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The Effects of Teaching a Specific Top-Level Structure on the Organization of Written Texts

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**THE EFFECTS OF TEACHING A SPECIFIC
TOP-LEVEL STRUCTURE ON THE ORGANIZATION
OF WRITTEN TEXTS**

BY

K. Brown Dip Teach., Post-Grad Dip. Reading Education.

**A Thesis Submitted in Partial Fulfilment of the
Requirements for the Award of**

Master of Education

at the Faculty of Education, Edith Cowan University.

Date of Submission 30-12-94

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ABSTRACT

The purpose of this study was to investigate the effectiveness of teaching a specific top-level structure on students' recall and organization of expository text. The hypothesis to be investigated was that students explicitly taught the scientific report text structure schema would show improved recall and organization of written report text protocols.

The report text structure utilized in this study was derived from Sloan and Latham's top-level structure of text organization devised from schema theory and semantic memory models.

The experimental design involved a pre-test-post-test format. Sixty nine year four students were tested on reading achievement and categorized as novice or better readers. Students from each group of readers were then randomly assigned to either the two control (structured/unstructured) or two experimental (structured/unstructured) groups. Those readers in the structured text group were read an organized report text (based on Sloan and Latham's scientific report text) while the unstructured text group were read text devoid of organization. Subjects were asked to provide written recalls of the content information in an immediate test condition. Three weeks later a second recall test was administered to determine if there had been any long term change to text structure schema and comprehension.

The treatment phase was conducted over a three week period. During this time the experimental group were explicitly taught the top-level structure of the scientific report text while their control counterparts were involved in the 'reading only' of the scientific report.

Statistical analysis was conducted on the mean number of concepts recalled and the students' use of the report text macrostructure to organize their written protocols. Data were subjected to ANOVA and The Student-Newman-Keuls' post-hoc tests to determine significant differences.

Results of the study reveal that the teaching of the scientific report text structure has positive organizational effects on students' structuring of written recalls, even if the text is jumbled. This effect was found for both novice and better readers. It appears that teaching students text structure schema did lead to an improved organization of content in written protocols. However this finding was not paralleled in the comprehension aspect of the investigation. Reasons discussed for the minimal comprehension gains included the insufficient time frame allocated to the training period and the measure used to assess comprehension.

The implications of these findings suggest that the text structure frameworks and strategies postulated by Sloan and Latham (1989, 1990) provide an effective tool for teaching students the purpose, function and components of informational text. As students progress through the educational system expository text becomes more dominant in their learning. An understanding of the structure and organization of informational text provides readers with metalinguistic and metacognitive strategies which may facilitate the understanding and composition of expository text. As the memory based top-level structures proposed by Sloan and Latham have been advocated in recent major literacy initiatives such as First Steps, Stepping Out, this study provides some preliminary research findings to support current practice.

"I certify that this thesis does not incorporate without acknowledgment any material previously submitted for a degree or diploma in any institution of higher education; and that to the best of my knowledge and belief it does not contain any material previously published or written by another person except where due reference is made to the text."

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CHAPTER 1

BACKGROUND, STATEMENT OF PROBLEM, AND PURPOSE OF THE STUDY

Expository or informational text becomes the predominant text-type used by students as they progress through school. Students increasingly need to acquire information for themselves in upper primary and in secondary school from factual texts rather than be given information by teachers. To be able to acquire information successfully, students must be able to understand the different expository text-types presented across the curriculum and compose written assignments in subject specific domains. The ability to compose and comprehend this discourse style is essential for academic success.

Traditionally most instructional reading and writing practice in primary schools have been delivered through narrative based texts with minimal attention assigned to the purpose and function of expository or informational text forms. Recent advances in reading theory and text linguistics have signalled this imbalance between narrative instructional procedures and the expository text demands of the classroom situation. As a consequence professional development programs, such as, ERICA - Effective Reading in the Content Areas (1984), First Steps (1992), Stepping Out (1992), and CALL - Content Area Literacy and Learning (1993) have endeavoured to move the pedagogical focus from instruction in the narrative domain to a broader approach which includes expository text. (See appendix L for description of these programs.)

This shift has been complemented by developments in reading comprehension which have broadened the view of comprehension from an information transfer model involving the transmission of data from text to reader, to that of a dynamic,

interactive process involving the reader, the text and the socio-cultural context in which the reading act occurs.

Whilst these three factors have been shown to influence the comprehension of text, a large body of data has been documented which focuses on the value of teaching the structural elements of informational text. Specifically the research has attempted to define and describe the various text structure frameworks which constitute expository text.

Just as the story grammarians (Stein & Glenn, 1978; Mandler & Johnson, 1977 b) outlined the way in which children internalize basic story structures and use these in their comprehension of narrative texts, researchers have attempted to explain the frameworks which constitute expository text structure. This research has highlighted the area of top-level structure. Top-level structure refers to the plans or patterns used by a writer when composing informational text (Meyer, 1975). Top-level structures used by writers in constructing expository text include attribution/listing, sequence, cause/effect, problem/solution and comparison/contrast (Meyer, 1975; Morris & Stewart-Dore, 1984).

During the last decade there has been a gradual awareness raising of the need to explicitly teach the structure and function of expository text. While the move originated in the secondary domain through the ERICA (1984) program, the process and practices have filtered through to the primary context. This radiation of ideas and strategies has been accelerated in recent years by the genre movement and the inclusion of text forms or genre, in various national and state mandated documents such as, W.A. K-7 Language Syllabus, National Student Outcome Statements.

As there is vocabulary used in this study which requires technical knowledge a definition of some of these terms is presented before proceeding.

Definition of Terms

Expository Text

Text concerned with the presentation of factual information. Expository text is characterized by its specific discourse structure such as cause and effect, explanation or report format, as well as its graphic lay-out such as headings, diagrams, pictures and labels. Term used interchangeably with informational text.

Informational Text

Non-narrative text. Term used interchangeably with expository or factual text.

Macrostructure

The way the content and the macropropositions featured in narrative or expository text are organized. The term is also used by Meyer and others to refer to the global organization of text. Used interchangeably with text structure.

Macropropositions

The way text is organized at the paragraph level. For example in the following paragraph, the main proposition is *Sydney is a great place to visit*. The two other sentences contain subordinate ideas which are linked back to the macroproposition.

Sydney is a great place to visit. It has lots of museums and fancy shops in which to browse. There are many historical and recreational sights within easy walking distance of the CBD.

Term used interchangeably with macro level elements.

Memory Based Top-Level Structure

Alternative top-level structure as proposed by Sloan and Latham (1989,1990) based on the storage of information in semantic memory.

Metacognition

The awareness of one's own thinking and learning processes. Metacognition includes the learner's ability to use strategies to monitor and control his/her comprehension.

Metalinguistic

Knowledge and understanding of the functions and terminology used to describe language.

Micropropositions

The organization of text at the sentence and phrase level. For example, in the sentence *Mary went to the shop after it stopped raining* the two phrases *Mary went to the shop* and *after it stopped raining* are linked by the coordinating conjunction *after*. Term used interchangeably with micro level elements.

Phonology

The study of the sounds of language, including how they are produced and how they are received.

Schema Theory

Contemporary reading theory which asserts that readers construct meaning through the interaction of data held in the reader's head (schemata) with information presented in the text. Schemata constitute all the reader's past experiences that is, beliefs, expectations, concepts and processes, used in

predicting and making sense of text. (Detailed explanation of schema theory presented pp. 23-27.)

Story Grammar

The elements constituting the pattern or structure of narrative text. At its simplest level story grammar comprises a beginning, middle and end. A more sophisticated view includes the components orientation, problem, climax and resolution. (See pp. 30-32 for detailed discussion of story grammar.)

Top-Level Structure

This term refers to the writing plans used by an author when constructing expository text (Meyer, 1975). In the context of this study it also refers to the text structure schemata or global organization of text structure held in the head of the writer/reader.

Text Based Top-Level Structure

Top-level structure as developed by Meyer (1975) and her colleagues.

Text Structure

The framework and conventions related to the organization of text. For example, the thesis, argument/assertions and conclusions typical of an exposition text.

The Problem

Several researchers (Moffett, 1968; Kinneavy, 1969; Britton, 1975; Meyer, 1975; Bartlett, Turner & Mathams, 1981; Calfee & Curley, 1984; Sloan & Latham, 1989, 1990) have described various text frameworks or top-level structures which comprise expository text structure, for example, cause and effect and report. Although the frameworks vary in structure and description the underlying purpose

of each top-level structure is to make explicit the structure and function of expository text thereby assisting the reader in the comprehension process.

Research has demonstrated the value of teaching top-level structure to students, showing that such teaching had a positive impact on their ability to structure and recall informational text (Bartlett, 1978; Taylor & Beach, 1984; Carrell, 1985; Slater, 1985; Berkowitz, 1986; Armbruster, Anderson & Ostertag, 1987; Meyer, Young & Bartlett, 1989; Smith, 1989; Selenger, 1993). However, early investigations in this field concentrated almost exclusively on the text structure itself, and gave little consideration to the other factors which influence the comprehension process. These shortcomings have been redressed by recent studies in socio-linguistics (Halliday, 1975, 1985; Kress, 1982; Martin & Rothery, 1980, 1981, 1986) and cognitive psychology (Sloan & Latham, 1989, 1990). These studies have shifted the focus beyond the text to examine the socio-cultural and reader related factors which impinge upon the comprehension of expository text.

Of particular importance has been the development of genre theory (Halliday, 1975, 1985). Genre theory is derived from studies in the field of systemic linguistics. Genre theorists contend that genre is a social process in which texts are constructed and manipulated to achieve their purpose. For example, a visit to the doctor or buying a new car are considered genres as there are certain predictable, common elements which occur in each scenario. Likewise these elements operate according to an acceptable sequence of events. Proponents of genre theory advocate that students must learn about how language or genre functions in society so that they can construct their own texts and participate effectively within society.

Similarly, Sloan and Latham's memory based top-level structure (1989, 1990) advocates teaching students how texts are constructed to achieve their purpose. However, rather than a socio-cultural underpinning Sloan and Latham describe a top-level structure model which draws from cognitive psychology, specifically schema theory. Their model asserts that top-level structure is a reflection of the memory structures or cognitive frameworks found in the writer's head. According to Sloan and Latham these structures (schemata) comprise the genuine top-level structures which control and direct readers/writers in their encoding and decoding of text.

Sloan and Latham's model seeks to describe the purpose, categories and structure of text involved in all writing. They advocate the teaching of these structures because knowledge of the structure and function of expository text provides readers/writers with a powerful metacognitive and metalinguistic advantage which assists in the manipulation and control of expository reading and writing. Making this knowledge explicit to students has proved beneficial to their reading/writing in the expository domain (Richgels, McGee, Lomax & Sheard, 1987).

While there has been a considerable amount of research conducted in the area of top-level structure as conceptualized by Meyer and others, there exists little or no experimental research into the effectiveness of teaching genre-based frameworks. Validation of the genre-based frameworks has been based upon qualitative research methods. Most of the investigations into the area being reported in case studies and action based research (Campagna, 1987; Weiss, 1987; McNamara, 1989; Gunther, 1991; Boustead, 1992; Drysdale, 1992; McDiarmid, 1993). However, validation from an empirical perspective has been lacking.

Moreover the majority of top-level structure studies, as documented by Meyer and others, concentrate on the effects of teaching top-level structure with adult and

adolescent populations (Bartlett, 1978; Meyer, Brandt & Bluth, 1980; Meyer & Freedle, 1980; Geva, 1983; Barnett, 1984; Winograd, 1984; Slater, Graves & Piche, 1985; Berkowitz, 1986; Slater, Graves, Scott & Redd-Boyd, 1988; Roller & Schreiner, 1989; Smith, 1989; Kletzein, 1992; Selenger, 1993). Few studies have been conducted with younger cohorts, particularly middle and lower primary students. Despite a few investigations targeting younger students (Englert & Hiebert, 1984; Kinney, 1985; Armbruster, Anderson, & Ostertag, 1987; Drysdale, 1992) the majority of evidence supporting the use of top-level structure has been deduced from studies involving older subjects.

Purpose of the Study

Given this lack of experimental research into the effectiveness of genre based frameworks with younger learners the general purpose of this study is to investigate the effectiveness of teaching a specific text-type (derived from the Sloan and Latham memory based top-level structure model) on the organization and recall of expository writing of fourth grade students. The scope of this study did not allow for an investigation of each text-type therefore a specific text-type, that is, the scientific report, was selected for experimental investigation.

To satisfy the general purpose, this study was planned to meet the following specific purposes:

1. To overview reading comprehension research, specifically top-level structure investigations and to examine its pedagogical implications.
2. To determine if year four students given explicit instruction in a specific top-level structure, that is, the scientific report, recall more concepts than year four students not given instruction.

3. To determine if year four students given explicit instruction in a specific top-level structure, that is, the scientific report, utilize the report text top-level structure to organize their written protocols.
4. To determine the effect of teaching the memory based report top-level structure on good and poor readers.
5. To identify if students given specific instruction in the report top-level structure are able to apply the structure in recall protocols when the written text lacks an organizing structure.
6. To determine if students are able to maintain the top-level structure over time. That is, does instruction in a specific top-level structure (i.e., the report text structure) have an organizing validity on students' writing.

Significance of the Study

This study is significant for two reasons. First, it is one of the few studies which has examined the impact of teaching memory based top-level structure using empirical research methodologies. For example, Puhl (1990) found significant effects on the organization of year seven's semantic memory following the explicit teaching of a memory based top-level structure. While the memory based top-level structures have been advocated in curriculum initiatives such as First Steps and Stepping Out, there exists little empirical evidence to validate their use. As the First Steps program advocates the use of five expository text structures as proposed by Sloan and Latham, as well as a teaching sequence similar to that employed in this study, it would be beneficial to have some quantitative data to further substantiate their inclusion.

Although there has been documented success regarding the impact of the First Steps program (ACER Evaluations, 1993), particularly in the writing domain with the use of informational text-types (Deschamp, 1995) this validation is derived from qualitative measures such as teacher interviews and surveys. The teachers' observations about the value of teaching the structure of text-types has not been supported by a rigorous analysis of the quality of students' work before the teaching of the text-types, that is, there is no baseline data against which the success of these structures can be measured. Moreover this teaching has not been conducted in controlled situations. That is, the value of teaching text-types has not been empirically tested. As First Steps is being promoted both nationally and internationally it is imperative to have more conclusive data which demonstrates the effectiveness of the writing frameworks. While this study was not specifically designed to provide evidence supporting the implementation of the First Steps program, it does provide some preliminary experimental research into the teaching of the report text structure.

Second, this study investigated the usefulness of teaching top-level structure to younger learners which again has been a neglected research area. A search of the current literature revealed few experimental studies conducted with younger students. A possible reason accounting for the limited number of investigations into top-level structure with younger students is the research evidence that indicates that the acquisition of text-types is developmental (Taylor, 1982; McGee, 1982; Taylor and Samuels, 1983; Taylor and Beach, 1984; Berkowitz, 1986; Richgels and McGee, 1989; Loranger, 1994). That is, the acquisition and understanding of text-types develops over time, for example listing and sequence patterns are acquired first while cause and effect are acquired later (McGee, 1982). These research findings may have lead teachers to disregard the teaching of top-level structure to younger learners.

A much broader view of text structure is being advocated through genre theory and the memory based top-level structure approaches. This view is supported by current educational curricula (National Student Outcome Statements, K-7 Language Syllabus) which advocate the teaching of expository text from the early years of school. It seems appropriate therefore to investigate the impact of teaching text structures to younger learners. Such studies may ascertain the usefulness of particular top-level structures for younger students.

Plan of the Study

This study was designed to investigate the effectiveness of teaching the report top-level structure on the writing of year four students. The study is reported according to the plan outlined below.

Chapter one overviews the background associated with the area of top-level structure. The discussion acknowledges various approaches to top-level structure investigations adopted over the years and presents the current situation regarding the teaching of expository text structure. This discussion foregrounds the top-level structure approach devised by Sloan and Latham. The problem to be investigated is presented and the general and specific purposes of the study are highlighted. The chapter concludes with an overview of the investigation.

Chapter two examines the three factors influencing reading comprehension. An overview of the socio-cultural influences as well as reader and textual factors are presented. Specific attention is assigned the textual issues associated with comprehension as this area forms the kernel of this study.

Chapter three presents the theoretical position on which this investigation is based. This chapter clarifies the debate regarding the Meyer and memory based approaches to top-level structure and presents the focus of this study. Having

established the theoretical framework of the study, the main study question and associated research questions are distilled from this discussion. These questions generate the hypotheses which are listed at the conclusion of the chapter.

Chapter four outlines the methodology used to investigate the effectiveness of the memory based top-level structure.

Chapter five tables the results from the three areas of analysis and reports the findings of each section. This data is supported by the discussion section which explores possible interpretations of the results.

Chapter six presents the conclusions and limitations associated with this study and outlines recommendations for further investigations in top-level structure.

CHAPTER 2

REVIEW OF RELATED LITERATURE

Wixon and Peters (1984) define reading comprehension as "the process of constructing meaning through dynamic interaction among the reader's existing knowledge, the information suggested by the written language and the context of the reading situation." The three areas identified in this definition form the main topic divisions of this chapter. Although examined in isolation these factors are intertwined and interdependent and thread their way through all aspects of the comprehension process.

Section One: Socio-Cultural Influences

The interaction between reader and text in the reading act has been shown to include an array of socio-cultural or contextual influences. This socio-cultural milieu encompasses many wide ranging influences, "some within the text, some within the reader and some within the reading environment" (Morgan, 1983 p. 306). Such issues include purpose for reading, students' cognitive learning styles and cultural background, as well as the physical, emotional and social context in which reading occurs. This section considers how differences amongst students related to prior knowledge, vocabulary and interest can impact upon the construction of meaning.

Cultural Background

In a schema-theoretic view of the reading process readers comprehend a message when they are able to activate a schema that gives a good account of the objects and events described in written discourse. A schema is a memory structure which enables the reader to store information in an organized framework, rather than hold information as isolated facts and ideas. For example, rather than hold the items *reservation, candle, table, menu, food* and *wine* as isolated items in memory

schema theory suggests that the items would be better stored as part of a restaurant schema.

F.C. Bartlett's (1932) investigation of cognitive processes involved in the retelling of the North American Indian tale "The War of the Ghosts," showed that readers are able to understand the structure of a story or draw inferences from a passage only when the text relates to their background knowledge and is consistent with their cultural expectations.

Research by Bransford and Johnson (1972) and Bransford and McCarrel (1974) demonstrates that what is critical for comprehension is a schema accounting for the relationships among elements in text. Consider the following sentence drawn from the work of Bransford and McCarrel :

The notes were sour because the seams split.

In this example the reader can make a degree of sense from the grapho-phonetic, syntactic and semantic information given by the author, but without a context, the reader is unable to construct enough meaning to make sense of the sentence. When the additional semantic clue *bagpipe* is given, the reader is able to interpret the sentence in terms of its relationship to a musical instrument, thus highlighting the fact that words have no totally fixed meanings and rely on context to provide meaning. This notion is supported by Anderson's statement "text is gobbledygook unless the reader has an interpretative framework to breathe meaning into it" (Anderson, 1977 p. 423). Other studies investigating context arousal, for example, pictorial settings, (Bransford & Johnson, 1973) sentences, (Jenkins, 1977) themes, (Dooling & Lachman, 1971) and instructions (Pichert & Anderson, 1977) support the notion that the 'mental set' a reader brings to a piece of prose influences not only how the reader perceives the text but what the reader is able to recall at a later point.

The influence of cultural background on the meaning making process is further highlighted in the work of Anderson, Reynolds, Shallert and Goetz (1977) who demonstrated that more than one interpretation of text is possible and that interpretations of text are influenced by a reader's age, sex, religion and nationality. In their study, sixty subjects (thirty physical education students and thirty music students) were given an extract to read (see Figure 2.1) which had two possible interpretations, that is as a convict planning an escape or as a wrestler locked in a struggle with an opponent.

Tony slowly got up from the mat, planning his escape. He hesitated a moment and thought. Things were not going well. What bothered him most was being held, especially since the charge against him had been weak. He considered his present situation. The lock that held him was strong but he had been penalized severely - much too severely from his point of view. The situation was becoming frustrating; the pressure had been grinding on him for too long. He was being ridden unmercifully Tony was getting angry now. He felt he was ready to make his move. He knew that his success or failure would depend on what he did in the next few seconds.

Figure 2.1. Comprehension extract from the work of Anderson, Reynolds, Shallert and Goetz (1977).

Subsequent testing related to the interpretation of the text revealed the music students had viewed the text as a convict planning his escape, while the physical education students, who had been involved in wrestling, had understood the passage to represent an article about a wrestler caught in the hold of an opponent.

Another passage with a dual meaning was given to the students which could be interpreted as several people playing cards or as a rehearsal for a woodwind ensemble. The comprehension results from this extract again reflected the students' background (context). That is, the music students viewed the extract as depicting a music rehearsal while the physical education students saw the incident as a card playing session.

These studies along with other investigations (Lipson, 1984; Roller, 1985) show the importance of schemata in activating appropriate background information by which a reader can process text effectively. Without a schema or context to match the content against readers are unable to make sense of text and the reading process breaks down.

Cognitive Learning Style

The topic of cognitive learning style covers such issues as students' processing style and preferred learning modalities. Processing style refers to whether students are more globally or analytically orientated in their learning whilst learning modalities are the dispositions to learning (kinaesthetic, tactile, visual and auditory) that students demonstrate. Such issues are worthy of contemplation in all pedagogical contexts, especially in relation to students from divergent cultures.

In the majority of western classroom settings knowledge is passed through the oral interaction of teacher and students. The discourse protocol of knowing when to talk, to whom and how to talk, constitutes a socio-linguistic competence by which some cultures do not operate. This situation is highlighted in the work of Phillips, (1972) Harris (1982) and Kearins (cited in McIlwraith, 1994) who investigated the learning styles of indigenous children operating in western classroom settings.

Phillips observed that American Indian students were reluctant to participate before the classroom audience preferring individual contact with the teacher while working independently. The children appeared to learn best when they were able to observe successful performance or demonstration, participate in an activity with supervision and engage in private self testing. The procedure of learning through the public instruction of the regular classroom proved culturally foreign to native American Indian learning style.

Similar learning dispositions are reported in the cognitive learning style of Australian aboriginals in North East Arnhemland (Harris, 1982). Harris (1982) contrasted aboriginal and western learning styles and noted that the contrived, artificial context of the western classroom with its emphasis on verbal inquiry presented a learning approach which was often confusing and incomprehensible to aboriginal students.

Kearins (cited in McIlwraith, 1994) has provided additional support for Harris' viewpoint concluding that aboriginal child rearing practices may be responsible for the characteristic learning styles of aboriginal children.

Teaching Styles and Classroom Practice

Included under socio-cultural factors are the reading experiences of students in the classroom context. This focus explores how the dynamics of the classroom context that is, the relationship between the teacher and students, the purpose for reading and the instructional practices employed in class can impact upon the students' attitude and task orientation.

Research demonstrates that when the purpose for reading is known students perform better than when the purpose is unknown (Duchastel, 1979). Making explicit the purpose(s) for reading that is, for enjoyment or to find the main idea,

assists students to use monitoring strategies more effectively and also exerts a positive influence on motivation and orientation to the reading task (Estes & Vaughn, 1973; Asher, Hymel & Wigfield, 1978; Fass & Schumacher, 1978). In the reading of informational text specific purposes can be addressed through the use of pre-reading questions, graphic outlines and other schema activation strategies, which assist students to become actively involved in the processing of text (Morris & Stewart-Dore, 1984; Sloan & Latham, 1986; Thanos, 1989).

