". The underlying process of two of the accurate paraphrase strategies was judged to be "*Competent Decoding*" — accurate interaction at the sentence level — whilst the third was identified as "*Interaction with Sentence in Isolation/Ignoring Textual Evidence which Contradicts Hypothesis*". The underlying process of each of the accurate coherence-detection strategies was judged to be "*Establishing Cohesive Links*".

a) The Use of Comprehension-Promoting Strategies and their Effect on Overall Comprehension

i) The following verbalisations were judged as demonstrating the ability to establish cohesive links:

"He is also referred to as an anaesthetist" (Protocol 2:2);
"Dr. Admiraal is also known because of his famous researches" (Protocol 2:5).

ii) The examples of competent decoding follow:

"Here we are told about a doctor of the Dutch who is regarded as an expert on people who are dying" (Protocol 2:1);
"... and discuss that particular pain or suffering with the other nurses and priests, etc." (Protocol 2:18);

The above all indicate accurate interaction at sentence level, and the ability to establish cohesive links across sentences. None of these verbalisations in any way interfere with the subject's inaccurate hypothesis.

b) Overtly Comprehension-Promoting Strategies which do not Promote Comprehension

The following example from protocol 2 demonstrates how a comprehension-promoting strategy such as an accurate paraphrase did not aid the subject's interpretation of the text.

> "But we find that this euthanasia in Holland is taken illegal" (Protocol 2:11).

Having verbalised her lack of understanding of the word euthanasia (Protocol 2:9,10), she then picks up from the text that it is illegal, and immediately goes on to identify euthanasia as an "unknown disease ... (which) has caused many people to be the victim of death" (Protocol 2:13). She seems to be unaware of the incongruity of an illegal disease, which suggests that she has either:

- interacted with the sentence in isolation, without making the necessary links between bottom-up decoding and top-down analysis to formulate an accurate meaning representation of the text as a whole; or
- ignored textual evidence which might conflict with the hypothesis she is in the process of formulating.

4.4.4 Summary of Analysis 3: Protocols 1 and 2

Protocols 1 and 2 were analysed together on the basis that the subjects were both unsuccessful in their comprehension outcome. Both formulated inaccurate hypotheses, the cause of which seemed to emanate from slightly different perspectives: the one subject seemed to formulate her hypothesis prematurely, whilst the other subject's inaccurate hypothesis seemed to emanate from inappropriately accessing her

background knowledge, which then coloured her subsequent textual interaction.

The analysis demonstrates that both subjects maintained their inaccurate hypothesis in various ways.

a) There was evidence that they interpreted textual information in accordance with their inaccurate hypotheses despite the fact that the specific section of text actually contradicted these hypotheses.

b) Another reason for maintaining inaccurate hypotheses was to selectively sample from the text only those propositions which would support the hypotheses. This process seemed to suggest pulling out certain propositions from their textual context, and incorporating them within the context of their own inaccurate hypotheses.

c) There were instances where the verbalisations indicated competent interaction, which actually contradicted the subjects' ongoing hypotheses. The fact that the subjects did not seem to be aware of any inconsistency between textual information and hypotheses, or did not amend their hypotheses to incorporate new information suggested two possible underlying reading processes. The subjects were either:

   1) ignoring textual information which contradicted their hypotheses; or

   2) interacting with individual sentences in isolation, without making the necessary links between bottom-up decoding and top-down analysis to form a coherent meaning representation of the text as a whole.

   In two cases, an alternative explanation was offered: despite apparent competent interaction at sentence level, the subjects actually did not comprehend the meaning of the sentence. In these instances, verbalisations might not have conflicted with ongoing hypotheses.

d) A fourth means of — or perhaps reason for — maintaining inaccurate hypotheses was by imposing their own interpretation onto the text without any textual

evidence to substantiate the verbalisations. This seemed to serve the purpose of reinforcing inaccurate hypotheses without any textual support. The verbalisations seemed to be comments emanating from their formulated inaccurate hypotheses, rather than from current textual interaction.

This analysis also allowed the consideration of evidence of decoding difficulties experienced by the subjects, under two classifications: decoding problems of supporting textual information, and decoding problems of textual information which the writer judged to be crucial for the understanding of the text. Because verbalisations did not fit neatly into the "*Decoding Difficulty*" category, and there were alternate explanations for a number of the verbalisations, it was found that the TOL data could not provide conclusive evidence that inaccurate hypotheses were the result of decoding problems.

The analysis also looked at evidence of the subjects' use of comprehension-promoting strategies in terms of their lack of effect on the subjects' inaccurate hypotheses. Two aspects of textual interaction emerged from this perspective:

a) The subjects demonstrated the ability to competently interact with text, provided that the interaction did not contradict their inaccurate hypotheses;

b) When the interaction contradicted their hypotheses, they seemed to activate a "blocking mechanism" which either enabled them to ignore contradictory textual information, or allowed them to interact with the sentence in isolation from their inaccurate hypotheses.

A third aspect which emerged from considering the comprehension-promoting strategies of the unsuccessful subjects is that what might have the appearance of an accurate paraphrase could in fact be indicative of a decoding problem. This was proffered in some cases as an alternate explanation for the subjects interacting with sentences in isolation or ignoring textual information which contradicted their hypotheses.

4.4.5 Overall Comments on TOLs' Ability to Reveal Causes of Comprehension Problems.

The above analysis of the two unsuccessful readers' protocols suggests that an in-depth scrutiny of the individual reader's textual interaction — as revealed by TOLs — certainly provides evidence which supports input from ESL reading theory about the ways in which ESL readers fail to comprehend a text. However, the limitations of TOLs is that — whilst they might reveal trends such as formulating an inaccurate hypothesis and maintaining that hypothesis — they cannot identify the CAUSE of the problem, whether the cause is in the "second" component or the "first"; whether the problem is a "reading" or "language" problem. They seem to indicate the manifestation of the underlying root of the problem, yet the "root" remains covert.

Once again, the analysis has demonstrated an "either/or" interpretation of many of the reading processes. The writer feels, at this point in the overall evaluation of TOLs, that if TOL data could be combined with other tests of comprehension, and tests of vocabulary — perhaps in an intensive case study involving all measures of reading ability — they could make a worthwhile contribution to a holistic view of the ESL reader's interaction with text, and pinpoint more accurately the causes of comprehension problems. Perhaps an in-depth, follow-up interview along the lines of Aslanian's (1985) investigation might further illuminate reasons for breakdowns in comprehension which the TOL technique alone is unable to supply.

4.4.6 Analysis of Protocol 3 as Successful in Textual Interaction

Because protocol 3 demonstrated successful textual interaction, different criteria for analysis were employed from those used in the assessment of protocols 1 and 2. Whilst the analysis of protocols 1 and 2 centred around what caused breakdowns in comprehension, this analysis tries to account for the reasons for the subject's successful comprehension. The first section looks at how the subject — from lack of

crucial content schemata — manages to extrapolate beyond the text itself. Emerging patterns of interaction are then discussed, followed by a consideration of the subject's use of comprehension-deterring strategies in the light of her overall successful interaction.

4.4.6.1 Tracing the Subject's Route from Lack of Background Knowledge, to Extrapolation of Text Content

This is considered under the following sub-headings:

a) Evidence of Lack of Background Knowledge

b) Evidence of the Subject's Identification of Key Information

c) Evaluation of Text Content, and Extrapolation Beyond the Text Itself

a) Evidence of Lack of Background Knowledge

It is evident from a study of protocol 3 that the subject had no background knowledge of euthanasia. The first appearance of the word euthanasia in the text as Dr. Admiraal being the "euthanasia professional" (Text L.5) elicits the subject's verbalisation: "... what is a euthanasia?" (Protocol 3:8). Apart from indicating the subject's lack of content schemata, her usage of the word in context with the indefinite article reinforces her lack of knowledge.

As the meaning of euthanasia is clarified during her interaction with the text, it is apparent that this information is surprising to the subject, indicating that it is in some way inconsistent with her previously-acquired background knowledge. Examples from the protocol follow.

i) The questioning intonation in her voice as she repeats "Sad and satisfied?" (Protocol 3:16) suggests that the textual information of a person's death causing satisfaction is somehow inconsistent with her existing background knowledge.

ii) The intonation of surprise in her question: " ... Sometimes doctors kill people?" (Protocol 3:21) suggests that this concept of the role of a doctor killing people is not only new to her, but actually conflicts with her background knowledge of the function of a doctor.

b) Evidence of the Subject's Identification of Key Information

Despite the above evidence that the subject knew nothing about euthanasia, and that this new information she was deriving from the text actually conflicted with her existing schematic structures, she manages to grasp all the major propositions within the text, and construct an accurate meaning representation from this key information. Her interpretation of the text is evident in the following verbalisations.

i) "Mmm. For only in cases of hopeless suffering — so that is euthanasia ... euthanasia ... oh ... ooh" (Protocol 3:28).

ii) "Oh — they just ask the doctors — when they are hopeless — to kill them with those drugs" (Protocol 3:32).

iii) "So somehow or ... the patient may need this thing and when the patient is a believer, he or she could expect a priest so that he can pray for him" (Protocol 3:34).

iv) "Oh ... the patient can request this euthanasia. So this killing is euthanasia, and it's discovered by Dr.Ãdmiraal, a Dutch doctor. But it's illegal, but somewhere or somehow the doctor ... the law ... Mmmm ... grant legal to those who want this euthanasia" (Protocol 3:37–39).

c) Evaluation of Text Content, and Extrapolation Beyond the Text Itself

Not only does the subject successfully interact with the text to derive its basic meaning, but she also evaluates the concept of euthanasia in terms of the textual information, as well as extrapolating the concept beyond the boundaries of the text itself. At the end of the reading, she "removes" euthanasia from

its textual context, and evaluates the concept objectively, considering its pros and cons. This takes place in three stages, as follows.

i) Her initial attitude is one of acceptance of the legality of a painless death, indicated by: "That is better. Because if you are still suffering and you are hopeless and that pain — there is no other way just the pain to be taken off, and then you can die a painless death" (Protocol 3:40). At this point the subject reasons through the information contained within the text, evaluating the concepts as they are presented by the textual information.

ii) She then reviews her initial attitude of acceptance by questioning it in the light of "people are not animals": "But what makes me think more is that people are not animals. You can kill an animal when he is suffering but it is differ from a human being" (Protocol 3:41–42). The introduction of the comparison of animal life and human life suggests that the subject is stimulating her own moral schematic structures which seem to incorporate issues of human life being more sacred than animal life and bringing these outside-the-text factors to bear on the textual information.

iii) The subject then seems to reconsider euthanasia in the light of the patient's right to decide his/her own fate: "If it's differ from a human being ... but this human being asks himself or requested that this be done to him ..." (Protocol 3:43).

This section demonstrates how, from evidence of no content schemata, the subject has not only successfully interacted with the main information within the text, but has also made all the higher level schematic associations which surround the concept of euthanasia. Not only has she comprehended the text, but she has demonstrated the use of critical reasoning in her interaction with the text.

At this point, the writer feels that the TOL technique has captured a part of successful textual interaction — the "working out" of the text's meaning from no

background knowledge — in a way in which no other test of comprehension could demonstrate so clearly and lucidly.

The next section looks at the strategies the subject has utilised to achieve her level of comprehension.

4.4.6.2 Emerging Patterns of Interaction: Questioning, and Supplying Answers to Explicit/Implicit Questions

The most interesting pattern of interaction to emerge from inferring processes from a closer examination of the identified strategies in protocol 3, is the pattern of questioning information within the text, and finding the answers to those questions. The overt questions are easily identified from the subject's verbalisation, whilst the writer has inferred the existence of an unstated question when the subject appears to have found an answer to some covert question. These patterns of interaction are clarified below, under the following sub-headings:

a) Explicit Questions

b) Answers to Implicit Questions

a) Explicit Questions

The strategy of questioning which emerges from protocol 3 seems to serve the function of highlighting areas of uncertainty, or acknowledging key information for which answers must be found, in order to formulate an hypothesis of the text's meaning. In all cases, the subject seems to have found the answers to the questions she poses to herself. This question/answer strategy is indicative of an overt problem-solving process to aid her comprehension of the text. The writer tentatively suggests that by consciously asking a question, the subject is highlighting a possible problem or key information for which she requires clarification during her textual interaction, to which she then actively endeavours to find answers from within the text. It is almost a quest to resolve uncertainties — or those uncertainties which she has consciously identified as

such. The following are the questions the subject asks, and the apparent answers to those questions.

Question: "A pioneer of what?" (Protocol 3:3)

Answer: " ... euthanasia ... (is) discovered by Dr. Admiraal, a Dutch doctor" (Protocol 3:38).

Question: "What is a euthanasia?" (Protocol 3:8)

Answer: "Mmm. For only in cases of hopeless suffering — so that is euthanasia ... euthanasia ... oh ... ooh" (Protocol 3:28). "So this killing is euthanasia ..." (Protocol 3:38).

Question: "Sometimes doctors kill people?" (Protocol 3:21)

Answer: "Oh. This woman was totally suffering from this pain and then ... Dr. Admiraal killed her" (Protocol 3:23).

Question: "And the law?" (Protocol 3:24)

Answer: "But it's illegal, but somewhere or somehow the doctor ... the law ... Mmmm ... grant legal to those who want this euthanasia" (Protocol 3:39).

b) Answers to Implicit Questions

The following seem to be answers to — or clarifications of — questions which the subject has not verbalised, but has silently or unconsciously posed to herself. Evidence of this is the subject's use of "Oh" or "Okay", which seems to indicate that an uncertainty — or a possible uncertainty — has now been resolved. The implicature is: "Oh — so that's the answer"; or "Oh — so that's what it means". Many of these examples add strength to the theory of reading as a problem solving activity, as the subject seems to be actively engaged in problem-solving as she resolves her "problems" through interaction with the text.

i) "Oh — he is a doctor ..." (Protocol 3:5).

The writer has inferred that the subject found the answer to some implicit question such as "who is this Dr. Admiraal?"

ii) "Oh. Sometimes doctors kill people?" (Protocol 3:21). The "Oh." suggests that the subject is interacting with the textual information to formulate her hypothesis, and is incorporating this new information into that hypothesis. Her subsequent querying of the concept of "doctors kill" suggests that this textual information is surprising, and somehow inconsistent with her existing background knowledge.

iii) "Oh — they just ask the doctors — when they are hopeless — to kill them with those drugs" (Protocol 3:32).

The implicit question has been inferred from the subject's repeat of "voluntarily" (Protocol 3:30), which suggests a recognition of new information to her hypothesis. The "Oh" suggests that she has resolved a possible uncertainty, and her accurate paraphrase indicates that she has competently incorporated this additional information into her hypothesis.

iv) "Okay." (Protocol 3:35). This verbalisation follows her accurate paraphrase: "So somehow or ... the patient may need this thing and when the patient is a believer, he or she could expect a priest so that he can pray for him" (Protocol 3:34). The "okay" almost signals the acceptance of the information contained within her paraphrase. The inferred process of the apparent problem-solving activity seems to be:

- the subject paraphrases the textual information;
- she establishes whether it fits into her ongoing hypothesis;
- she accepts this new information; and
- verbalises her acceptance with "okay".

v) "Oh ... the patient can request this euthanasia" (Protocol 3:37). This verbalisation arises from her reading of the text: "Once a patient has repeatedly and lucidly requested euthanasia ..." (Protocol 3:36). The "Oh" followed by her accurate paraphrase appears to be the recognition

of additional textual support for her hypothesis (Protocol 3: 32, 34, 35); she seems to be reinforcing newly-established key information within her hypothesis, and resolving any possible uncertainty with further textual evidence.

Whether the questions were explicitly stated, or covert, this strategy of posing questions, and finding solutions to resolve uncertainties, seems to be one of the ways that has enabled the subject to "get at" the text's meaning. To what extent this is indicative of the subject's "personal reading style", or "usual" textual interaction to aid comprehension cannot be gauged.

4.4.6.3 The Role of Repetition of Key Information

Another strategy which emerges from protocol 3 is the subject's repetition of certain propositions which are contained within the section of text she has just read. This repeating of words or phrases, or selecting certain propositions from the text, seems to serve various functions in assisting the subject's comprehension. These functions have been discussed as follows:

a) Establishing cohesive Links

b) Identifying key information

a) Establishing Cohesive Links

The writer has judged the following repetitions as serving the function of establishing cohesive links.

i) "Dr. Admiraal is that ..." (Protocol 3:7). The writer has inferred that the subject has established the cohesive links in the text which identify Dr. Admiraal as the euthanasia professional: "If there is a euthanasia professional in Holland, Dr. Admiraal is it" (Text L.5–6).

ii) "Those patients ... dying patients" (Protocol 3:18) indicate that the subject has made the cohesive links between the "friends" Dr. Admiraal is "losing" (Text L. 16–17) and "dying patients".

b) Identifying Key Information

The following repetitions seem to indicate the subject's identification of key information.

i) The repetition of "illegal" (Protocol 3:26) seems to be the identification of key information which supplies — or perhaps partially supplies, at this stage — the answer to her previous question: "And the law?" (Protocol 3:24).

ii) The subject repeats the words from the text: "... For only in cases of hopeless suffering ..." (Protocol 3:28) which supplies her answer to "what is a euthanasia?" (Protocol 3:8).

iii) The repetition of "voluntarily" (Protocol 3:30) signifies her recognition of key information which she incorporates into her ongoing hypothesis.

There were two other repetitions from which the writer was unable to infer their possible contribution to the subject's textual comprehension:

i) "A block of flats" (Protocol 3:10)

ii) "Mmm. A chronic doctor" (Protocol 3:14)

However, whatever the subject might have gained, or did not gain from these two repetitions, they remain an integral part of the subject's apparent strategy of "pulling out" words or propositions from the text she has just read, in the process of her interaction with text.

