

# INVESTIGATING FL READING PERFORMANCE THROUGH VERBAL PROTOCOLS

Marilda Cavalcanti - UFPA

## INTRODUCTION

The issue of methodology with respect to the investigation of (FL) reader-text interaction is complex due to the inadequacy of existing instruments to investigate a highly unknown process. The present paper, which is divided into three parts, describes the choice, adaptation and utilization of an instrument of data elicitation, viz. verbal protocols. This tripartite description results from an attempt to capture the reader's point of view about pragmatic interpretation problems arising from reader-text interaction.

### 1. TOOLS FOR TAPPING THE READING PROCESS

Research in reading has a long tradition of product analysis done on a quantitative basis. This tradition reflects researchers' preoccupation with how much readers can grasp from text. This preoccupation is evidenced in the use of measurable techniques of data collection and analysis which invariably teake on the format of multiple choice reading comprehension tests. These tests, which have been criticized for measuring more or less than that which comprehension may involve, are said to measure behaviour which is only an indirect measure of the process.

Another measurement of behaviour which presents itself as an advance over multiple choice questions is the Cloze procedure (see Taylor, 1953). This type of procedure neither tests readers' short term memory capacity nor skill in understanding questions as multiple-choice comprehension tests do. It is dependent on the readers' knowledge - structure range with respect to the easiness or difficulty

encountered in blank filling. In other words, I am implying that blanks may be meaningfully filled without reading and/or understanding a passage.

In recent years simultaneously with research into the product of reading, there has been a development of interest in the reading process. This development of interest was aided by the emergence of Information Theory and fostered by the advent of the computer. This growth of interest is reflected in qualitative approaches to reading research which seek a description of behaviour for the purposes of inferring the process(es). The outcome of this trend is, on the one hand, reading models (such as Goodman, 1957), and, on the other hand, the advancement and/or revival of tools for tapping the reading process. In this paper I focus on the latter. I view these tools as falling into a four-fold classification:

- (a) miscue analysis as proposed by Goodman & Burke (1970);
- (b) recall tasks as used by Kintsch et al. (1975) and Kintsch & van Dijk (1978);
- (c) reading monitors and/or recorders as developed by Just & Carpenter (1977); Whalley (1977); Pugh (1978); Thomas & Augstein (1972, 1979);
- (d) introspective techniques as advanced by Hosenfeld (1977), Olshavsky (1976-7), Kavale & Schreiner (1979), and Alderson & Short (1981).

I will briefly consider each one of the instrument types above to justify my choice of an instrument of data elicitation for adult Brazilian informants. Before doing this, however, I should point out that I examined these instruments with the following set of requirements in mind to account for the preservation of reading as

- (i) a silent and (as much as possible) private activity, however, yielding performance data;

- (ii) part of a real situation with minimum use of electronic apparatus;
- (iii) a process allowing for the capture of ongoing thoughts on the reader's part;
- (iv) based on an authentic text laid out in its full extent and not in chunks; and
- (v) done both in the L<sub>1</sub> and in the FL.

(a) Miscue Analysis. Miscue analysis, a technique based on the analysis of 'miscues' or errors made in oral reading, was the first instrument to be dismissed. It does not meet the requirement of preserving reading as a silent and private activity.

(b) Recall Protocols. Recall Protocols as used by Kintsch & van Dijk (op. cit.) refer to tasks usually known as 'written summaries' in the classroom tradition. It is important to emphasize, however, that these writers view written summaries as 'texts on their own right'. In other words, their analysis of recall protocols accounts for the text base and for the recall protocols proper. I ruled out this instrument of data collection because it does not allow for the reader's ongoing thoughts due to the time interval between the reading task and the recall task.

(c) Reading monitors/recorders. The area of research which uses reading monitors and/or reading recorders in so far as the processing of extended<sup>2</sup> pieces of prose is concerned is fairly recent. Furthermore, its instruments are especially developed and not easily available.

Thomas & Augstein (op. cit.), for example, designed a reading recorder (i.e. the Brunel Reading Recorder) which enables readers to see on a viewer an average of five lines at a time. This recorder provides print-outs of patterns of reading (e.g. hesitations and think sessions) and serves as the basis for counselling. To my mind, this recorder, which

makes a very reduced amount of text available at a time, is likely to render the reading situation unreal and tiresome.