Armbruster (1988) cites four key concerns regarding instructional practice in content reading. First, failure of teachers to use content area textbooks. That is, the teacher perceiving the difficulty of the class text for some children 'covers' the content through oral retelling. Whilst the content is 'covered' in such practices, the students are denied exposure and practice in using expository text forms.

Employment of round robin reading strategies in which students are cued by the teacher to read unrehearsed text aloud to the class, creates a further hindrance to content area reading. In this situation good readers are forced to adjust their pace and style of reading to accommodate less fluent readers, often detracting from meaning making. Moreover this practice does little to enhance the self-concept of the less fluent reader. Finally Armbruster noted that the round robin strategy was often interrupted by teacher questioning and discussion which concentrated on low-level issues and this further fragmented the reading task. Observations (Durkin, 1978-79, 1981) verify that low level questioning techniques are frequently employed by teachers in such circumstances and this practice impacted upon students' interest and motivation to read.

Durkin's investigations (1978-79) reveal that the majority of classroom teachers spend most of their instructional reading time assessing the comprehension product. Little instructional time is devoted to providing appropriate

demonstration, assistance or practice of the required task (Pearson, 1985). These findings lead to significant debate and reflection in educational fields and stimulated the promotion of teaching practices and strategies aimed at monitoring comprehension before, during and after reading. Such practices occupy a significant focus in current professional development programs such as First Steps (1992), Stepping Out (1993), and Content Area Literacy and Learning (1993).

Whilst the socio-cultural setting influences the reading process through both direct and indirect means, fundamental to a schema-theoretic view of reading is the belief that comprehension results from the construction of meaning between the text and the reader. The reader's role is central to constructing meaning from text. In the next section the issues associated with the reader's construction of meaning are explored.

Section Two: Reader Influences

The reading act involves the matching of data held in the head of the reader (non-visual information) with the text (visual information). The closer the match between the visual and non-visual elements the easier the comprehension process (Smith, 1978; Sloan & Latham, 1979). The factors associated with the reader's contribution to the reading process are discussed under physical, affective and cognitive domains.

Physical Domain

Physical factors associated with reading performance include an array of issues ranging from general health concerns such as adequate nutrition, sufficient sleep and maturation, to specific visual and auditory processing capacities.

Visual processing difficulties such as poor visual acuity, inadequate tracking ability and poor eye muscle control can lead to fatigue and ineffective concentration

which can detract from learning. However there is insufficient evidence to connect any relation between these issues and reading ability (Harris & Sipay, 1985). Reading is only incidentally visual (Smith, 1978), occurring mainly in the cognitive domain, however adequate vision is required to process text effectively. Similarly recurrent ear infections and hearing problems may restrict the development and knowledge of vocabulary and language patterns required for the prediction of text. Problems with either senses can lead to a breakdown in the reading process.

Affective Domain

The affective domain is significantly influenced by the socio-cultural issues examined previously. On a broad level affective issues encompass motivation and orientation to the reading task. Motivational aspects include low self esteem in relation to reading; a lack of significant models - readers and/or texts; fear of failure, often compounded by non risk-taking behaviour and low value assigned to reading. Misunderstanding of the nature of the reading process (i.e, decoding words) and perceiving oneself as a passive participant in the construction of meaning, constitute other affective issues related to reading comprehension performance (Johnston & Winograd, 1985).

Cognitive Domain

The reader's cognitive functioning is the third domain considered under reader related factors. This avenue describes the memory structures and how the reader stores and retrieves information. As the cognitive aspects of this study provide the foundation on which the theoretical position is based a detailed account of the reader's cognitive structures is undertaken.

The Memory Systems

Various theories and models have been postulated to explain the structure and function of the reader's in-head knowledge (Waugh & Norman, 1965; Atkinson &

Shiffrin, 1968; Collins & Loftus, 1975; Rumelhart, 1977, 1980). Current views of memory and its structures drawn from cognitive psychology and related disciplines depict memory as a unitary system involving three interacting sub-systems: short term memory, working memory and permanent memory (Moates & Shumacher, 1980). An explanation of these sub-systems and their function is undertaken in the next section.

Short Term Memory

Short term memory refers to that part of memory concerned with holding information for brief periods, that is up to several seconds. This information is held in a special active state and can only be utilized in this special state. Visual information is initially held in the sensory registers, in this case the iconic store (Neisser, 1976) until more elaborate processing is initiated. Further processing occurs in the short term memory through the processes of chunking (Miller, 1956) and rehearsal (Klatzky, 1975). Rehearsal refers to the continuous repetition of information while chunking is the grouping or organizing of information into meaningful units so that more efficient storage space is available. The amount of information that can be stored by chunking is unclear but estimates put the amount at 7 ± 2 items (Miller, 1956). The concept of chunking describes an important way in which the human memory system is able to impose order and structure on incoming data.

Working Memory

Working memory is the conscious, active component of the memory system. It contains information that is currently occupying the person's attention. Working memory is the thinking system of memory and has links with permanent and short term memory. Working memory processes are invoked whenever:

1. Underlying schemata provide information for validation.
2. The retrieval of information from permanent memory is necessary.

3. New processes must be invoked and old ones terminated.
4. The output of one schema must be communicated to others not immediately invoked.
5. There is a mismatch between data and process or expectations and occurrences.

(Bobrow & Norman, 1975, p. 43).

Permanent Memory

Permanent memory refers to storage of information over time periods lasting from minutes to years (Moates & Schumacher, 1980, p. 82). Information stored in permanent memory is in an inactive state and can only be retrieved or recalled through activation. Activation spreads along paths through a network of associations from the currently active portion of memory to the to be retrieved portion.

Tulving (1972) distinguishes between two types of permanent memory, namely **episodic memory** and **semantic memory**. Episodic memory encompasses time-related information such as experiences and events. Semantic knowledge includes the knowledge a person possesses about language and its use and knowledge about the world.

Anderson (1976, 1983; Anderson, Kline & Lewis, 1977) postulates that semantic memory comprises two types of knowledge - procedural knowledge and declarative knowledge. Procedural knowledge includes knowledge of how to do things, that is how to tie a knot or a complete a long division algorithm. Declarative knowledge refers to the facts, concepts and beliefs held by a person. This distinction between procedural and declarative knowledge is significant in that it represents two different types and functions of the semantic aspects of permanent memory.

Storage of Information in the Memory Systems: Schema Theory

Several models have been proposed regarding the storage and retrieval of information in semantic memory. (Collins & Quillian, 1969; Rips, Shoben & Smith, 1973; Collins & Loftus, 1975; Meyer & Schvaneveldt, 1976). In recent years the notion of schema theory has gained increasing prominence (Devine, 1986; McNeil, 1987; Smith, 1988). Schema theory embodies a number of theoretical accounts which explain how human knowledge is stored and used. The theory describes how humans organize and structure information to make sense of the world around them. Specifically it postulates "the underlying mechanisms by which comprehension and language acquisition occur" (Shallert, 1982, p. 14).

A schema is a mental structure which contains all the knowledge associated with a particular concept. Each schema is thought of as having slots or frames (Minsky, 1975) which are filled with information. In addition to these slots or frames, are scenarios or scripts, further packages of information which guide and direct how the information is to be used (Shank & Abelson, 1977). For example, a person dining at a Mongolian restaurant for the first time would activate his/her restaurant script and apply a 'generic' restaurant routine to the new situation. As the diner discovers that the food at a Mongolian restaurant is selected in its raw state by the patron and cooked in front of him/her on a large hot plate by the chef, the newly acquired information is added to the diner's restaurant script.

Schemata are used to represent all kinds of knowledge. As Singer and Donlan state schemata may be used to represent:

objects (man, apple) **relationships between objects** (The man ate the apple) and **situations** (Two or more related events such as the sequence of events in a story or in a script for making apple pie).

(Singer & Donlan, 1989, p. 103)

Schemata develop as a result of peoples' experiences, real or vicarious. Individuals possess hundreds of schemata. Some schemata are large and comprehensive with other schemata subsumed within them, while other schemata represent smaller units of information. It is possible for schemata to have virtually no information. (Rumelhart & Ortony, 1977). To illustrate, an individual may be aware of the term 'quantum physics' but have no understanding or conceptual information of the topic at all. In such cases an individual's schema could be compared to the mathematical concept the empty set.

Semantic Networks

Various theorists have proposed that schemata are organized hierarchically within memory as conceptual frameworks or networks. (Anderson, 1976; Neisser, 1976; Klix, 1980; Sloan, 1983). These frameworks or networks comprise concepts and ideas (nodes) which are linked to other concepts by various propositional relationships. These relationships may be super-ordinate, co-ordinate or subordinate. Although such cognitive frameworks are hypothetical one way of representing schemata is through semantic maps.

Figure 2.2 shows a semantic map for the concept cat. The diagram illustrates the various relationships which exist for the concept cat. These relationships can be intra or inter (Klix, 1980). Intra relationships describe the way cats are connected or related through isa, hasa, locative and dynamic connections. For example, a cat is a feline, a feline is an animal, cats have fur, four legs and a tail and are commonly found in baskets or on rooves. Cats scratch, purr and meow and can be exemplified by Tom, Moggy, Puss or Persian, Siamese or stray. Inter relationships describe how the concept cat is related to other schemata such as dogs and/or caring for pets. Semantic mapping demonstrates a tangible way in which memory associations can be graphically represented. This procedure has been employed in

studies to theorize how information is stored and related to other concepts within permanent memory (Sloan, 1983; Puhl, 1990).

Although semantic maps represent a static view of knowledge, schemata are not mere definitions of concepts but rather dynamic mental structures which can be modified by context or situation, as was discussed in the previous section.

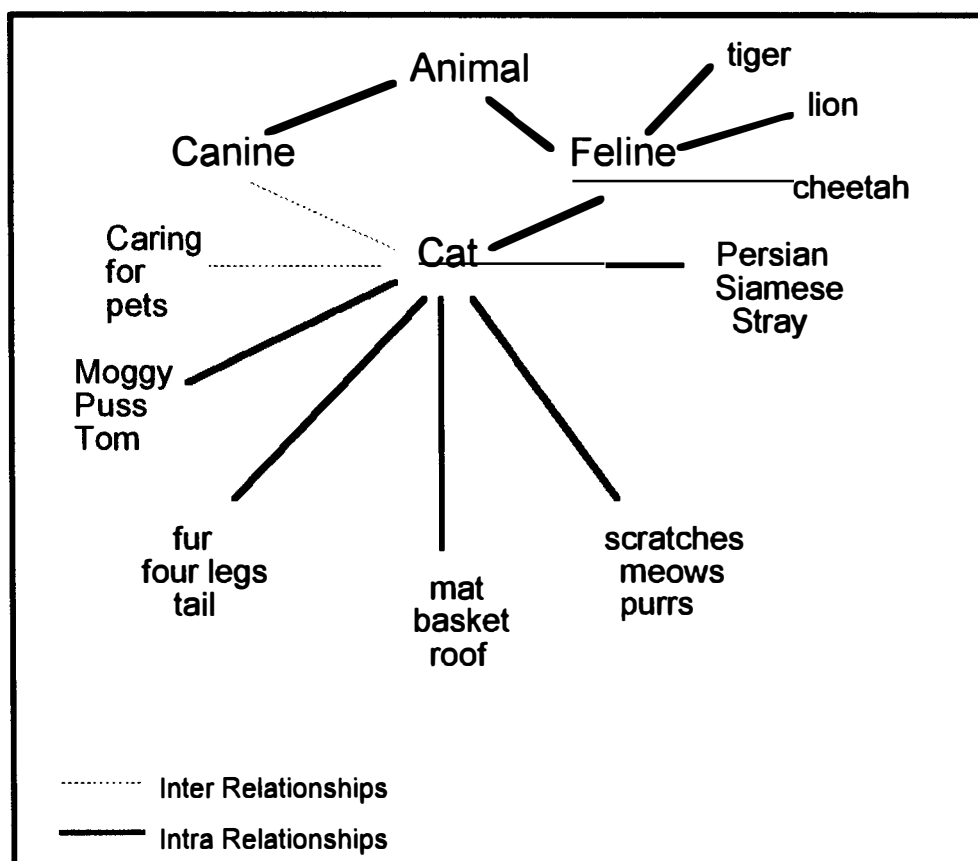


Figure 2.2 Semantic map of the concept cat showing inter and intra relationships, adapted from Singer and Donlon, 1989, p. 105.

Schema Theory and its Relationship to the Reader/Writer

Schema theory has significantly influenced current understanding of the comprehension process. A schema theoretic view of reading suggests that reading is an active process in which readers construct relationships between their existing schemata and the information suggested by the text.

Readers build meaning by engaging in a series of recursive interactions. In each interaction readers generate a model that provides the best possible fit with the data perceived to be in the text. New text data provide an invitation to reconsider the adequacy of the model. Gradually iteration by iteration readers construct their own meaning.... no reader will develop the same model of the author; nor will any two readers develop exactly the same model. Each of us prints a unique personal stamp on each act of reading we undertake (Pearson, Roehler, Dole & Duffy, 1992, p. 149).

Schemata may be viewed as containing various conceptual, linguistic and affective information. These schemata having further embedded sub-schemata that guide and direct how the information is to be used. Consequently a student who has a well developed linguistic (discourse) schemata is more likely to be able to decode print to meaning (read) and encode meaning to print (write) fluently.

A key means by which readers/writers compose meaning is through knowledge of the distinctive and characteristic ways in which specific types of text are presented, that is, text structure schemata. Knowledge of a text's structure and organization helps both the reading and writing processes by allowing a person to match the current text structure to what is known about that text structure. For example, the anticipation of text (prediction) enables readers to use their prior knowledge relevant to the material being read, that is, schema matching. The more prior knowledge available to readers in the form of conceptual and linguistic schemata the more quickly they can make predictions and eliminate unlikely alternatives (Smith, 1978).

Readers approach text governed by "expectations at the global and focal level" (Smith, 1988, p. 168). Global expectations include anticipation of the text based on knowledge of the author, title and content of the text, which in turn directs

anticipation of the organization and content of each chapter. Focal expectations include anticipation of forthcoming words, sentences and paragraphs.

Readers' expectations are further governed by conventions (Smith, 1988) or text structures which provide a scaffold that enables readers to filter information and eliminate unlikely alternatives in text. In this way text structure schemata act as advance organizers (Ausubel, 1960) which prime appropriate linguistic and conceptual schemata, thus allowing readers to facilitate the organization and integration of new text information into their existing knowledge structures.

Similarly, writers, governed by purpose (global and focal intentions, Smith, 1988, p. 172) are greatly aided in the production of text if they have schemata for text structure. Writers who possess knowledge of text structure and text-types can access the relevant cognitive and linguistic schemata available in permanent memory and use the activated schema in working memory to provide a structural framework or advance organizer which would assist them in the composing and encoding process. Linguistic schemata, specifically text structure schemata are an important means by which readers and writers can process text. It is knowledge of these text structures that enables the comprehension of text. If readers do not have a schema for a specific text-type then comprehension will be impaired or distorted. Similarly, writers without a knowledge of text structure will face difficulties in achieving the purpose for which they write.

The need to delineate the role of text structure and its influence upon the comprehension process has focused attention on the science of text analysis. This topic forms the basis of discussion in the next section.

Section Three: Textual Issues

Written texts are characterized by several factors which can influence readers' reconstruction of the author's meaning. These factors occur at the macropropositional and micropropositional levels of text. Macropropositional influences include the structure and organization of text, that is the way ideas are presented and integrated within text; while micropropositional elements relate to how ideas are linked and connected at sentence and intersentential levels, that is cohesion and coherence (Hittleman, 1988, p. 206).

Texts which reflect effective macropropositional and micropropositional arrangements are labelled considerate texts, whilst texts lacking such features are termed inconsiderate texts (Armbruster, 1988). Armbruster suggests five criteria which characterize considerate (reader friendly) text. These criteria elaborate the main textual factors described previously.

Structure a logical and easily identifiable organization in which headings and sub-headings reflect a reasonable organization of the subject matter; introductions reveal content and structure; structure clearly signalled throughout text.

Unity addressing one purpose at a time; main ideas are obvious; information is clearly related to the main idea; transition statements help readers move from idea to idea.

Coherence clear relationships made between connecting ideas by explicit or obvious connectives; references are clear; the order of events in the text is easy to follow; graphics clearly related to text.

Truth accurate information that is non contradictory.

Audience Appropriateness allowing the text to be understood by target audience; the text contains information relevant for target students to know.

(Armbruster in Hittleman, 1988, p. 207).

These factors cover the main influences associated with the coherence and cohesion of expository text. As noted they include a broad array of interrelated issues. However as the major focus of this study is related to expository text structures a more thorough analysis of text structure is undertaken.

Historical Overview of Text Structure Research

Current understanding of text structure and its effect on comprehension has evolved from investigations spanning the last six decades and includes three distinct phases.

The initial work stemmed from Bartlett's seminal study of schema (1932). This emphasis was complemented by several early studies (McCallister, 1930; Salisbury, 1934; Center & Persons, 1937; Dearborn & Wilking, 1941) which emphasized the importance of organizational patterns in successful comprehension. These early directions were overshadowed by linguistic studies concerned with the microstructure of text which formed the basis of experimental investigation during the 1940's and 1950's (Shuy, 1981).

Experimental investigations of narrative text in the late 1960's and 1970's reexamined the topic of text macrostructure and established the second phase of text structure investigations. From their exploration of narrative text structure researchers deduced a number of significant findings which influenced the comprehension and recall of narrative text and inspired numerous pedagogical

strategies. Encouraged by these results researchers endeavoured to broaden their research base and investigate the structure and organization of expository text.

This attention to expository text constitutes the third phase of text structure investigations. Researchers aimed to provide a systematic approach to analysing informational text and to make explicit for learners the patterns of organization in text. This focus led to the development of several prose analysis systems (Fredriksen, 1975; Kintsch & Van Dijk, 1978; Meyer, 1975, 1977).

The increased understandings of text structure gained from these macrolevel studies were complemented by research on the interrelated roles of schema, reader and socio-cultural factors on the comprehension process. This focus led to the development of more broadly based text analysis systems (Halliday, 1975, 1985; Martin, 1985; Sloan & Latham, 1989, 1990; Derewianka, 1990). It is with factors related to text analysis that this study is concerned. In particular the role of top-level structure as a facilitator of comprehension. The following discussion provides a detailed examination of the factors associated with this aspect of the study.

Story Grammar

Early studies in text analysis concentrated on the microstructure of text that is, the morphological and phonological elements of language (Shuy, 1981). Chomsky's (1965) study of syntax and discourse units larger than words, led researchers to turn their attention to the macrostructure of text. This focus was based on examination and analysis of the features of stories, passages and expositions.

Researchers examining the macrostructure of narrative text aimed to achieve two objectives. Firstly, they sought to describe the cognitive structure that readers use to encode, predict, store and retrieve information from narrative text. Secondly,

story grammarians attempted to examine the story elements "that were idealized in human memory" (Pearson & Camperell, 1981 p. 39). These investigations lead researchers to develop the concept of story grammar.

Story grammar was developed by researchers (Rumelhart, 1975; Mandler & Johnson, 1977a; Thorndyke, 1977; Stein & Glenn, 1978) analysing the structural framework that constitutes narrative text. Story grammars were based on a set of structural components that formed a story hierarchy. Stein and Glenn (1978) used the concept of story grammar for analysing the relationships among propositions in stories. Mandler and Johnson (1977 b) used the term 'story schema' to describe an idealized representation of the parts of a typical story.

The structural components of each narrative story grammar vary but generally include the elements: setting, theme, plot and resolution. The setting contains information about the main character(s), the location and a time reference. The plot includes at least one episode which causes the protagonist to react, form a goal or make attempts at achieving his/her goal. The resolution represents the outcome of events and the long range consequences of the actions.

Figure 2.3 shows the hierarchical components of a story grammar based on Stein and Glenn's (1978) model. At the higher levels of the framework are story setting and episode while character actions, solving the problem and achievement of the goal feature in the lower levels of the framework.

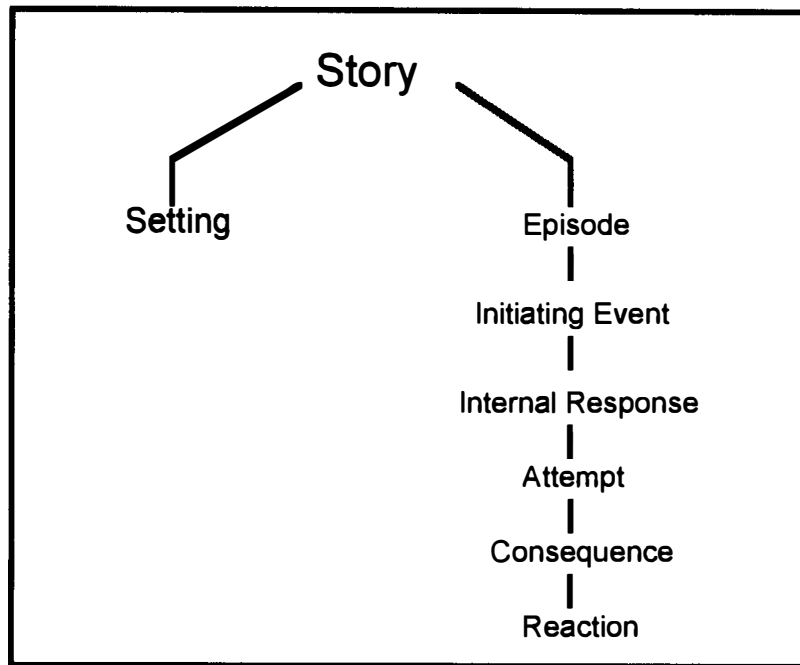


Figure 2.3 Story grammar hierarchy (Stein & Glenn, 1978).

Narrative Recall

Story grammar research found that recall of narrative text was influenced in two ways. Firstly the organization of narrative text influenced the story recall, that is, information presented in higher level nodes was recalled more frequently than information presented in lower level nodes (Rumelhart, 1975, 1977; Thorndyke, 1977). Secondly, violations to the structure of narrative text (text scrambled, key events reversed) were shown to debilitate story comprehension (Mandler & Johnson, 1977b; Stein & Nezworski, 1978). These findings lead researchers to generate a number of strategies and activities aimed at enhancing student's understanding and application of story structure knowledge in their written work.

Instructional application of story grammar. A number of instructional practices were devised on the basis of story grammar to aid recall and comprehension of text (e.g., story frames, Fowler, 1982; story maps, Reutzel, 1985; plot profiles, story ladder, Johnson & Louis, 1985). These activities have been beneficial in aiding students to enhance and refine their schemata for narrative

text, specifically equipping students with metalinguistic and metacognitive strategies to process narrative text more effectively.

The application of "story grammar" approaches of discourse analysis to expository texts is not as clear cut as their application to narrative texts. Although there was some application of narrative structures to expository forms it was clear that new techniques for analysing text were required to deal with expository or informational texts. Efforts to analyse expository texts resulted in the development of prose analysis systems.

Prose Analysis Systems

Prose analysis systems were devised by several researchers from various disciplines such as; psychology, linguistics, education and artificial intelligence, to describe the knowledge structures which explain the written patterns that characterize expository text (Fredriksen, 1975; Meyer, 1975; Kintsch & Van Dijk, 1978; Crothers, 1979; Graesser, 1981). Two main prose analysis systems to emerge from this research focus were those of Meyer (1975) and Kintsch and Van Dijk (1978) .