4.4.6.4 A Consideration of the Subject's Use of Comprehension-Deterring Strategies in the Light of Overall Successful Comprehension

Just as evidence of the subjects' use of comprehension-promoting strategies in protocols 1 and 2 were considered in the light of overall breakdown in comprehension, so evidence of comprehension-deterring strategies in protocol 3 will be considered in the light of the subject's overall successful comprehension. Two questions need to

be addressed: what were the subject's comprehension-deterring strategies, and why did these not affect the comprehension outcome?

Two strategies in protocol 3 were coded as comprehension-deterring in analyses 1 and 2. However, the closer inspection afforded by analysis 3 reveals that only one of these strategies actually was comprehension-deterring, whilst the other two only had the appearance of a possible deterrent to comprehension. These will be discussed below.

a) The subject questions the meaning of a word in her verbalisation: "What is a pioneer?" (Protocol 3:3) which is indicative of a decoding difficulty. However, her subsequent question indicates her appropriate use of the word in context which suggests that she actually does know the meaning of "pioneer". Thus, what is overtly a comprehension-deterring strategy is only such at "face value"; a deeper investigation reveals competent textual interaction.

b) The second comprehension-deterring strategy was also coded as questioning the meaning of a word (QUESTION ITEMS$^-$), the inferred process being indicative of a lack of content schemata: "... what is a euthanasia?" (Protocol 3:8). However, despite having no knowledge of the meaning of euthanasia, this did not impede the subject's comprehension of the text. She was able to interact with the semantic, syntactic and lexical clues, as well as employing certain strategies discussed above, which enabled her to successfully comprehend the text. Thus the lack of knowledge of the most crucial word in the text did not cause a breakdown in overall comprehension.

4.4.7 Summary of Results from Protocol 3

The analysis of protocol 3 demonstrates how the subject has successfully interacted with the text. Drawing on evidence from the verbalisations, the analysis has shown that despite lack of content schemata, the subject has not only managed to grasp the key concepts within the text, but has also evaluated the information contained within the text, and extrapolated this information beyond the text itself. She has

demonstrated all the abilities of critical reasoning, and has employed higher order reading skills in her textual interaction.

The strategy which the subject seemed to consistently employ to aid her comprehension was a question/answer strategy. The questions she asked were either explicitly stated, or there was evidence of what seemed to be answers to implicit questions.

Another strategy which emerged from this analysis was the role of repetition of words from the text she had just read, or propositions contained within that section of text. This seemed to serve the function of "pulling out" key information from the text to aid her comprehension.

The subject's use of comprehension-deterring strategies was then considered. It was established that the only response which could be classified as a possible deterrent to comprehension was the subject's lack of knowledge of the word euthanasia. This however was not sufficient an impediment to hinder competent textual interaction.

4.4.8 Overall Comments on TOLs' Ability to Reveal Aspects of Textual Interaction which Led to Successful Comprehension

The writer feels that the close observation of the TOL data revealed aspects of this student's successful interaction with text, which could not have been ascertained from any other measure of comprehension. The TOL technique has managed to "capture" certain reading patterns which seem to have enabled the subject not only to understand the text, but to interact with the whole concept of euthanasia beyond the boundaries of the text itself.

The value of case study research — the in-depth observation of a single case — is that the attention is focussed on "the subtlety and complexity of the case in its own right" (Cohen & Manion 1987:146). In other words, the TOL technique has adequately revealed aspects of this subject's successful interaction with this

particular text, at a particular time of textual interaction. Whether patterns of interaction which emerged through the TOL data constitute the "usual" pattern of this subject's reading interaction, is impossible to assess. In other words, do these findings have a "life" beyond the parameters of the case study?

One observation which has emerged from this analysis, is that successful textual interaction seems to be easier to "get at" by means of analysing TOL data, than trying to identify reasons for breakdowns in comprehension of unsuccessful readers. The possible reason for this is that there is more scope for diverse interpretations of a verbalisation which signifies a comprehension breakdown, involving more researcher inferencing, whereas the analysis of a successful reader involves a fairly straightforward exercise in tracing the comprehension process in accordance with reading theory.

The final chapter, **Chapter 5: Conclusions and Recommendations for Future ESL TOL Research**, summarises the critical analysis of TOLs, combining both the writer's theoretical critical evaluation of current ESL TOL research, with the practical input from the writer's case study. Included in this chapter are the writer's recommendations for future ESL TOL research.

Chapter 5

Conclusions and Recommendations for Future ESL TOL Research

The central concern of this thesis has been the critical evaluation of TOLs, and the extent to which the TOL technique can reveal the nature of ESL reading interaction with expository prose.

The writer conducted a critical evaluation of current TOL research, which was essentially an assessment of problems which derived from a theoretical examination of TOL studies. The writer's own case study represents a small scale practical implementation of the TOL technique, putting into practice suggestions from the critical evaluation, as well as issues dealt with in current TOL literature. The major findings from both the theoretical and practical aspects of this thesis have been corroborated, and are summarised below under the following headings:

5.1. The Inappropriacy of Utilising TOLs to Identify "Good Reader Strategies" with a view to Training ESL readers in the Use of those Strategies

5.2. The Need for a More Rigid Application of TOL Terminology

5.3. The Need for a Strict Adherence to Certain Methodological Procedures in the Collection of TOL Data

5.1 The Inappropriacy of Utilising TOLs to Identify "Good Reader Strategies" with a view to Training ESL readers in the Use of those Strategies.

Cohen (1986) discusses the shift in emphasis in TOL research away from a description of the ideal reader, to a description of reading behaviour that promotes or deters comprehension. Sarig's (1987) study challenges the traditional dichotomy between good and poor reading behaviour, and Anderson (1991) highlights the importance of using strategies "strategically".

The writer's own case study demonstrates how the two readers who were unsuccessful in their textual interaction were in fact misapplying good reader strategies, or applying good reader strategies unsuccessfully due to limitations in their language competence. These unsuccessful readers formulated their inaccurate hypotheses by bringing knowledge to the text through the activation of their existing background knowledge, which is essentially a good reader strategy. There was evidence of the subjects selectively sampling from the text, touching as few textual bases as necessary to confirm their hypotheses, which is also a good reader strategy. However, the TOL data clearly demonstrates how the use of these good strategies actually militated against comprehension.

5.2 The Need for a More Rigid Application of TOL Terminology

The writer has criticised current ESL TOL research on the apparent loose application of terminology which she feels discredits ESL TOL studies. She feels the need for a more precise application of terminology, and basic concepts surrounding TOL research, in order to establish the necessary parameters within which all future ESL TOL research should be conducted. Aspects of terminology which were addressed

are summarised below.

a) There is a need to identify the type of verbal report utilised, as defined by TOL literature (Anderson's (1991) use of "think aloud protocols" which the writer feels are essentially "retrospective verbal reports" (2.4.2.) refers).

b) The need to take cognisance of the basic issue of TOL data being an indirect means of "getting at" reading strategies.

c) The need for precise theoretical input of definitions of terms such as "strategies" and "processes". Because the literature lacks clear-cut definitions, these terms tend to be used interchangeably in much of the current ESL TOL studies.

ESL TOL research has largely focused on the identification of reading strategies, despite the conflation of "strategies" and "processes". Working on her own "rule of thumb" distinction of TOL data revealing the strategies whilst the researcher infers the processes, the writer has attempted to take the analysis of TOL data one step further in Analysis 3 of her protocols, to infer the reading processes which underlie the identified strategies. This attempts to account for comprehension success or failure at any point in a protocol in terms of the underlying process which seems to have generated the verbalisation.

In effect, this represents an endeavour to bridge the gap between ESL reading theory and TOL research. Whilst TOL research has identified strategies utilised by the reader, ESL reading theory accounts for the reasons behind comprehension success and comprehension failure. In the absence of appropriate terminology, the writer has utilised "inferred process" to account for what might be going on in the subject's mind which could have elicited a particular reading strategy.

Because the writer has tried to make a distinction between strategies and their underlying processes, she feels an even greater urgency for more clearly-defined terminology. Her own "rule of thumb" is inadequate, because inferencing is involved in both the identification of strategies, as well as the identification of underlying processes. However, inferring processes from strategies relies even more heavily on

researcher inference, and thus is more vulnerable to all the hazards associated with subjective analysis.

5.3 The Need for a Strict Adherence to Certain Methodological Procedures in the Collection of TOL Data

The writer itemised certain methodological problems in her critical evaluation of current TOL research which she felt could interfere with the reader's "normal" interaction with text. She identified these as the lack of simple instructions, and the complicating of the TOL task by forcing a response at specific points in the text.

Further methodological issues emerged from the writer's case study, which she feels could be addressed in future ESL TOL research in order to further authenticate TOL findings. The writer felt that the subjects should be given the option to verbalise their thoughts in their mother tongue. The writer made no mention in the instructions to the task of the language that the subjects were to use during their verbalisations, and they spontaneously verbalised in English. However, the writer feels that this option might simplify the task for the reader, and perhaps lead to easier textual interaction in an unnatural reading task.

Corroborating this suggestion, Anderson (1991) found that subjects produced richer and more fluent verbalisations when he gave them the opportunity to verbalise in their mother tongue. A caveat to Anderson's research, however, is that the subjects were reporting retrospectively. At the risk of making unsubstantiated assumptions, the writer suggests that any subject would find it easier to report back in the L1 on what he/she was "doing" after completing a reading task. She feels that concurrent verbalisations raise other unanswered questions such as: do ESL subjects "think" in their L2 or their L1 during interaction with English text? The only way to discover whether MT verbalisations would facilitate the TOL task is to give the subjects the choice of reporting in their L1 or their L2.

5.4 The Importance of the Submission of a Coding Scheme and Coded Protocols

In both her critical evaluation of current ESL TOL research, and in her own case study, the writer has stressed the importance of the submission of the coding scheme utilised in any particular TOL study, and the application of the selected coding scheme to the protocols. Evidence of coded protocols is lacking in current research.

The writer cites three reasons for the importance of the submission of coding schemes and coded protocols.

The first reason stems from a methodological issue which emerged from the case study: the lack of an existing coding scheme which could universally be applied to all TOL data. Whilst this could be considered as a weakness of the TOL technique itself, it becomes a "strength" when the technique is placed firmly within the research paradigm of case study research which considers "initial conceptual schemes" (Sanders & Pinhey 1983:356) as merely a guide, open for redefinition of conceptual categories if there is no "fit" between data and concepts. Because the TOL technique is still in the process of establishing itself as a viable research tool in the field of ESL reading research, the writer feels that the flexibility of redefinition of conceptual schemes afforded by the case study research paradigm is crucial at this early stage in the use of TOLs. It is this very flexibility within which each TOL researcher operates that highlights the need for the submission of coding schemes and coding protocols to give the reader accessibility to the researcher's judgements.

The second reason for submitting coded protocols arises from the difficulties the writer experienced in coding her own data. Certain verbalisations required dual coding when they could be judged as "fitting" two different coding categories. Current TOL studies are singularly silent about these difficulties, which definitely present a problem in the application of the TOL technique. It is imperative that the reader has access to any TOL data, so that he/she can ratify, or otherwise, a researcher's coding decision, particularly when the verbalisation could indicate various coding alternatives.

The third reason for submitting protocol data arises from the practicality of conducting TOL studies. The transcribing of recorded material is a lengthy process, and even if not fraught with as many technical hitches as the writer experienced, it is certainly very time-consuming to collect the data. The writer feels that if current ESL TOL researchers could make their transcripts available, these could form "an archive of descriptive material sufficiently rich to admit subsequent reinterpretation" (Cohen & Manion 1987:146). This would allow subsequent TOL researchers to "test out" new concepts of analysis without having to resort to the lengthy procedure of transcription.

5.5 Emergent Hypotheses: Fact or Fiction?

The writer has been very critical of certain ESL TOL studies which she feels make far-reaching assumptions (see 2.4.4.) on the grounds of insufficient evidence (Block's (1986) categories of "integrators" and "nonintegrators" refers). The TOL technique has been considered as a rich source of hypotheses, but the writer has been cautious about the stream of hypotheses which have emanated from current ESL TOL studies which lack a step-by-step explication of the deductive steps which result in the hypotheses. Once again, this strengthens the importance of submitting all evidence of TOL studies, and drawing on that evidence to support the emergent hypotheses, so that the reader might assess for himself/herself the validity of the claims.

5.6 Inappropriacy of Quantification of Data in Small TOL Studies

The writer's own TOL case study demonstrated the inappropriacy of quantifying and tabulating the data. Utilising quantification methods similar to those in current ESL TOL research, the writer proffered interpretations based on the tabulated data (Analysis 1), which were subsequently refuted in the graphic analysis (Analysis 2).

Quantifying the data essentially "pools" all responses from all the protocols, and

allows judgements to be made on incidence of response types — in this case, the incidence of bottom-up and top-down strategies, and the percentage use of these strategies associated with comprehension success and comprehension breakdown. Whilst there are decided advantages of quantification, such as accessibility to data, and a degree of "research" acceptability, these so-called advantages are gained at the expense of losing potentially valuable information, and encouraging the researcher to draw rash conclusions which are actually unsubstantiated by the data.

The writer's findings of the inappropriacy of quantification in her own case study suggests that the reader of TOL research approach findings from small case studies based on quantified data with caution.

The fallibility of quantification became evident in Analysis 2, which was a graphic representation of the protocol data. The graphs were found to contextualise each response within the context of each subject's protocol, emphasising the subject's personal reading strategies, an emphasis which is supported by current literature: Sarig (1987) speaks of the importance of "personal reading strategies" and Carrell (1989) recommends that TOLs look at large study populations on the grounds of the "highly individualistic nature of readers' application of strategies" (Carrell 1989:122). The graphs clearly demonstrated that the high incidence of certain category types contained within individual protocols had the effect of unrealistically loading certain responses in the tabulated representation.

5.7 A New Perspective to the Analysis of TOL Data: Inferring Processes from Strategies

Whilst the findings of the first two analyses supported the findings of current ESL TOL research (see 4.3.6.) the writer felt that the exclusive concentration on the identification of strategy type, and whether an identified strategy promoted or deterred comprehension, was to limit the possible use of TOLs.

Prompted by her desire to discover what in fact TOLs can reveal, the writer focussed analysis 3 on TOL's ability to facilitate the assessment of why and how a

particular subject was successful in his/her textual interaction, and why/how the other subjects failed to comprehend the text. This extended the identification of comprehension-deterring and comprehension-promoting strategies associated with decoding and analysis, to a consideration of the underlying reading processes inferred from a particular strategy. In other words, the identified strategy might be failure to detect coherence, whilst the underlying process could indicate a range of possibilities such as: the formulation of an inaccurate hypothesis, the interpretation of text in accordance with that hypothesis, selectively sampling from the text to confirm the hypothesis, imposing an unsubstantiated interpretation onto the text.

This type of analysis places new demands on the researcher. Each verbalisation has to be assessed in terms of where the subject is "at" at any particular stage in his/her textual interaction. It requires a consideration of not only that the subject has failed to comprehend, but the possible underlying process which lead to the comprehension breakdown: does the misinterpretation arise from a lack of content schemata? Is it due to some overriding background knowledge concept that the reader has stimulated and which has coloured his/her subsequent judgement? Because the range of possibilities is substantially increased, the researcher has to virtually place himself/herself into the "mind" of the reader — as indicated by the verbalisations — and try to reconstruct the process of comprehension breakdown, and how the misinterpretation is sustained throughout the textual interaction, in the light of conflicting textual evidence. Perhaps the most difficult task for the researcher in an analysis of this kind is to be receptive to all possible alternatives which could account for the verbalisation.

In order to justify this analysis in terms of ESL reading theory, the writer has suggested that to identify the underlying process from the reading strategy requires a consideration of both "process" — what strategy the reader is using — and "product" — what the reader has understood about the text; his/her comprehension outcome at that specific moment of textual interaction. If one could formulate this into an equation, perhaps this could be:

Strategy Used + Comprehension Outcome = Inferred Process Responsible for Successful/Unsuccessful Comprehension

This change in focus of ESL TOL analysis widens the possibilities of the use of TOLs, but with this widening comes a renewed demand for clearly-defined parameters within which ESL TOL research should be conducted, and definitions of central concepts which could be applied with the precision required to facilitate the description of TOL phenomena.

5.8 What Can TOLs Reveal about Successful / Unsuccessful ESL Textual Interaction? Strengths and Weaknesses of the "New" Analytic Approach

In this section, the writer evaluates TOL's ability to reveal certain aspects of successful and unsuccessful reading interaction. This essentially involves a critical analysis of the writer's own analysis. Throughout this section, the writer wishes to assess whether TOLs in fact can reveal anything more than a good test of comprehension.

5.8.1 What can TOLs Reveal about Unsuccessful Textual Interaction?

5.8.1.1 Evaluation of TOL's Ability to Reveal the Concepts Contained within a Subject's Inaccurate Hypothesis

The verbalisations of the unsuccessful subjects provided adequate evidence of the concepts contained within each reader's inaccurate hypothesis (4.4.3.1). The writer intuitively feels that this is a strength of TOLs above, for example, a comprehension test, since comprehension questions directed specifically at text content might alert the reader to possible inconsistencies with his/her hypothesis, which might result in the reader reformulating that hypothesis in accordance with test expectations.

An interesting study would be the combination of the TOL technique, with a comprehension test, or an interview (Aslanian 1985) administered immediately afterwards, in order to establish whether the reader amends the hypothesis he/she formulates during textual interaction, in the light of subsequent comprehension questions. Anderson (1991) combined retrospective verbal reports with the administration of a standardised reading comprehension test, to compare reading strategies used by ESL readers in reading and testing. It seems that Anderson's subjects reported on both reading strategies, and testing strategies, after reading and answering the comprehension questions — in both the timed testing conditions, and the test with no time limits. The writer questions the validity of the subjects' reports on their reading strategies, in the light of their exposure to the comprehension questions which could have influenced their recollection of strategies used while reading.