As to reading monitors, Whalley (op. cit.), concerned with purposes in reading, developed an apparatus for monitoring reading. This apparatus requires a darkened booth and provides facilities for illuminating sections of the text being read at the reader's will. Although it allows for a book-reading situation in so far as amount of text available at a time is concerned, Whalley's monitor has a serious disadvantage, viz. the unrealistic reading atmosphere resulting from the darkened booth.

(d) Introspective techniques. Having examined these three types of tools for investigating the reading process, Hosenfeld's (op. cit.) think aloud (while tackling a reading task) technique suggested itself as promising in the search for a research instrument to meet the requirements I had initially set. Think aloud, also referred to as verbal protocols in Problem Solving Theory (see Newell & Simon, 1972) where it was first introduced and developed as a research instrument, requires the subjects to verbalize their thoughts while solving a problem. This technique belongs to the broad context of introspection which is itself as old as general psychology (see Cavalcanti, 1982, 1983).

## 2. INTROSPECTIVE TECHNIQUES

Radford & Burton (op. cit.: 395) nicely summarise the appeal and the status of introspective techniques by saying:

Introspection gives us information about experience. It yields data otherwise inaccessible. It may besides bring to light facts that might otherwise be overlooked, or stimulate us to ask new questions. Like any technique, it has peculiar difficulties, especially when used in odd circumstances. These, however, are the hazards of science.

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- (b) a process allowing for the capture of ongoing thoughts on the reader's part;
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Introspective techniques are a controversial issue both in cognitive psychology and in other schools of thought in psychology. Mann (1982), for example, suggests that the drawbacks attributed to these techniques are related to:

(1) cognitive demands

- (a) capacity (i.e. the maximum amount of information and number of activities dealt with in short term memory)
- (b) memory (i.e. demands from short term memory or long term memory)
- (c) metacognition (i.e. subjects' capacity to observe and talk about cognitive processes in operation)

(2) social psychological demands (i.e. threat and pressure of an unfamiliar situation)

Despite these drawbacks, I view these techniques as promising due to their nature. In other words, they are likely to encourage questions about aspects of 'cognitive processes in operation' which are usually ignored when other techniques are used.

Introspective techniques are classified by Radford & Burton (op. cit.) into three groups:

(1) Self-observation (or introspection proper) - The analyst-observer reports on mental events.

(2) Self-reports or self-perception (or retrospection) - The subjects tell the researcher/analyst about their experience.

(3) Think aloud (verbal protocols or protocol analysis) - The subjects verbalize their thoughts while tackling a task.

The classification above seems to be useful from the point of view of data collection design. In practice, however, as has been pointed out by Radford & Burton (op. cit.), the borderlines may not be very clear cut. The three groups in this classification, I believe, might be better understood as part of a continuum which ranges from introspection proper through naive psychology<sup>3</sup> to a version of psychoanalysis (in so far as the interviewing technique is concerned and not in terms of therapy). These three groups would fit on the continuum as shown in Fig. 1.

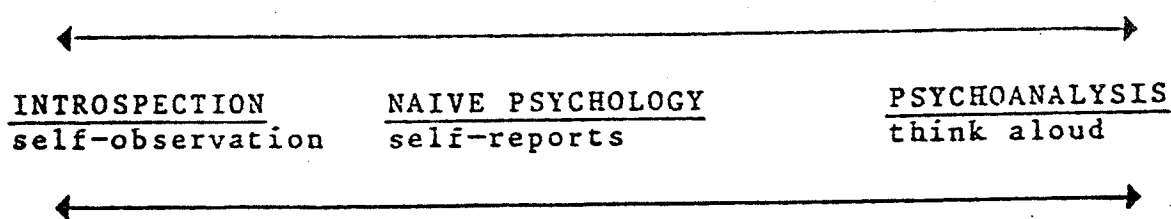


Fig. 1 CONTINUUM OF INTROSPECTIVE TECHNIQUES

Introspective techniques of one sort or another have always been used in reading research. In fact, self-observation is the one technique which characterizes theoretical approaches to reading (e.g. Thorndike, op. cit.; and Smith, 1971, inter alia).

Self-reports, which are not as common in reading research as self-observation, play a crucial role in the work developed (a) by the Göteborg group, i.e. Marton & Sjöljö (1976) (b) by Thomas & Augustein (1972, 1979), and (c) by Cohen et al. (1979). (See Cavalcanti, 1983, for an extended elaboration on self-reports.)

Think aloud emerged in reading research through the work of Hosenfeld (1977) in foreign language reading and of Olshavsky (1976-7) in first language reading. Before reviewing their work, I will discuss the strengths and weaknesses of the technique known as verbal protocols. This technique is the focus of attention throughout the remainder of this paper.