Kintsch and Van Dijk's Model

Kintsch and Van Dijk (1978) proposed a propositionally based model of text schema to explain how readers represent their knowledge of conventionalized texts such as reports and stories. When activated in working memory these schemata drive macrorules such as deletion and generalization, which condense the text until it is reduced to its macropropositions. These macropropositions form a macrostructure or 'mental gist' of the important information in the text. As readers cannot remember everything read in a passage a macrostructure is formed representing the information readers perceive as important. It is the macrostructure not the original text that readers recall. Similarly, when required to

remember a text readers use the macrostructure and the rules of addition, specification and particularization to transform the gist into a more detailed version of the text that was read.

This model provided an avenue for experimental investigation which concentrated on the macroprocessing of text. Studies utilizing Kintsch and Van Dijk's model examined how readers determine the significant details in a text and how that information is used to construct a summary (Brown & Smiley, 1978; Brown & Day, 1981; Winograd, 1984; Hare & Borchardt, 1984; Rinehart, Stahl & Erickson, 1986). Whilst Kintsch and Van Dijk focused on the 'in-head' text (schema) Meyer's prose analysis system described the textual data.

Meyer's Model

Meyer utilized a propositional analysis model to examine how text organization effects the amount and type of information recalled. Meyer's outline for representing the macrostructure of expository text resulted from utilizing Fillmore's (1968) case grammar and Grime's (1975) theory of connected discourse. Case grammar is concerned with micropropositional relationships, that is the relationships within clauses and simple sentences. Grime's theory concentrates more on the macropropositional connections and explores how rhetorical relationships from the semantic grammar of propositions specify the relationship among sentences, paragraphs and larger text. Combining and utilizing aspects of these very technical theoretical bases Meyer (1975) developed her top-level structure model.

"Text structure specifies the logical connections in text as well as the subordination of some ideas to others. It is the hierarchical structure of text which differentiates it from simple lists of words and sentences " (Meyer, 1984, p. 80). According to Meyer, text hierarchy is composed of three levels: The first level is the

overarching or overall organization of the text as a whole, that is the top-level structure. The second level is the macropropositional or paragraph level which pertains to the logical organization of ideas across sentences and paragraphs. The third level is the micropropositional or sentence level which is concerned with the way sentences are organized within a text.

Textual information is represented in Meyer's prose analysis system by propositions depicted in a tree diagram or content structure. The tree diagram shows how some ideas are of central importance to the text while others are peripheral. Figures 2.4 and 2.5 show the parsing of a problem/solution text using Meyer's top-level structure.

Meyer contends that her classification system includes the basic organizational structures used by writers to organize expository text. These categories include covariance (cause/effect), attribution (description) sequence (collection) comparison (adversative) and response (problem/solution). Meyer claims the relationships of these top-level structures are signalled to the reader through various semantic and syntactic techniques. For example, temporal indicators such as; *first*, *second*, *then* and *finally*, signal the sequence structure; whereas the terms *need to prevent*, *question* and *answer*, signal the problem/solution top-level structure (Meyer, 1975, 1983).

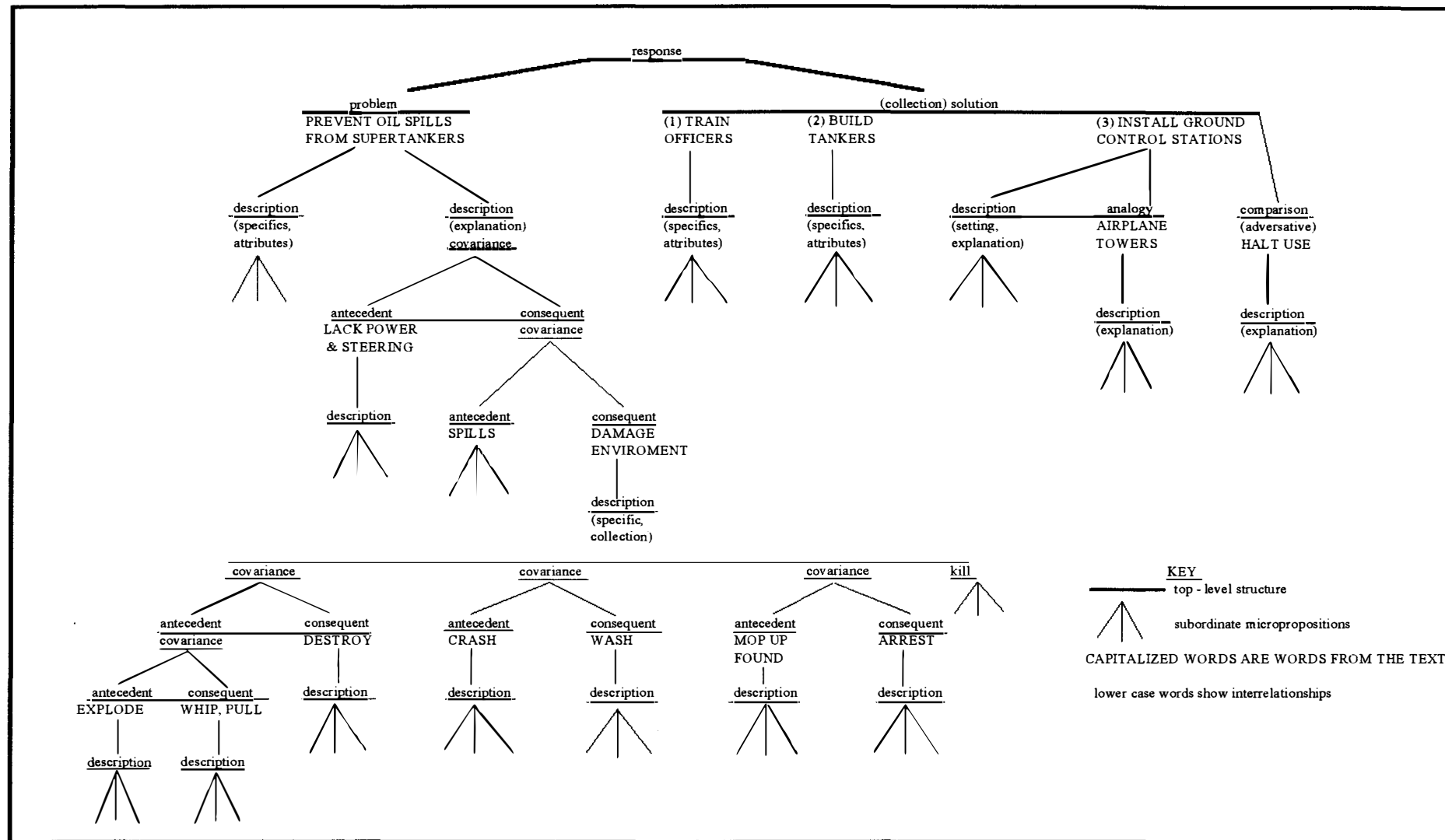


Figure 2.4 Meyer's Content Structure Detailing the Arrangement of Ideas in Response Text

Text: A problem of vital concern is the prevention of oil spills from supertankers. A typical supertanker carries a half-million tons oil and is the size of five football fields. A wrecked supertanker spills oil in the ocean; this oil kills animals, birds, and microscopic plant life. *For example*, when a tanker crashed off the coast of England, more than 200,000 dead seabirds washed ashore. Oil spills *also* kill microscopic plant life which provide food for sea life and produce 70 percent of the world's oxygen supply. Most wrecks result from the lack of power and steering equipment to handle emergency situations, such as storms. Supertankers have only one boiler to provide power and one propeller to drive the ship.

The solution to the problem is not to immediately halt the use of tankers on the ocean since about 80 percent of the world's oil supply is carried by supertankers. *Instead, the solution lies in the training of officers, better building of tankers, and installing ground control stations to guide tankers near shore.* *First*, officers of supertankers must get top training in how to run and manoeuvre their ships. *Second*, tankers should be built with several propellers for extra control and backup boilers for emergency power. *Third*, ground control stations should be installed at places where supertankers come close to shore. These stations would act like airplane control towers, guiding tankers along busy shipping lanes and through dangerous channels.

Figure 2.5 Oil Tanker response text. (Meyer, 1994, p. 331).

Meyer's Five Top-Level Structures

Attribution (description). This writing plan is organized as a listing of features and attributes about a topic. (Signalling words include: for example, such as and for instance.)

Sequence (collection). The sequence plan groups ideas on the basis of order or time. The main idea is the procedure of the history related. (Signalling words include: to begin with, as time passed and later.)

Covariance (causation). In this writing plan information is presented as showing how something occurs because of other factors. The main idea(s) is discussed before the reason or cause is elaborated. (Typical signal words include: because, so caused, reasons and if-then.)

Response (problem/solution). The response writing plan presents information in two parts. In the first part the problem is posed, while the second part discusses a course of action that seeks to solve the problem. (Signalling words include: need to prevent, problem, solution, question and answer.)

Comparison (adversative). The comparison plan relates ideas on the basis of differences and similarities. The main idea is organized in parts that provide a comparison, contrast or an alternative perspective on a topic. (Signal words include: instead, on the other hand, however and in contrast.)

Research Findings

Experimental investigations of Meyer's five top-level structures have generated numerous studies. Essentially these studies aimed to determine the effectiveness of teaching text structure as a means of better understanding readers' comprehension

of expository text. Manipulation of text structure and the teaching of specific top-level structure strategies occupied the major thrust of these investigations.

Roller (1990, p. 82) classified studies of text structure into five main categories:

1. manipulation of text structure (sentences/paragraphs) to alter the relations between ideas in the text and determine which elements facilitated the comprehension process (Kintsch, Mandel & Kozminsky, 1977; Kintsch & Yarborough, 1982; Taylor & Samuels, 1983; Richgels, McGee, Lomax & Sheard, 1987).

2. use of intact and scrambled text structure to determine which aspects facilitate/hinder comprehension (Meyer, 1975; Marshall & Glock, 1978-1979; Meyer, Brandt & Bluth, 1980; Spyridakis & Standal, 1987).

3. the effects of text structure on comprehension by substituting pseudowords for content words (Lovett, 1977; Ohlhausen & Roller, 1988).

4. the examination of structural effects through measuring readers' awareness of text structure or the explicit teaching of text structure strategies (Bartlett & Briese, 1979; Meyer, Brandt & Bluth, 1980; Bartlett, Turner & Mathams, 1981; McGee, 1982; Geva, 1983; Taylor & Samuels, 1983; Englert & Hiebert, 1984; Hare & Borchardt, 1984; Taylor & Beach, 1984; Slater, 1985; Carrell, 1985; Slater, Graves & Piche, 1985; Berkowitz, 1986; Rinehart, Stahl & Erikson, 1986; Armbruster, Anderson & Ostertag, 1987; Meyer, Young & Bartlett, 1989; Usher, 1989).

5. the effects on "readers" performance when they read text segments occurring at different hierarchical levels in text. Generally referred to in the literature as the levels effect (Meyer & McConkie, 1973; Meyer, 1975; Meyer & Freedle, 1984; Richgels, McGee, Lomax & Sheard, 1987).

Limitations of Top-Level Structure Research

Despite variations in the research findings with some studies finding positive effects and others being inconclusive, the extensive research and instructional

investigation conducted in this area has been fruitful. Specifically top-level structure models have provided a systematic way of describing how expository text is interpreted by readers and represented by writers. However the approach taken by each model is quite different.

Kintsch and Van Dijk present a strong cognitive or in-head (schema) based perspective. This perception explores how reader's schemata are used to represent knowledge of conventionalized texts. Kintsch and Van Dijk's model represents a flexible prose analysis model which can be applied to various text-types - narrative or expository.

Despite its flexibility this highly elaborate model is not suitable for use in a practical sense in the classroom context. Specifically Kintsch's prose analysis model has a more useful role to serve as a research tool complementing current discourse comprehension research. This research role has been realized in the development of explicit macroprocessing techniques and strategies which assist readers in the recall and summarization of expository text. (Brown & Day, 1981; Hare & Borchardt, 1984; Rinehart, Stahl & Erickson, 1986).

Kintsch and Van Dijk's model has provided a mental 'blueprint' that describes the basic cognitive processes involved in the storage and retrieval of textual content. Conversely Meyer's model focuses essentially on the textual data and explores how the content in an expository text is hierarchically structured to achieve its message.

The top-level structure model proposed by Meyer relies heavily on the text itself with little acknowledgment of the interaction of other factors (reader related issues, socio-cultural factors) involved in the reading process. Whereas narrative text structure approaches assume a culturally internalized 'story schema' Meyer's work suggests that " in expository text there is not an expository grammar that

individuals in a culture share. Rather, there is only the superstructure created by the author" (Tierney & Mosenthal, 1982, p. 88).

Meyer uses the term top-level structure to describe the organizational plans used by writers in composing expository text such as problem/solution (Meyer, 1975, 1983, 1984). Meyer maintains that teaching students to be aware of a text's top-level structure enables students to better encode and recall an author's intended message. This suggestion is supported in studies by Meyer, Brandt and Bluth, (1980) Brooks and Dansereau (1983) Taylor and Beach (1984) Englert and Hiebert (1984) Berkowitz (1986) Anderson, Armbruster and Ostertag (1987). While the explicit teaching of these text-types may assist students to develop some schematic connections across texts and contexts with a specific text structure, they are limited in that they represent categories of writing rather than specific text structures. Furthermore they are restricted in their generalizability across all texts and contexts.

Critique of Meyer's Top-level Structure

Despite the strong experimental data supporting the use of Meyer's text based top-level structures, debate exists regarding the nature of the text frameworks and the theoretical foundation of Meyer's top-level structure approach. Two main issues to be explored in this discussion are the similarities to generic writing patterns and the theoretical underpinning of Meyer's approach.

Similarities to Generic Writing Patterns

The five top-level structures proposed by Meyer that is, sequence, attribution, covariance, response, and comparison are similar to the organizational patterns identified by Niles (1965) and Herber (1970). Niles (1965) identified four patterns common to expository text material that is, enumeration, time order, cause/effect and comparison/contrast. Similarly Herber (1970) described six paragraph

patterns including enumeration, classification, generalization, comparison/contrast, problem/solution and sequence, which constitute most expository text writing.

Close examination of Meyer's top-level structures reveals that they are replications of the generic writing patterns used by writers to convey their intended message. They are not structures but rather categories of writing. To use an analogy, a brick wall is a structure comprised of the bricks and the mortar which cement the wall firmly in place. A pile of bricks alone does not, however, constitute a wall. In this analogy what Meyer calls top-level structures are the individual categories of writing. Only when combined in various ways do they form different texts, in the same way that in the brick wall analogy the bricks combined in different ways would form differently shaped walls. In expository text, the types of writing, which occur in various arrangements form different texts. This idea however, is not developed by Meyer whose work seems more strongly attached to the story grammar approaches.

Theoretical Underpinning

A further limitation exists in that Meyer does not fully explore the relationship between text and the memory structures. Turner (1992, p. 21) describes Meyer's top-level structure as having its "origins in schema theory." While aspects of the top-level structure model certainly complement schema theory, an analysis of Meyer's theoretical foundation reveals that this area is not fully explored in relation to schema theory. The links between how text is encoded, stored and retrieved in permanent memory are not explicitly developed in her model which appears more concerned with content organization and the parsing of text.

A levels-of-processing model of memory (Craik & Lockhart, 1972; Cermak & Craik, 1979) serves as the cognitive base for Meyer's top-level structure. This memory model postulates that incoming visual information is subjected to a

number of perceptual analyses. Initial analysis concentrates on perceptual features while deeper levels of analysis result in more elaborate representations of meaning and the formation of a memory trace. The memory trace is used in subsequent attempts to recall the encoded information. Figure 2.6 depicts how textual information is processed into the reader's memory, Meyer contends that constant exposure to specific text organization plans such as, problem/solution, help "instantiate" schemata which are built up in the short term memory buffer and transferred to permanent memory.

While the levels-of-processing model is consonant with theories of memory as a unitary system Meyer does not fully explore the theoretical base and ramifications of top-level structure using this cognitive foundation. The model does not explain how processing of text using top-level structure affects understanding. Anderson and Ortony, 1975, p. 172 state:

models of memory should involve understanding and that understanding is not just parsing; it is processing to a level whose depth depends on the degree of interaction with the content and the existing knowledge base.

Meyer does not tie together the relationship between text and memory operations. Her cognitive framework lacks depth and neglects the issue of how encoded information is stored and related to existing schemata.

Meyer asserts that identification of the top-level structure of text enables the reader to use what she calls the "structure strategy" (Meyer, 1983, p. 8). Employment of this strategy allows the reader to identify an author's writing plan and in turn utilize that plan as a guide to store and trigger the retrieval of information. This assertion is supported in the operational sense by the description of cognitive memory strategies put forward by Moates and Schumacher (1980, p. 221).

A strategy is a systematic procedure for discovering a concept. Strategies are more efficient than trial and error procedure and often reduce strain on working memory.

Application of the 'structure strategy' requires the reader to use the author's schema, that is, the writing plans used by the writer to organize and structure text. While this strategy proves effective for encoding and retrieving information according to a writer's schema difficulties may arise if the reader's schema does not match the author's schema. A mismatch occurs and meaning is not conveyed. Spiro (1977) suggests "sometimes students need to update their own knowledge and therefore would be better off working within their own schemata rather than an author's schema". Several researchers (Geva, 1983; Muth, 1989; Robinson, Farone, Hittleman & Unruh, 1990) have indicated this shift toward encouraging students to work within the domain of their own schema.

To sum up, reading involves the matching of the reader's schema (content and discourse schemata) with the writer's schema to make meaning from text. However top-level structure approaches as advocated by Meyer and others focus exclusively on the writer's schema with minimal consideration of the reader's background knowledge. Whilst the notion of top-level structure demonstrates an effective means of improving the comprehension of expository text, there appears to be an imbalance between the text and the reader (memory). As Tierney and Mosenthal (1982, p. 95) state, "Meyer fails to consider the differential and interactive contributions reader and context play in discourse comprehension." A much broader focus which considers the reader and the socio-cultural context involved in the reading process is required.

Memory Based Top-Level Structure

Another approach to top-level structure is to see it as a reflection of the memory structures which guide the reading and writing processes. This is the view taken by Sloan and Latham (1989, 1990). Drawing largely from the area of cognitive psychology their approach seeks to describe the in-head or memory based structures which support the composition and comprehension of text.

The source for all written texts are the memory structures (schemata) stored in the writer's head. According to Sloan and Latham these memory structures constitute the top-level structures which control and direct writers/readers in the encoding and decoding of text. Utilizing Collins and Quillian (1972) spreading activation model of cognitive functioning and Anderson's (1976, 1983) Adaptive Control of Thought (ACT) model as their theoretical underpinning Sloan and Latham (1989, 1990) have proposed a text-memory relational hierarchy which explains the various purposes, categories and structures involved in all writing. The memory functions and roles described by Anderson (1976, 1983) provide the theoretical underpinning on which the classification and organization of text is achieved.

Figure 2.7 shows that Sloan and Latham have determined two major divisions of text, that is, episodic or time governed text and propositional or logic governed text. These dichotomies reflect the roles ascribed the episodic and semantic components of permanent memory in Anderson's (1976, 1983) ACT model. Episodic memory refers to information or events stored according to time and is a personalized memory. Semantic memory comprises knowledge of conceptual relations about the world and represents a more "public" knowledge in which information is stored irrespective of time.

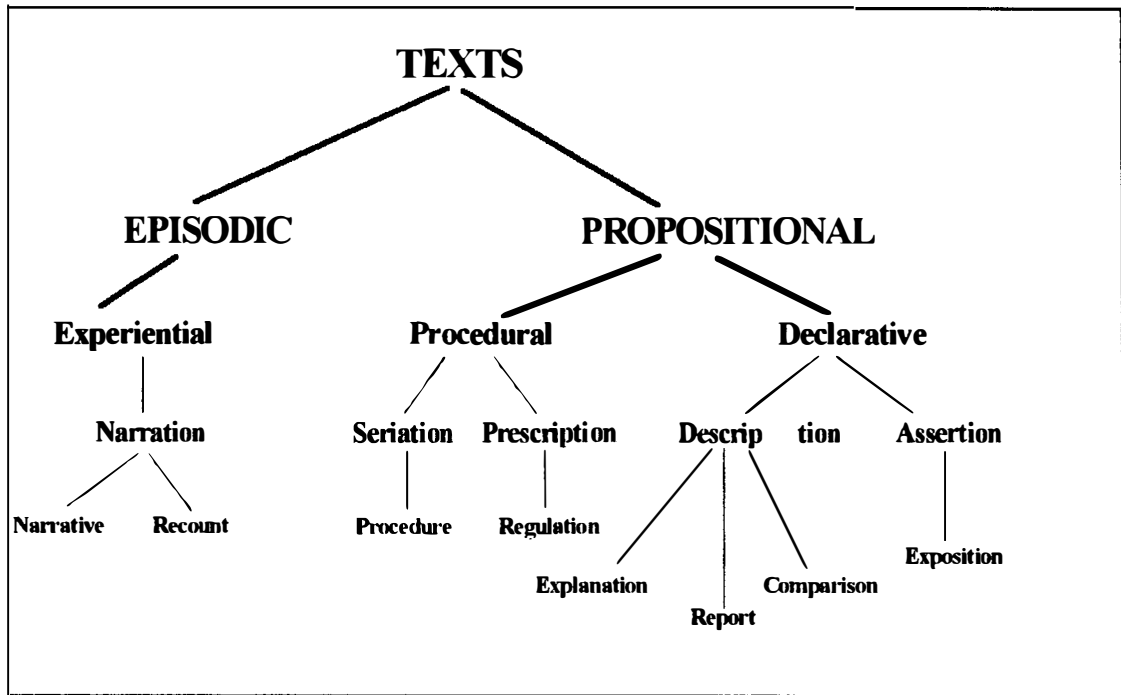


Figure 2.7 Text-memory relational hierarchies depicting text organisation by time or logic (Sloan & Latham, 1989, 1990).

From these major text divisions Sloan and Latham (1989, 1990) have classified text as being either experiential, procedural or declarative. This classification reflects further divisions of semantic memory as described by Anderson (1976, 1983). Figure 2.7 also shows that Sloan and Latham have identified five categories of text, that is, narration, seriation, prescription, description and assertion which specify the orientation or purpose for writing. From these five purposes Sloan and Latham have proposed eight basic text-types: narrative, recount, procedure, regulation, explanation, report, comparison and exposition. For each basic text-type Sloan and Latham have proposed a schematic framework which represents a generalizable macrostructure. These structures are discussed in detail on pages 50 to 58.

In advocating this approach the proponents argue that their model is a genuine top-level structure because it is generated from the memory structures stored in the head of the reader/writer. Memory based top-level structure is accorded three

operational levels: the in-head schemata of the writer (top-level structure) the paragraph level (macropropositional level) and the sentence level (micropropositional level).

Network Categories

In the ACT model Anderson (1976, 1983) postulates that semantic memory consists of two different types of knowledge, that is, procedural knowledge and declarative knowledge. Procedural knowledge is knowledge of how things are done such as, how to drive a car, how to calculate a mathematics problem or what to do when you visit a doctor (Shank, 1973). Declarative knowledge includes all concepts and ideas and represents a static type of knowledge.