The strength of TOLs — which constitute concurrent reports — is that they represent an "on-line" record of what the subject is "doing" throughout his/her textual interaction. If this is compared with a comprehension test on the same text, one would be in a better position to assess whether the reader changes or modifies his/her hypothesis in the light of subsequent comprehension questions.

To summarise, it seems that TOLs may have a unique ability to "get at" the concepts contained within a reader's inaccurate hypothesis, but this requires further investigation.

5.8.1.2 Evaluation of TOL's Ability to Identify the Origins of an Inaccurate Hypothesis

Certainly in this case study, the writer was able to suggest the origins of the readers' formulation of inaccurate hypotheses. The TOL data provided evidence that one subject formulated her hypothesis BEFORE interacting with text which would refute this interpretation — a "premature hypothesis".

The second subject, however, formulated her hypothesis DURING textual interaction which would actually refute this hypothesis; her verbalisations indicate that she has stimulated some existing schematic representation which she has im-

posed on the text, despite contradictory textual evidence — "*Inappropriate Accessing of Schemata*".

The writer feels that no other test of comprehension could provide evidence which allow for researcher judgments of the origins of an inaccurate hypothesis. In this respect, TOLs seem to have a unique strength.

ESL reading theory accounts for both a premature, over-zealous determination to apply meaning to the text, as well as the stimulation of an existing schematic structure in terms of which the reader imposes interpretations onto the text. Both of these phenomena are associated with reading problems from a top-down perspective of reading interaction: in the light of the lack of content schemata (i.e. the knowledge of the word "euthanasia"), the readers apply meaning to the text either by accessing schemata too early (Spiro 1980) or accessing existing schemata inappropriately.

However, an alternative explanation for the formulation of an inaccurate hypothesis could apply, which indicate problems associated with a bottom-up perspective of reading interaction. From this perspective, the ESL reader who simply does not have the necessary language skills to competently interact with text, will inappropriately activate existing schemata, and impose an interpretation onto the text, in accordance with his existing schemata. ESL literature proffers the induction of the short-circuit (1.6.2.) to account for the guessing at meaning in the face of decoding difficulties, and Stanovich's interactive-compensatory model, whereby top-down analysis over-compensates for the lack of language skills.

Because problems associated with decoding and analysis could both manifest as the formulation of an inaccurate hypothesis, it is impossible to identify the cause as being in the first or second component, and TOLs are certainly unable to identify this.

5.8.1.3 Evaluation of TOL's Ability to Demonstrate the Ways in which a Reader Maintains an Inaccurate Hypothesis

Evidence from the TOL case study corroborates ESL reading theory on the ways in which a subject — having formulated an inaccurate hypothesis — manages to

sustain that hypothesis, despite contradictory textual evidence.

There were recurring examples in the protocols of each of the following identified means of, or reasons for maintaining inaccurate hypotheses:

a) Interpreting the text in accordance with the hypothesis

b) Selectively sampling from the text to confirm the hypothesis

c) Ignoring textual evidence which contradicts the hypothesis; or interacting with a sentence in isolation

d) Reinforcement of the hypothesis without any textual support.

Each of these identified means of maintaining an inaccurate hypothesis could indicate a "reading" problem, or a "language" problem. The evidence of the application of meaning to the text, and touching only those textual bases which confirm the hypothesis, suggest a problem in the second component. However, the case for a problem in the first component is equally as strong: the readers just do not have the language skills to interact within the textual constraints. The reader does not reconsider an initial inaccurate hypothesis either because he/she is applying meaning to the text, or because his/her lack of language competence does not alert him/her to the inconsistencies at the level of decoding.

In the above discussions, the strength of TOLs lies in their apparent ability to allow the researcher to infer various ways in which a reader sustains an inaccurate hypothesis.

A weakness, or limitation of TOLs, however, is their inability to identify the root cause of the maintenance of these inaccurate hypotheses — whether they represent manifestations of reading problems in the first or second component.

An additional weakness to emerge from inferring reader processes as some means of maintaining hypotheses, is that some verbalisations were not only subject to an "either/or" alternative, but a third possible interpretation could be offered which would just as readily apply. This was particularly evident in some strategies identified as accurate paraphrases. On the strength of this apparent competent decoding,

and the fact that the subject did not amend her hypothesis in the light of this accurate information, the inferred process was judged to be either ignoring textual evidence which contradicts the hypothesis, or interacting with a sentence in isolation and not making the bottom-up/top-down connections, both of which were considered means of maintaining an inaccurate hypothesis. Closer observation, however, revealed that an overtly accurate paraphrase might have had nothing to do with hypothesis maintenance in the face of conflicting textual evidence, but could in fact indicate decoding difficulty — the subject had not understood the language of the text.

Discrepancies such as these highlight the fact that TOLs represent only one picture of the total reading process. Because they allow for so many alternatives, the root cause of the reading problems remains as elusive as ever.

Perhaps it is because the reading process is so difficult to "get at", one of the "strengths" of TOLs could be likened to the recognised strength of case study research. The writer utilises the critique of case study research from Cohen and Manion (1987:146) to draw the following analogy. Just as case studies recognise the "complexity and "embeddedness" of social truths", so TOLs reveal the complexity and embeddedness of the reading process. Case studies, "by carefully attending to social situations ... can represent something of the discrepancies or conflicts between the viewpoints held by participants". In the same way, TOL data represent the discrepancies and intricacies between viewpoints of ESL reading problems held by reading theorists. And just as "the best case studies are capable of offering some support to alternative interpretations", so perhaps the very strength of TOLs lies in their capacity to offer support to alternative interpretation.

5.8.1.4 The Apparent Inability of TOLs to Identify Whether Reading is a "Language" or "Reading" Problem: TOLs as One Aspect of the Total Picture

Although the TOL data provided evidence that the unsuccessful readers experienced problems with the language of the text, there were as many instances of competent

textual interaction at the sentence level. The evidence suggested that accurate sentence level interaction which contradicted their hypotheses seemed to activate a "blocking mechanism" which either enabled them to ignore textual information, or allowed them to interact with the sentence in isolation from their inaccurate hypotheses. In other words, one could speculate that the unsuccessful readers were able to construct meaning by creating a "chain" of propositions through accurate interaction with individual sentences, but may have lacked the ability to synthesize these into a macro-proposition of the text's meaning.

The limitations of TOLs is apparent in the above discussion. TOL data provides evidence of reading as a "language" and a "reading" problem, as well as inconclusive evidence which permits both interpretations. At the end of the analysis, one is still no nearer to answering the crucial questions: Is reading a language problem or a reading problem? Is the problem in the first component or the second? Is the breakdown in comprehension a bottom-up decoding problem, or a problem of top-down analysis? The respective contributing roles played by the two different perspectives of ESL reading problems cannot be assessed through TOL data alone.

These findings confirm that TOL data cannot give the holistic picture of the reader's comprehension problems; they are just one aspect of the total reading process. The writer suggests that the combination of TOL data with other comprehension and language tests, and possibly interviews, would provide a clearer insight into the causes of ESL reading problems.

5.8.2 What Can TOLs Reveal about Successful Textual Interaction?

In this particular study, the TOL technique was able to reveal two overriding aspects of successful textual interaction. Whether these issues could emerge with such clarity from other TOL studies of the successful ESL reader cannot be ascertained. Once again, the interest rests with the close observation of one subject's successful comprehension of a particular text at a particular time, to ascertain what TOLs might reveal about successful ESL interaction.

And just as one could not generalise that all TOLs of successful comprehension could reveal issues with such lucidity, so one could not generalise the findings of the TOL analysis to the individual as indicative of her "usual" successful textual interaction, least of all to the broader population of successful ESL readers.

The two overriding issues which emerged from the in-depth analysis of the successful subject's TOL data will be summarised below.

5.8.2.1 TOL's Ability to Demonstrate how the Subject Successfully Comprehended the Text

The writer feels that no measure of comprehension other than TOLs could so lucidly demonstrate the comprehension "steps" evident in this reader's derivation of meaning from the text, and meaning beyond the text. Firstly, the TOL data provided evidence that the subject did not have any schematic representation of the concept of "euthanasia". As the meaning of this word became apparent to her during her textual interaction, it was clear from her verbalisations that this new knowledge was inconsistent with her existing schematic representations of the functions of doctors. Despite this inconsistency, she managed not only to interact with the all the salient textual information, but also to demonstrate the use of critical reasoning by evaluating and extrapolating beyond the boundaries of the text itself. At the end of her reading, her verbalisations demonstrated that she has grasped the whole controversy surrounding euthanasia.

5.8.2.2 TOL's Ability to Reveal Emerging Patterns of Interaction which seemed to Facilitate Comprehension

The TOL data indicated the recurrence of certain patterns of interaction which seemed to facilitate the subject's comprehension of the text. One of the patterns was identified as a question/answer strategy, which seemed to indicate an overt problem-solving process to aid her comprehension of the text. The subject's questions seemed to serve the function of highlighting areas of uncertainty or acknowledging key information for which answers were required in order for her to construct

the text's meaning.

The answers seemed to indicate that some uncertainty had been resolved, or some concept clarified. There was evidence from the verbalisations that answers had been found to some unstated, implicit questions which the subject had not verbalised, but which she had posed to herself.

The second pattern of interaction which the TOL data was able to identify was the subject's repetition of key information pertaining to a section of text which she had just read, which seemed to serve the purpose of establishing cohesive links within the text, and identifying key information to aid her comprehension.

Whether these patterns of interaction have a "life" beyond this particular case study is for the reader of this thesis to judge for himself/herself. In accordance with the case study research paradigm, the data "at its best, ... allow(s) the reader to judge the implications of a study for himself" (Cohen & Manion:146). The writer's primary concern is the extent to which the TOL data has allowed accessibility to apparent patterns of successful textual interaction. She feels that this analysis has ably demonstrated TOL's ability to do so.

5.9 A Critique of TOL's Use in Successful / Unsuccessful Textual Interaction: Suggestions for Future Research

One observation which has emerged from this critique of TOLs is that TOL data seems to be able to more easily identify what a reader is "doing" during successful textual interaction, whilst it is more difficult to infer what is causing comprehension breakdowns during unsuccessful textual interaction.

This observation stresses the limitations of TOLs, which confirms the writer's suggestions that TOL data be used in conjunction with other language and comprehension measures, in order to address one of the major issues in ESL reading theory: whether reading problems are in fact a language, or a reading problem.

A further issue which hinges on the difficulties of "getting at" what the unsuccessful reader is doing, is that comprehension breakdowns demand that the researcher consider the theoretical input of a range of possible alternatives which could account for any specific breakdown. On the other hand, following the successful reader's comprehension does not make as many demands on researcher inference.

The writer found that the analysis of unsuccessful interaction demanded the application of a different set of criteria from the analysis of successful interaction. The number of ESL reading factors increases geometrically when one begins to ask why the reader fails to comprehend, whereas the successful reader more or less interacts in accordance with established frameworks of reading theory proposed by current models of reading. It is easier to follow the successful progression, than to account for the deviations.

Despite the above, the writer feels that TOLs have great potential as one means of revealing aspects of comprehension breakdowns, and when combined with other measures, they could make a valuable contribution to ESL reading theory.

The TOL technique is unique in its capacity to provide the researcher with an on-line assessment of reader interaction. What is required from TOL researchers, however, is the establishment of research parameters within which ESL TOL research should be conducted. It is only then that the potential strength of TOLs can be harnessed, and it can take its rightful place within ESL reading research as a reliable research tool.

Appendix 1

The Last Appointment

The Dutch medical profession regards Dr Pieter Admiraal as a pioneer. At the Reiner de Graaf General Hospital in Delft he has established radical new methods of treating the dying — and of ending their suffering. He is the author of Justifiable Euthanasia, a manual for the medical profession, the standard how-to-do-it guide for Dutch doctors. If there is a euthanasia professional in Holland, Dr Admiraal is it.

His hospital is set in a bleak landscape of modern blocks of flats, a mile or two outside the pretty medieval centre of Delft with its shops selling antique tiles and its pale watercolourist's light. Admiraal is a bluff, florid, bearded individual for whom most of the questions about voluntary euthanasia seem to have been answered. His conversation is enthusiastic, proselytising and profoundly chilling.

As an anaesthetist he has been involved with the treatment of chronic pain for 25 years and he has come to the view that a painless death is the last, honest treatment a doctor can give to his suffering patient.

"When it has been done," he says, "I am sad and satisfied. Sad because I am losing a friend — I have usually got to know them well in their last weeks. Then later I am satisfied because I know he died with dignity and without pain."

Such words come neatly from Dr Admiraal; less forthcoming is the total number of euthanasia cases in which he has been involved. "I know about newspaper headlines which say Doctor Kills So Many People," he says. Nonetheless, unlike most Dutch doctors, he is not afraid to go public on the issue. In 1985 he admitted to administering lethal drugs to a woman suffering from total paralysis as a result of multiple sclerosis. The case was important, because she was not actually close to death. Proximity to death had previously been one of the conditions laid down in the Dutch case law.

Strictly speaking, euthanasia in Holland remains illegal under the criminal code. But numerous legal precedents have been established which allow doctors to offer it as a last resort in cases of hopeless suffering. In a country with a population of only 14 million, somewhere between 6000 and 10,000 people a year — perhaps 8 per cent of the total number of deaths — are thought to die voluntarily at the hands of their doctors.

Dr Admiraal's method is to establish around each dying patient a team of doctors, nurses and a priest of the appropriate faith. He is a non-believer himself, but he thinks the moral debate should be somehow represented.

Once a patient has repeatedly and lucidly requested euthanasia and the team have discussed the various alternatives of relief of pain or depression, the decision may be taken to go ahead.

Appendix 2

Coded Protocols

Protocol 1

1. L.1–2
   The way I think is, the Dutch was the professional ... eh ... Dr. Pieter Admiraal was the Dutch ... was the Dutch medical profession.
   PARAPHRASE UNCLEAR

2. L.2
   He was valued as a pioneer.
   PARAPHRASE^{+}

3. L.3
   He established radical methods of treating the dying and the ending of suffering.
   REPRODUCTION^{-}

4. L.4–5
   He was the author of Justifiable Enthanasia, a manual for the medical profession, which means ... he may ... may be he was a doctor.
   PARAPHRASE^{+}

5. L.5–6
   He guided most of the Dutch doctors ...
   PARAPHRASE UNCLEAR

6. L.6–7
   ... the enthanasia professional in Holland, which means he was ... he specialised in enthanasia ...
   PARAPHRASE^{+}

7. L.7–8
   ... but I don't know what ... what's the meaning of enthanasia.
   QUESTION ITEMS^{-}

8. L.8–10
   His hospital was built in modern blocks of flats and it was mile away from

outside the centre of Delft with its shops where it was set in tiles and water ... watercolourist's ...
PARAPHRASE UNCLEAR
STUMBLE

9. L.10–11
He was a bluff, florid, bearded, but I don't know what's the meaning of bluff, florid and bearded.
QUESTION ITEMS^{-}

10. L.11–12
Most of the people who have suffered ... eh ... enthanasia were ... were being helped by Dr. Admiraal.
COHERENCE-DETECTION^{-}

11. L.12–15
As Dr. Admiraal was an ... anae ... anaesth ... he was involved in the treatment of chronic pain for about 25 years which means most of the people who were being helped ... who were suffering for enthanasia.
PARAPHRASE^{-}
STUMBLE

12. L.15
Mostly he treated his patients who have suffered.
PARAPHRASE UNCLEAR

13. L.15–16
If he have had a ... an operation, usually ... he was usually satisfied.
COHERENCE-DETECTION^{-}

14. L.16–18
If a patient was not well, he can't go on, overcome that pain, he usually becomes sad, because he said he's losing a friend ... because he usually knows them best for some weeks ...
PARAPHRASE^{+}

15. L.18–20
... and he can usually said that ... if a patient can die, he usually says that he is satisfied because he has done her best in order to survive that patient ...
PARAPHRASE^{-}

16. L.20–21
These words were coming from Dr. Admiraal.
PARAPHRASE^{-}

17. L.21–22
He was one of the doctors who have ... who have tried to treat enthanasia.
COHERENCE-DETECTION^{-}

18. L.22–25
    In what he says, he says that most of the doctors have killed many people because of not ... especially Dutch doctors who didn't have ... eh ... didn't have an attit ... eh ... who didn't have the knowledge of treating enthanasia.
    PARAPHRASE^{-}

19. L.25–26
    But nevertheless he was not like Dutch doctors, he was not afraid to go to the public.
    PARAPHRASE^{-}

20. L.26–27
    In 1985 he admitted some ... some lethal drugs to a woman who was suffering ... who was paralysed as a result of multiple sclerosis ...
    PARAPHRASE^{+}

21. L.27–28
    ... I don't know what's the meaning of sclerosis.
    QUESTION ITEMS^{-}

22. L.28–29
    And this one ... this thing was most important because he was ... that woman was dying, so he helped her ... so he helped her.
    COHERENCE-DETECTION^{-}

23. L.30–31
    And ... death in most of the Dutch was a common thing because of that ... of that disease.
    COHERENCE-DETECTION^{-}

24. L.31–32
    And enthanasia in Holland remains illegal which means it is not legal under the criminal code.
    PARAPHRASE^{+}

25. L.32–34
    Most legal precedents have established or allowed doctors to offer them ... eh ... to go on to help those who are helpless because of their suffering.
    PARAPHRASE UNCLEAR

26. L.34–37
    Eh ... it shows here that there are about 14 million people in ... 14 million people of Dutch, so between 6,000 and 10,000 per year perhaps 8 per cent of the total number of deaths are being reported, and most of them are ... they die in the hands of their doctors.
    PARAPHRASE^{+}

27. L.37–40
    And Dr. Admiraal's method was to establish each ... each dying patient to have a ... to have a team of doctors and nurses and priests so that he can be ... have ... he can have a faith or believe that may be he'll survive.
    COHERENCE-DETECTION$^-$