### 3. VERBAL PROTOCOLS

As originally developed in Problem Solving Theory by Newell & Simon (1972), verbal protocols require the subject to think aloud while tackling a task. This technique, which has become a hallmark of the Information Processing approach, is emphasized in Problem Solving Theory because 'it becomes essential to get enough data about each individual subject to identify what information he has and how he is processing it'. Newell & Simon (op. cit.) mention that the first think aloud tapes (on a logic task) were transcribed in 1957, and the tradition in the use of verbal protocols was started as a technique to check computer models of information processing, hence the emphasis on tasks based on chess and symbolic logic. Verbal protocols play a central and unquestionable role perhaps only in Problem Solving Theory. In other present or past theories and in branches of psychology, verbal protocols (and introspection in general) remain a point of debate.

In the literature regarding learning strategies (and learning styles), for example, the use of verbal protocols or of any other form of 'introspection' is unusual and 'frequently met with disfavor for not being reliable enough' (Cohen, 1981: 4).

In  $L_1$  reading two works were selected, i.e. Olshavsky (1976-7) and Kavale & Schreiner (1979), as the only one to my knowledge besides Newell & Simon (op. cit.) to give a detailed account of procedures used to elicit verbal protocols. This lack of information is not surprising, since verbal protocols are never mentioned as a technique for data collection in books on research methodology. The two articles just mentioned combined with Newell & Simon (op. cit.), were, therefore, the starting points for the version of verbal protocols adopted in my research work.

Olshavsky (op. cit.: 661) chose to use verbal protocols after considering three types of techniques, viz. 'introspection, retrospection and verbal protocols' to identify readers' strategies. She describes verbal protocols as requiring

...the subject to think aloud as he solves a problem. This method [ sic ] was adapted here to study reading strategies in the following manner. The subjects were required to 'think aloud' after reading each clause of a short story.

In her adaptation of verbal protocols, Olshavsky (op. cit.) emphasizes and encourages clause reading which, to my mind, is not very different from unrelated-sentence reading (as done in psychological experiments as the ones carried out by Clark & Clark, 1977, inter alia). I believe that if readers interrupt their task at the end of every clause or sentence, reading becomes artificial, i.e. experiment-like.

Kavale & Schreiner (op. cit.: 109), interested in the identification of reasoning strategies by average and above average readers, elicit verbal protocols by presenting their subjects with

Four different question types representing measures of verbal reasoning (VR) determining cause and effect (CE), reading for inference (I), and selecting the main idea (MI)...

Kavale & Schreiner (op. cit.), therefore, use verbal protocols to investigate the product of reading. Their questions are based on a set of sentence-long texts from varied sources. Although their study is dated of 1979, it falls into the category of research based on unrelated sentences which characterizes work published from 1970 to 1975 as pointed out by Golinkoff (1975-76). Golinkoff (op. cit.) in a review of the literature on the 'reading processes in good and poor comprehenders' further adds that there was

some questioning at that time as to what a unit of reading is, i.e. a phrase, a clause, whole sentences or a combination of the three. Although the questioning persists to date, there has certainly been a move towards research based on whole texts and away from unrelated sentences (see Schank & Abelson, op. cit.).

Both Oshavsky's (op. cit.) and Kavale & Schreiner's (op. cit.) studies investigate the reading processes of secondary school children. Both have a training phase before the actual elicitation of verbal protocols is done. Olshavsky (op. cit.: 661) says, 'The subjects learned this [think aloud] before the study began so they read and respond in an ongoing manner with no time delay'.

In FL reading, verbal protocols are best represented by the work developed by Hosenfeld (1976, 1977, 1979, forthcoming). Her early work focusses on the identification of reading strategies of successful and non-successful (non-native high-school level learners) through the use of think-aloud data elicited individually in an interview-type situation. Her work is limited to the study of strategies related to word-meaning problem solving and meaning retention while decoding. To analyse this data Hosenfeld developed a (complicated) system of notation which displays the reading strategies identified in reading maps'. With respect to these maps, Hosenfeld's (1976, 1977) work is unique, since she proposes what could be described as a 'manual' reading recorder which produces (homemade) 'computer print-outs'<sup>4</sup>. As I hinted at above, her system of notation is complex for mapping word-decoding strategies, let alone for mapping any other type of strategy.