Declarative knowledge. In the Adaptive Control of Thought (ACT) model declarative knowledge is represented as a vast organized network of associated concepts. This accords with studies done by Collins and Quillian (1969), Lindsay and Norman (1972) and Collins and Loftus (1975). These concepts are linked and mutually accessible through propositional relationships. Although Anderson (1976) initially described the propositional relationships as subject-predicate and relational argument, a more advanced view of these concepts or network categories includes the relationships of class, example, attributes and cause and effect (Pearson & Johnson, 1978; Sloan & Latham, 1979; Klix, Hoffman & Van der Meer, 1982; Sloan, 1983).

Network relationships within declarative knowledge can be described as having isa, hasa, locative and dynamic connections. For example the following sentences represent specific relationships in which concepts may be related to one another.

The sun is a star illustrates the relationship of class.

The sun has a corona represents an attributional relationship.

The sun is located in the Milky Way Galaxy describes a locative attribute.

The sun radiates heat describes attributes associated with the dynamics

of the object

(Sloan & Latham, 1979, p. 29).

Procedural knowledge. Procedural knowledge is described in ACT as a memory store for procedures or how to do things. It is represented as a production system comprising a condition-action pair (Anderson, 1976, 1983). An example of this production system is shown in figure 2.8 depicting the condition-action process involved in engine assembly. First, the bolt is placed in the hole. Second, the washer is placed on the bolt. Third, the nut is placed on the bolt..

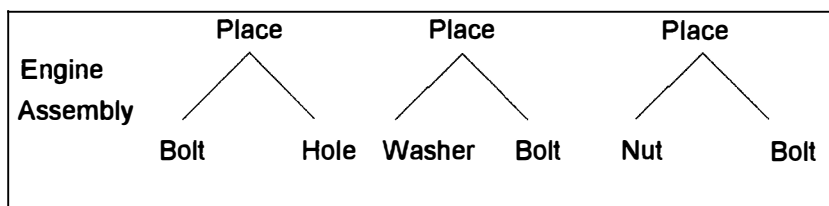


Figure 2.8 Anderson's model of procedural knowledge as related to engine assembly.

The distinction between declarative and procedural knowledge provided Sloan and Latham with a way of discriminating between the different functions and operations of the propositions stored in memory. This knowledge combined with the delineation of the roles of the episodic and semantic aspects of permanent memory enabled Sloan and Latham to match the function of permanent memory with the organization and classification of text. The distinction between episodic and semantic memory is useful because it not only represents two different ways in which one stores information but also two different ways in which texts are constructed either in the head or out of the head, that is by time or logic.

Sloan and Latham's Top-Level Structures

Sloan and Latham (1989, 1990) outline five categories of writing in their top-level structure model. These categories although different in detail are analogous to the

top-level structures advanced by Meyer (1975). Sloan and Latham assert that these categories are not top-level structures but the generic types of writing (patterns of writing) which combined in various ways form the top-level structure of a text. That is, the structure of any particular text will be a product of the particular combination of selected categories of writing in a specific order.

The categories of writing delineated by Sloan and Latham are formed into eight text-types which achieve the various purposes which writers may have. Each of these text-types has a specific framework which comprises the order and selection of the particular categories of writing. Sloan and Latham describe each of the text-types as having the following characteristics:

1. It is directed at achieving a particular purpose.
2. It has a distinct framework or top-level structure.
3. It is time or logic driven.
4. The particular text-type controls style and form, that is, the sort of document in which the text is actually written. For example, the text-type RECOUNT can be realized in the following forms: biography, journal, the relating of personal experiences.
5. A specific text-type is distinguished by the use of particular linguistic elements, that is, specific types of verbs, discourse markers, pronouns and so on.

(Sloan & Latham, 1989, p. 5).

The following discussion describes the eight text-types proposed by Sloan and Latham (1989, 1990). Each text-type is presented in general terms and examples of the way the text is realized in various forms are highlighted. The schematic structure of each text is overviewed and analysis of specific language features pertinent to each text-type is documented.

Recount. This text-type is related to a writer's actual experience(s) and can be realized in a variety of forms, for example, diaries, journals, newsreports, autobiographies, biographies and histories. The recount framework consists of the following elements: setting, the events in time order and a concluding statement as shown in figure 2.9.

The elements or stages of the recount form a structure into which the text is encoded. These elements when combined, as shown in Figure 2.9 form the top-level structure for the text-type, recount.

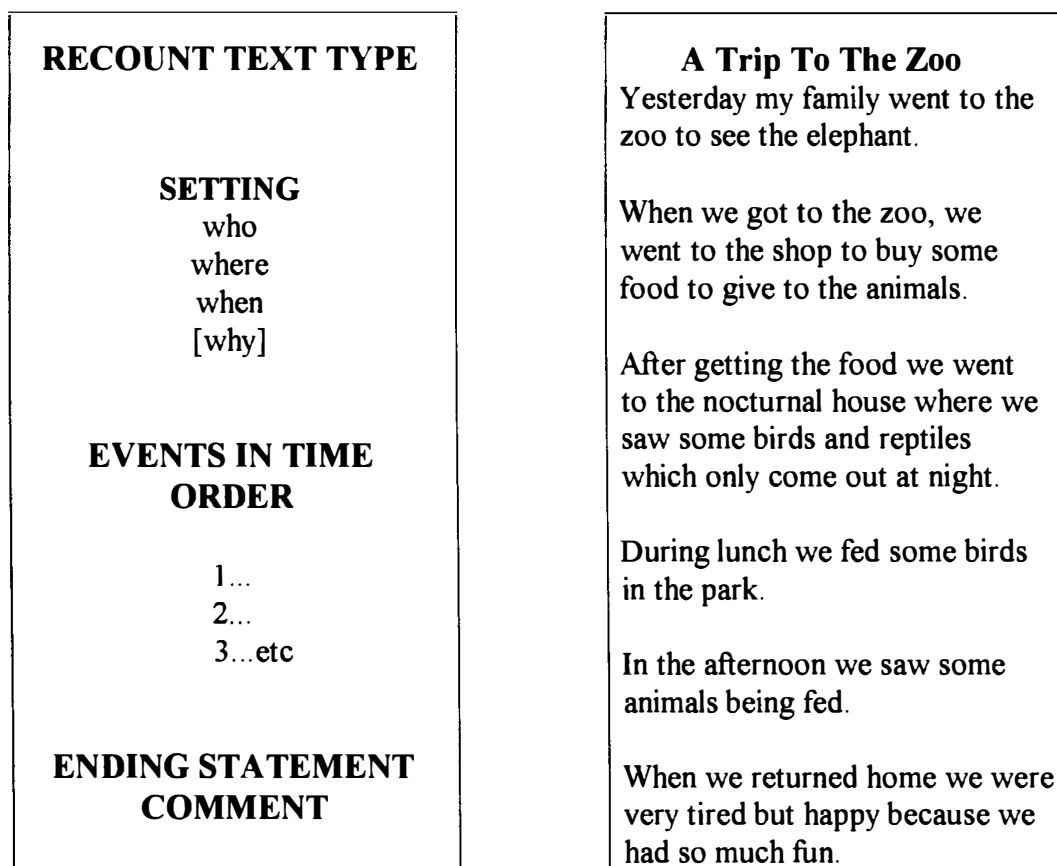


Figure 2.9 Framework and exemplar of recount text-type (Sloan & Latham, 1989, 1990).

Narrative. The narrative text-type involves the telling of fictional stories and events involving a complication and subsequent resolution. This text-type is evidenced in a variety of forms such as, fairytales, poetry, plays, myths, science fiction, short stories and novels.

The structural components of the narrative text-type include the setting, initiating events, complications and resolution as shown in figure 2.10.

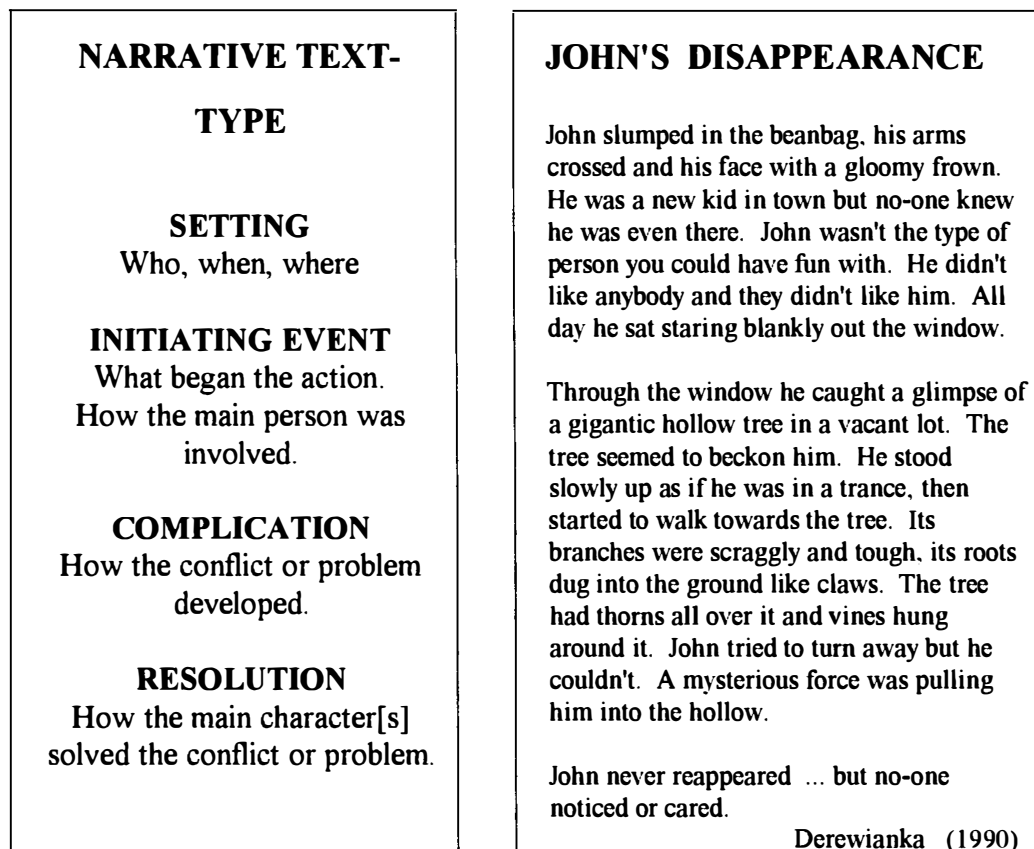


Figure 2.10 Framework and exemplar of narrative text-type (Sloan & Latham, 1989, 1990).

Narrative text-type, like the recount, is a time-driven text, however the sequence of events in narrative may not always be from first to last. In many narrative forms for example, novels, the time sequences are often complex. Narrative text also features more varied settings than the recount and generally a more descriptive and detailed style of language. Moreover the use of personal pronouns is significantly increased in narrative texts.

Report. Report text-types present information involved in the classification and description of objects or animals. This text-type features information that adheres

to the true scientific report style or essay format. The report scaffold contains elements illustrated in figure 2.11.

REPORT TEXT-TYPE	The Honey Bee
CLASSIFICATION What is it?	The honey bee is an insect.
DESCRIPTION What does it have? (size, shape, features)	The honey bee is bright yellow and orange. It is 12mm long and has six legs. The honey bee has three separate parts to its body.
LOCATION Where / when is it? (time / place)	This insect lives in all parts of Australia.
DYNAMICS What does it do?	These bees collect nectar for honey. They dance on the honey comb to show the other bees where the best flowers for nectar are. Honey bees may fly 20 000km to collect enough nectar for 500kg of honey.
COMMENT/CONCLUSION	Most people like the honey that the honey bees work so hard to make.

Figure 2.11 Framework and exemplar of report text-type (Sloan & Latham, 1989, 1990).

The structural components (classification, description etc) in the report text 'The Honeybee' are easily discernible. Examination of this text-type reveals that each particular paragraph uses a specific type of verb. The classification paragraph uses relational verbs, for example "is", while the description paragraph uses attributional verbs, for example "has." The locative and dynamics paragraphs utilize genuine action verbs.

In addition, the scientific report text-type has a very specific and precise style of language and makes little use of non objective adverbs and adjectives.

Procedure. The procedural text-type describes how to do things, such as bake a cake or build a fence. It requires the logical ordering of information. This text is evidenced in instructions, handbooks, recipes and scientific experiments. The procedure text has the elements goal, requirements, method and evaluation as shown in figure 2.12.

The goal, requirements and evaluation components of this text-type are presented in written discourse comprising complete sentences. The method component contains the procedure proper and requires the detailed sequencing of the steps involved. The sentences in this part of the procedure are generally presented in the imperative form, as they reflect the procedural or command type language postulated by Anderson (1976, 1983) in the ACT model (see Figure 2.8).

<p>PROCEDURE TEXT-TYPE</p> <p>GOAL/AIM</p> <p>What is to be done?</p> <p>REQUIREMENTS</p> <p>What is needed to complete this task.</p> <p>a) tools, instruments, utensils ...</p> <p>b) data, ingredients, parts...</p> <p>METHOD</p> <p>First step to last step.</p> <p>a) What is to be done.</p> <p>b) How it is to be done.</p> <p>EVALUATION /TESTING</p> <p>Was the goal achieved?</p>	<p>REPLACEMENT of BATTERIES in the XYZ CALCULATOR</p> <p>When the calculator fails to show a lighted display or does not compute correctly, the batteries are run down and must be replaced. The following procedure, will result in the correct installation of new batteries.</p> <p>In order to complete the battery installation, a small Phillips screwdriver is required. Two new AAA size batteries should be used.</p> <p>The following steps are implemented.</p> <ol style="list-style-type: none"> 1. Undo the two screws in the back of the calculator. 2. Take off the back cover. 3. Remove the old batteries and replace with the new batteries. 4. Replace the back cover of the calculator. 5. Insert and tighten the two screws <p>Turn the calculator on and test the display and the accuracy of the computation.</p>
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Figure 2.12 Framework and exemplar of procedure text-type (Sloan & Latham, 1989, 1990).

Exposition. The exposition text-type discusses ideas that seek to persuade, criticize, debate or arouse an emotive response. Exposition may be presented in the following forms: essays, letters, formal argument, political debate, critical reviews and advertisements.

A description and example of the exposition text-type is presented in the figure 2.13.

EXPOSITION TEXT-TYPE	CAR COLOUR and ROAD SAFETY
<p>THESIS</p> <p>Statement of the problem or point of view. Thesis statement is accompanied by background information and preview of the argument to follow.</p>	<p>Many road accidents happen at night. A main reason for this is that certain colours are not easily observed in poor light conditions. Thus cars painted in those colours are not easily noticed by other drivers.</p>
<p>ARGUMENTS/ASSERTIONS</p> <p>This section presents the argument and evidence to support the point of view being expressed. It can also offer a counter argument to the main point of view supported by data, references or comment.</p>	<p>One solution would be to legislate that all cars be painted yellow or white. This would overcome the problem of poor visibility due to car colour and thus reduce traffic accidents related to it.</p>
<p>CONCLUSION/SUMMARY COMMENT</p> <p>Summing up of position and/or call for action.</p>	<p>Yellow and white are the two paint surfaces which reflect most light. For this reason yellow is used as a background on road signs and other important signals. Moreover , yellow and white are not generally problems for the colour-blind.</p> <p>The problem with this solution is that people have strong preferences with regard to colour. They like their cars to have distinctiveness. It is an emotional issue.</p> <p>Although there may be emotional resistance to this idea, of painting all cars yellow or white, the life-saving benefits must surely outweigh the conditioned colour fad motorists.</p>

Figure 2.13 Framework and exemplar of exposition text-type (Sloan & Latham, 1989, 1990).

The thesis involves stating the background to the topic and the position taken in regards to the topic. The arguments/assertions section reviews data for and against the issue and supports these with examples. Evaluation and re-statement of the position are expressed in the final section.

Explanation. The explanation text-type states how things work. It encompasses explanations relating to machines, procedures, processes and natural phenomena. The explanation macrostructure includes the elements depicted in figure 2.14.

EXPLANATION TEXT-TYPE	HOW A KITE WORKS
<p>DEFINITION What it is.</p>	<p>A kite is a heavier than air flying object.</p>
<p>COMPONENTS/PARTS Description of the parts.</p>	<p>A kite consists of a frame, a skin which covers the frame and a long string that is held by the user.</p>
<p>OPERATION How it works ...cause and effect...</p>	<p>A kite becomes airborne when the wind pressure between the kite and the ground lifts the structure into the air. The tilt of the plane surface of the kite causes a lesser air pressure to occur behind the kite's upper surface than the pressure created by the wind on the under-surface.</p>
<p>APPLICATIONS When and where it works or is applied.</p>	<p>Kites have been used as signals, experimental instruments in atmospheric measurement and as play objects dating back many thousands of years</p>

Figure 2.14 Framework and exemplar of explanation text-type (Sloan & Latham, 1989, 1990).

The explanation text is a very precise and objective text-type. Personal opinion is not employed and the text is always presented in the third person. The writing used is cause and effect and the text is often supported by diagrams and illustrations.

This explanation text-type is found in handbooks, science writing and essays.

Comparison. Comparison text-type includes the same elements or stages as the report with specific focus on the comparative aspects of the information being presented. Comparison text-types are realized in a variety of forms including:

<p>COMPARISON TEXT-TYPE</p> <p>This text type has the same structure as the report.</p> <p>CLASSIFICATION</p> <p>State what the two [or more] things are and how they are related.</p> <p>DESCRIPTION</p> <p>Describe each of the general and then the specific features in a comparative way. Eg... size, shape, colour, cost etc.</p> <p>LOCATION</p> <p>Where/when the things may be found.</p> <p>DYNAMICS</p> <p>What the things can do and how the do it relative to each other.</p> <p>INTERESTING COMPARATIVE ASPECTS</p> <p>CONCLUDING COMPARATIVE COMMENT</p>	<p>CROCODILES and ALLIGATORS</p> <p>Crocodiles and alligators are the biggest of all reptiles and belong to the family of crocodilians.</p> <p>Most crocodilians are similar in appearance. They have an elongated body and a long, powerful tail. These reptiles are heavily armoured with scales and a ridge of bony plates extending down their spine. Crocodilians have four short legs with webbed, clawed feet. They vary in length from 3-6m. Both alligators and crocodiles have long snouts but the crocodile's snout becomes narrower toward the nostrils. Alligators have broad snouts.</p> <p>Crocodilians are found in the warmer parts of the world. They live on the edges of lakes or rivers where there is a good supply of food. Crocodiles are found in Africa, South America, Asia and Australia. Alligators are found in China and America.</p> <p>Crocodilians are carnivores but they cannot chew their food. They use their long, powerful jaws and strong sharp teeth for seizing prey and for biting and ripping off pieces they can swallow.</p> <p>After mating, crocodilians lay about 50 eggs in a pit or nest. The eggs are well covered with soil and both parents guard them from other animals.</p> <p>Although they look similar in many ways, the different types of crocodilians have distinctive features and live in different parts of the world. Crocodiles are recognized by their longer, more pointed mouth with a projecting front tooth on the lower jaw.</p> <p>Both creatures are fierce predators and have been known to attack humans that intrude into their territory.</p> <p>Author's addition</p>
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Figure 2.15 Framework and exemplar of comparison text-type (Sloan & Latham, 1989, 1990).

advertising, product reports and so on. The components of this text-type are illustrated in figure 2.15.

The text-types related to the main purposes of writing are recount, report, procedure, exposition, explanation and comparison and constitute the major informational and event text macrostructures as formulated by Sloan and Latham (1989, 1990). Other less used text-types also defined by Sloan and Latham, are briefly outlined in the following discussion.

Poetic. This text-type may encompass any of the previously discussed text-types depending on the purpose of the poem. However specific conventions do exist for certain types of poetry such as haiku, cinquain and lyric.

Rules. This text includes all rules, directions, laws, signs and captions.

Labels. These text-types may feature as a part of the major text-types such as labels or may be found in diagrams in an explanation text or serve as a text alone as in graffiti.

Comparison to Other Text Categorization Approaches

Just as similarities between Meyer's top-level structure and the generic writing patterns described by Niles (1965) and Herber (1970) were noted in the previous section, similar comparisons are suggested with the Sloan and Latham categories of writing. Analysis of the categories of text in the memory based top-level structure model resemble Britton's (1970) functional approach to writing and Moffett's (1968) modes of writing.

Britton (1970) classifies text into three categories, that is: personal, transactional and artistic. Each of these categories is briefly elaborated in the following discussion.

Personal (expressive). Writing is generally free flowing and concentrates on the writer. This form of writing is realized in dairies, personal response journals, explosion charts, graffiti and stream of consciousness writing.

Transactional (practical). Writing involves an interaction with the world in a practical sense. This form of writing focuses on the information conveyed. It encompasses reports of various descriptions, letters, essays, form filling and research.

Artistic (poetic). Artistic writing expresses ideas. This type of writing concentrates on the language itself and the structure. This writing form is expressed in ballads, novels, short stories, fables, myths and legends.

Moffett's (1968) categorization of text is considered under the term 'mode' and includes the four modes: narration, description, exposition and argument.

It is important to note that a number of researchers have approached text categorization from various perspectives. Although the labels and terms are not consistent the formats and functions described are similar. Further similarities between form and function of writing, specifically in relation to the memory based top-level structures are noted in the next section which briefly examines genre theory.

Genre Theory

While Sloan and Latham have proposed a model of top-level structure which purports to overcome the limitations of traditional top-level structure approaches another avenue of text analysis which is closely aligned with this topic is that of genre theory. Genre theory has evolved from the work of Halliday (1975, 1985) and his investigations in the area of systemic linguistics and semiotics. These

studies have presented another perception of the text structure debate which addresses the socio-cultural influences impinging on text and how these influences effect the meaning realized in text.

Genre theory proposes that genre is "a social process which has some purpose" (Collerson, 1986, p. 12). Consequently a visit to the doctor, a church service or a family meal are considered genres as they have certain predictable components and operate according to an accepted sequence of events.

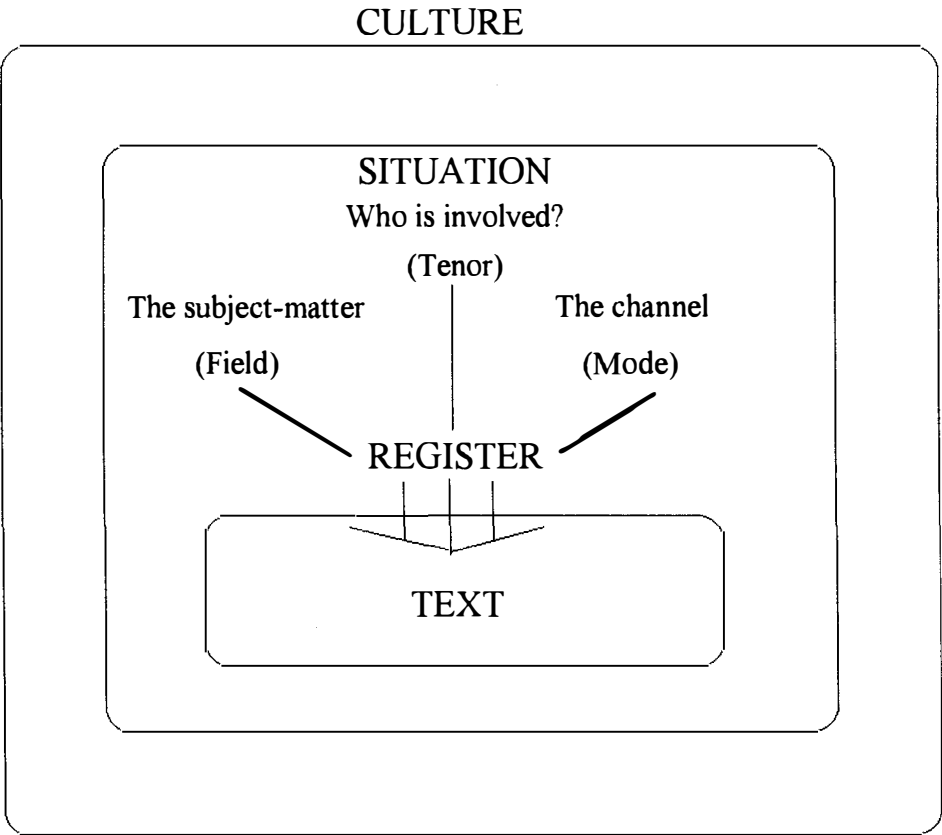


Figure 2.16 Factors influencing construction of genre (Derewianka, 1990, p. 19).