28. L.40–41
    But although he was ... he was a non-believer ... he thought that the moral debate should be ... should be represented.
    REPRODUCTION$^-$

29. L.41–42
    If a patient have, or have reported to have enthanasia ...
    COHERENCE-DETECTION$^-$

30. L.42–43
    ... the team will discuss the various ... the various to relieve the pain of the patient and the decision to make.
    PARAPHRASE UNCLEAR

31. L.43–45
    So Dr. Admiraal has been taken ... as one of the most powerful doctors because he established the method of treating patients who have enthanasia.
    COHERENCE-DETECTION$^-$

32. L.45–46
    So most of the doctors didn't have the best treatment of treating the patients.
    COHERENCE-DETECTION$^-$

33. L.46–47
    Most of the patients did die in the hands ... in the hands of their doctors.
    COHERENCE-DETECTION$^-$

34. L.47–49
    So the method that he used was of making a team of doctors and nurses and priests to pray or to give that patient ... to have faith.
    COHERENCE DETECTION$^-$

Protocol 2

1. L.1–2
   Here we are told about a doctor of the Dutch who is regarded as an expert on people who are dying.
   PARAPHRASE^{+}

2. L.2
   He is also referred to as an anaesthetist.
   COHERENCE-DETECTION^{+}

3. L.2–3
   This doctor has been involved with the treatment of chronic pain for 25 years and has come to ...
   REPRODUCTION^{-}

4. L.3–5
   ... and he used certain injections for curing those people that were suffering from their pains.
   COHERENCE-DETECTION^{-}

5. L.5
   Dr. Admiraal is also known because of his famous researches.
   COHERENCE DETECTION^{+}

6. L.5–7
   Here it is said that ... it is said that "In 1985 he admitted to administering lethal drugs to a woman suffering from total paralysis as a result of multiple sclerosis".
   REPRODUCTION^{+}

7. L.7–9
   Here we find that this doctor, Dr. Admiraal, had been trying by all means to save that woman from death.
   PARAPHRASE^{-}

8. L.9
   Euthanasia ... remains illegal under the criminal code.
   REPRODUCTION^{-}

9. L.9–10
   I don't understand the word "euthanasia".
   QUESTION ITEMS^{-}

10. L.10–11
    Euthanasia ... I don't understand the word "euthanasia".
    QUESTION ITEMS^{-}

11. L.11
    But we find that this euthanasia in Holland was taken illegal.
    PARAPHRASE^{+}

12. L.12
    In a country with a population ...
    REPRODUCTION^{+}

13. L.12–14
    There were many people in Holland that were suffering from this unknown disease called euthanasia, and the result this disease has caused many people to be the victim of death.
    COHERENCE-DETECTION^{-}

14. L.14–16
    Dr. Admiraal's methods ... Dr. Admiraal had established methods for curing the people that were suffering from that ... that disease euthanasia.
    COHERENCE-DETECTION^{-}

15. L.16–17
    He is a non-believer himself, and moral should be somewhere.
    PARAPHRASE UNCLEAR

16. L.17–18
    Although he killed those person or those people he was not in himself sure of what was the cause of that disease.
    COHERENCE-DETECTION^{-}

17. L.18–19
    Then he would repeatedly ... he would repeatedly ask the patient ...
    PARAPHRASE UNCLEAR

18. L.19–20
    ... and discuss that particular pain or suffering with the other nurses and priests, etc.
    PARAPHRASE^{+}

19. L.21–22
    When I'm reading this passage, my mind is thinking about the test I have recently written now.
    SUBJECTIVE REACTION

20. L.22–23
    I am worried because I am not concentrating on this because
    I think that I have failed the test, therefore that affects my concentration here.
    SUBJECTIVE REACTION

21. L.23–25
    I also find myself not in a happy mood because of my first ... my first attendance on the language lab.
    SUBJECTIVE REACTION

22. L.25
    Next time I'll try to acquaint myself with these needs.
    SUBJECTIVE REACTION

23. L.26–27
    Pertaining to the passage again, I find difficult words and some of them ... I'm not familiar with them, e.g. watercolourist, proselytising ...
    QUESTION ITEMS

Protocol 3

1. L.1
   The Dutch medical profession regards Dr. Pieter Admiraal as a pioneer.
   REPRODUCTION^{+}

2. L.1–2
   What is a pioneer?
   QUESTION ITEMS^{-}

3. L.2
   A pioneer of what?
   COHERENCE-DETECTION^{+}

4. L.2–5
   At the Reiner de Graaf General Hospital in Delft he has established radical new methods of treating the dying — and of ending their suffering. He is the author of Justifiable Euthanasia, a manual for the medical profession.
   REPRODUCTION^{+}

5. L.5
   Oh — he is a doctor...
   QUESTION ITEMS^{+}
   COHERENCE-DETECTION^{+}

6. L.5–7
   ... the standard how-to-do-it guide for Dutch doctors. If there is a euthanasia professional in Holland, Dr. Admiraal is it.
   REPRODUCTION^{+}

7. L.7
   Dr. Admiraal is that — ...
   COHERENCE-DETECTION^{+}

8. L.7
   ... what is a euthanasia?
   QUESTION ITEMS^{-}

9. L.8–10
   His hospital is set in a bleak landscape of modern blocks of flats, a mile or two from outside the medieval centre of Delft with its shops selling antique tiles and its pale watercolourist's light.
   REPRODUCTION^{+}

10. L.10
    A block of flats.
    REPRODUCTION^{+}

11. L.10–12
    Admiraal is a bluff, florid, bearded individual for whom most of the questions about voluntary euthanasia seem to have been answered.
    REPRODUCTION^{+}

    L12–13 His conversation is enthusiastic, proselytising and profoundly chilling.
    REPRODUCTION^{+}

12. L.14–16
    As an anaesthetist he has been involved with the treatment of chronic pain for 25 years and he has come to the view that a painless death is the last, honest treatment a doctor can give to his suffering patient.
    REPRODUCTION^{+}

13. L.16
    Mmm. A chronic doctor.
    COHERENCE DETECTION UNCLEAR^{-}

14. L.17
    "When it has been done," he says, "I am sad and satisfied."
    REPRODUCTION^{+}

15. L.17
    Sad and satisfied?
    REPRODUCTION^{+}
    EVALUATION

16. L.18–19
    Sad because I am losing a friend — I have usually got to know them well in their last weeks.
    REPRODUCTION^{+}

17. L.19
    Those patients ... dying patients.
    COHERENCE-DETECTION^{+}

18. L.19–20
    Then later I am satisfied because I know he died with dignity and without pain.
    REPRODUCTION^{+}

19. L.21–24
    Such words come neatly from Dr. Admiraal; less forthcoming is the total number of euthanasia cases in which he has been involved. "I know about newspaper headlines which say Doctor Kills So Many People," he says. Nonetheless, unlike most Dutch doctors, he is not afraid to go public on the issue.
    REPRODUCTION^{+}

20. L.24–25
    Oh. Sometimes doctors kill people?
    QUESTION ITEMS^{+}
    EVALUATION

21. L.25–28
    In 1985 he admitted to administering lethal drugs to a woman suffering from total paralysis as a result of multiple sclerosis. The case was important, because she was not actually close to death. Proximity to death had previously been one of the conditions laid down in the Dutch case law.
    REPRODUCTION^{+}

22. L.28–29
    Oh. This woman was totally suffering from this pain and then ... Dr. Admiraal killed her.
    PARAPHRASE^{+}
    QUESTION ITEMS^{+}

23. L.29
    And the law?
    EXTRAPOLATION

24. L.30
    Strictly speaking, euthanasia in Holland remains illegal under the criminal code.
    REPRODUCTION^{+}

25. L.31
    Illegal.
    REPRODUCTION^{+}

26. L.31–32
    But numerous precedents have been established which allow doctors to offer it as a last resort in cases of hopeless suffering.
    REPRODUCTION^{+}

27. L.32–33
    Mmm. For only in cases of hopeless suffering — so that is euthanasia ... euthanasia ... oh ... ooh.
    COHERENCE-DETECTION^{+}
    QUESTION ITEMS^{+}

28. L.33–36
    In a country with a population of only 14 million, somewhere between 6,000 and 10,000 people a year — perhaps 8 per cent of the total number of deaths — are thought to die voluntarily ...
    REPRODUCTION^{+}

29. L.36
... voluntarily ...
REPRODUCTION^{+}
COHERENCE DETECTION^{+}

30. L.36
... at he hands of their doctors.
REPRODUCTION^{+}

31. L.36–37
Oh — they just ask the doctors — when they are hopeless — to kill them with those drugs.
PARAPHRASE^{+}
QUESTION ITEMS^{+}

32. L.38–40
Dr. Admiraal's method is to establish around each dying patient a team of doctors, nurses and a priest of the appropriate faith. He is a non-believer himself, but he thinks the moral debate should be somehow represented.
REPRODUCTION^{+}

33. L.40–42
So somehow or ... the patient may need this thing and when the patient is a believer, he or she could expect a priest so that he can pray for him.
PARAPHRASE^{+}

34. L.42
Okay.
QUESTION ITEMS^{+}

35. L.43–45
Once a patient has repeatedly and lucidly requested euthanasia and the team have discussed the various alternatives of relief of pain or depression, the decision may be taken to go ahead.
REPRODUCTION^{+}

36. L.45
Oh ... the patient can request this euthanasia.
COHERENCE-DETECTION^{+}
QUESTION ITEMS^{+}

37. L.45–46
So this killing is euthanasia, and it's discovered by Dr. Admiraal, a Dutch doctor.
COHERENCE-DETECTION^{+}

38. L.47–48
But it's illegal, but somewhere or somehow the doctor ... the law ... Mmmm

... grant legal to those who want this euthanasia.
COHERENCE-DETECTION^{+}

39. L.48–50
That is better. Because if you are still suffering and you are hopeless and that pain — there is no other way just the pain to be taken off, and then you can die a painless death.
EVALUATION

40. L.51
But what makes me think more is that people are not animals.
EXTRAPOLATION

41. L.51–52
You can kill an animal when he is suffering but it is differ from a human being.
EXTRAPOLATION

If it's differ from a human being ... but this human being asks himself or requested that this be done to him ...
EXTRAPOLATION

Appendix 3

All verbalisations from every protocol categorised according to codes

Detail Interpretations

PARAPHRASE^{+}

- Protocol 1

  2. He was valued as a pioneer.
  4. He was the author of Justifiable Enthanasia, a manual for the medical profession, which means ... he may ... may be he was a doctor.
  6. ... the enthanasia professional in Holland, which means he was ... he specialised in enthanasia ...
  14. If a patient was not well, he can't go on, overcome that pain, he usually becomes sad, because he said he's losing a friend ... because he usually knows them best for some weeks ...
  20. In 1985 he admitted some ... some lethal drugs to a woman who was suffering ... who was paralysed as a result of multiple sclerosis ...
  24. And enthanasia in Holland remains illegal which means it is not legal under the criminal code.
  26. Eh ... it shows here that there are about 14 million people in ... 14 million people of Dutch, so between 6,000 and 10,000 per year perhaps 8 per cent of the total number of deaths are being reported, and most of them are ... they die in the hands of their doctors.

- Protocol 2

  1. Here we are told about a doctor of the Dutch who is regarded as an expert on people who are dying.
  11. But we find that this euthanasia in Holland was taken illegal.
  18. ... and discuss that particular pain or suffering with the other nurses and priests, etc.

- Protocol 3

23. Oh. This woman was totally suffering from this pain and then ... Dr. Admiraal killed her.

32. Oh — they just ask the doctors — when they are hopeless — to kill them with those drugs.

34. So somehow or ... the patient may need this thing and when the patient is a believer, he or she could expect a priest so that he can pray for him.

PARAPHRASE^{-}

- Protocol 1

11. As Dr. Admiraal was an ... anae ... anaesth ... he was involved in the treatment of chronic pain for about 25 years which means most of the people who were being helped ... who were suffering for enthanasia.

15. ... and he can usually said that ... if a patient can die, he usually says that he is satisfied because he has done her best in order to survive that patient ...

16. These words were coming from Dr. Admiraal.

18. In what he says, he says that most of the doctors have killed many people because of not ... especially Dutch doctors who didn't have ... eh ... didn't have an attit ... eh ... who didn't have the knowledge of treating enthanasia.

19. But nevertheless he was not like Dutch doctors, he was not afraid to go to the public.

- Protocol 2

7. Here we find that this doctor, Dr. Admiraal, had been trying by all means to save that woman from death.

PARAPHRASE UNCLEAR

- Protocol 1

1. The way I think is, the Dutch was the professional ... eh ... Dr. Pieter Admiraal was the Dutch ... was the Dutch medical profession.

5. He guided most of the Dutch doctors ...

8. His hospital was built in modern blocks of flats and it was mile away from outside the centre of Delft with its shops where it was set in tiles and water ... watercolourist's ...

12. Mostly he treated his patients who have suffered.

25. Most legal precedents have established or allowed doctors to offer them ... eh ... to go on to help those who are helpless because of their suffering.

30. ... the team will discuss the various ... the various to relieve the pain of the patient and the decision to make.

- Protocol 2

15. He is a non-believer himself, and moral should be somewhere.
17. Then he would repeatedly ... he would repeatedly ask the patient ...

QUESTION ITEMS$^-$

- Protocol 1

7. ... but I don't know what ... what's the meaning of enthanasia.
9. He was a bluff, florid, bearded, but I don't know what's the meaning of bluff, florid and bearded.
21. ... I don't know what's the meaning of sclerosis.

- Protocol 2

9. I don't understand the word "euthanasia".
10. Euthanasia ... I don't understand the word "euthanasia".
23. Pertaining to the passage again, I find difficult words and some of them ... I'm not familiar with them, e.g. watercolourist, proselytising ...

- Protocol 3

2. What is a pioneer?
8. ... what is a euthanasia?

Macro Interpretations

QUESTION ITEMS$^+$

- Protocol 3

5. Oh — he is a doctor ...
21. Oh. Sometimes doctors kill people?
23. Oh. This woman was totally suffering from this pain and then ... Dr. Admiraal killed her.
28. Mmm. For only in cases of hopeless suffering — so that is euthanasia ... euthanasia ... oh ... ooh.
32. Oh — they just ask the doctors — when they are hopeless — to kill them with those drugs.
35. Okay.
37. Oh ... the patient can request this euthanasia.

COHERENCE DETECTION^{+}

- Protocol 2

  2. He is also referred to as an anaesthetist.
  5. Dr. Admiraal is also known because of his famous researchers.

- Protocol 3

  3. A pioneer of what?
  5. Oh — he is a doctor.
  7. Dr. Admiraal is that — ...
  18. Those patients ... dying patients.
  28. Mmm. For only in cases of hopeless suffering — so that is euthanasia ... euthanasia ... oh ... ooh.
  30. ... voluntarily ...
  37. Oh ... the patient can request this euthanasia.
  38. So this killing is euthanasia, and it's discovered by Dr. Admiraal, a Dutch doctor.
  39. But it's illegal, but somewhere or somehow the doctor ... the law ... Mmmm ... grant legal to those who want this euthanasia.

COHERENCE DETECTION^{-}

- Protocol 1

  10. Most of the people who have suffered ... eh ... enthanasia were ... were being helped by Dr. Admiraal.
  13. If he have had a ... an operation, usually ... he was usually satisfied.
  17. He was one of the doctors who have ... who have tried to treat enthanasia.
  22. And this one ... this thing was most important because he was ... that woman was dying, so he helped her ... so he helped her.
  23. And ... death in most of the Dutch was a common thing because of that ... of that disease.
  27. And Dr. Admiraal's method was to establish each ... each dying patient to have a ... to have a team of doctors and nurses and priests so that he can be .. have ... he can have a faith or believe that may be he'll survive.
  29. If a patient have, or have reported to have enthanasia ...
  31. So Dr. Admiraal has been taken ... as one of the most powerful doctors because he established the method of treating patients who have enthanasia.

32. So most of the doctors didn't have the best treatment of treating the patients.
33. Most of the patients did die in the hands ... in the hands of their doctors.
34. So the method that he used was of making a team of doctors and nurses and priests to pray or to give that patient ... to have faith.

- Protocol 2

4. ... and he used certain injections for curing those people that were suffering from their pains.
13. There were many people in Holland that were suffering from this unknown disease called euthanasia, and the result this disease has caused many people to be the victim of death.
14. Dr. Admiraal's methods ... Dr. Admiraal had established methods for curing the people that were suffering from that ... that disease euthanasia.
16. Although he killed those person or those people he was not in himself sure of what was the cause of that disease.

COHERENCE-DETECTION UNCLEAR

- Protocol 3

14. Mmm. A chronic doctor.

EVALUATION

- Protocol 3

16. Sad and satisfied?
21. Oh. Sometimes doctors kill people?
40. That is better. Because if you are still suffering and you are hopeless and that pain — there is no other way just the pain to be taken off, and then you can die a painless death.

EXTRAPOLATION

- Protocol 3

24. And the law?
41. But what makes me think more is that people are not animals.
42. You can kill an animal when he is suffering but it is differ from a human being.
43. If it's differ from a human being ... but this human being asks himself or requested that this be done to him ...

Neutral Responses

REPRODUCTION+

- Protocol 2

  6. Here it is said that ... it is said that "In 1985 he admitted to administering lethal drugs to a woman suffering from total paralysis as a result of multiple sclerosis".

  12. In a country with a population ...

- Protocol 3

  1. The Dutch medical profession regards Dr. Pieter Admiraal as a pioneer.

  4. At the Reiner de Graaf General Hospital in Delft he has established radical new methods of treating the dying — and of ending their suffering, He is the author of Justifiable Euthanasia, a manual for the medical profession.