More recently Hosenfeld (1979, forthcoming) carried out some case studies with non-successful (non-native) learners. In these studies not only did she identify their reading strategies but also she helped them acquire new reading behaviour. These case studies are based on

think aloud data stemming from reading (and grammar) tasks. Hosenfeld (op. cit.) uses an inductive technique in remedial sessions with her subjects, i.e. the subjects go through a trial-and-error process to choose a model of a successful learner which is suitable to their style of reading. This model, which is summarized in a set of strategies, is used by the readers as a basis for the improvement of their strategies. The model is used as a starting point for comparisons. The readers work in a learn-to learn situation assisted by the researcher. Her findings (limited to word-decoding and meaning retention) demonstrate that unsuccessful readers, who used to do word-by-word translation and turned to the dictionary for the meaning of new words, acquired 'effective strategies'. These effective strategies (sic) include translation into broad phrases, contextual guesses of the meaning of new words, and use of varied information sources in decoding (e.g. illustration, cognates, grammar).

In so far as verbal protocols are concerned, Hosenfeld's (op. cit.) approach is very much based on interviewing techniques. In other words, in the elicitation of data the researcher intervenes as many times as necessary to prompt the subject to think aloud and to move from retrospection to 'introspection'. In her early studies, Hosenfeld (1976, 1977) adopted an oversimplified view of introspection, i.e. she considered think aloud as pure<sup>5</sup> introspection. More recently (see Cohen & Hosenfeld, 1981) she adopted a new perspective in a proposal for a methodological framework for researching into mental states.

### 3.1 ADAPTATION OF VERBAL PROTOCOLS: PAUSE PROTOCOLS

Since the verbal protocol technique is borrowed from Problem Solving Theory, an adaptation was necessary to make it fit the requirements and purpose of the reading

tasks used for data elicitation. I chose to adapt this technique in a series of four pilot studies (see Cavalcanti, 1983). These pilot studies were undertaken to provide a basis for decisions concerning the outline for data collection and including

- (a) the type of text to be used;
- (b) directions to be given to the subject-informants; and
- (c) the role to be played by the researcher-analyst in the elicitation of data.

The adaptation of the verbal protocol technique developed from the pilot studies consisted of asking the subject-informants to read silently (for the purpose of making an oral summary) and to think aloud whenever realizing the occurrence of pauses in the reading process. My aim in eliciting what I labelled pause protocols was to encourage silent reading in verbal protocols and thus overcome a drawback faced in the first three pilot studies, that is reading aloud and verbalizing only after large chunks of text had been read. The readers were, therefore, asked to monitor their reading process and to start reasoning aloud on the bases of the pauses detected. This reasoning should include minimally elaborations on (a) the location of the problem encountered, (b) the description of the problem, and (c) the description of the way the problem was dealt with.

Pause protocols were used as a 'breaching procedure' (Garfinkel, 1967), that is, the subjects were requested to face a familiar task (reading) in an unfamiliar way (thinking aloud when they detected the occurrence of a pause). The use of this procedure is based on the assumption that the identification of pauses, i.e. potential problem situations caused either by the reader's inadequacy or by the reader's hyperinterest in parts of the text (or in the

topic as a whole), results from a natural slowing down of the processing of information. It represents a shift from 'automatic'<sup>6</sup> to 'controlled' processing in reading (see Shffrin & Schneider, op. cit.).

The pause protocols were preceded by a training phase to guide the reader to focus upon pauses. The training phase aimed at providing practice in raising the reader's awareness towards the pauses that occur naturally in the reading process. It was developed as a 'warm-up' exercise to lead the subjects from retrospection proper (i.e. retrospection about pauses made) to thinking aloud (when the pause is first noticed). This phase was designed as a result of the first pilot studies carried out. It indicated that, when asked to think aloud while reading, subjects usually ended up reading large chunks of text (or even the whole text) and then self-reporting. By the time they started doing these retrospections, they did not remember much of the process anymore. In the training phase, readers went from retrospective to think aloud tasks, i.e. from tasks which required them to retrospect at the end of paragraphs to tasks which required them to think aloud while reading the paragraphs with a focus on pauses.