Specifically genre theory examines the way in which texts are constructed and manipulated to achieve their purpose. According to Halliday (1985) differences in text-type are related to the purpose of the language use (**genre**), the setting and the subject matter of the communication (**field**), the roles and relationships of the

people communicating (**tenor**) and whether the language is spoken or written (**mode**). These differences are culture specific and a major tenet of this approach is to explain how cultures can empower learners through the explicit teaching of these structures and purposes. The diagram shown in figure 2.16 shows how these factors are interrelated and embedded within culture.

In the Australian context a number of linguists are investigating the socio-cultural issues associated with the construction of meaning (Christie, 1989; Martin & Rothery, 1985; Derewianka, 1990; Wing Jan, 1991). Three key ideas that provide the framework for their investigations are: language as a tool for meaning making, language as text and language in context.

Derewianka (1990) has presented six generic text-types or schematic structures, which include recounts, instructions narratives, information reports, explanations and arguments. These schematic structures are similar to the writing frameworks presented by Sloan and Latham and like the memory based text-types are considered to be driven by purpose. An outline of the information report genre is presented in figure 2.17. This text-type is selected for illustration as this study focuses on the report text-type specifically. Details of the other text-types detailed by Derewianka are located in appendix H.

Comparison of this report genre with the memory based scientific report top-level structure reveals several common elements, particularly in relation to purpose and language features. Although there are structural differences in the schematic organization of each text-type these are attributed to differences in context/situation. Context and social interaction are major contributing influences in the genrists approach to describing text structure.

INFORMATION REPORT

PURPOSE

The function of this text-type is to document, organize and store factual information on a topic. Information reports classify and describe the phenomena of the world.

TYPES

The term report is used to refer to various kinds of reports-e.g., news/weather. In this context report is used to refer to texts written to store information about a class of things.

TEXT ORGANIZATION

Opening general statement usually a classification or definition.
Facts about various aspects of the subject often clustered as classification information; an examination of components or as descriptive or behavioural items.

LANGUAGE FEATURES

- * Generalized participants: a whole class of things rather than specific participants i.e., volcanoes rather than Mt Etna
- * Timeless present
- * Lots of linking verbs
- * Descriptive language-factual and precise
- * Language for defining, classifying, comparing and contrasting e.g., are called, belong to, are similar to, are more powerful than,
- * Formal and objective style. Use of personal pronouns and writer's opinions not appropriate.

Figure 2.17 Derewianka's (1990, p. 51-53) report text genre.

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Text Structure Models Compared and Contrasted

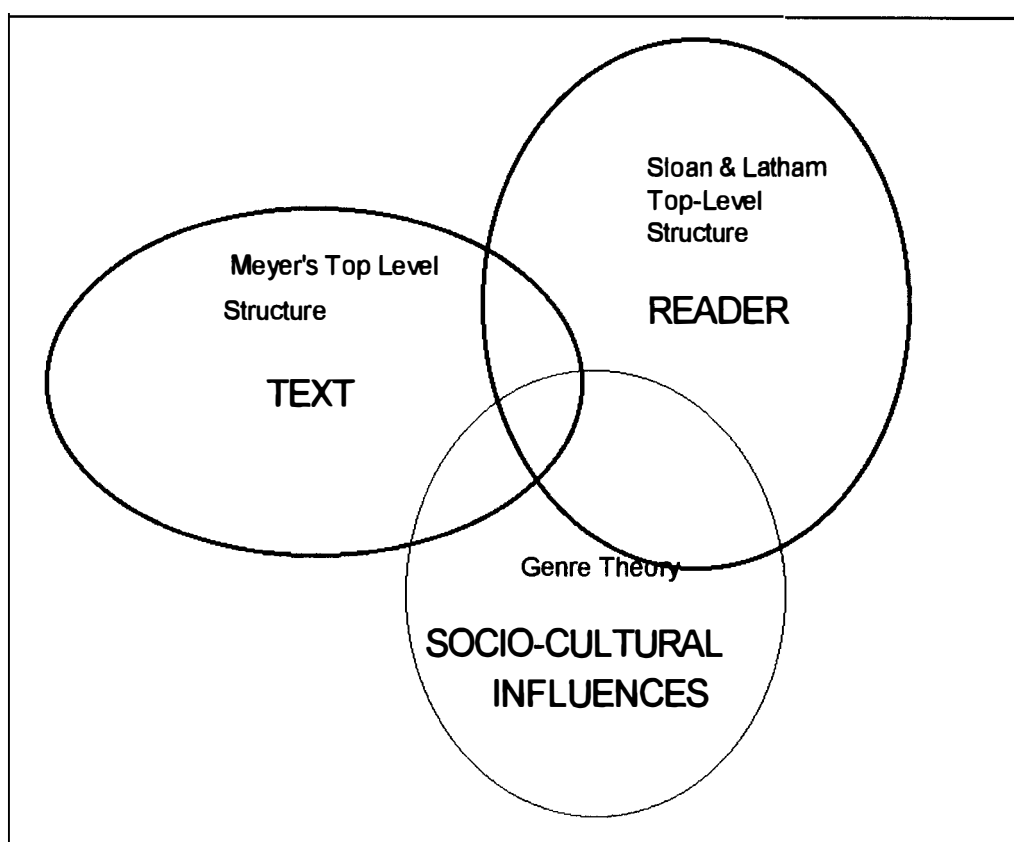


Figure 2.18 Comparison of the three text structure approaches.

The diagram in figure 2.18 illustrates the relationship between the three areas influencing reading comprehension (socio-cultural, reader and textual influences) and their relationship to the three text structure models discussed in the previous section. The diagram is constructed to visually represent the degree of commonality between the three models presented.

Genre theory represents the socio-cultural aspects, the memory based top-level structures symbolize the reader's perspective and Meyer's model is the textual representative. As stated previously these three factors are not seen as isolated components of the reading process but rather as three interacting and dynamic aspects of reading comprehension. Similarly each approach considers the same topic (text structure) however the viewing lens is focused differently in each case.

Areas of Overlap

Figure 2.18 shows an overlap between the three models. This overlap is representative of the three goals common to each text structure approach. First, all three approaches seek to enhance the learner's ability to use language effectively, thus empowering the learner to have choice and control over the language selected for use. A second goal is that all the models describe a system for analysing text. Each model makes explicit for learners the various patterns and text arrangements found in expository text.

Making explicit the arrangement of text structure provides learners with metalinguistic and metacognitive processing strategies. This metacognitive aspect comprises the third common goal of each approach. All three text structure approaches endeavour to provide learners with metalinguistic and metacognitive strategies which allow them to monitor their comprehension of expository text. Sloan and Latham (1989) specify the nature of this metacognitive advantage in that it allows readers to:

- Facilitate the matching of text in the head with text out of the head (schema- matching) that is, comprehension.
- Utilise text structure as a prediction mechanism. For example, students about to read a report are alerted to search for the structural elements classification, description, dynamics and location.
- Utilise text structure as a signalling device alerting readers to what is known and unknown and thereby assist in 'bridging the gap' between these states.
- Use text structure as a retrieval mechanism that assists and directs readers in studying, that is, a study strategy.

While the first metacognitive advantage cannot be argued in the case of the Meyer and genre models, the other metacognitive aspects forwarded by Sloan and Latham

could be considered as being inherent in the other approaches. The degree of application is however, debateable considering the theoretical base from which each approach is derived.

Differences

The differences between the three models are highlighted in their theoretical underpinnings and structural frameworks. Meyer's prose analysis model is very much a text orientated approach which links indirectly to the story grammar approaches and the parsing of text developed from the early work in story grammar. Meyer's concentration on text representation is evidenced in the historical association of her work with that of Fillmore (1968) and Grimes (1972) and their early work in prose analysis.

In contrast, Sloan and Latham's model is derived from semantic network theories which constitute the theoretical basis of schema theory. Their model is represented in the diagram as a reader based approach. Sloan and Latham's perspective elaborates a way of structuring and organizing expository text which is based on the way learners structure and store information in their head. The emphasis assigned the reader not only forms the basis of this approach but also represents the source from which all texts are derived, that is the content and discourse schemata held in the reader's/writer's head. Although the diagram depicts some overlap between the textual and socio-cultural components, and notwithstanding the contribution of each of these factors in the construction of meaning, the memory based top-level structure model is essentially reader based.

Genre theory offers a different theoretical focus again, stemming from a social constructivist orientation which seeks to ensure empowerment for all members of a society. Genre theorists place great emphasis both on the socio-cultural context in

which texts are constructed and on the influences these socio-cultural factors bring to the construction of meaning.

Structural variations. In structural terms the models outlined by both Meyer and Sloan and Latham explain a rather prescriptive and controlled textual framework, whereas the genrists describe a broader and less rigid text arrangement. This variety exists because the genrists consider all the variations of structure and levels of interaction that can occur in the development of text. Although these structural aspects are not portrayed in the diagram it is important to acknowledge these structural differences, as structure is a key issue on which the thesis of this study is founded.

The purpose of comparing and contrasting these three text structure approaches was to highlight the common features of each model and to describe the differences that exist between the theoretical focus of each approach. Recent developments in text analysis and reading comprehension have enabled teachers to become more sensitive to the need to teach students how to process expository text. Despite differences in theory and structural representation the text analysis models presented offer teachers a powerful tool which can facilitate the teaching of expository text. Teacher expectations that students can automatically abstract the higher-order structure of expository text are gradually fading as research indicates the need for students to understand the "what" and "how" of expository text.

Conclusion

Students become increasingly reliant on expository text as they move through the school system. An explicit and effective means of teaching students about the structure and organization of expository text would provide students with metalinguistic and metacognitive strategies to support them in their reading and writing assignments across the curriculum. Currently there exists a plethora of

experimental data supporting the macrostructures advocated by Meyer and her colleagues, as well as numerous commercial publications (Morris & Stewart-Dore, 1984; Bartlett, Barton & Turner, 1988; Hardy & Klarwein, 1990; Turner, 1992). Documented support realized in action based research projects (McNamara, 1989) and a booming market in commercial publications promoting text genres (Derewianka, 1990; Wing Jan, 1991; Bradford, 1992) is adding testimony to the genrists' approach. However there is little research data to substantiate the memory based text structures of Sloan and Latham.

Apart from two studies (Puhl, 1990, Berridge, 1991) which investigated aspects of the memory based top-level structures there exists little empirical evidence to support this approach. Indeed the test of any educational theory must be measured in its translation to the classroom context. While the theoretical principles underlying the memory based top-level structure are consistent with current views of learning theory, corroboration at a practical level is required if credence is to be apportioned to this approach.

This study is aimed at providing some of the preliminary experimental data to validate the Sloan and Latham report top-level structure. In light of the Education Department of W.A. utilizing five of the Sloan and Latham top-level structures (i.e., recount, report, procedure, explanation and exposition) as part of the writing focus in its First Steps professional development program (1992), it is appropriate that some research data be offered to substantiate the inclusion of these text structures in this program.

CHAPTER 3

THEORETICAL POSITION AND HYPOTHESES

This chapter presents the theoretical position adopted in this study and explores the key issues pertaining to this position. The discussion covers the theoretical debate concerning the structural framework and application of the Meyer and Sloan and Latham top-level structures. Recall and comprehension issues are clarified and the use of recall protocols as utilized in this study is argued. In particular, awareness and application of top-level structure in good and poor readers is examined. These issues establish the platform for the main study question and the related research questions and hypotheses.

Evidence reveals that reading and writing tasks become increasingly directed towards expository text as students move through the education system. Until recent years the instructional focus in the primary sector dealt exclusively with narrative text. This imbalance has been overcome through application of theoretical advances in reading comprehension, specifically schema theory and text analysis. Insights gained from this research have led to the establishment of professional development programmes (ERICA-Effective Reading in the Content Areas, 1984; First Steps, 1992; Stepping Out, 1992; CALL-Content Area Literacy and Learning, 1993) which have endeavoured to bridge the gap between narrative and expository instructional practices. A measure of the success of such programmes is perhaps acknowledged in the upsurge in classroom use of commercial publications such as Bookshelf (1988) Informazing (1987) Magic Bean (1991) and Connections (1993) which have a strong focus on informational texts. This movement has been complemented by an increase in students' writing in the expository domain.

While the utilization of informational text is being achieved across the primary curriculum, this increased awareness of the importance of instruction in non

narrative texts also creates the context for this investigation. At present there are a number of approaches to the teaching of expository text (Meyer, Brandt & Bluth, 1980; Morris & Stewart-Dore, 1984; Slater & Graves, 1989; Sloan & Latham, 1989, 1990; Konopak, Martin & Martin, 1990). A valid area of research therefore is to compare the effects of these methodologies. For example, could the teaching of Meyer's top-level structures equip students to deal effectively with informational text or is a combination of top-level structure approaches for teaching students organizational frameworks for writing the more effective?

Investigations in text analysis have resulted in the development of various text structure categorization systems (Moffett, 1968; Kinneavy, 1969; Britton, 1975; Halliday, 1975, 1985; Meyer, 1975, Calfee & Curley, 1984; Sloan & Latham, 1989, 1990). These systems draw from a diversity of theoretical bases and while each approach does not provide a definitive answer to the complex question of how information is stored and recalled for later use, these approaches attempt to explain how readers can organize and remember informational data more efficiently.

The literature review concentrated on two top-level structure systems: the text based top-level structure proposed by Meyer (1975) and the memory based model advocated by Sloan and Latham (1989, 1990). Both approaches assert that teaching students organizational frameworks on which to 'hang' selected relevant information assists readers in the macroprocessing of text. However debate regarding the nature of the organizational framework continues.

Meyer Debate

Meyer's top-level structure as detailed in the previous chapter, is shown to be an effective strategy for recalling texts which match the five organizational text patterns described in her work. However locating texts from curriculum

documents and references which fit the Meyer top-level structure is not easy to do in the primary classroom context. In a pilot of materials for the present study, it was found that locating texts which adhered to the five top-level structures outlined by Meyer proved to be a difficult task. In many cases the text patterns realized in content area texts such as problem/solution, cause/effect, are not easily identifiable, as they are embedded within other writing patterns, making the macrostructure difficult to determine (Shallert & Tierney, 1981; Hoskins, 1986; Slater & Graves, 1989).

The difficulty in locating texts which adhere to Meyer's top-level structure is due to the fact that Meyer's text structures are not structures as such, but rather categories of writing. These writing categories can be used to develop many specific text structures, however on their own they are limited in their application. For example, the text category, 'comparison' can be used to develop a number of texts that relate ideas on the basis of similarities and differences. Thus a student may compose a text detailing the similarities and differences between frogs and toads, however the text created serves the immediate purpose and context of the writer and could not be generalized to other compare/contrast writing situations. Certainly awareness of the purpose (to compare and contrast) would assist the writer in determining the focus and orientation of the text but the text created is confined to the writer's particular situation/context. The text cannot be translated to other comparison situations because it is a category of writing and not a genuine structure in itself.

Moreover the choice of writing patterns and formats available to writers in general, suggests that not all writing will be fashioned according to the five top-level structures advocated by Meyer. Similarly in the classroom context many of the informational texts utilized do not adhere to the five organizational frameworks outlined by Meyer.

This situation is explained by the fact that the Meyer top-level structures are not representative of text structures but rather categories of writing which when combined in various ways constitute a text structure. From a practical perspective it appears the top-level structure patterns devised by Meyer lack generalizability across all expository texts.

In a theoretical overview of Meyer's top-level structure applications Turner (1992, p. 21) states that "in making sense of texts an individual draws upon two knowledge sources: his (her) memory and the text." While acknowledging that in-head text (memory) may vary from individual to individual, written text remains constant. Turner argues that in focusing on text and investigating the way texts are structured and organized, Meyer has targeted a more constant source of information involved in the construction of meaning. However such claims fail to consider the variety of text arrangements possible and the difficulty in finding texts that mirror the top-level patterns described by Meyer.

Memory Based Debate

Writers structure texts for given purposes and readers must interpret and arrive at their own construction of what the text means. Whilst text based top-level structures assist readers to organize and recall text according to the author's schema, comprehension involves the matching of written text with the cognitive frameworks available in the reader's head. What happens when there is a mismatch between the author and reader's schema? In such cases would readers not be better off operating within their own schemata to structure and recall expository text?

This is the underlying thesis advocated by the memory based approach. Sloan and Latham assert that in teaching text structures which match the organizational frameworks held in the head of readers, readers have a processing advantage of

operating within their own schemata. This processing strategy serves readers not only in determining what is known and unknown but also assists readers to apply their own top-level structure to text which is poorly constructed. That is, memory based top-level structures offer readers an organizing schemata on which to structure their recall.

While discussion regarding text-based and memory based top-level structure appears polarized perhaps an amalgam of these approaches is most appropriate. Hoskins (1986) suggests a compromise between these views in recommending that text superstructure (text patterns and concept/schema organization) be taught. In advocating this approach text structure (author's purpose) and text patterns (as documented in Meyer's work) are made explicit to the reader. Hoskins (1986, p. 542) suggests:

Once the author's major purpose has been identified, readers begin to control the text rather than the text controlling them. The text becomes a particular person's creation, a communication to readers on one particular aspect of the world, rather than the world itself. Once the purpose is identified, the superstructure is known and (vice versa).

While such proposals may be the outcome of this investigation nonetheless baseline data on the memory based top-level structure is warranted. This study aims to investigate the effects of teaching the scientific report text on student's organization and recall of information.

Comprehension and Recall

A current view of comprehension determined from schema-theoretic models of reading defines comprehension as "the degree of 'fit' between the written text and the psychological text" (McNeill, 1987, p. 2). As comprehension is an intangible

act, occurring in the head of the reader, a direct analysis of the process cannot be undertaken.

All assessment of reading comprehension is indirect, in that we cannot actually see the process or get a pure measure of reading comprehension alone. Thus we must take it as given that we can never have a perfect measure of the cognitive processes we are investigating (Johnston, 1983, p. 74).

At best only indirect measures of the comprehension process can be determined. Therefore the reader's ability to communicate the information and interrelationships conveyed as discourse, suggests a reasonable way of assessing reading comprehension. Traditional attempts to measure comprehension have included procedures such as question and answer, multiple choice questions, informal reading inventories, group or diagnostic tests and cloze procedure. These measures have been shown to have a number of limitations, for example, time constraints, artificial "reading" situation, passages that are inconsiderate (Royer & Cunningham, 1981; Johnston, 1984; Calfee & Hiebert, 1988). Alternative measures of comprehension include free recall, think aloud protocols, guided recall (Goodman & Burke, 1971), read and retell, (Cambourne & Brown, 1987) and a combination of these procedures such as portfolio assessment (Stiggins, Conklin & Bridgeford, 1986).

Research suggests that there are advantages and disadvantages associated with all aspects of comprehension assessment and that various methodologies may report different findings (Baumann, 1986). Moreover there are often variations in the way researchers employ the various methodologies associated with recall assessment. Winograd and Bridge (1986) cite studies in which researchers using generative tasks such as summary writing to assess comprehension have required a one sentence summary of recalled text, while other investigators have stipulated a

sixty word synopsis. The variety of assessment procedures illustrates the difficulty that exists in endeavouring to measure comprehension.

Recall Protocols

Recall protocols require the reader to give an unprompted written or oral retelling of a text. Retellings used in this manner provide a way of describing how well the reader has encoded textual information into memory and offer a window into the macroprocessing ability of the reader. The principle guiding this approach is that the degree of match between the original text and the recalled text provides a measure of the "comprehension" of the reader.

Generative tasks such as recall protocols have demonstrated improved comprehension and memory of text (Berkowitz & Taylor, 1981; Morrow, 1983; Taylor & Beach, 1984) and have been successfully employed in a number of research paradigms (Brown & Smiley, 1978; Gambrell, Pfeiffer & Wilson, 1984; Slater, Graves, Scott & Redd-Boyd, 1988). Meyer and her colleagues repeatedly use the procedure in determining the match between the author's ideas and the readers' organization of ideas in retellings (Meyer, Brandt & Bluth, 1980; Bartlett, Turner & Mathams, 1981). How well readers incorporate the writer's plan into their recall protocols signals the success of Meyer's top-level structure. The recall protocol employed in this way provides a legitimate means of indirectly measuring the effect of the top-level 'structure strategy'. As this present study seeks to determine the effects of teaching Sloan and Latham's scientific report text structure on children's organization and recall of information, it was decided to utilize the recall procedure as a means of assessing the organizing effects of the memory based top-level structure.

The recall procedure was selected for use as an assessment tool as it provided a better 'measure' of how well students had internalized the scientific report top-level

structure than questioning, multiple choice answers or the use of cloze procedure. Although questions could have been designed to 'tap' the appropriate information this technique was not employed because of its possible association by students with a testing procedure. Other arguments against questioning included that it would only reveal macropropositional connections rather than the top-level structure used by students to organize information. Cloze procedure was omitted because it generally focuses on lower level skills (McCan, 1983; Shanahan, Kamil & Tobin, 1982) and would not determine sufficient macrolevel information. Similar reasons were considered for the exclusion of a multiple choice format.

It is acknowledged that no exact measure of comprehension is possible however the data from research studies and general classroom practice (Olsen & Gee, 1991) indicates that using recall protocols has provided a degree of success in determining the impact of text on readers' recall and organization of information. Therefore bearing the limitations of free recall in mind (tendency for recall to be subjective and situation specific) this study employed the recall protocol as a 'measure' of reading comprehension.

Good / Poor Readers

In endeavouring to design a study which would provide answers to the structural issues associated with text organization a further aspect of top-level structure research was considered. This issue was related to the documented observations of the non-strategic behaviour of poor readers in processing expository text. Meyer and others (Marshall & Glock, 1979; Meyer, Brandt & Bluth, 1980; Kintsch & Yarborough, 1982, Paris & Jacobs, 1984; Afflerbach & Johnston, 1986; Taylor, 1992) consistently report that poor readers lack awareness of the purpose and structure of informational text and their performance when dealing with expository text often reflected this deficit in procedural knowledge.

In a comparison of good and poor readers McNeil reports:

Efficient readers approach reading tasks in a more active, strategic and flexible fashion than poor readers. Poor readers' passivity is reflected in their lack of predicting and monitoring activities: They do not pose questions, identify a goal or check the extent to which answers have been confirmed (McNeil, 1987, p. 49).

In this excerpt McNeil highlights the inability of poor readers to use metacognitive strategies in monitoring their comprehension. He contrasts poor readers lack of a strategic operational plan with the more organized metacognitive devices employed by efficient readers. These metacognitive strategies include the good readers' ability to apply what they know and to use what they know about language structure and content as they interact with text. Such skills include the reader's ability to select, monitor and regulate the reading process (Baker & Brown, 1984; Forrest-Pressley & Waller, 1984).