  6. ... the standard how-to-do-it guide for Dutch doctors. If there is a euthanasia professional in Holland, Dr. Admiraal is it.

  9. His hospital is set in a bleak landscape of modern blocks of flats, a mile or two from outside the medieval centre of Delft with its shops selling antique tiles and its pale watercolourist's light.

  10. A block of flats.

  11. Admiraal is a bluff, florid, bearded individual for whom most of the questions about voluntary euthanasia seem to have been answered.

  12. His conversation is enthusiastic, proselytising and profoundly chilling.

  13. As an anaesthetist he has been involved with the treatment of chronic pain for 25 years and he has come to the view that a painless death is the last, honest treatment a doctor can give to his suffering patient.

  15. "When it has been done," he says, "I am sad and satisfied."

  17. Sad because I am losing a friend — I have usually got to know them well in their last weeks.

  19. Then later I am satisfied because I know he died with dignity and without pain.

  20. Such words come neatly from Dr. Admiraal; less forthcoming is the total number of euthanasia cases in which he has been involved. "I know about newspaper headlines which say Doctor Kills So Many People," he says. Nonetheless, unlike most Dutch doctors, he is not afraid to go public on the issue.

  22. In 1985 he admitted to administering lethal drugs to a woman suffering from total paralysis as a result of multiple sclerosis. The case was important, because she was not actually close to death. Proximity to death

had previously been one of the conditions laid down in the dutch case law.

25. Strictly speaking, euthanasia in Holland remains illegal under the criminal code.
26. Illegal.
27. But numerous precedents have been established which allow doctors to offer it as a last resort in cases of hopeless suffering.
29. In a country with a population of only 14 million, somewhere between 6,000 and 10,000 people a year — perhaps 8 per cent of the total number of deaths — are thought to die voluntarily ...
31. ... at the hands of their doctors.
33. Dr. Admiraal's method is to establish around each dying patient a team of doctors, nurses and a priest of the appropriate faith. He is a non-believer himself, but he thinks the moral debate should be somehow represented.
36. Once a patient has repeatedly and lucidly requested euthanasia and the team have discussed the various alternatives of relief of pain or depression, the decision may be taken to go ahead.

REPRODUCTION⁻

- Protocol 1

  3. He established radical methods of treating the dying and the ending of suffering.
  28. But although he was ... he was a non-believer ... he thought that the moral debate should be ... should be represented.

- Protocol 2

  3. This doctor has been involved with the treatment of chronic pain for 25 years and has come to ...
  8. Euthanasia ... remains illegal under the criminal code.

STUMBLE

- Protocol 1

  8. ... water ... watercolourist's ...
  11. As Dr. Admiraal was an ... anae ... anaesth ...

SUBJECTIVE REACTION

- Protocol 2

19. When I'm reading this passage, my mind is thinking about the test I have recently written now.
20. I am worried because I am not concentrating on this because I think that I have failed the test, therefore that affects my concentration here.
21. I also find myself not in a happy mood because of my first ... my first attendance on the language lab.
22. Next time I'll try to acquaint myself with these needs.

Appendix 4

Table 1: Analysis 1

	Detail Interps				Macro Interpretations						Neutral Responses			
	Par +	Par -	Par Uncl	Ques Its -	Ques Its +	Coh Det +	Coh Det -	Coh Det Uncl	Eval	Extr	Rep +	Rep -	Stum	Sub Reac
Proto-col 1	C-P 7 19%	C-D 5 14%	X 7 19%	C-D 3 8%	C-P -	C-P -	C-D 11 30%	X -	C-P -	C-P -	X -	X 2 5%	X 2 5%	X -
		Total C-Ps C-Ds	59% 19% 21%				Total C-Ps C-Ds	30% 0% 30%				Total	11%	
Proto-col 2	3 13%	1 4%	2 9%	3 13%	-	2 9%	4 17%	-	-	-	2 9%	2 9%	-	4 17%
		Total C-Ps C-Ds	39% 13% 17%				Total C-Ps C-Ds	26% 9% 17%				Total	35%	
Proto-col 3	3 6%	-	-	2 4%	7 14%	9 18%	-	1 2%	3 6%	4 8%	22 43%	-	-	-
		Total C-Ps C-Ds	10% 6% 4%				Total C-Ps C-Ds	47% 46% 0%				Total	43%	

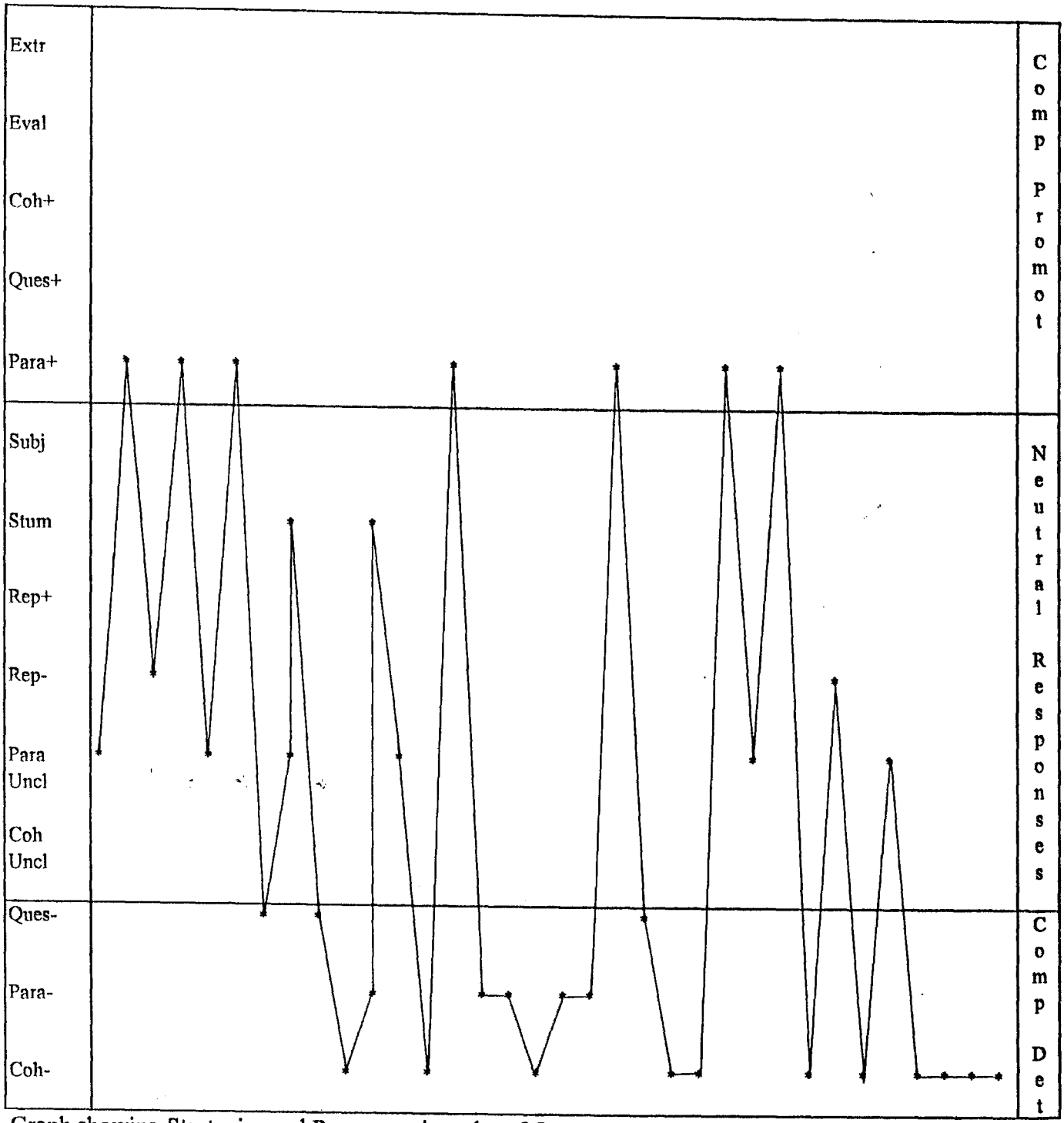
C-Ps = Comprehension-promoting responses
C-Ds = Comprehension-deterring responses

Classification of Responses from Protocols, indicating Percentages in each Category, and Percentages of Comprehension-Deterring and Comprehension-Promoting responses associated with each Category.

Appendix 5

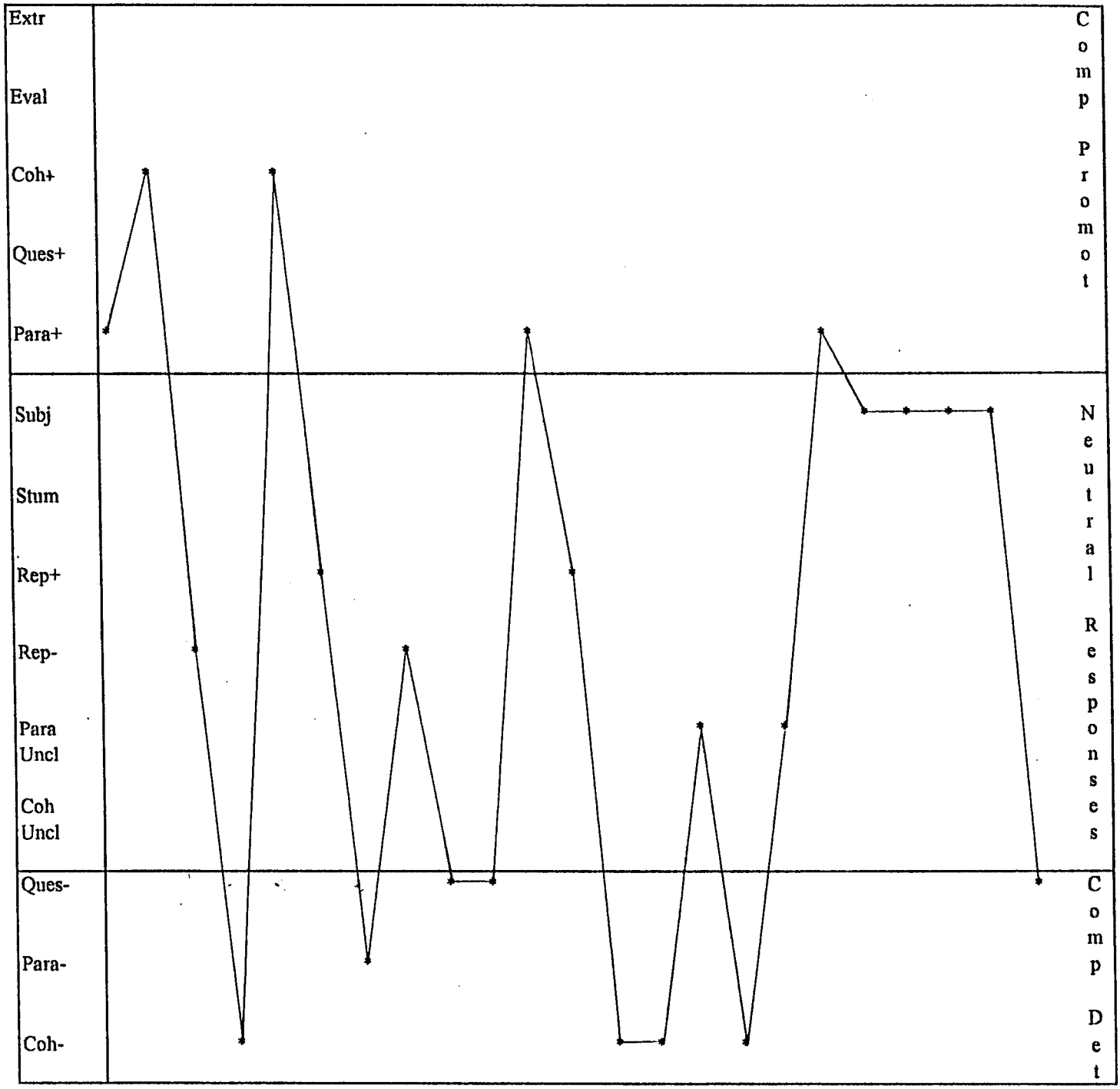
Analysis 2

Protocol 1



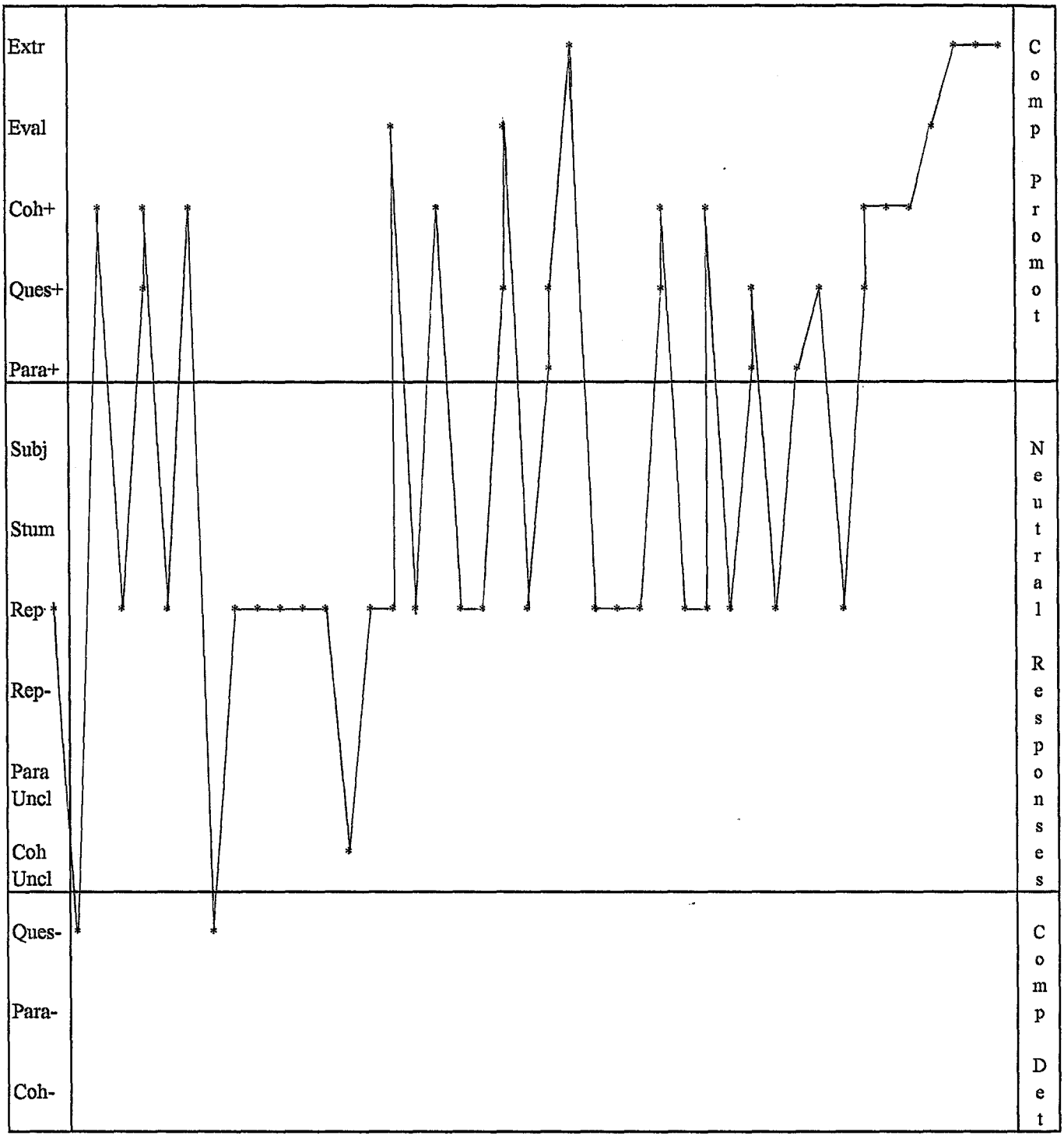
Graph showing Strategies and Responses in order of Occurrence:
Protocol 1

Protocol 2



Graph showing Strategies and Responses in order of Occurrence:
Protocol 2

Protocol 3



Graph showing Strategies and Responses in order of Occurrence:
Protocol 3

Appendix 6

Analysis 3: Inferring Processes from Strategies

Protocol 1

1. L.1–2
   The way I think is, the Dutch was the professional ... eh ... Dr. Pieter Admiraal was the Dutch ... was the Dutch medical profession.

   Strategy: PARAPHRASE UNCLEAR
   Inferred Process: *X*
   Writer's Comment: Unable to gauge subject's interpretation due to lack of clarity of response.

2. L.2
   He was valued as a pioneer.

   Strategy: PARAPHRASE^{+}
   Inferred Process: *Competent Decoding*
   Writer's Comment: This signifies competent interaction at the sentence level.

3. L.3
   He established radical methods of treating the dying and the ending of suffering.

   Response: REPRODUCTION^{-}
   Inferred Process: *X*

4. L.4–5
   He was the author of Justifiable Enthanasia, a manual for the medical profession, which means ... he may ... may be he was a doctor.

   Strategy: PARAPHRASE^{+}
   Inferred Process: *Competent Decoding*
   Writer's Comment: The subject correctly identifies Dr. Admiraal as a doctor.

5. L.5–6
   He guided most of the Dutch doctors ...

   Strategy: PARAPHRASE UNCLEAR
   Inferred Process: *X*

Writer's Comment: The writer is unable to gauge the subject's interpretation.

6. L.6–7
   ... the enthanasia professional in Holland, which means he was ... he specialised in enthanasia ...

   Strategy: PARAPHRASE^{+}
   Inferred Process: *Competent Decoding*
   Writer's Comment: This represents accurate sentential decoding.

7. L.7–8
   ... but I don't know what ... what's the meaning of enthanasia.

   Strategy: QUESTION ITEMS^{-}
   Inferred Process: *Lack of Content Schemata*
   Writer's Comment: This indicates a lack of crucial content schemata which would have facilitated textual interaction.