### 3.2 UTILIZATION OF PAUSE PROTOCOLS: DATA ELICITATION DESIGN AND PROCEDURE

The final data elicitation design developed from the pilot studies was divided into three phases (see Fig. 2.). Phase I and Phase III are tests. The former had the purpose of checking the readers' adequacy, i.e. a construct combining

Fig. 2 DATA ELICITATION DESIGN: BRAZILIAN INFORMANTS (EFL readers)

SOURCE	PURPOSE	NEEDS
1. Self-assessment	To check reader's adequacy { 1. Reader's linguistic confidence 2. Reader's proficiency	Portuguese
2. Proficiency Test		English
3. Structured interview	To establish reader's profile	Portuguese
4. Training phase	To lead reader from REFLECTION TO THINK ALOUD To provide practice in raising reader's awareness towards occurrence of pauses in reading	English Portuguese
5. Elicitation of protocols	As a control measure for topic knowledge and content anticipation (prediction) To identify pragmatic interpretation problems As a control measure for pause occurrence As a control and comprehension measure To check intersubjective agreement in reader-text interaction As a comparison measure among EFL readers	English
5.1 IL reading		Portuguese
5.1.1 Title study task		English
5.1.2 Pause protocol		Portuguese
5.1.3 Interventionist procedure		English
5.1.4 Oral summary		Portuguese
5.1.5 Selection of key lexical items		Portuguese
5.2 L1 reading		Portuguese
5.2.1 Title study task		Portuguese
5.2.2 Pause protocol		Portuguese
5.2.3 Interventionist procedure		English
5.2.4 Oral summary		Portuguese
5.2.5 Selection of key lexical items		Portuguese
6. Cloze task	As a comparison measure with EFL readers	P O R T U G U E S E

Phase I

Phase II

Phase III

the reader's self-assessment (see Cavalcanti, 1983) in so far as linguistic confidence is concerned, and the reader's proficiency as measured by the ELBA (English Language Battery) test. The latter, i. s. Phase III: Cloze test (Fig. 2), is a comparative measure between the foreign language readers (Brazilian-Portuguese native speakers) and the EL<sub>1</sub> readers (native speakers of English).

Phase II referred to the actual elicitation of protocols from the FL readers. This phase was divided into three parts (see 3, 4 and 5 in Fig. 2). The elicitation of the protocols was introduced by a structured interview (see Cavalcanti, 1983) which represented the transition between Phases I and II (See Fig. 2). It had the double purpose of, on the one hand, supplying some information about the readers' profile (e.g. attitudes, habits), and on the other hand, of serving as an ice breaker of the data elicitation session as a social encounter<sup>7</sup>. Following the structured interview, the readers had a training phase (see Cavalcanti, 1983) with a double-folded aim, viz. provision of practice in raising the readers' awareness towards the occurrence of pauses in the reading process, and in leading the readers from retrospective to think aloud tasks. The former required the readers to retrospect about their processing of information at the end of paragraphs and the latter required them to think aloud while reading the paragraphs (focus on pauses). In other words, the think aloud tasks required them to read silently and think aloud whenever they noticed the occurrence of a pause in the process.

The third part of Phase II in the data elicitation design involved the elicitation of pause protocols first based on an English text, and second on a Portuguese text. The pause protocols constituted the focal point of the data elicitation, since they were used for the identification of pragmatic interpretation problems as related to key lexical items. These protocols were combined with four control measures on an



informal basis, viz. title study task, interventionist procedure, oral summary, and selection of key lexical items.

The title study task (see Cavalcanti, 1983) aimed at identifying differences/similarities in knowledge structures (SCHEMATA) in so far as the topic of the data base was concerned. This task was also used to check content anticipation, that is what the readers expected from the text.

The purpose of the interventionist procedure (see Appendix) was to include one induced pause requiring immediate retrospection at about the same point (i.e. the second paragraph) in the data base. This induced pause was to represent one set point of pause comparison among the subjects, since it was assumed that they would pause at different places in the data base. The interventionist procedure (adapted from Cohen, 1981) consisted of a set of questions about ongoing thoughts/activities (see Cavalcanti, 1983) which were used to interrupt the readers 30" after they had turned the first page of the text (i.e. data base).

The oral summary (at the end of each paragraph and at the end of the text) corresponds to retrospective accounts of how the data base was being processed from the point of view of content. In this sense, it is an informal measure of negotiation of meaning throughout reader-text interaction. It is also a measure of control for comparative purposes, since it occurs at pre-determined points in the text. These points were signalled by an arrow ( ← ) to remind the readers of the task required of them.

Finally, the selection-of-key-lexical-item task, had the objective of checking whether there was minimal basic intersubjective agreement in so far as key lexical items were concerned (see Cavalcanti, 1983).

The data elicitation design in the case of the EL<sub>1</sub> readers was a reduced version of the one for the FL readers as illustrated in Fig. 3. It started at Step 3 of Phase II of the DATA ELICITATION DESIGN: FL readers (Fig.