Evidence suggests that good readers are more effective at monitoring their comprehension than poor readers (Di Vesta, Hayward & Orlando, 1979; Garner & Reis, 1981; Zabucky & Ratner, 1992). In an investigation involving good, poor and average readers Meyer, Brandt and Bluth (1980) found that there was a positive correlation between those readers who used the author's top-level structure to organize their retellings and comprehension levels. Good readers who employed the top-level structure to organize their retellings remembered more total information and more gist information than poor readers. Replication of this research direction found similar effects (Taylor, 1982; Brooks & Dansereau, 1983; Taylor & Beach, 1984; Roller & Schreiner, 1985; Winograd & Bridge, 1986; Armbruster, Anderson & Ostertag, 1987; Zabucky & Ratner, 1992; Loranger, 1994).

Although the research gives testimony to the differences between good and poor readers and their use of metacognitive strategies in comprehending text Paris, Lipson and Wixson (1983) and Kletzien (1991, 1992) report that the issue is not cut and dried. Kletzien (1991) in a study of good and poor readers' strategy use across increasingly difficult levels of expository texts, reports no difference between good and poor readers in dealing with easy text. However as the text difficulty increases poor readers utilize fewer strategies than they had on the easier text. Kletzien concluded that poor readers know and use the same strategies as good readers but they regulated the use of these strategies less efficiently than good readers.

The contrast between good and poor readers and their processing capabilities may suggest that there is a difference between the memory capabilities of good and poor readers. However researchers examining good and poor readers while manipulating text structure have recorded no difference in memory capabilities when the text is familiar.

Reasons for poor performance. Various suggestions have been forwarded to account for the differences between good and poor readers. Baker (1985) suggests a possible reason for the differences between good and poor readers ability to monitor comprehension may lie in that good readers employ different standards for evaluation. Baker has identified seven possible strategies employed by good readers in processing text. These standards are presented below. The situations described in parentheses are what Baker (1985, p.303) considers violations of the standard.

1. Lexical (An individual word is not known or does not make sense.)
2. External consistency (The information is not consistent with one's prior knowledge.)

3. Internal consistency (Ideas within the passage conflict with one another.)
4. Syntax (The syntax does not make sense.)
5. Integrative cohesiveness (The relationship between sentences does not make sense - that is, a connective, anaphoric reference or other implied integrative information is nonsensical.)
6. Organizational cohesiveness (The relationship between this idea and the overall structure is unclear.)
7. Informational completeness (The information necessary to achieve the author's stated goal is not all included.)

These standards range from a focus on differences at the microprocessing level through to the macroprocessing level and present similar arguments to the "Taxonomy of Comprehension Failure" proposed by Collins and Smith (1980).

The general picture emerging from this line of research is that good readers demonstrate sensitivity to text structure and exploit the textual features of expository text to their processing advantage. They see relationships between ideas in text, make associations, chunk ideas into meaningful categories, distinguish between relevant and irrelevant information and connect new information to data already available in schemata, whereas poor readers rarely perform such tasks on a consistent basis.

Documented data consistently shows that poor readers in dealing with expository text:

1. Do not impose structure upon the data. That is, they randomly recall ideas and serially list items in their written recalls (Meyer, Brandt & Bluth, 1980).

2. Often focus attention on items in the text that are contextually important (to the reader depending on his/her purpose) rather than on items that are textually important (i.e., items important to the author and highlighted through the use of relevance signals) (Winograd, 1984; Hidi & Anderson, 1986).
3. Produce poorly connected discourse and display fewer superordinate connections in their recall protocols (Meyer, Brandt & Bluth, 1980; Birnbaum, 1981; Anderson & Pearson, 1984).
4. Demonstrate poor monitoring strategies and are less able to compensate when meaning breaks down (Garner & Reis, 1981; Baker & Brown, 1984; Garner, 1987; Zabucky & Ratner, 1992).

Disregarding prior knowledge (content schemata) these findings suggest that poor readers do not have a well developed text schemata or macrostructure framework on which to 'hang' content information. It appears poor readers are confused about the purpose for reading expository text and possess few strategies for extracting content area information. A limited operational repertoire such as this often leads to the copying of large slabs of information from reference texts, (Morris, 1984) simple text matching or answer grabbing techniques (Pearson & Johnson, 1978) or the random recall of items from text strung together with very little cohesion (Morris & Stewart-Dore, 1984).

Given that poor readers are generally non-strategic and concerned with microprocesses rather than macroprocesses one of the aims of this study is to determine if training in the use of a specific top-level structure will improve poor (novice) readers' recall and organization of expository text.

Experimental Design

In order to gain answers to the questions and issues raised in the theoretical aspects of this study it was decided to approach this investigation in three ways:

1. To target good (better) and poor (novice) readers in the general population of the study.
2. To include scrambled text (i.e., text without a structure) as part of the experimental design.
3. To include a time delay between the treatment and final recall procedure.

Novice and Better Readers

Targeting novice and better readers in the general context of the study allowed the writer to determine if the organizing effects of the memory based top-level structure could be applied to sub-groups of the general population. Whilst significant differences were not expected to be observed with better readers, as they may already possess metacognitive strategies for dealing with informational text, it was anticipated that if the teaching of the report text top-level structure was validated then significant differences would be observed within the general population that is, all readers and within the novice readers group.

Scrambled Text

The use of scrambled text provided a further variable upon which to verify if the teaching of the memory based report top-level structure had an organizing validity on student's report writing. Investigations reveal that good readers are not only more sensitive to text structure but when text is lacking a macrostructure good readers are more able than poor readers to impose a structure on the text (Stein & Nezworski, 1978; Armbruster, Anderson & Ostertag, 1987; Ohlhausen & Roller, 1988). If the Sloan and Latham text structures do provide an organizing framework it could be argued that readers given training in the report text

macrostructure should be able to impose structure on text which is scrambled. To test this assertion it was decided to include a scrambled report text as part of the experimental design.

Time Delay

To ascertain if the text macrostructure had been internalized as part of the reader's text schema it was decided to include a delayed recall test as part of the experimental design. In many comprehension studies recall is often measured immediately after reading a passage, thus measuring the quantitative effects of short term memory. As the students' recall over longer periods was particularly critical to this investigation students were requested to produce an immediate written recall and a delayed written recall. A three week delay was decided as being a sufficient time lapse by which to validate the internalization of the text structure schema.

Main Study Question

Meyer reports improvement in the organization and writing of expository text when top-level structure is taught. In this study it is argued that Meyer's top-level structures are not structures at all but rather categories of writing. A structure implies some form of framework on which ideas are attached. This concept is a central aspect of the theoretical and practical areas of this investigation. This study seeks to determine if improvement in the organizing and writing of expository text, will be achieved by going beyond the identification of the generic writing categories (Meyer) to the genuine top-level structures of text (Sloan & Latham) which guide the writer's selection, style and organization of context .

To test this proposal the following main study question is formulated:

Does the teaching of a top-level structure, specifically The Scientific Report top-level structure, improve children's organization and writing of expository text?

If the teaching of the scientific top-level structure does improve children's organization and writing of expository text is the effect maintained (a) following a time delay?

(b) with novice/better readers?

If such teaching does improve students' organization and writing of expository text it could be predicted that children given an explicit instructional program on the scientific report text-type involving the strategies of modelling, guided reading, interviews, role playing and joint composition, should as a result show an improvement in the recall and organization of information which reflects the reorganized or enhanced memory structures. It is postulated that the teaching of the report text-type framework will change the way in which children organize text information. That is, the text-type framework will act as an organizing schema.

Research Questions and Hypotheses

Consideration of the general study question lead to the derivation of the following research questions and related hypotheses:

- 1. Do students given instruction in the report text top-level structure recall more concept items than students not given training in the report text top-level structure?**

Hypothesis 1. There will be no difference in the mean number of concept items recalled between the control group and the experimental groups on trial 1
(a) structured text, immediate recall condition at the

- (a) group level,
- (b) text group level, and
- (c) performance group level.

Hypothesis 2 There will be no difference in the mean number of concept items recalled between the control group and the experimental group on trial 1 (b) **unstructured** text, **immediate** recall condition at the

- (a) group level,
- (b) text group level, and
- (c) performance group level.

Hypothesis 3. There will be no difference in the mean number of concept items recalled between the control group and the experimental groups on trial 3 (a) **structured** text, **immediate** recall condition at the

- (a) group level,
- (b) text group level, and
- (c) performance group level.

Hypothesis 4. There will be no difference in the mean number of concept items recalled between the control group and the experimental group on trial 3 (b) **unstructured** text, **immediate** recall condition at the

- (a) group level,
- (b) text group level, and
- (c) performance group level.

2. Do students given instruction in the report text top-level structure recall more concept items than students not given training in the report text top-level structure following a delay period?

Hypothesis 5. There will be no difference in the mean number of concept items recalled between the control group and the experimental groups on trial 2 (a) **structured** text, **delayed** recall condition at the

- (a) group level,
- (b) text group level, and
- (c) performance group level.

Hypothesis 6. There will be no difference in the mean number of concept items recalled between the control group and the experimental group on trial 2 (b) **unstructured** text, **delayed** recall condition at the

- (a) group level,
- (b) text group level, and
- (c) performance group level.

Hypothesis 7. There will be no difference in the mean number of concept items recalled between the control group and the experimental groups on trial 4 (a) **structured** text, **delayed** recall condition at the

- (a) group level,
- (b) text group level, and
- (c) performance group level.

Hypothesis 8. There will be no difference in the mean number of concept items recalled between the control group and the experimental group on trial 4 (b) **unstructured** text, **delayed** recall condition at the

- (a) group level,
- (b) text group level, and
- (c) performance group level.

3. Do students given instruction in the report text top-level structure demonstrate better organization of written protocols than students not given training ?

Hypothesis 9. There will be no difference in the structural organization of recalled text between the control group and the experimental group on trial 1 (a) **structured** text, **immediate** recall condition at the

- (a) group level,
- (b) text group level, and
- (c) performance group level.

Hypothesis 10. There will be no difference in the structural organization of recalled text between the control group and the experimental group on trial 1 (b) **unstructured** text, **immediate** recall condition at the

- (a) group level,
- (b) text group level, and
- (c) performance group level.

Hypothesis 11. There will be no difference in the structural organization of recalled text between the control group and the experimental group on trial 3 (a) **structured** text, **immediate** recall condition at the

- (a) group level,
- (b) text group level, and
- (c) performance group level.

Hypothesis 12. There will be no difference in the structural organization of recalled text between the control group and the experimental group on trial 3 (b) **unstructured** text, **immediate** recall condition at the

- (a) group level,

- (b) text group level, and
- (c) performance group level.

4. Do students given instruction in the report text top-level structure demonstrate better organization of written protocols than students not given training following a delay period?

Hypothesis 13. There will be no difference in the structural organization of recalled text between the control group and the experimental group on trial 2 (a) **structured** text, **delayed** recall condition at the

- (a) group level,
- (b) text group level, and
- (c) performance group level.

Hypothesis 14. There will be no difference in the structural organization of recalled text between the control group and the experimental group on trial 2 (b) **unstructured** text, **delayed** recall condition at the

- (a) group level,
- (b) text group level, and
- (c) performance group level.

Hypothesis 15. There will be no difference in the structural organization of recalled text between the control group and the experimental group on trial 4 (a) **structured** text, **delayed** recall condition at the

- (a) group level,
- (b) text group level, and
- (c) performance group level.

Hypothesis 16. There will be no difference in the structural organization of recalled text between the control group and the experimental group on trial 4 (b) **unstructured text, delayed** recall condition at the

- (a) group level,
- (b) text group level, and
- (c) performance group level.

5. Is there a difference in the number of concepts recalled between the control and experimental populations?

Hypothesis 17. There will be no difference in the number of concepts recalled for the control group on each of the four test conditions at the

- (a) group level,
- (b) text group level, and
- (c) performance group level.

Hypothesis 18. There will be no difference in the number of concepts recalled for the experimental group on each of the four test conditions at the

- (a) group level,
- (b) text group level, and
- (c) performance group level.

6. Are there differences in the structural organization of written protocols between the control and experimental populations?

Hypothesis 19. There will be no difference in the structural organization of written protocols for the control group on each of the four test conditions at the

- (a) group level,
- (b) text group level, and

(c) performance group level.

Hypothesis 20. There will be no difference in the structural organization of written protocols for the experimental group on each of the four test conditions at the

(a) group level,

(b) text group level, and

(c) performance group level.

Conclusion

This chapter has highlighted the movement towards the explicit teaching of expository text structure. As there are a number of text structure approaches being promoted in pedagogical circles it is important to determine which of these is most suitable in the classroom situation. Although there is a plethora of data supporting the effectiveness of the Meyer based models, there exists little testimony to support the memory based approach advocated by Sloan and Latham. This study seeks to provide some of the empirical data required to validate the memory based report top-level structure.

The investigation also seeks to provide answers to the questions that have been raised in the general discussion. In endeavouring to provide answers to these questions it is hoped that information regarding student's understanding and employment of top-level structure strategies will be realized, thus providing valuable pedagogical data for those involved in the teaching of expository text structures.

CHAPTER FOUR

DESIGN OF THE STUDY

This chapter provides a description of the procedural and design aspects of this study. A schematic overview of the research design is presented along with an overview of the population, methods and instrumentation involved in this investigation.

Population

The research population consisted of 69 year four students (26 males 43 females) ranging in age from 8.1 - 9.11 years. The students attend a catholic, suburban primary school in the north eastern area of Perth, Western Australia. The school draws from a range of socio-economic classes, though the school is predominantly middle class.

The school's two year four classes were used in the study so as to minimize disruption to school routines. These classes remained intact for the reading comprehension test however subject to the results of the test students were randomly allocated to either the control or experimental groups. Depending on students' placement, some movement between classes and classrooms was required. This arrangement was not considered a threat to reliability as both classes swapped regularly for maths, social studies and science lessons and were accustomed to working in either classroom and with either teacher.

The teachers involved in this investigation were given an overview of the purpose and structure of the experimental design. To ensure compatibility between presentations, the teachers were provided with a script for the testing and treatment phases of the study. Moreover as both teachers trained at the same tertiary institution, shared an interest in curriculum issues, particularly language

education, and collaborated regularly regarding planning it was considered that teacher effect would be significantly reduced.

Methods

An experimental research design was employed to investigate the effect of teaching a specific top-level structure on children's writing. The design and procedure is schematically illustrated in figure 4.1.

Reading Achievement: Group Allocation

The year four students were administered the Progressive Achievement Test (PAT) reading comprehension test as a measure of reading achievement. The purpose of the (PAT) test was to rate students as novice and better readers. Derived scores (stanines and percentile rankings) were used to rank subjects from better to novice readers. Novice readers were classified as those students scoring between stanines 1 - 5 on the PAT. A stanine rating of 4 and 5 is considered an average reader according to the PAT manual, however for convenience novice readers in the context of this study, included poor - average readers. Similarly students scoring stanines between 6 - 9 were classified as better readers. Although a stanine rating of 6 is an average reader in PAT terms, for convenience better readers included average as well as above average and superior readers.

Randomization of groups. Following allocation to better or novice reader performance groups, subjects in each group were assigned code numbers which were recorded on strips of paper. These numbers were drawn at random and subjects were allocated to either the experimental or control groups. Students were subsequently assigned to either class 4B (experimental group) or 4C (control group) for the study. Whilst the students were aware of these two classifications, further grouping and classification of subjects was orchestrated by the researcher.

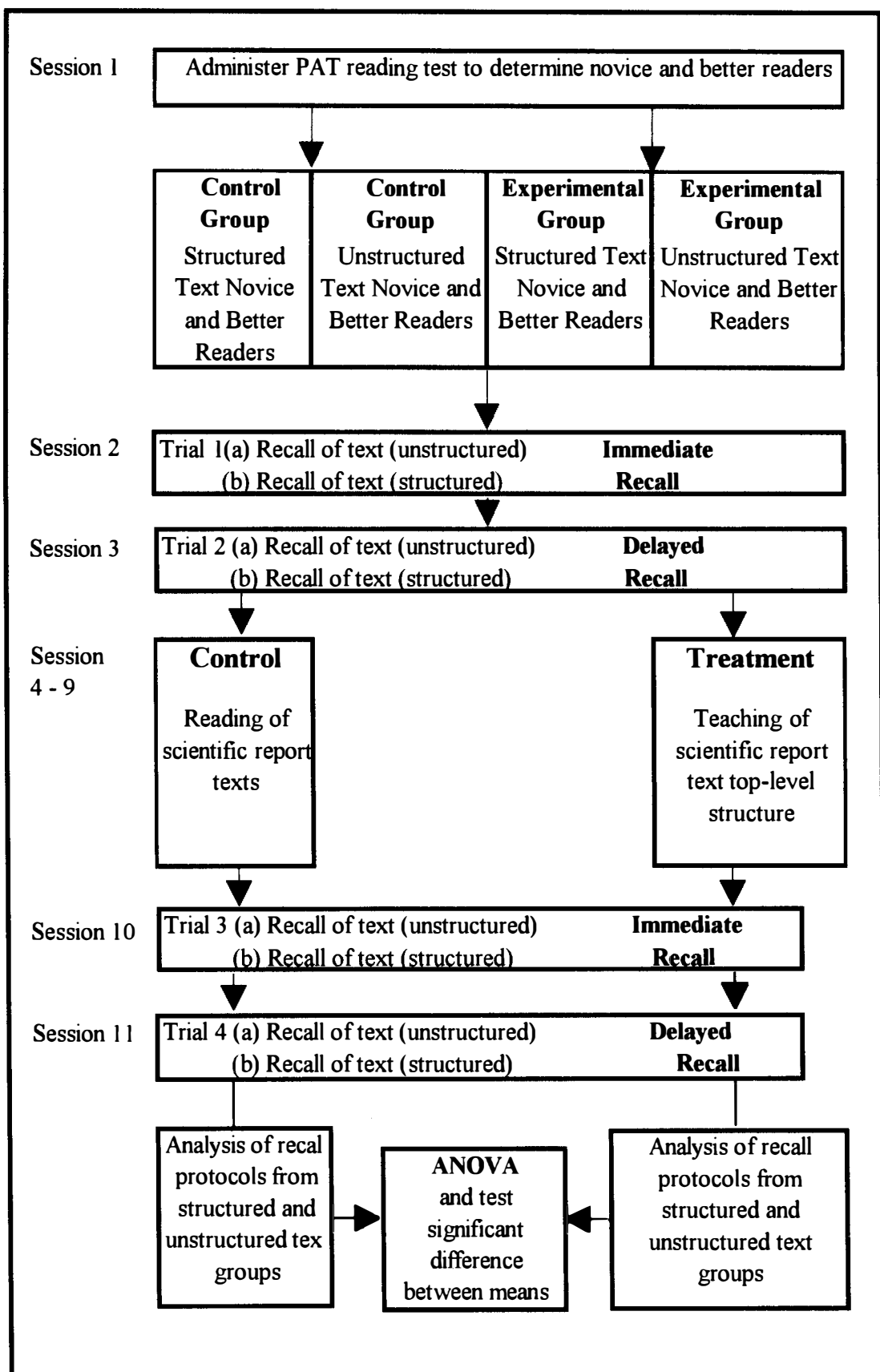


Figure 4.1. Research design.

Subjects in each group were assigned to either a structured or unstructured control or experimental group (see Figure 4.1).

Two control and two experimental groups were established to investigate the impact of the report text structure on student's recall and organization of information. Providing both structured and unstructured text enabled the researcher to differentiate between the effects of the treatment and the effects of the exposure to structured and unstructured text.

The experimental design was also engineered to focus upon subject's reading achievement. The effect of text organization and the treatment was considered in relation to subject's reading ability. Therefore a further performance group was created to examine this aspect of the study. Figure 4.2 depicts the grouping arrangements for the study.

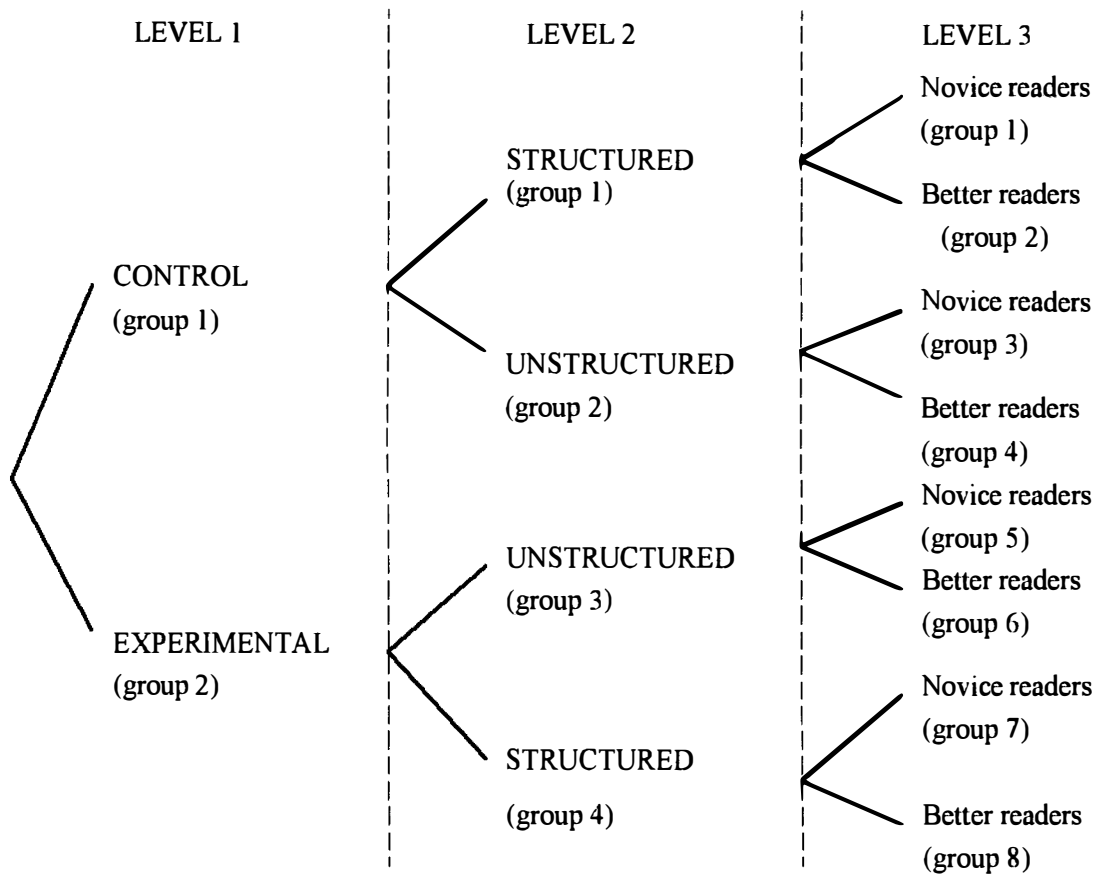


Figure 4.2. Subject grouping.

Level one group allocation was designed to provide information regarding the treated and untreated populations. Level two categorization consisted of subgroups of level one and concentrated on variables associated with text structure. The third level of categorization focused on reading achievement. This group was specifically designed to focus on the effect of the treatment on the successful (better) readers and less successful (novice) readers.

Pre-Treatment

Two pre-treatment measures (immediate and delayed recall tests) were conducted prior to the experimental investigation. Subjects allocated to the structured text group were exposed to text structured according to the scientific report text top-

level structure while the unstructured text groups were given texts devoid of an organizing structure.