8. L.8–10
   His hospital was built in modern blocks of flats and it was mile away from outside the centre of Delft with its shops where it was set in tiles and water ... watercolourist's ...

   Strategy: PARAPHRASE UNCLEAR
   Response: STUMBLE
   Inferred Process: *X*

9. L.10–11
   He was a bluff, florid, bearded, but I don't know what's the meaning of bluff, florid and bearded.

   Strategy: QUESTION ITEMS^{-}
   Inferred Process: *Decoding Difficulty of Supporting Textual Information*
   Writer's Comment: This signifies decoding difficulty; however the textual information is not essential to the overall gist of the passage.

10. L.11–12
    Most of the people who have suffered ... eh ... enthanasia were ... were being helped by Dr. Admiraal.

    Strategy: COHERENCE-DETECTION^{-}
    Inferred Process: *Formulating Premature Hyptothesis*
    Writer's Comment: This signifies the first formulation of an incorrect hypothesis — that "enthanasia" is a disease.

11. L.12–15
    As Dr. Admiraal was an ... anae ... anaesth ... he was involved in the treatment of chronic pain for about 25 years which means most of the people who were being helped ... who were suffering for enthanasia.

Strategy: PARAPHRASE$^-$

Response: STUMBLE

Inferred Process: *Interpretation of Text in Accordance with Hypothesis*

Writer's Comment: The subject incorrectly interprets the text in accordance with her hypothesis: Dr. Admiraal treats people suffering from "enthanasia".

12. L.15

Mostly he treated his patients who have suffered.

Strategy: PARAPHRASE UNCLEAR

Inferred Process: *X*

13. L.15–16

If he have had a ... an operation, usually ... he was usually satisfied.

Strategy: COHERENCE-DETECTION$^-$

Inferred Process: *Inappropriate Accessing of Schemata*

Writer's Comment: The subject seems to have derived "if he have had a ... an operation ..." from "When it has been done ..." (Text L.16). Given her hypothesis that Dr. Admiraal cures people suffering from euthanasia, the subject seems to be imposing an interpretation on the text from her existing background knowledge of doctors curing patients by operating; in other words, Dr. Admiraal cures patients; doctors can cure by operating; therefore Dr. Admiraal conducts operations.

14. L.16–18

If a patient was not well, he can't go on, overcome that pain, he usually becomes sad, because he said he's losing a friend ... because he usually knows them best for some weeks ...

Strategy: PARAPHRASE$^+$

Inferred Process: *Competent Decoding*

Writer's Comment: This correct paraphrase does not conflict with her ongoing hypothesis.

15. L.18–20

... and he can usually said that ... if a patient can die, he usually says that he is satisfied because he has done her best in order to survive that patient ...

Strategy: PARAPHRASE$^-$

Inferred Process: *Interpretation of Text in Accordance with Hypothesis*

Writer's Comment: The text states that Dr. Admiraal is satisfied because he knew the patient had "died with dignity and without pain" (Text L.18). The subject attributes Dr. Admiraal's satisfaction to: "he has done her best in order to survive that patient". This seems to indicate that the subject is forcing the text to fit into her hypothesis, despite conflicting textual evidence.

16. L.20–21
    These words were coming from Dr. Admiraal.

    Strategy: PARAPHRASE$^-$
    Inferred Process: *Decoding Difficulty*
    Writer's Comment: The irony of "Such words come neatly from Dr. Admiraal" (Text L.19) is lost in this paraphrase.

17. L.21–22
    He was one of the doctors who have ... who have tried to treat enthanasia.

    Strategy: COHERENCE-DETECTION$^-$
    Inferred Process: *Imposing Unsubstantiated Interpretation*
    Writer's Comment: The subject reinforces her hypothesis without any textual evidence to justify it.

18. L.22–25
    In what he says, he says that most of the doctors have killed many people because of not ... especially Dutch doctors who didn't have ... eh ... didn't have an attit ... eh ... who didn't have the knowledge of treating enthanasia.

    Strategy: PARAPHRASE$^-$
    Inferred Process: *Selective Sampling of Text*
    Writer's Comment: The subject seems to have extracted the newspaper headlines of "Doctor Kills So Many People" (Text L.21) from its context, and paraphrases it in accordance with her hypothesis, ignoring contradictory textual evidence.

19. L.25–26
    But nevertheless he was not like Dutch doctors, he was not afraid to go to the public.

    Strategy: PARAPHRASE$^-$
    Inferred Process: *Decoding Difficulty of Supporting Textual Information*
    Writer's Comment: This indicates a lack of familiarity with the expression "to go public on the issue" (Text L.22).

20. L.26–27
    In 1985 he admitted some ... some lethal drugs to a woman who was suffering ... who was paralysed as a result of multiple sclerosis ...

    Strategy: PARAPHRASE$^+$
    Inferred Process: *Decoding Difficulty* or
    Ignoring Textual Evidence which Contradicts Hypothesis or
    Interaction with Sentence in Isolation
    Writer's Comment: This correct paraphrase indicates accuracy at the sentence level, yet the subject does not amend her hypothesis to accommodate her paraphrase. This could indicate one of three alternatives:

a) the subject does not know the meaning of "lethal", therefore her paraphrase does not conflict with her inaccurate hypothesis; or
b) her overriding hypothesis effectively "blocks out" contradictory textual evidence; or
c) she interacts with the sentence in isolation, without making the necessary links between decoding and analysis.

21. L.27–28
... I don't know what's the meaning of sclerosis.

Strategy: QUESTION ITEMS$^-$
Inferred Process: *Decoding Difficulty of Supporting Textual Information*
Writer's Comment: This indicates decoding difficulty, which is not essential information to the overall gist of the passage.

22. L.28–29
And this one ... this thing was most important because he was ... that woman was dying, so he helped her ... so he helped her.

Strategy: COHERENCE-DETECTION$^-$
Inferred Process: *Selectively Sampling from Text to Confirm Hypothesis*
Writer's Comment: This interpretation is in direct contradiction to the information within the text. The text states that "she was not actually close to death" (Text L.24–25); the subject interprets "that woman was dying". The importance of the case centred around the patient's lack of proximity to death; what the subject interpreted as being "most important" was that Dr. Admiraal helped the dying woman. The subject seems to be sampling only certain propositions from the text, and creating a context for those decontextualised propositions which will fit her hypothesis.

23. L.30–31
And ... death in most of the Dutch was a common thing because of that ... of that disease.

Strategy: COHERENCE-DETECTION$^-$
Inferred Process: *Imposing Unsubstantiated Interpretation*
Writer's Comment: The writer can find no evidence from the text which might have elicited this response — the euthanasia statistics appear in the next paragraph of the text, which the subject at this point had not read. The comment reinforces her ongoing, inaccurate hypothesis.

24. L.31–32
And enthanasia in Holland remains illegal which means it is not legal under the criminal code.

Strategy: PARAPHRASE$^+$
Inferred Process: *Ignoring Textual Evidence which Contradicts Hypothesis or Interaction with Sentence in Isolation*

Writer's Comment: This is an accurate paraphrase at the sentence level which makes a mockery of the subject's hypothesis. In terms of her hypothesis, the text is stating that the disease — "enthanasia" — is illegal.

The subject seems to be unaware of any inconsistency between the textual information and her hypothesis. This could either indicate:

a) a blocking mechanism which ignores information which contradicts her hypothesis; or

b) an example of "sentence-boundedness", whereby the subject becomes locked in at the sentence and word level and fails to make the necessary connection between bottom-up decoding and top-down analysis. In this case the subject interacts with the individual sentence, without utilising it to construct a meaning representation of the discourse as a whole.

25. L.32–34

Most legal precedents have established or allowed doctors to offer them ... eh ... to go on to help those who are helpless because of their suffering.

Strategy: PARAPHRASE UNCLEAR

Inferred Process: *X*

26. L.34–37

Eh ... it shows here that there are about 14 million people in ... 14 million people of Dutch, so between 6,000 and 10,000 per year perhaps 8 per cent of the total number of deaths are being reported, and most of them are ... they die in the hands of their doctors.

Strategy: PARAPHRASE^{+}

Inferred Process: *Competent Decoding*

Writer's Comment: This accurate paraphrase indicates competent decoding which does not conflict with the subject's hypothesis.

27. L.37–40

And Dr. Admiraal's method was to establish each ... each dying patient to have a ... to have a team of doctors and nurses and priests so that he can be ... have ... he can have a faith or believe that may be he'll survive.

Strategy: COHERENCE-DETECTION^{-}

Inferred Process: *Interpretation of Text in Accordance with Hypothesis*

Writer's Comment: In accordance with her hypothesis that Dr. Admiraal cures his patients, the subject has interpreted the team's function as to instill faith of survival into the patient.

28. L.40–41

But although he was ... he was a non-believer ... he thought that the moral debate should be ... should be represented.

Response: REPRODUCTION$^-$
Inferred Process: *X*

29. L.41–42
    If a patient have, or have reported to have enthanasia ...

    Strategy: COHERENCE-DETECTION$^-$
    Inferred Process: *Decoding Difficulty or Interpretation of Text in Accordance with Hypothesis*
    Writer's Comment: This appears to be the subject's interpretation of "Once a patient has repeatedly and lucidly requested euthanasia ..." (Text L.36). This indicates either a problem with the language of the text, or that the subject is imposing her own interpretation on the text in an effort to make it "fit" to her hypothesis.

30. L.42–43
    ... the team will discuss the various ... the various to relieve the pain of the patient and the decision to make.

    Strategy: PARAPHRASE UNCLEAR
    Inferred Process: *X*

31. L.43–45
    So Dr. Admiraal has been taken ... as one of the most powerful doctors because he established the method of treating patients who have enthanasia.

    Strategy: COHERENCE-DETECTION$^-$
    Inferred Process: *Identification of Key Information of Hypothesis*
    Writer's Comment: These last few remarks represent a summary of the key information which she has derived from her interaction with the text. She states that Dr. Admiraal's fame derives from his method of treating euthanasia.

32. L.45–46
    So most of the doctors didn't have the best treatment of treating the patients.

    Strategy: COHERENCE-DETECTION$^-$
    Inferred Process: *Identification of Key Information of Hypothesis*
    Writer's Comment: Another key issue in her interpretation seems to be that most doctors did not have the knowledge of treating "enthanasia".

33. L.46–47
    Most of the patients did die in the hands ... in the hands of their doctors.

    Strategy: COHERENCE-DETECTION$^-$
    Inferred Process: *Identification of Key information of Hypothesis*
    Writer's Comment: The gist of her interpretation seems to be that because doctors were unable to treat "enthanasia", most patients died in their hands.

34. L.47–49

So the method that he used was of making a team of doctors and nurses and priests to pray or to give that patient ... to have faith.

Strategy: COHERENCE DETECTION^{-}

Inferred Process: *Identification of Key Information of Hypothesis*

Writer's Comment: The subject reiterates her interpretation of the "team of doctors, nurses and a priest of the appropriate faith" (Text L.33–34).

Protocol 2

This subject first read the whole text aloud and then returned to the beginning to offer comments.

1. L.1–2
   Here we are told about a doctor of the Dutch who is regarded as an expert on people who are dying.

   Strategy: PARAPHRASE^{+}
   Inferred Process: *Competent Decoding*
   Writer's Comment: This represents competent interaction at the sentence level.

2. L.2
   He is also referred to as an anaesthetist.

   Strategy: COHERENCE-DETECTION^{+}
   Inferred Process: *Establishing Cohesive Links*
   Writer's Comment: The subject demonstrates the ability to connect the information links between sentences.

3. L.2–3
   This doctor has been involved with the treatment of chronic pain for 25 years and has come to ...

   Response: REPRODUCTION^{-}
   Inferred Process: *X*

4. L.3–5
   ... and he used certain injections for curing those people that were suffering from their pains.

   Strategy: COHERENCE-DETECTION^{-}
   Inferred Process: *Inappropriate Accessing of Schemata*
   Writer's Comment: The hypothesis which the subject has formulated is that Dr. Admiraal cures people with injections. Her interpretation seems to arise from an overriding background knowledge concept of the role of doctors which she forces onto the text despite contradictory textual evidence. This could include ideas such as: doctors cure; doctors use injections to cure; Dr. Admiraal is a doctor, therefore Dr. Admiraal uses injections to cure people who are suffering.

5. L.5
   Dr. Admiraal is also known because of his famous researches.

   Strategy: COHERENCE DETECTION^{+}
   Inferred Process: *Establishing Cohesive Links*
   Writer's Comment: Whilst Dr. Admiraal's work on euthanasia may or may not constitute "research" the writer has judged the subject's interpretation as reasonably accurate and therefore coded it accordingly, giving the subject the benefit of the doubt.

6. L.5–7
   Here it is said that ... it is said that "In 1985 he admitted to administering lethal drugs to a woman suffering from total paralysis as a result of multiple sclerosis".

   Response: REPRODUCTION^{+}
   Inferred Process: *X*

7. L.7–9
   Here we find that this doctor, Dr. Admiraal, had been trying by all means to save that woman from death.

   Strategy: PARAPHRASE^{-}
   Inferred Process: *Interpretation of Text in accordance with Hypothesis* or *Decoding Difficulty*
   Writer's Comment: This interpretation is in direct contradiction to the textual information. The text states that Dr. Admiraal administered "lethal drugs to a woman ... (who) ... was not actually close to death" (Text L.23–25). The subject states that Dr. Admiraal had been trying to save the woman. This seems to indicate a decoding difficulty.
   The alternative explanation for her comment is that the subject could be forcing the text to fit her hypothesis, without any textual evidence to substantiate it.

8. L.9
   Euthanasia ... remains illegal under the criminal code.

   Response: REPRODUCTION^{-}
   Inferred Process: *X*

9. L.9–10
   I don't understand the word "euthanasia".

   Strategy: QUESTION ITEMS^{-}
   Inferred Process: *Lack of Content Schemata*
   Writer's Comment: This indicates the subject's lack of crucial content schemata which would have facilitated textual interaction.

10. L.10–11
    Euthanasia ... I don't understand the word "euthanasia".

    Strategy: QUESTION ITEMS^{-}
    Inferred Process: *Lack of Content Schemata*
    Writer's Comment: The subject repeats her lack of knowledge of a crucial vocabulary item.

11. L.11
    But we find that this euthanasia in Holland was taken illegal.

    Strategy: PARAPHRASE^{+}

Inferred Process: *Interaction with Sentence in Isolation* or *Ignoring Textual Evidence which Contradicts Hypothesis*

Writer's Comment: Whilst this paraphrase constitutes accurate decoding, the subject does not seem to incorporate this information into her hypothesis which appears in Response 13 below. This suggests that she is either interacting with the sentence in isolation, and not utilising it in the formulation of her hypothesis; or ignoring textual evidence which might contradict with the hypothesis she is in the process of formulating.

12. L.12

In a country with a population ...

Response: REPRODUCTION^{+}

Inferred Process: *X*

13. L.12–14

There were many people in Holland that were suffering from this unknown disease called euthanasia, and the result this disease has caused many people to be the victim of death.

Strategy: COHERENCE-DETECTION^{-}

Inferred Process: *Formulating Inaccurate Hypothesis*

Writer's Comment: Having verbalised her lack of understanding of the word euthanasia (response 9 and 10) the subject now resolves her conflict by interpreting euthanasia as an "unknown disease ... (which) ... has caused many people to be the victim of death".

This interpretation discredits her previous accurate paraphrase of euthanasia being illegal. Her verbalisations suggest that a disease which causes death is illegal. There is no indication of the subject's awareness of this incongruity.

14. L.14–16

Dr. Admiraal's methods ... Dr. Admiraal had established methods for curing the people that were suffering from that ... that disease euthanasia.

Strategy: COHERENCE-DETECTION^{-}

Inferred Process: *Interpretation of Text in accordance with Hypothesis*

Writer's Comment: The subject interacts with textual information in the light of her recently-established interpretation of euthanasia, and her imposed interpretation of Dr. Admiraal's role of curing.

15. L.16–17

He is a non-believer himself, and moral should be somewhere.

Strategy: PARAPHRASE UNCLEAR

Inferred Process: *X*

16. L.17–18

    Although he killed those person or those people he was not in himself sure of what was the cause of that disease.

    Strategy: COHERENCE-DETECTION$^-$

    Inferred Process: *Interaction with Sentence in Isolation* or *Ignoring Textual Evidence which Contradicts Hypothesis*; *Imposing Unsubstantiated Interpretation*

    Writer's Comment: The subject recognises that Dr. Admiraal kills people, which is in direct contradiction to her previously stated hypothesis that he cures people (response 14). There is no indication that she is aware of this contradiction, and there is no attempt to reconcile it with her ongoing hypothesis. This may be an example of a) interacting with the sentence in isolation, and not making the necessary links between bottom-up decoding and top-down analysis to formulate textual coherence; or b) effectively ignoring textual evidence which contradicts her hypothesis.

    Her remark that "he was not in himself sure of what was the cause of that disease" is an imposed interpretation, with no textual support whatsoever.

17. L.18–19

    Then he would repeatedly ... he would repeatedly ask the patient ...

    Strategy: PARAPHRASE UNCLEAR

    Inferred Process: *X*

    Writer's Comment: This has been coded "unclear" because the sentence is unfinished. However, the text states that the patient repeatedly requests, whilst the subject states that Dr. Admiraal repeatedly asks, which suggests decoding difficulties, or lack of attention to textual detail.

18. L.19–20

    ... and discuss that particular pain or suffering with the other nurses and priests, etc.

    Strategy: PARAPHRASE$^+$

    Inferred Process: *Competent Decoding*

    Writer's Comment: This is evidence once again of the subject's ability to interact competently with sentences or phrases in isolation.

19. L.21–22

    When I'm reading this passage, my mind is thinking about the test I have recently written now.