2), skipped Step 5.1 altogether, and went straight into Steps 5.2 and 6.

For the data elicitation the only hardware instrument was a pocket-book size (15 x 9) Sony K-7 recorder combined with a micro clip-microphone. The software consisted of a set of typed instructions for the tasks, and the two texts (for the training phase and for the pause protocols).

The data base (stimuli for data elicitation) were two introductions to academic articles from political studies journals, one in English and the other in Portuguese. No readability formula was used to assess the texts which were selected on the bases of the following criteria:

- (a) the researcher's intuition about what could be of potential interest to the Brazilian readers, viz. politics and Northern Ireland,

although probably not part of their background knowledge;

- (b) the research requirements in relation to

- . topic - The text(s) should be from an area of study other than that of the subjects'. This requirement was part of the 'breaching-procedure' approach to reading through pause protocols to compel the readers to process the information more slowly.
- . organization - The texts should be self-contained in so far as organization into the PROBLEM-SOLUTION<sup>8</sup> structure was concerned.
- . length - The texts should have an average of 650 words.

The researcher-elicitor chose to act as a 'sounding board' during the protocol elicitation to foster reader-text interaction and avoid reader-text-elicitor interaction.

Fig. 3 DATA ELICITATION DESIGN: ENGLISH NATIVE SPEAKERS

SOURCE	PURPOSE
1. Structured interview	To establish reader's profile
2. Training phase	To lead reader from RETROSPECTION to THINK ALOUD To provide practice in raising reader's awareness towards occurrence of pauses in the reading process
3. Elicitation of protocols	
3.1 Title study task	As a control measure: topic knowledge/content anticipation
3.2 Pause protocol	To identify pragmatic interpretation problems
3.3 Interventionist procedure	As a control measure
3.4 Oral summary	As a control and comprehension measure
3.5 Selection of key lexical items	To check notion of agreed basis in reader-text interaction
4. Cloze task	As a comparison measure with FL readers

Marilda Cavalcanti  
 IV SEMINÁRIO NACIONAL (RELIÇÃO SUL)  
 PRONTO ENLACE DE FOLHAS INSTRUMENTAL EM UNIVERSIDADES BRASILEIRAS  
 UNIVERSIDADE FEDERAL DE SANTA MARIA, RS  
 01-05/09/1981

If necessary interference was to be done, however, to prompt the readers to think aloud. This type of interference was allowed for to prevent the series of long silences which may characterize some readers' protocols. It represented an added measure to the adaptation of the think-aloud technique into pause protocols.

## CONCLUSION

This paper reported the choice, adaptation and use of an introspective technique for data elicitation. This technique which I labelled pause protocols is promising as an attempt to capture the ongoing reading process. As such I find it promising also as a reading exercise for the purposes of awareness raising on the reader's part in the classroom.

## NOTES

1. This paper is a reduced version of a monograph to be published in the monograph series Exeter Linguistic Studies.
2. The research tradition of eye movement photography was strong during the 1950's and 1960's. It focussed on the recording of eye movements to find out about number of fixations and eye span with respect to words and sentences in isolation.
3. Berkowitz (1980: 203) says naive psychology is associated with Heider's (1958) work in attribution theory. "Heider's theorizing is usually referred to as 'naive psychology' because of its emphasis on the phenomenology of the perceiver in his attempt to understand the causes of behavior".

4. See Rosenfeld (1977) for examples of 'reading maps' to which she refers as 'computer print-outs'.
5. This oversimplified view of introspection is also taken by Glahn (1980: 119) in her research in oral FL communication. Specifically interested in grammatical phenomena, she had her subjects 'introspect' to find out whether they 'were at all capable of remembering what had been going on in their minds during the communication situation'. The obvious inference is that Glahn (op. cit.) uses a retrospective technique and not an introspective one as she claims.
6. Shiffrin & Schneider (1977) suggest that reading is a fast and automatic process which tends to slow down and become partly controlled when problems are encountered.
7. For Salmon (1976: 39) 'encounters between investigators and their subjects are social situations between people, no less complex than other situations between people'.
8. The PROBLEM-SOLUTION STRUCTURE as proposed by Hoey (1979) is a framework imposed upon the organization of factual text. It suggests that text can be analysed with respect to its SITUATION, PROBLEM and SOLUTION. Each one of these parts is overtly signalled by grammatical/lexical items and by clauses.

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