Pre-test One

In this initial session students in control group 1 and experimental group 4, (**structured text**) were assembled together in classroom 4 C, while subjects in control group 2 and experimental group 3 (**unstructured text**) gathered in room 4 B, for the administration of the pre-test.

Structured text group. Students in this group (control group 1 and experimental group 4) were given a report text on the Malayan Tapir to read. As an idealised report text structure on this animal was not located an appropriate text was developed by the researcher using various encyclopedic and animal reference texts to provide content data. The Malayan Tapir text was written according to the report text top-level structure (see appendix A) and comprised information presented in paragraphs detailing classification, description, location and dynamics information.

Unstructured text group. This group was presented with a scrambled expository text on the Malayan Tapir to read (see appendix B). The text listed sentences (concepts) about the Malayan Tapir in a scrambled and jumbled format. For example, descriptive, dynamic and locative information were not clustered together but rather separated and interspersed with other concepts throughout the text. Thus producing a text which lacked an organizational structure.

Administration of pre-test-one. The Malayan Tapir text was distributed face down to all students along with a blank sheet for written recall of the text. Students in each group were then asked to turn over the texts and listen while the presenter(s) read the text aloud. This procedure of using a superior reader to

model the text aloud for the students was employed in each of the test conditions to ensure all subjects had an opportunity to process the textual information. It was felt that if the students were given the text to read themselves then this would disadvantage the slow, silent readers whose tedious word by word processing strategies would require a longer period of time than that allocated to the reading of the expository text.

Following the oral reading of the texts, students were given five minutes to reread the text. The presenter(s) then directed subjects to turn the text face down and recall the data presented about the Malayan Tapir in a written recall. (See appendix E for instruction details.)

Pre-test Two

Pre-test two was conducted following a three week delay. Subjects were assembled in their respective groups, that is, **structured text** (control and experimental groups 1 and 4) and **unstructured text** (control and experimental groups 2 and 3). Each student was given a blank piece of paper and asked to provide a written recall of any information they could remember on the Malayan Tapir.

Analysis of written protocols. The written recalls were analysed to determine two factors. The first analysis was to determine the number of concept items recalled by the students in their writing. The second analysis was to establish if the written protocols demonstrated evidence of students using the report top-level structure to organize their written protocols.

Determining the use of text structure involved a rigorous analysis of the recalled protocols. Text structure was determined as being utilized if students clustered concept items relating to a specific category of information together. That is, if a

subject recorded several concepts relating to dynamics information together this was considered a conscious attempt by the subject to utilize the category classification (report text top-level structure) as a structuring aid. However if the clustered ideas contained reference to other category data such as location or classification information, then the classification was designated invalid. For example, if a student's recall had several concept items relating to locative information grouped together and an idea relating to descriptive information was included with this data, the clustering of data was considered contaminated and was not counted as an authentic representation of the report text schema.

Although the criteria selected for determining text structure was harsh, it was considered that in adopting this approach the researcher would ensure the consistency of the results. Although it is acknowledged that some effects may have been masked because of this rigid categorization system, in electing to apply a consistent grading system to all the written protocols there was less room for the interpretation and categorizing of the data in alternative ways. Maintaining this grading system ensured consistency of the judging of the data.

Treatment

The treatment phase operated over a three week period. Two sessions per week (2 x 40 mins) were conducted with both the control and experimental groups. The writer worked with the experimental group whilst another year four teacher worked with the control group. The experimental group was explicitly taught the scientific report text top-level structure while the control group was involved in the 'reading only' of the report texts.

Control subjects were given the same texts as the experimental group for each session, including several additional report texts. The extra texts were given to overcome time difficulties between the instruction (experimental) group and the

'reading only' (control) group. Moreover it was considered that interest would be maintained through exposure to a variety of texts rather than forty minutes focused on a specific text.

General Description of the Teaching Phases

The following section discusses the teaching sequence employed in the treatment phase of this study. The discussion covers three main areas. First, it provides a general description of the phases used in the teaching sequence. Second, it details the strategies used with the experimental group. Third, it presents an overview of the teaching sequence employed.

Sloan and Latham (1989) highlight three main phases in the teaching of a specific text-type. These phases include an *introductory section* where students have an opportunity to interact with the specified text through a variety of activities, a *teaching phase* where the components and function of the text-type are made explicit and a *consolidation phase* where understanding and refining of the purpose and function of the text-type is cemented. This strategy sequence is similar to the approach to teaching expository text advocated by Readence, Bean and Baldwin (1985).

Introduction

Introductory activities range from a less structured role play model where children assume the role of an animal and are interviewed using the report text framework questions, to the more structured direct teaching of the text-type in which the teacher introduces the text-type through explicit explanation. The central focus of the introductory phase is to provide concrete interaction with the report text-type so that guided discovery and specific discussion of the function and features of the text-type can be achieved.

Teaching

The second phase comprises the teaching component. In this phase the teacher is responsible for the explicit teaching of the specific components and function of the text-type. A variety of strategies and activities are used in this part of the process, including direct teaching, text reconstruction activities, games and employment of the directed silent reading strategy.

Consolidation

Consolidation constitutes the third phase advocated by Sloan and Latham (1989). In this phase the content taught in the previous lessons is explored, clarified and refined through activities such as semantic grids, modelled writing, and various reading and writing opportunities.

Strategies employed in the experimental design endeavoured to reproduce the three phases outlined above. It is acknowledged however that the teaching period in the context of this experiment was limited, and does not adequately parallel an authentic classroom situation in which the described activities may be ongoing over a period of several weeks rather than isolated in twice weekly sessions.

In addition to adhering to Sloan and Latham's suggested approach, the series of lessons planned for the experimental group were designed to focus explicitly on the structural elements of the report text-type. To achieve this objective, the lesson sequence devised reflected a whole-part-whole approach (Goodman, 1986). This meant that the initial lesson presented a general introduction and explanation of the purpose and function of the report text structure. This approach concurs with findings (Duffy, Roehler, Sivan, Rackliffe, Book, Meloth, Vavrush, Wesselman, Putman & Bassiri, 1987; Garner, 1990; Grant, 1994) which suggest that in order for students to see value in using a strategy they should be informed about its purpose and application.

Moving to the more explicit focus on the report text structure required the development of lessons which fragmented the report text structure into its component parts. This fragmentation into smaller chunks allowed the teacher to direct students' attention to the function of the micro and macro level elements which underpin the report top-level structure.

The final focus of the lesson sequence was to provide activities and opportunities for students to put the pieces back together. The shared writing of the report text achieved the latter. Orchestrating the shared writing activity allowed the teacher to model how to implement and integrate the strategies taught in the teaching focus. This assistance from the teacher in the form of explaining, demonstrating and guiding (scaffolding) enabled students to think through the process and observe how the report text structure provided an organizational framework which assisted in the production of a coherent and cohesive informational text. Explicitly demonstrating these links ensures greater application of the strategy by students (Grant, 1994) and empowers students to develop a sense of conscious control over the strategies and their use (Dole, Duffy, Roehler & Pearson, 1991).

Strategies Used with the Experimental Group

The next segment contains a detailed discussion of the treatment strategies used with the experimental group. Four issues are detailed:

- purpose (which outlines the objective of the strategy)
- strategy components (which lists the procedural steps involved in the strategy)
- rationale (which explains why the strategy was selected for inclusion in the treatment phase)
- evaluation (which presents the strengths and limitations of each strategy as used in the context of this study).

Directed Silent Reading (DSR)

Purpose

DSR (Sloan & Latham, 1981) is an instructional reading strategy designed to focus on the teaching of comprehension skills. This strategy and similar procedures (Stauffer, 1969; Manzo, 1975) enables students to practice a range of comprehension skills under the observation and guidance of the teacher. Moreover it requires students to read a complete text rather than excerpts, so that construction of meaning emerges from a complete and cohesive piece of discourse.

Strategy Components

The main elements of DSR as used in this study:

- Prediction using title, first paragraph, pictures or sub-headings. This aspect of the strategy is designed to activate the readers' schemata and establish an appropriate context for the reading of the text. In establishing the semantic field readers are better prepared to anticipate the possible meanings suggested by the text.
- The setting of a discourse question. The discourse question is an open ended question posed before silent reading. Its purpose is to provide a discourse orientation for readers thereby establishing an appropriate context for the construction of the text's meaning(s).
- Students read the text silently. Silent reading aims to achieve two objectives. Firstly it allows teachers to monitor the reading habits of students. Secondly it provides students time to process the text, through confirming and rejecting predictions. The main purpose of the strategy is to provide students time to be engaged in the comprehension process.
- Discussion of the discourse question, individually, in pairs or whole class occurs after silent reading. Returning to the discourse question allows students to share their responses with others. It also provides an opportunity for students to be reoriented toward the text's meaning.

- Guided questioning of text by the teacher follows. This questioning sequence provides an opportunity for the teacher to monitor the meaning making strategies of the students. In this case specific reference to questions which elicited the key structural elements of the Sloan and Latham report text structure (i.e., What is it? What features does it have? Where is it found? How does it move?) were employed. Students were asked to provide oral substantiation of the answers by referring to specific statements within the text thereby encouraging meaningful and purposeful processing of the text.

Rationale

Directed silent reading was selected for use in the treatment phase for two reasons. It provided a means of introducing the report text structure to the students in an wholistic manner. Second, it could be used to develop the main framework questions of the report text.

Through the provision of a complete piece of discourse, students were exposed to the overall "big picture" of the report text (its purpose and function) before being asked to focus of the smaller component parts of the report structure. This whole-part-whole approach is consistent with contemporary approaches to literacy education (Goodman, 1986; Cambourne, 1988).

A second reason for employing the DSR strategy was that the guided questioning section of the strategy could be manipulated to utilize the framework questions constituting the report text structure. The framework questions (i.e., What is it? What features does it have? Where is it found?) were derived from the semantic propositional memory model proposed by Anderson (1976). Incorporating these framework questions into the DSR strategy presented an ideal opportunity by which to reinforce the structural components of the report text.

Moreover the continued exposure to the report framework questions would help students to realize that the report text questions can be viewed as goals which provide a strategic purpose for reading. Knowing that a report text provides classification, description, location and dynamics information can provide students with sufficient metacognitive knowledge to generate their own questions as they read. It was anticipated that the repeated exposure to the report text framework questions would enable students to become (a) more strategic in their processing of informational report texts (b) would assist students internalizing the report text structure.

Evaluation

Table 4.1
Strengths and Limitations of Directed Silent Reading

Strengths	Limitations
<ul style="list-style-type: none"> ● activates appropriate schema prior to reading ● provides purpose for reading ● makes visible to students the purpose for questioning using the report text framework (possible metacognitive advantages). 	<ul style="list-style-type: none"> ● less effective used on whole class basis ● less focus on secondary reading strategies (i.e., word identification).

DSR provided students the opportunity to predict, discuss and set a purpose for their reading. Its main strength stems from the fact that it gives students the chance to apply metacognitive strategies to enhance their understanding of the report text structure. The main weakness of the strategy as used in this context, was that it was employed on a whole class basis. Using DSR in this way prevented the teacher from gauging if all students had grasped the components of the report text structure. In hindsight perhaps Discussion Aided Analytical Reading (a variation of DSR) would have proved a more suitable choice of strategy.

Text Reconstruction

Purpose

To provide guided practice (in controlled situations) in the structural components of a text.

Strategy Components

This hands-on strategy involves the following sequence:

- Presentation of jumbled report text paragraphs.
- Students reading the jumbled text pieces to ascertain the purpose of the text.
- Resequencing of the text according to the report text framework.
- Discussion and reflection of the reconstruction process

Rationale

Text reconstruction was chosen because of its focus on the linguistic elements of the report text framework. The activity provides the teacher with an informal assessment of the students' understanding of the macro and micro level elements underpinning the top-level structure of the report text. Sequencing the paragraphs into order not only required a knowledge and understanding of the report text framework but also involved students employing their knowledge of the micropropositional and macropropositional elements which constitute coherent and cohesive text such as topic sentences, discourse markers, logical sequence and anaphora. Students' ability to comprehend discourse markers used in paragraph beginnings and detect the relational links such as "isa" and "hasa" connectors within the report text, were able to be scrutinized by this task. (See p. 48 for description of "isa" and "hasa" connectors.)

Furthermore, the reflection time at the conclusion of the strategy allowed students to discuss and share understandings of the terminology and discourse markers encountered in the text. This aspect of the strategy allowed students time to

consolidate their thinking about the activity and share outcomes of that thinking with others. It was anticipated that in this instance reflection time would enable students to consolidate their understanding of the purpose and function of the report text.

A further reason for the inclusion of this activity, is that the task is student-centred. This means that the teacher has time to observe and monitor the students' ability to categorize and cluster the descriptive, locative and dynamic components of the report text. This time allows the teacher to gauge each students' progress through the experience of the activity as well as enabling the teacher to provide direct intervention and assistance where required.

Evaluation

Table 4.2
Strengths and Limitations of Text Reconstruction

Strengths	Limitations
<ul style="list-style-type: none">● completed at class/small group/individual level● emphasis on linguistic elements linking report text together● opportunity for extension and understanding of report structure● enables discussion of report scaffold and purpose of specific vocabulary	<ul style="list-style-type: none">● considerable preparation time

Text reconstruction proved a valuable strategy by which to reinforce the components of the report text framework at all discourse levels. Its only drawback being the time required for the preparation of the various texts used in each lesson.

Semantic Grid

Purpose

Semantic grids provide a visual way of representing relations between concepts (Pearson & Johnson, 1978; Schwab & Coble, 1985). The semantic grid is a derivative of the semantic feature analysis strategy developed by Pearson and Johnson (1978). The strategy is based on the theoretical construct of cognitive structure as discussed in Chapter 2 (pp. 25-25). This theory postulates that in-head knowledge is stored in semantic networks with criterial attributes being used to categorize and cluster information.

Semantic grids can be used in either pre or post reading settings to enhance comprehension. Specifically the strategy can be used to develop vocabulary and categorization skills, to understand similarities and differences in relationships as well as expand and retain content area vocabulary and concepts.

Strategy Components

- The preparation of a grid matrix by the teacher incorporating the main elements of the report text framework accompanied by report text extracts.
- Students read the information presented in the semantic grid and classify the information using ticks and question marks. A tick indicates known information, a question mark indicates students are not sure about the relationship.

Rationale

This strategy enabled students to demonstrate their knowledge of the report text framework. It was selected for inclusion as it offered another way for the teacher to observe children's understanding of the function and components of the report text structure.

Evaluation

Table 4.3
Strengths and Limitations of Semantic Grid

Strengths	Limitations
<ul style="list-style-type: none">● assists students to organize and categorize report text information● enables students to refine their understanding of the report top-level structure	<ul style="list-style-type: none">● fragmented focus

This strategy offered an alternative way for students to represent their knowledge of the report text framework.

Labelling of Text Extracts

Purpose

This teacher directed activity is aimed at providing instruction in content specific vocabulary. The strategy enables students to learn vocabulary and key concepts related to the topic or concept being studied.

Strategy Components

The main elements of this strategy are:

- Students read short extracts of report text information. (Extracts comprise approximately one - three sentences.)
- Students label the information according to the report text framework, that is, classification, description etc.
- The teacher directs students to circle words indicating specific functions and features, for example verbs and adjectives. (All grammatical terms used were explained to students.)
- The teacher and students discuss and review the task.

Rationale

Johnson and Pearson (1984, p. 3) contend that giving "explicit instruction in vocabulary critical to the understanding of a particular text is imperative." Therefore this task aimed to highlight the function and purpose of the discourse markers and propositional links specific to each part of the report text structure. Through identifying the discourse markers and specific types of verbs relevant to each part of the report text framework students were further sensitized to the micro and macro level elements which constitute the report text top-level structure. (See Chapter 2 p. 53 for detail regarding discourse markers and verbs specific to report text.)

Evaluation

Table 4.4

Strengths and Limitations of Text Labelling

Strengths	Limitations
<ul style="list-style-type: none">● focus on micro/macro elements of report text● review function of verbs and specific discourse markers	<ul style="list-style-type: none">● introduced too soon

This reductionist strategy provided a purposeful focus on the micropropositional and macropropositional elements of the report text structure. The main weakness associated with this strategy in the experimental phase was that due to the strict time schedule the strategy was possibly introduced prematurely, that is, before students had the opportunity to develop a thorough grasp of the report top-level structure.

Role Play

Purpose

Role play is a dramatic device which enables the student to go beyond the words on the page to make meaning. Derived from the work of Heathcote (1983) and Bolton (1985) this technique involves the teacher and students assuming specified roles and participating in the drama or role play.

Strategy Components

This interactive strategy involves the following components:

- The teacher models an interview with an animal. (Teacher is the interviewer, student is the interviewee, student adopts "role" of the selected animal.)
- As the interviewer, the teacher utilizes the key structural questions of the report text framework (i.e., What is it? What does it look like? Where is it found? How does it move?) to elicit information about the animal. The student responds "in role."
- At the conclusion of the interview the teacher debriefs the activity. This involves discussion and reflection of the language used in the role play.
- Other students are selected to adopt the animal role or act as the interviewer.
- Class members pair up and take turns being interviewer/interviewee.

Rationale

Role play was included as an enjoyable and non threatening means by which to reinforce the structural elements of the report text structure. The interview process allowed students to consolidate their knowledge and understanding of the framework questions. Moreover it provided a purposeful context in which to engage students in the language and process of reporting that is, eliciting appropriate information through the asking of key questions as well as active listening.

The debriefing at the conclusion of the role play provided a forum in which to explore and clarify the type of questions asked during the interview. This focus permitted the teacher to highlight how the main structural components of the report text structure could be used to generate information regarding the animal. Finally the oral and interactive involvement required in this activity provided an alternative response to representing the report text knowledge.

Evaluation

Table 4.5
Strengths and Limitations of Role Play

Strengths	Limitations
<ul style="list-style-type: none">● enjoyable● involves students operating in both roles - interviewer and interviewee● alternative means for students to represent understanding of the report text framework	<ul style="list-style-type: none">● difficult to monitor all interviews

The main strength of this strategy was that it provided an enjoyable and interactive means by which to revisit the report text scaffold. The only difficulty experienced with this strategy was that not all interviews could be monitored to ensure that students were on task re asking/responding to the framework questions.

Test/Retest Method

Purpose

To ensure mastery of specific information.

Strategy Components

Two variations of the test/retest method were used in the treatment phase. Both strategy sequences are explained in the following:

Test/Retest Method (a)

- The teacher creates a set of flash cards with report text components and their definitions boldly printed on them.
- Cards are randomly distributed to some class members.
- Students who receive flash cards go to the front of the room where they physically arrange themselves in the sequence of a report text, that is, classification, description, location and dynamics, as well as match up with their appropriate definition. This aspect of the strategy requires a physical and cognitive response to the sequencing of the report text components.
- The rest of the class checks the sequencing of the report text structure. Feedback regarding the process is discussed with the class. While the strategy only involves a few students, the monitoring of the responses requires a whole class effort. This interactive focus ensures students maintain interest and attention to the task.
- Cards are then rejumbled and given to other class members who repeat the process.

Test/Retest Method (b)

- The teacher creates flash cards (class set) with the report text components and definitions printed on cards.
- Cards are randomly distributed to all class members.
- Students mill around room swapping their cards until the teacher calls "match" at which point students must match up with the appropriate label or definition. For example, a student holding a card labelled *dynamics* must match up with a student holding the statement *provides information about how the animal or object moves*.

- Students move into a circle formation as they match up. The teacher moves around the circle checking the match between descriptor and description. Questions/clarification are provided at point of need.
- Cards are rejumbled and the process repeated.

Rationale

This strategy was utilized to determine if students had mastered the definitions of the main elements and function of the report text framework. In order for students to internalize the report framework initial knowledge of its structure was imperative. Therefore the test/retest activities were employed to provide a base from which to build and extend students understanding of the report text framework.

Evaluation

Table 4.6
Strengths and Limitations of Test/Retest Method

Strengths	Limitations
<ul style="list-style-type: none"> ● consolidates understanding of report text framework ● enjoyable ● method (b) involved participation of all students 	<ul style="list-style-type: none"> ● method (a) limited student participation

Test/Retest method proved an appropriate choice of strategy by which to ensure students had learnt the basic framework underpinning the report scaffold. The only difficulty encountered with the strategy was that method (a) required minimal class participation. While test/retest (a) was used considerably in the first few sessions to establish the students' report text schema, version (b) was employed as a fun, revisionary activity in the latter phases of the teaching sequence.

Shared Writing Strategy

Purpose

Shared writing is the process in which the teacher and students share their ideas and decisions in the creation of a text. The teacher models a range of strategies such as planning, drafting, proof-reading, revising and editing during the shared writing process. Discussion and negotiation of the task with students is critical to this process.

Strategy Components

- Following the selection of the topic students brainstorm ideas and suggestions about the animal. The ideas can be generated through various processes such as observation, brainstorming, research from reference texts, discussion or information tape-recorded from role play sessions. The purpose of this phase is to acknowledge available information and determine if further research/information is required to complete the task.
- The ideas recorded in the brainstorm are categorized according to the report text framework. This process permits the teacher to guide students to use their knowledge of the structural components of the report framework to impose order over the generated data.
- Following the classification of the brainstormed information the teacher and students develop a draft report text. The explicit modelling of the writing process allows the teacher to demonstrate metacognitive and metalinguistic decisions being made by the writer during the production of a report text.
- The draft report text is cooperatively proofread and edited.
- The teacher produces the final version of the report text. This text can then serve as a reference in future writing sessions.

Rationale

Shared writing offers teachers and students the chance to work cooperatively on the development of a piece of writing from initial conception to final draft stage. This practice allows the teacher to demonstrate processes such as thinking out loud, editing and proofreading strategies as well as the opportunity to explicitly demonstrate how the report text framework can be used to organize and generate information about an animal.

Evaluation

Table 4.7

Strengths and Limitations of Shared Writing

Strengths	Limitations
<ul style="list-style-type: none">● explicit demonstration of how to organize, structure, proof-read and edit report text● opportunity to observe and participate in process	<ul style="list-style-type: none">● artificial context● time constraints● restricted opportunity to teach functional skills

Modelling the writing of the report text allowed students to see an explicit demonstration of how the micro and macro elements of the report are interwoven to create an informational text. Through this process students observed how the report text scaffold provided an organizing framework on which to hang relevant information. The main limitation of the strategy was that it was a "one-off" demonstration and appeared somewhat contrived. Consequently the opportunity to teach functional skills and strategies at the point of need was severely restricted

Overview of Teaching Approach

All strategies employed in the teaching sequence complemented an wholistic approach to language education. This whole-part-whole approach proved an

effective process to adopt because it established a context for the more fragmented activities involved in the teaching sequence.

The instructional period also afforded students the opportunity to communicate and reflect upon their knowledge of the report text structure. The variety of activities experienced in the three week instruction period allowed students to talk, listen, read, write, represent and reflect on their learning about the report text top-level structure. Students were keenly engaged in all sessions and remained on task throughout the duration of each session.

Whilst the format appeared successful the time frame proved challenging, particularly in the latter sessions where modelled writing and negotiation of text were involved. Time constraints meant there was little opportunity to capitalize on the wealth of 'teachable moments' which arose during the shared writing sessions. Moreover as the lessons were limited to six occasions the urgency to achieve the required objective determined for each lesson produced an almost 'clinical' feel to the lessons.