    Response: SUBJECTIVE REACTION

    Inferred Process: *X*

    Writer's Comment: The following protocol responses labelled "subjective reaction" are all expressions of the subject's personal feelings towards

her particular circumstances at the time of her textual interaction, and her feelings about the task. To what extent these factors influenced her textual interaction, and accounted for her comprehension difficulties, are considerations beyond the scope of this study.

20. L.22–23
    I am worried because I am not concentrating on this because I think that I have failed the test, therefore that affects my concentration here.

    Response: SUBJECTIVE REACTION
    Inferred Process: *X*

21. L.23–25
    I also find myself not in a happy mood because of my first ... my first attendance on the language lab.

    Response: SUBJECTIVE REACTION
    Inferred Process: *X*

22. L.25
    Next time I'll try to acquaint myself with these needs.

    Response: SUBJECTIVE REACTION
    Inferred Process: *X*

23. L.26–27
    Pertaining to the passage again, I find difficult words and some of them ... I'm not familiar with them, e.g. watercolourist, proselytising ...

    Strategy: QUESTION ITEMS^{-}
    Inferred Process: *Decoding Difficulty of Supporting Textual Information*
    Writer's Comment: The subject verbalises vocabulary difficulties, which the writer judges as not crucial to the comprehension of the overall gist of the text.

Protocol 3

1. L.1
   The Dutch medical profession regards Dr. Pieter Admiraal as a pioneer.

   Response: REPRODUCTION^{+}
   Inferred Process: *X*

2. L.1–2
   What is a pioneer?

   Strategy: QUESTION ITEMS^{-}
   Inferred Process: *Decoding Difficulty*
   Writer's Comment: The subject's response suggests that she does not know, or is uncertain of the meaning of "pioneer".

3. L.2
   A pioneer of what?

   Strategy: COHERENCE-DETECTION^{+}
   Inferred Process: *Question Signifying Search for Key Information*
   Writer's Comment: Having questioned the meaning of the word "pioneer" in the previous verbalisation, her subsequent question — "a pioneer of what?" — indicates appropriate use of the word in context. It is almost as if the subject has resolved her uncertainty by posing another question.
   This questioning strategy suggests that the subject is seeking an answer to what she has accurately identified as key information. This marks the first of a question/answer pattern which is evident throughout the protocol.

4. L.2–5
   At the Reiner de Graaf General Hospital in Delft he has established radical new methods of treating the dying — and of ending their suffering. He is the author of Justifiable Euthanasia, a manual for the medical profession.

   Response: REPRODUCTION^{+}
   Inferred Process: *X*

5. L.5
   Oh — he is a doctor...

   Strategy: QUESTION ITEMS^{+}
   COHERENCE-DETECTION^{+}
   Inferred Process: *Answer to Implicit Question*
   Identification of Key Information
   Writer's Comment: This suggests that the subject has found the answer to a question she has posed to herself.

6. L.5–7
   ... the standard how-to-do-it guide for Dutch doctors. If there is a euthanasia professional in Holland, Dr. Admiraal is it.

   Response: REPRODUCTION^{+}
   Inferred Process: *X*

7. L.7
   Dr. Admiraal is that — ...

   Strategy: COHERENCE-DETECTION^{+}
   Inferred Process: *Establishing Cohesive Links*

8. L.7
   ... what is a euthanasia?

   Strategy: QUESTION ITEMS^{-}
   Inferred Process: *Lack of Content Schemata*;
   Question Signifying Search for Key Information
   Writer's Comment: The subject does not know the meaning of "euthanasia", and once again poses a question to herself.

9. L.8–10
   His hospital is set in a bleak landscape of modern blocks of flats, a mile or two from outside the medieval centre of Delft with its shops selling antique tiles and its pale watercolourist's light.

   Response: REPRODUCTION^{+}
   Inferred Process: *X*

10. L.10
    A block of flats.

    Response: REPRODUCTION^{+}
    Inferred Process: *X*

11. L.10–12
    Admiraal is a bluff, florid, bearded individual for whom most of the questions about voluntary euthanasia seem to have been answered.

    Response: REPRODUCTION^{+}
    Inferred Process: *X*

12. L.12–13
    His conversation is enthusiastic, proselytising and profoundly chilling.

    Response: REPRODUCTION^{+}
    Inferred Process: *X*

13. L.14–16
    As an anaesthetist he has been involved with the treatment of chronic pain for

25 years and he has come to the view that a painless death is the last, honest treatment a doctor can give to his suffering patient.

Response: REPRODUCTION^{+}
Inferred Process: *X*

14. L.16
Mmm. A chronic doctor.

Strategy: COHERENCE-DETECTION UNCLEAR
Inferred Process: *X*

15. L.17
"When it has been done," he says, "I am sad and satisfied."

Response: REPRODUCTION^{+}
Inferred Process: *X*

16. L.17
Sad and satisfied?

Strategy: REPRODUCTION^{+}
EVALUATION
Inferred Process: *Evaluation of Textual Information through Questioning*
Writer's Comment: The intonation in her voice as she questions "sad and satisfied?" suggests that the textual information is either: a) in some way inconsistent with her background knowledge — that a person's death might cause satisfaction; or b) surprising textual information in terms of her ongoing hypothesis which she is formulating.

17. L.18–19
Sad because I am losing a friend — I have usually got to know them well in their last weeks.

Response: REPRODUCTION^{+}
Inferred Process: *X*

18. L.19
Those patients ... dying patients.

Strategy: COHERENCE-DETECTION^{+}
Inferred Process: *Establishing Cohesive Links*
Writer's Comment: The subject demonstrates the ability to recognise cohesive links to aid in the identification of key information.

19. L.19–20
Then later I am satisfied because I know he died with dignity and without pain.

Response: REPRODUCTION^{+}
Inferred Process: *X*

20. L.21–24
    Such words come neatly from Dr. Admiraal; less forthcoming is the total number of euthanasia cases in which he has been involved. "I know about newspaper headlines which say Doctor Kills So Many People," he says. Nonetheless, unlike most Dutch doctors, he is not afraid to go public on the issue.

    Response: REPRODUCTION^{+}
    Inferred Process: *X*

21. L.24–25
    Oh. Sometimes doctors kill people?

    Strategy: QUESTION ITEMS^{+}
    EVALUATION
    Inferred Process: *Answer to Implicit Question*;
    Evaluation of Textual Information through Questioning
    Writer's Comment: The "Oh." signifies that the subject now has the answer to some implicit question she has posed herself. The intonation of surprise in her question "Sometimes doctors kill people?" suggests that this is inconsistent with her background knowledge concept of the function of a doctor.

22. L.25–28
    In 1985 he admitted to administering lethal drugs to a woman suffering from total paralysis as a result of multiple sclerosis. The case was important, because she was not actually close to death. Proximity to death had previously been one of the conditions laid down in the Dutch case law.

    Response: REPRODUCTION^{+}
    Inferred Process: *X*

23. L.28–29
    Oh. This woman was totally suffering from this pain and then ... Dr. Admiraal killed her.

    Strategy: PARAPHRASE^{+}
    QUESTION ITEMS^{+}
    Inferred Process: *Answer to Implicit Question*
    Writer's Comment: Once again the subject verbalises understanding of the text, signified by "Oh.", followed by an accurate paraphrase. It is almost indicative of the resolution of an uncertainty — or possible uncertainty; the answer to a question which she has silently, implicitly, or unconsciously posed to herself.

24. L.28–29
    And the law?

    Strategy: EXTRAPOLATION
    Inferred Process: *Question Signifying Search for Extra-textual Information*

Writer's Comment: This is an explicit question which seeks answers or clarification of concepts beyond the text itself. At this point, no mention of the law has been made in the text, therefore the subject's question seems to have emanated from her previous verbalisation that "Dr. Admiraal killed her".

25. L.30
Strictly speaking, euthanasia in Holland remains illegal under the criminal code.

Response: REPRODUCTION^{+}
Inferred Process: *X*

26. L.31
Illegal.

Strategy: REPRODUCTION^{+}
Inferred Process: *Answer to Explicit Question by Repetition of Key Information*
Writer's Comment: Although this was coded as "REPRODUCTION^{+}", it seems likely that the repetition of "illegal" represents the identification of key information, supplying the answer to her previous question — "and the law?".
This demonstrates the disadvantage of the application of a simple, unambiguous coding scheme, which attempts to limit researcher inference and promote inter-reader agreement of its application. The advantage of a contextualised, line by line analysis of each protocol allows consideration of both process (strategy) and product (comprehension outcome) and the justification of both at a particular point in the subject's textual interaction.

27. L.31–32
But numerous precedents have been established which allow doctors to offer it as a last resort in cases of hopeless suffering.

Response: REPRODUCTION^{+}
Inferred Process: *X*

28. L.32–33
Mmm. For only in cases of hopeless suffering — so that is euthanasia ... euthanasia ... oh ... ooh.

Strategy: COHERENCE-DETECTION^{+}
QUESTION ITEMS^{+}
Inferred Process: *Identification of Key Information*;
Answer to Explicit Question
Writer's Comment: The subject has found the answer to her question "what is a euthanasia?" (response 8), linking it to "only in cases of hopeless suffering". The intonation in her voice (evident from the tape) as she

says "so that is euthanasia" suggests some sort of "Aha!" principle, as if the hypothesis she has been formulating has now been ratified.

29. L.33–36
    In a country with a population of only 14 million, somewhere between 6,000 and 10,000 people a year — perhaps 8 per cent of the total number of deaths — are thought to die voluntarily ...

    Response: REPRODUCTION^{+}
    Inferred Process: *X*

30. L.36
    ... voluntarily ...

    Strategy: REPRODUCTION^{+}
    COHERENCE DETECTION^{+}
    Inferred Process: *Identification of Key Information through Repetition*
    Writer's Comment: There is no doubt that the repetition of "voluntarily" signifies the recognition of key information, as she paraphrases this additional information to her ongoing hypothesis of euthanasia in her subsequent response (response 32).

31. L.36
    ... at the hands of their doctors.

    Response: REPRODUCTION^{+}
    Inferred Process: *X*

32. L.36–37
    Oh — they just ask the doctors — when they are hopeless — to kill them with those drugs.

    Strategy: PARAPHRASE^{+}
    QUESTION ITEMS^{+}
    Inferred Process: *Answer to Implicit Question*
    Writer's Comment: This is the paraphrase of "voluntarily", which the subject recognised as key information (response 30). "Oh" suggests the resolution of some uncertainty — the answer to some unstated question — in her ongoing hypothesis.

33. L.38–40
    Dr. Admiraal's method is to establish around each dying patient a team of doctors, nurses and a priest of the appropriate faith. He is a non-believer himself, but he thinks the moral debate should be somehow represented.

    Response: REPRODUCTION^{+}
    Inferred Process: *X*

34. L.40–42
    So somehow or ... the patient may need this thing and when the patient is a believer, he or she could expect a priest so that he can pray for him.

Strategy: PARAPHRASE^{+}
Inferred Process: *Competent Decoding*

35. L.42
Okay.

Strategy: QUESTION ITEMS^{+}
Inferred Process: *Answer to Implicit Question*
Writer's Comment: This suggests an acceptance of her paraphrase above. It is almost as if the subject paraphrases the textual information, establishes whether it fits into her ongoing hypothesis, accepts this additional information and verbalises her acceptance with "Okay.". She seems to have found the answer to key information which she identified through paraphrase (response 34).

36. L.43–45
Once a patient has repeatedly and lucidly requested euthanasia and the team have discussed the various alternatives of relief of pain or depression, the decision may be taken to go ahead.

Response: REPRODUCTION^{+}
Inferred Process: *X*

37. L.45
Oh ... the patient can request this euthanasia.

Strategy: COHERENCE-DETECTION^{+}
QUESTION ITEMS^{+}
Inferred Process: *Identification of Key Information*;
Answer to Implicit Question
Writer's Comment: The subject verbalises acceptance of key information into her ongoing hypothesis.

38. L.45–46
So this killing is euthanasia, and it's discovered by Dr. Admiraal, a Dutch doctor.

Strategy: COHERENCE-DETECTION^{+}
QUESTION ITEMS^{+}
Inferred Process: *Identification of Key Information*
Answer to Explicit Questions
Writer's Comment: Having reached the end of the text the subject sums up her comprehension outcome. This response supplies answers to two of the questions she posed at the beginning of her textual interaction:
Question: "... what is a euthanasia?" (response 7)
Answer: "So this killing is euthanasia ..."
Question: "A pioneer of what?"
Answer: " ... it's discovered by Dr. Admiraal, a Dutch doctor."

39. L.47–48

But it's illegal, but somewhere or somehow the doctor ... the law ... Mmmm ... grant legal to those who want this euthanasia.

Strategy: COHERENCE-DETECTION^{+}

Inferred Process: *Identification of Key Information through Reasoning*

Writer's Comment: This verbalisation is indicative of a type of problem-solving process; she seems to be actively reasoning out key information, to fill in the missing links of her comprehension of the text.

40. L.48–50

That is better. Because if you are still suffering and you are hopeless and that pain — there is no other way just the pain to be taken off, and then you can die a painless death.

Strategy: EVALUATION

Inferred Process: *Acceptance of Textual Information through Evaluation*

Writer's Comment: "That is better" indicates the subject's acceptance of the legality of a painless death, in terms of her own evaluation of the textual information: "if you are still suffering and ... there is no other way".

41. L.51

But what makes me think more is that people are not animals.

Strategy: EXTRAPOLATION

Inferred Process: *Questioning Text Content through Extrapolation*

Writer's Comment: Having accepted the concept of euthanasia as presented in the text, the subject now evaluates the content beyond the boundaries of the text itself, in terms of her own background knowledge of "people are not animals".

42. L.51–52

You can kill an animal when he is suffering but it is differ from a human being.

Strategy: EXTRAPOLATION

Inferred Process: *Questioning Text Content through Extrapolation*

Writer's Comment: The subject appears to be making all the higher level schematic associations surrounding the concept of euthanasia. She seems to be stimulating her own attitudes towards moral issues — which seem to incorporate the concept of human life being more sacred than animal life — and bringing these outside-the-text factors to bear on the textual information.

43. L.52–54

If it's differ from a human being ... but this human being asks himself or requested that this be done to him ...

Strategy: EXTRAPOLATION

Inferred Process: *Questioning Text Content through Extrapolation*

Writer's Comment: The process of critical reasoning is evident in the subject's last verbalisations. She seems to now reconsider euthanasia in the light of the patient's right to decide his/her own fate.

Bibliography

Adams, M.J., & Collins, A. (1985). A schema-theoretic view of reading. In H. Singer & R.B. Riddell (Eds.), *Theoretical models and processes of reading.* International Reading Association, Delaware.

Afflerbach, P., & Johnston, P. (1984). Research methodology on the use of verbal reports in reading research. *Journal of Reading Behaviour*, XVI(4).

Alderson, J.C. (1984). Reading in a foreign language: a reading problem or a language problem? In J.C. Alderson & A.H. Urquhart (Eds.), *Reading in a foreign language.* Longman, New York.

Alderson, J.C., & Urquhart, A.H. (1984). *Reading in a foreign language.* Longman, New York.

Anderson, J.R. (1980). *Cognitive psychology and its implications.* Freeman & Co., San Franscisco.

Anderson, N.J. (1991). Individual differences in second language reading and testing. *Modern Language Journal*, 75(4), 1–38.

Anderson, N.J., Bachman, l., Perkins, K., & Cohen, A. (1991). An exploratory study into the construct validity of a reading comprehension test: triangulation of data sources. *Language Testing*, 8(1), 41–66.

Anderson, R.C., & Ortony, A. (1975). On putting apples into bottles: a problem in polysemy. *Cognitive Psychology*, 7, 167–180.

Anderson, R.C., Reynolds, R.E., Schallert & Goetz, T.E. (1977). Frameworks for comprehending discourse. *American Education Research Journal*, 14.

Aslanian, Y. (1985). Investigating the reading problems of ESL students: an alternative. *ELT Journal*, 39(1), 20–27.

Ballstaedt, S.P., & Mandl, H. (1984). Elaborations: Assessment and analysis. In H. Mandl, N.L. Stein & T. Trabasso (Eds.), *Learning and comprehension of text.* Erlbaum, Hillsdale, NJ.

Barrett, T.C. (1968). What is reading? In T. Clymer (Ed.), *Innovation and change*

in reading instruction. 67th Year Book of the National Society for the Study of Education. University of Chicago Press.

Bartlett, B.J. (1978). *Top-level structure as an organisational strategy for recall of classroom text.* Ph.D. dissertation, Arizona State University.

Bereiter, C., & Bird, M. (1985). Use of think aloud in the identification of reading comprehension strategies. *Cognition and Instruction*, 2, 131–156.

Berkhoff, N.A. (1979). Reading skills in extended discourse in English as a foreign language. *Journal of Research in Reading*, 2(2), 95–107.

Bermhardt, E.B. (1984). Toward an information processing perspective in foreign language reading. *The Modern Language Journal*, 68(4), 322–331

Bird, M., (1980). *Reading comprehension strategies: A direct teaching approach.* Unpublished doctoral dissertation. The Ontario Institute for studies in Education.

Birkmire, D.P., (1985). Text processing: the influence of text structure, background knowledge, and purpose. *Reading Research Quarterly*, 20(3), 314–326.

Black, J.B., Galambos, J.A., & Reiser, B.J. (1984). Coordinating discovery and verification research. In Kieras & Just (Eds.), *New methods in reading comprehension research.* LEA.

Block, E. (1986). The comprehension strategies of second language readers. *TESOL Quarterly*, 20(3), 463–491.

Bridge, C., & Winograd, P. (1982). Readers' awareness of cohesive relationships during cloze comprehension. *Journal of Reading Behaviour*, 14, 299–312.

Calfee, R.C., & Curley, R. (1984). Structures of prose in the content areas. In J. Flood (Ed.), *Understanding reading comprehension.* Int. Reading Assoc.

Carrell, P.L. (1983). Some issues in studying the role of schemata, or background knowledge, in second language comprehension. *Reading in a Foreign Language*, 1(2), 81–92.

Carrell, P.L. (1984). The effects of rhetorical organisation on ESL readers. *TESOL Quarterly*, 18(3), 441–465.

Carrell, P.L. (1985). Facilitating ESL reading by teaching text structure. *TESOL Quarterly*, 19(4), 727–746.

Carrell, P.L. (1987). A view of written text as communicative interaction: implications for reading in a second language. In J. Devine, P.L. Carrell & D.E. Eskey (Eds.), *Research in reading in English as a second language.* TESOL, Washington D.C.

Carrell, P.L. (1988). Some causes of text-boundedness and schema interference in ESL reading. In P.L. Carrell, J. Devine & D.E. Eskey (Eds.), *Interactive approaches to second language reading.* Cambridge University Press.

Carrell, P. L. (1989). Metacognitive awareness and second language reading. *The Modern Language Journal*, 73(2), 121–134.

Carrell, P.L., Devine, J., & Eskey, D.E. (1988). *Interactive approaches to second language reading.* Cambridge University Press.

Carrell, P.L., & Eisterhold, J.C. (1983). Schema theory and ESL reading pedagogy. *TESOL Quarterly*, 17(4), 553–573.

Carrell, P.L., Pharis, B.G., & Liberto, J.C. (1989). Metacognitive strategy training for ESL reading. *TESOL Quarterly*, 23(4), 647–678.

Casanave, C.P. (1988). Comprehension monitoring in ESL reading: A neglected essential. *TESOL Quarterly*, 22(2), 283–302.

Cavalcanti, M. (1982). Verbal reports using the unorthodox, unmeasurable verbal protocol technique — qualitative data in foreign language reading research. In S. Dingwall & S. Mann (Eds.), *Methods and problems in doing applied linguistic research.* Department of Linguistics, University of Lancaster.

Clarke, M.A. (1988). The short-circuit hypothesis of ESL reading — or when language competence interferes with reading performance. In P.L. Carrell, J. Devine & D.E. Eskey (Eds.), *Interactive approaches to second language reading.* Cambridge University Press.

Cohen, A.D. (1986). *Mentalistic measures in reading strategy research: Some recent findings.* Revised version of a paper presented at the 20th Annual TESOL Convention, Anaheim, CA.

Cohen, A.D. (1987). Using verbal reports in research on language learning. In C. Faerch & G. Kasper (Eds.), *Introspection in second language research.* Multilingual Matters.

Cohen, A.D., & Hosenfeld, C. (1981). Some uses of mentalistic data in second language research. *Language Learning*, 31(2), 285–313.

Cohen, L., & Manion, L. (1987). *Research methods in education (2nd ed.).* Croom Helm, New York.

Conner, U. (1984). Recall of text: differences between first and second language readers. *TESOL Quarterly*, 18(2), 239–256.

Connor, U. (1987). The eclectic synergy of methods of reading research. In J. Devine, P.L. Carrell & D.E. Eskey (Eds.), *Research in reading in English as a second language.* TESOL, Washington D.C.

Day, J.D. (1980). *Training summarization skills.* Unpublished doctoral dissertation. University of Illinois.

Devine, J. (1988). The relationship between general language competence and second language reading proficiency: implications for teaching. In P.L. Carrell, J. Devine & D.E. Eskey (Eds.), *Interactive approaches to second language reading.* Cambridge

University Press.

Devine, J., Carrell, P.L., & Eskey, D.E. (1987). *Research in reading in English as a second language.* TESOL, Washington D.C.

Dobrin, D.N. (1986). Protocols once more. *College English*, 48(7), 713–725.

Dubin, F. (1987). Comments on Sarig. In J. Devine, P.L. Carrell & D.E. Eskey (Eds.), *Research in reading in English as a second language.* TESOL, Washington D.C.

Ericsson, K.A. (1988). Concurrent verbal reports on text comprehension: A review. *Text*, 8(4), 295–325.

Ericsson, K.A., & Simon, H.A. (1980). Verbal reports as data. *Psychological Review*, 87(3), 215–251.

Eskey, D.E. (1970). A new technique for the teaching of reading to advanced students. *TESOL Quarterly*, 4(4), 315–321.

Eskey, D.E. (1971). Advanced reading: the structural problem. *English Teaching Forum*, 9(5), 15–19.

Eskey, D.E. (1988). Holding in the bottom: an interactive approach to the language problems of second language readers. In P.L. Carrel, J. Devine & D.E. Eskey (Eds.), *Interactive approaches to second language reading.* Cambridge University Press.

Fletcher, C.R. (1986). Strategies for the allocation of short-term memory during comprehension. *Journal of Memory and Language*, 25, 43–58.

Garner, R. (1982). Verbal-report data on reading strategies. *Journal of Reading Behaviour*, 14(2), 159–167.

Garner, R. (1987). *Metacognition and reading comprehension.* Ablex Publishing Corporation, New Jersey.

Garner, R. (1988). Verbal-report data on cognitive and metacognitive strategies. In C.E. Weinstein, E.T. Goetz & P.A. Alexander (Eds.), *Learning and study strategies.* Academic Press, London.

Geva, E. (1983). Facilitating reading comprehension through flowcharting. *Reading Research Quarterly*, 18(4), 384–405.

Goodman, K.S. (1967). Reading: a psycholinguistic guessing game. *Journal of the Reading specialist*, 6(1), 126–135.

Goodman, K.S. (1971). Psycholinguistic universals in the reading process. In P. Pimsleur & T. Quinn (Eds.), *The psychology of second language learning.* Cambridge University Press.

Gordan, C.J. (1980). *The effects of instruction in metacomprehension and inferencing on children's comprehension abilities.* Ph.D. dissertation, University of Minnesota.

Grabe, W. (1988). Reassessing the term "interactive". In P.L. Carrell, J. Devine &

D.E. Eskey (Eds.), *Interactive approaches to second language reading.* Cambridge University Press.

Grellet, F. (1982). *Developing reading skills: A practical guide to reading comprehension exercises.* Cambridge University Press.

Grice, H.P., in Levinson, S. (1983). *Pragmatics.* Cambridge University Press.

Guindon, R. (1981). Use of verbal reports to study inferences in text comprehension. Paper presented at the Cognitive Science Conference, Berkeley, University of California.

Hannigan, J.L., Shelton, T.S., Franks, J.J., & Bransford, J.D. (1980). The role of episodic and semantic effects in the identification of sentences masked by white noise. Memory and Cognition, 8, 278–284.

Hinds, J.L. (1983). Contrastive rhetoric: Japanese and English. Text, 3(2), 183–195.

Hosenfeld, C. (1976). Learning about learning: Discovering our students' strategies. Foreign Language Annals, 9(2), 117–129.

Hosenfeld, C. (1977). A preliminary investigation of the reading strategies of successful and nonsuccessful second language learners. System, 5, 110–123.

Hosenfeld, C. (1984). Case studies of ninth grade readers. In J.C. Alderson & A.H. Urquhart (Eds.), *Reading in a foreign language.* Longman, New York.

Hudson, T. (1988). The effects of induced schemata on the "short circuit" in L2 reading: non-decoding factors in L2 reading performance. In P.L. Carrell, J. Devine & D.E. Eskey (Eds.), *Interactive approaches to second language reading.* Cambridge University Press.

James, M.O. (1987). ESL reading pedagogy: implications of schema-theoretical research. In J. Devine, P.L. Carrell & D.E. Eskey (Eds.), TESOL, Washington D.C.

Johnson, P. (1981). Effects on reading comprehension of language complexity and cultural background of a text. *TESOL Quarterly*, 15(2).

Johnston, P., & Afflerbach, P. (1983). The construction of main idea in reading comprehension. Paper presented at the annual meeting of the National Reading Conference, Austin.

Kavale, K., & Shreiner, R. (1979). The reading processes of above average and average readers: A comparison of the use of reasoning strategies in responding to standard comprehension measures. *Reading Research Quarterly*, 15, 102–128.

Keeves, J.P. (1988). *Educational research, methodology, and measurement: an international handbook.* Pergamon Press, Oxford.

Kintsch, W., & van Dijk, T.A. (1977). Cognitive psychology and discourse: recalling and summarising stories. In H. Singer & R.B. Ruddell (Eds.), *Theoretical models and processes of reading.* International Reading Association, Delaware.

Kintsch, W., & van Dijk, T.A. (1978). Toward a model of text comprehension and production. *Psychological Review*, 35(5), 363–394.

Kintz, B.L., Delprato, D.J., Mettee, D.R., Persons, C.E., & Schnappe, R.H. (1965). The experimenter effect. In P. Badia, A. Haber, & R.P. Runyon (Eds.), *Research problems in psychology.* Addison-Wesley Publishing Co.

Krashen, S.D. (1982). *Principles and practice in second language acquisition.* Pergamon, Oxford.

LaBerge, D., & Samuels, S.J. (1974). Toward a theory of automatic information processing in reading. *Cognitive Psychology*, 6, 293–323.

Langhan, D.P. (1990). *The textbook as a major source of difficulty in the teaching and learning of geography through the medium of English in standard 3 in black primary schools.* M.A. thesis, Rhodes University.

Lanham, L.W. (1986). *Another dimension of readiness to learn in the second language.* HSRC Conference, Pretoria.

Lanham, L.W. (1987). Learning to become a good reader — the basic skills of reading. Unpublished notes, Rhodes University.

Laufer, B., & Sim, D.D. (1985). Taking the easy way out: non-use and misuse of clues in EFL reading. *English Teaching Forum*, 23(2), 7–20.

Mann, S.J. (1982). Verbal reports as data: A focus on retrospection. In S. Dingwall & S. Mann (Eds.), *Methods and problems in doing applied linguistic research.* Department of Linguistics: University of Lancaster.

McClelland, J., & Rumelhart, D. (1981). An interactive activation model of the effect of context in perception. *Psychological Review*, 88, 375–407.

Meyer, B.J.F. (1975). *The organisation of prose and its effects on recall.* North Holland Publishing Co., Amsterdam.

Meyer, B.J.F. (1979). Organisational patterns in prose and their use in reading. In M.L. Kamil & A.J. Moe (Eds.), *Reading research: studies and applications.* National Reading Conference, Clemson, South Carolina.

Meyer, B.J.F., & Freedle, R.O. (1984). Effects of discourse type on recall. *American Educational Research Journal*, 21(1), 121–143.

Meyer, B.J.F., & Penland, M.J. (9182). Effects of text structure on use of cognitive capacity during reading. *Journal of Educational Psychology*, 74(1), 51–61.

Mosenthal, J.H. (1984). *Instruction in the interpretation of a writer's argument: a training study.* Ph.D. dissertation, University of Illinois.

Munby, J. (1978). *Communicative syllabus design.* Cambridge University Press.

Murray, S. (1985). *Reading and understanding: the influence of background knowledge*

on reading comprehension.

Newell, A., & Simon, J.A. (1972). *Human problem solving.* Prentice-Hall, Englewood Cliffs, NJ.

Nisbett, R.E., & Wilson, T.D. (1977). Telling more than we know: Verbal reports on mental processes. *Psychological Review*, 84, 231–279.

Nuttall, C.J.S. (1988). Review of research in progress; M.Ed. lecture, Rhodes University.

Olshavsky, J. (1976–1977). Reading as problem-solving: An investigation of strategies. *Reading Research Quarterly*, 12, 654–674.

Olson, G.M., Duffy, S.A., & Mack, R.L. (1984). Thinking-out-loud as a method for studying real-time comprehension processes. In Kieras & Just (Eds.), *New methods in reading comprehension research.* LEA.

Orne, M.T. (1962). On the social psychology of the psychological experiment: with particular reference to demand characteristics and their implications. In P. Badia, A. Haber, & R.P. Runyon (Eds.), *Research problems in psychology.* Addison Wesley Publishing Co.

Perfetti, C.A. (1985). *Reading ability.* Longman, New York.

Perfetti, C.A. (1986)a. Cognitive and linguistic components of reading ability. In B. Foosman & A. Siegal (Eds.), *Acquisition of reading skills.* Erlbaum, Hillsdale, NJ.

Perfetti, C.A. (1986)b. Reading acquisition and beyond: decoding includes cognition. In N. Stein (Ed.), *Literacy in American schools.* University of Chicago Press.

Reutzal, D.R. (1985). Story maps improve comprehension. *The reading teacher*, 38(4), 400–404.

Rivers, W. (1964). *The psychologist and the foreign-language teacher.* University of Chicago Press.

Rivers, W. (1968). *Teaching foreign language skills.* University of Chicago Press.

Rubin, J., & Henze, R. (1981). The foreign language requirement: A suggestion to enhance its educational role in teacher training. *TESOL Newsletter.*

Rumelhart, D.E. (1977). Toward an interactive model of reading. In J.T. Guthrie (Ed.), Comprehension and teaching. *Research Reviews*: IRA.

Rumelhart, D.E. (1980). Schemata: the building blocks of cognition. In R.J. Spiro, B.C. Bruce, & W.F. Brewer (Eds.), *Theoretical issues in reading comprehension.* Erlbaum, Hillsdale, NJ.

Rumelhart, D.E. (1981). *Understanding understanding (Report No. 100).* University of California at San Diego: Centre for Human Information Processing.

Salasoo, A. (1986). Cognitive processing in oral and silent reading comprehension. *Reading Research Quarterly*, 21, 59–69.

Samuels, S.J., & Kamil, M.L. (1988). Models of the reading process. In P. Carrell, J. Devine, & D. Eskey (Eds.), *Interactive approaches to second language reading.* Cambridge University Press.

Sanders, W.B., & Pinhey, T.K. (1983). *The Conduct of Social Research.* Holt, Rinehart & Winston, New York.

Sarig, G. (1987). High-level reading in the first and in the foreign languages: Some comparative process data. In J. Devine, P.L. Carrell, & D.E. Eskey (Eds.), *Research in reading in English as a second language.* TESOL, Washington D.C.

Scardemalia, M., & Bereiter, C. (1984). Development of strategies in text processing. In H. Mandl, N.L. Stein, & T. Trabasso (Eds.), *Learning and comprehension of text.* Erlbaum, Hillsdale, NJ.

Schmalhofer, F., & Boschert, S. (1988). Differences in verbalizations during knowledge acquisition from texts, and discovery learning from example situations. *Text*, 8(4), 369–393.

Shay, S. (1990). *Exploring ASP methodology: the use of think alouds in reading.* SAALA Conference, Rhodes University.

Short, E.J. (1982). *A self-instructional approach to remediating less skilled reader's use of story schema, causal attributions, and expectations for success.* Ph.D. dissertation, University of Notre Dame.

Silburn, G.D. (1991). *The effect of teaching text organisation on reading in English as a second language.* Masters Thesis, Rhodes University.

Simon, D., & Simon, H. (1978). Individual differences in solving physics problems. In R. Singer (Ed.), *Children's thinking: What develops?* Erlbaum, Hillsdale, NJ.

Singer, H., & Donlan, D. (1982). Active comprehension: problem-solving schema with question generation for comprehension of complex short stories. *Reading Research Quarterly*, 17(2), 165–186.

Smith, F. (1973). *Psycholinguistics and reading.* Holt, Rinehart & Winston, New York.

Smith, S. (1979). Strategies, language transfer and the simulation of the second language learner's mental operations. *Language Learning*, 29, 345–361.

Spiro, R.J. (1980). Constructive processes in prose comprehension and recall. *Theoretical issues in reading comprehension*, LEA.

Stanovich, K. (1980). Toward an interactive-compensatory model of individual differences in the development of reading fluency. *Reading Research Quarterly*, 16, 32–71.

Steffenson, M.S., Jrag-Dev, C., & Anderson, R.C. (1979). A cross-cultural perspective on reading comprehension. *Reading Research Quarterly*, 15(1).

Stenhouse, L. (1988). Case study methods. In J.P. Keeves (Ed.), *Educational research, methodology, and measurement: an international handbook.* Pergamon Press, Ox-

ford.

Taylor, B.M., & Beach, R.W. (1984). The effects of text structure instruction on middle grade students' comprehension and production of expository text. *Reading Research Quarterly*, 19(2), 134–146.

Taylor, I., & Taylor, M. (1983). *The psychology of reading.* Academic Press, New York.

Urquhart, A.H. (1987). Comprehensions and interpretations. *Reading in a Foreign Language*, 3(2).

van Dijk, T.A. (1980). *Macrostructures. An interdisciplinary study of global structures in discourse, interaction and cognition.* Erlbaum, Hillsdale, NJ.

van Dijk, T.A., & Kintsch, W. (1985). Cognitive psychology and discourse: recalling and summarising stories. In H. Singer & R.B. Ruddell (Eds.), *Theoretical models and processes.* International Reading Association, Delaware.

Waern, Y. (1982). How to get from deceive to detect: Association and creation in interpretation. Working papers from the *Cognitive Seminar 15*, Department of Psychology, University of Stockholm.

Weinstein, C.E., Goetz, E.T., & Alexander, P.A. (1988). *Learning and study strategies.* Academic Press, London.

White, P. (1980). Theoretical note: Limitations on verbal reports of internal events: A refutation of Nisbett and Wilson and of Bem. *Psychological Review*, 87(1), 105–112.

Widdowson, H.G. (1978). *Teaching language as communication.* Oxford University Press.

Widdowson, H. (1979). The process and purpose of reading. In H. Widdowson (Ed.), *Explorations in applied linguistics.* Cambridge University Press.

Winograd, P., & Chou Hare, V. (1988). Direct instruction of reading comprehension strategies: the nature of teacher explanation. In C.E. Weinstein, E.T. Goetz & P.A. Alexander (Eds.), *Learning and study strategies.* Academic Press, London.