Time constraints also may have restricted the students internalization and understanding of the report text structure. As the teaching period was confined to two lessons per week over a three week period, this detached and decontextualized situation did not allow for authentic links to other curriculum areas to be established within the classroom setting. Despite these limitations the treatment period enabled the researcher to conduct an effective teaching program within the proposed parameters.

General Description of the Sessions Conducted with the Control Group

As stated previously the control group were involved in the 'reading only' of the report texts. The six sessions conducted with the control group operated according to the following format:

- (1). Distribution of the report text to students.
- (2). Oral reading of the report text by the teacher to the students.
- (3). Silent reading of the report text by the students.
- (4). Distribution of second report text to students.
- (5). Oral reading of text by teacher.
- (6). Silent reading of text by students.
- (7). Collection of report texts.

Full details of the lessons conducted with the experimental and control groups are presented in appendix G.

Post-Treatment

Two post-treatment tests were conducted following the treatment phase. These comprised an immediate and delayed recall test using the Cassowary report text.

Post-test One

Immediately following completion of the treatment phase post-test one was conducted. Students were reassigned to their respective home groups. That is, students in the **structured** text group (control group 1 and experimental group 4) were assembled in classroom 4 C while the **unstructured** text group (control group 2 and experimental group 3) gathered in room 4 B. The Cassowary report text was presented to both groups using the procedures outlined in the administration of pre-test one.

Structured text. The structured text group were given an ordered report text on the Cassowary to read (see appendix C). This text conformed to the Sloan and Latham scientific report text comprising information about the Cassowary presented in paragraphs detailing classification, description, location and dynamics information.

Unstructured text. Students in the unstructured group were given a scrambled report text on the Cassowary to read (see appendix D). This text contained the same content as the structured groups' text, however the sentences were jumbled and interspersed with various categories of information. Thus the text was devoid of an organizing framework.

Administration of post-test one. The Cassowary text was distributed face down to all subjects. A blank sheet for the written recall was also provided. When directed, subjects in each group turned over the text and listened while the presenter(s) read either the scrambled or structured text. Modelled reading was employed to ensure all subjects had an opportunity to process the text. Subjects were given five minutes to read over the text.

When directed by the presenter(s) students turned the expository text face down and recalled the information presented on the Cassowary bird through written recall. (See appendix E for instruction details.)

Post-test Two

Post-test two was conducted following a three week delay in the presentation of the Cassowary text. Subjects were assigned to their respective groups (experimental or control) and asked to provide a written recall of any information available to them on the Cassowary bird. Written recalls were collected and subjected to analysis of variance.

Instrumentation

PAT Test - Comprehension Part 3: Form A

The Progressive Achievement Test revised edition (1986) was used to determine subject's reading ability. This comprehension test consists of eight prose extracts (approx 200-300 words) with accompanying literal and inferential questions. The eight prose extracts used in the test include a variety of text types: narrative text (three extracts) descriptive text (two extracts) and expository text (three extracts).

After reading each extract year four students are asked five multiple choice questions which purport to measure their factual and inferential comprehension. Raw scores from the test are converted to percentile rankings and stanines. Percentile rankings indicate the percentage of the reference group whose scores fall below the score, while stanines represent a type of standard score. For this reason stanines were selected as the criteria on which to determine better and novice readers.

Subjects involved in the study were administered part 3 of the PAT reading comprehension test so as to determine their reading ability. In the context of this study better readers were designated to be those subjects scoring stanines between 6 - 9 on the PAT. Novice readers were classified as those subjects registering stanines between 1 - 5 on the PAT. Although this ranking is quite severe in comparison to the guidelines described in the PAT manual, it was considered necessary in order to ensure a distinction between better and novice readers in the context of this investigation.

Pre- and Post-Test Report Texts

In order to assess children's recall and utilization of the scientific report top-level structure it was necessary to devise appropriate report texts to be used in the study. Two texts were required for the purposes of the investigation. In order to

reduce the impact of prior knowledge two unusual and little known animals were selected and a report text adhering to the scientific report framework was constructed. The animals chosen were the Malayan Tapir and the Cassowary.

Structured texts. As a suitable report text on either of these animals was not located, various encyclopaedic and animal reference texts were consulted to provide an accurate description of each animal. Using this data, report texts adhering to the scientific report text were constructed on the Malayan Tapir and the Cassowary (see appendices A and C). These texts served as the structured text in the pre-test and post-test situations.

Unstructured texts. The unstructured or scrambled texts were created by taking the concept information (sentences) presented in each structured script and rearranging the sentences in random fashion so that the text was devoid of an organizing structure. Where sentences contained several concepts such as: "This flightless bird has black, glossy feathers which hang loosely on its body looking more like hair than feathers." the sentence was broken down into smaller idea units, that is: "This flightless bird has black glossy feathers. The feathers hang loosely on the Cassowary's body. The feathers look more like hair than feathers." These sentences were then randomly placed throughout the unstructured text format.

Texts used in the treatment phase. Texts employed in the treatment phase for both control and experimental groups were taken from Sloan and Latham's (1989) publication "Animal Reports." Additional report texts were created for the control group using the same procedure as outlined above in the creation of the test texts. The experimental group's jointly constructed text on the Kangaroo was also included as part of the control group's report text selection.

This chapter has provided a detailed account of the design and procedural issues involved in the administration of this study. Full details of the lesson plans and report texts employed in the teaching phase are located in the appendices.

CHAPTER 5

RESULTS AND DISCUSSION OF THE FINDINGS

This study investigated the effects of teaching a specific memory based top-level structure on Year Four students' recall and organization of content information. The investigation was conducted over a three week period during which time the experimental group was taught the scientific report text top-level structure explicitly while the control group was involved in the reading of scientific report texts. Written recalls produced by the students in the pre-test and post-test conditions were used to determine if any treatment effects occurred.

Procedures Used to Analyse Data

The four written recalls (pre-test: immediate recall and delayed recall, post-test: immediate recall and delayed recall) were subjected to two analyses. Firstly, the recalls were examined to determine the number of concept items remembered by students. The second analysis involved determining if the written recalls demonstrated evidence of students employing the report top-level structure to organize their writing. The results of these analyses are reported in this chapter.

Subjects involved in the investigation were divided into a three tier hierarchy for analysis purposes (see Figure 4.2). There were four test situations for each control and experimental group, and two types of analyses were conducted at three different levels. Therefore level one results are reported with eight sub-groups, level two with sixteen and level three with thirty two sub-groups. Figure 5.1 illustrates the grouping arrangement for the analyses purposes

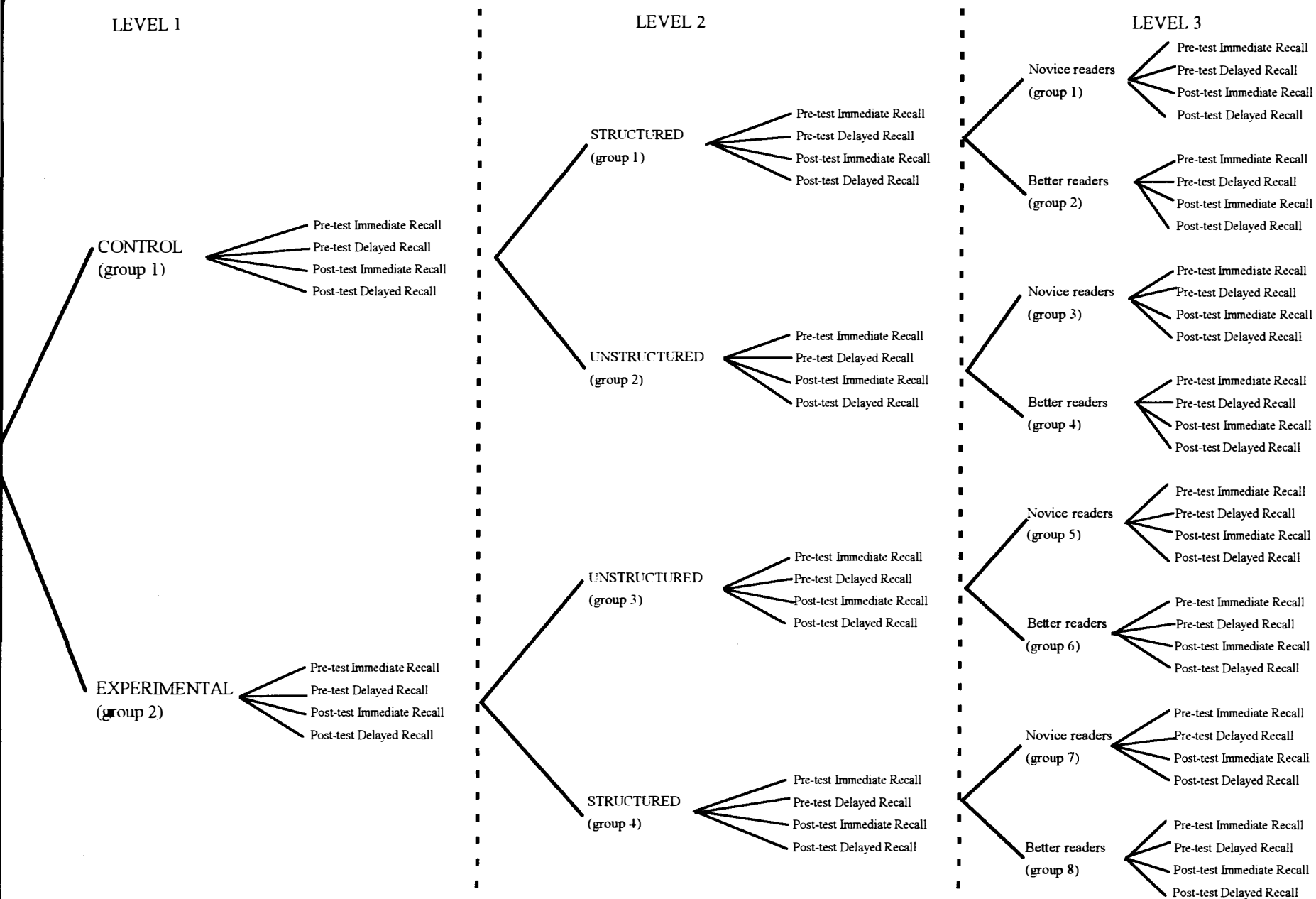


Figure 5.1 Grouping for analysis purposes for both number of concepts recalled and evidence of structure.

In order to determine whether there were any treatment effects, an analysis of variance (ANOVA) and *post hoc* tests were administered. The general purpose of an analysis of variance is to determine if there are significant differences between the means of the groups. An ANOVA was conducted for each group level. This means that three ANOVAS were conducted for each variable (number of concepts recalled, NCR; and evidence of structure, ES). For example, at level 1 ANOVA was conducted on the eight mean scores of the following test conditions: (NCR: Pre-test immediate recall, pre-test delayed recall, post-test immediate recall and post test delayed recall; ES: Pre-test immediate recall, pre-test delayed recall, post-test immediate recall and post test delayed recall). As each condition is presented separately, the results of the ANOVA will be restated each time it is relevant. Similarly one ANOVA was conducted at level 2 (16 test conditions) and one ANOVA was conducted at level 3 (32 test conditions). The results of these ANOVAS are included in appendices I and J).

The Student-Newman-Keuls' Multiple Comparison Procedure from the Statistica statistical analysis package (Statistica, 1992) was used to identify where the differences were located. This procedure compares each group with every other group to determine where differences occur for example, in a comparison of 4 groups, comparisons conducted between groups 1 and 2, 1 and 3, 1 and 4, 2 and 3, 2 and 4, 3 and 4. Results from The Student-Newman-Keuls' procedure are tabled in matrix format. Group comparisons are indicated with an * , those comparisons showing a significant difference are indicated ** . Probability levels were set at a five per cent level of significance ($p < .05$). (Only significant results are presented in the body of the text, the remainder are in appendices I-K).

The Student-Newman-Keuls' Test was selected for use in this study as it provided a more conservative analysis of the data than other multiple comparison

procedures. Dowdy and Wearden (1991) in an analysis of five multiple comparison procedures:

1. Fisher's Least Significant Difference;
2. Duncan's Multiple Range Test;
3. The Student-Newman-Keuls' Procedure;
4. Tukey's Honestly Significant Difference; and
5. Scheffe's Method

argue that The Student-Newman-Keuls' Procedure is more conservative than Fisher's and Duncan's but less conservative than Tukey's and Scheffe's. Its value is that being more conservative than Fisher's and Duncan's it is less likely to produce Type I errors (rejection of correct H). However it is not so conservative that it leads to Type 2 errors (acceptance of incorrect H).

Tables displaying means and standard deviations for each group (see Figure 5.1) at the various test conditions are presented in the following pages. The tables relate to the variable, number of concepts recalled.

Table 5.1
Number of Concepts Recalled by Group, Pre-treatment, Immediate Recall
Condition (Level 1)

Condition	Group	<u>n</u>	Mean	SD
Control	1	35	9.71	5.40
Experimental	2	34	7.50	3.23

Table 5.2
Number of Concepts Recalled by Text Group, Pre-treatment, Immediate Recall Condition (Level 2)

Condition		Group	<u>n</u>	Mean	SD
Control	Structured	1	17	9.47	5.88
	Unstructured	2	18	9.94	5.06
Experimental	Unstructured	3	17	7.64	3.53
	Structured	4	17	7.35	2.99

Table 5.3
Number of Concepts Recalled by Performance Group, Pre-treatment, Immediate Recall Condition (Level 3)

Condition			Group	<u>n</u>	Mean	SD
Control	Structured	Novice	1	9	6.11	4.01
	Structured	Better	2	8	13.25	5.47
	Unstructured	Novice	3	8	7.62	5.50
	Unstructured	Better	4	10	11.85	4.04
Expl	Unstructured	Novice	5	7	7.00	4.08
	Unstructured	Better	6	10	8.1	3.24
	Structured	Novice	7	8	6.5	1.85
	Structured	Better	8	9	8.11	3.68

Table 5.4
Number of Concepts Recalled by Group, Pre-treatment, Delayed Recall Condition (Level 1)

Condition	Group	<u>n</u>	Mean	SD
Control	1	35	5.14	3.45
Experimental	2	34	3.80	2.51

Table 5.5
Number of Concepts Recalled by Text Group, Pre-treatment, Delayed Recall Condition (Level 2)

	Condition	Group	<u>n</u>	Mean	SD
Control	Structured	1	17	4.64	2.69
	Unstructured	2	18	6.11	4.07
Expl	Unstructured	3	17	4.05	2.84
	Structured	4	17	3.52	2.18

Table 5.6
Number of Concepts Recalled at Performance Group Level, Pre-treatment, Delayed Recall Condition (Level 3)

	Condition		Group	<u>n</u>	Mean	SD
Control	Structured	Novice	1	9	4.11	3.33
	Structured	Better	2	8	5.25	1.75
	Unstructured	Novice	3	8	5.00	4.40
	Unstructured	Better	4	10	6.1	3.95
Expl	Unstructured	Novice	5	7	3.71	2.92
	Unstructured	Better	6	10	4.6	2.87
	Structured	Novice	7	8	2.75	1.90
	Structured	Better	8	9	4.22	2.27

Table 5.7
Number of Concepts Recalled at Group Level, Post-treatment, Immediate Recall Condition (Level 1).

	Condition	Group	<u>n</u>	Mean	SD
	Control	1	35	13.48	7.31
	Experimental	2	34	15.29	6.46

Table 5.8
Number of Concepts Recalled at Text Group Level, Post-treatment, Immediate Recall Condition (Level 2).

	Condition	Group	<u>n</u>	Mean	SD
Control	Structured	1	17	14.1	8.63
	Unstructured	2	18	12.8	5.99
Expl	Structured	3	17	14.0	6.20
	Unstructured	4	17	16.5	6.65

Table 5.9
Number of Concepts Recalled at Performance Group Level, Post-treatment, Immediate Recall Condition (Level 3).

	Condition		Group	<u>n</u>	Mean	SD
Control	Structured	Novice	1	9	7.88	4.34
	Structured	Better	2	8	21.10	6.55
	Unstructured	Novice	3	8	9.62	5.92
	Unstructured	Better	4	10	15.0	4.85
Expl	Unstructured	Novice	5	7	9.8	3.62
	Unstructured	Better	6	10	16.9	6.08
	Structured	Novice	7	8	15.5	6.14
	Structured	Better	8	9	17.5	7.29

Table 5.10
Number of Concepts Recalled at Group Level, Post-treatment, Delayed Recall Condition (Level 1).

Condition	Group	<u>n</u>	Mean	SD
Control	1	35	0.17	0.38
Experimental	2	34	0.73	0.44

Table 5.11
Number of Concepts Recalled at Text Group Level, Post-treatment, Delayed Recall Condition (Level 2)

Condition		Group	<u>n</u>	Mean	SD
Control	Structured	1	17	6.88	4.76
	Unstructured	2	18	9.38	6.24
Expl	Unstructured	3	17	9.05	3.63
	Structured	4	17	8.17	3.81

Table 5.12
Number of Concepts Recalled at Performance Group Level, Post-treatment, Delayed Recall Condition (Level 3)

Condition			Group	<u>n</u>	Mean	SD
Control	Structured	Novice	1	9	4.44	3.24
	Structured	Better	2	8	9.62	4.86
	Unstructured	Novice	3	8	6.62	4.24
	Unstructured	Better	4	10	11.6	6.88
Expl	Unstructured	Novice	5	7	8.71	3.03
	Unstructured	Better	6	10	9.30	4.13
	Structured	Novice	7	8	8.25	3.84
	Structured	Better	8	9	8.11	4.01

Reporting of Results

The results of the students' performances are reported in three sections. The first section reports the results and discussion of the students' performances in the number of concept items recalled in the two pre-treatment tests and the two post-treatment tests. This section relates directly to research questions one and two and the eight hypotheses generated from these questions.

Analysis two reports the results of the students' performances in their use of the scientific report text top-level structure in the same four tests. Results and discussion presented in this segment relate to research questions three and four and the eight associated hypotheses, that is, hypotheses 9-16.

The third section looks at the change in the students' performances over time. The latter examines the impact of the two variables (number of concepts recalled and evidence of structure) on the students' performances in each of the three group levels throughout the duration of the study. This section relates to research questions five and six and their related hypotheses.

Analysis 1: Concept Items Recalled

This section presents the findings of the comparisons of the means between the groups in the number of concept items recalled. ANOVA and The Student-Newman-Keuls' multiple comparison procedure were used for the three group levels in the number of concepts recalled (NCR) in the pre-test and post-test conditions. Two pre-treatment procedures (immediate and delayed recall) and two post-treatment procedures (immediate and delayed recall) were involved in the study. The results for each of the three groups in the pre-treatment and post-treatment situations are reported in this segment of the chapter.

Pre-Treatment

The following data reports the results in the immediate and delayed recall tests in the number of concept items recalled by students at the three group levels prior to the treatment.

Immediate Recall

These results report the mean number of concept items recalled by students immediately following the presentation of the Malayan Tapir text.

performance group level shows a significant difference ($F = 8.28$, $df = 31,69$ $p < .000$).

The Student-Newman-Keuls' results comparing the 32 groups (see Figure 5.1) indicates that there are no differences between any of the control and any of the experimental cohorts in the number of concepts recalled at the performance group level in the immediate recall condition.

Summary immediate recall. The results of the three pre-tests reveal that there were some differences between the control and experimental groups (group level 1) prior to the treatment phase. However, as these differences favoured the control group and only occurred in some categories the researcher decided to continue with the experiment. If, in spite of these initial differences, the experimental group still showed greater gains than the control group after treatment, then the success of the treatment would be obvious. Although a limitation of this approach is that it could be argued that in a situation where no difference is detected, a real difference could have been masked because of the lack of equivalence between the two groups.

Delayed Recall

The following discussion reports the results in the number of concept items recalled by the experimental population following a three week delay in the presentation of the Malayan Tapir text.

Group level 1. ANOVA conducted at this level for the 4 groups revealed a significant difference ($F = 20.62$, $df = 7,69$ $p < .000$).

The Student-Newman-Keuls' data indicates no significant differences between any of the 4 control and any of the 4 experimental groups (see Figure 5.1) following the delay period. For means see table 5.4.

Group level 2. This analysis reports the results for the four text groups (see Table 5.5). ANOVA conducted at the text group level for the 8 control and 8 experimental groups (see Figure 5.1) reveals significant differences ($F = 9.94$, $df = 15,69$ $p < .000$).

Examination of The Student-Newman-Keuls' results for the text group level indicates no differences between any of the control and any of the experimental groups (see Appendix I).

Group level 3. ANOVA conducted at this level for the 16 control and 16 experimental cohorts shows a significant result ($F = 8.28$, $df = 31,69$ $p < .000$). See Figure 5.1

The Student-Newman-Keuls' procedure reveals that there are no differences in the mean number of concept items recalled between any of the control and any of the experimental cohorts (see Appendix I). For means see Table 5.6.

Summary delayed recall. Results from the three pre-tests for the delayed recall condition reveal that there were no differences between the control and experimental populations at the group, text group and performance group levels.

Pre-Test Summary

The results from the six tests conducted prior to the treatment reveal some differences between the control and experimental cohorts. Although specific measures were adopted to ensure homogeneity between the groups, the tabled

results indicate the control group performed better than the experimental group at the group level immediate recall condition. Despite these differences the results were not considered a threat to the validity of the experiment as the differences favoured the control group. Therefore, if as a result of the treatment, differences are found which favour the experimental group, then this gives greater strength to the effect of the treatment.

Post-Treatment

This section presents the results related to the number of concept items recalled by students in the two post-treatment tests (immediate and delayed recall). Written recalls were analysed to determine the number of concept items remembered by students at each of the three group levels.

Immediate Recall

These results report the number of concept items recalled by students immediately after the presentation of the Cassowary report text.

Group level 1. ANOVA conducted for the group level shows a significant result ($F = 20.62$, $df = 7,69$ $p < .000$).

Analysis of The Student-Newman-Keuls' procedure reveals no significant differences between any of the control and any of the experimental groups in the mean number of concept items recalled. For means see Table 5.7.

Group level 2. In this analysis the mean number of concept items recalled by the text group is presented (see Table 5.8). ANOVA recorded for the text group level reveals significant differences ($F = 9.94$, $df = 15,69$ $p < .000$).

The Student-Newman Keuls' results comparing the 8 control and 8 experimental groups (see Figure 5.1) indicates that there are no significant differences between any of the control and any of the experimental cohorts.

Group level 3. In the next analysis the mean number of concepts recalled by the 8 groups constituting the performance group are presented (see Table 5.9). This level of analysis involved a comparison of 32 groups. ANOVA recorded for the performance group level indicated a significant result ($F = 8.28, df = 31,69 p < .000$).

Analysis of The Student-Newman-Keuls' multiple comparison procedure comparing the control and experimental cohorts as shown in Figure 5.3 reveals significant differences between the control and experimental cohorts.

	1	2	3	4	5	6	7	8
1								
2	**							
3	*	**						
4	**	*	*					
5	*	**	*	*				
6	**	*	**	*	**			
7	**	*	*	*	*	*		
8	**	*	**	*	**	*	*	

Note: * = Comparison control = odd nos
 ** = Significant difference (.05) experimental = even nos

Figure 5.3 The Student-Newman-Keuls' results indicating the pairwise comparisons for the performance group level at the post-test immediate recall condition (NCR 3).

Differences are detected between groups 1 (control, structured, novice readers) 3 (control, unstructured, better readers) and 5 (experimental, unstructured, novice readers) and the remainder of the performance groups, that is groups 2, 4, 6, 7 and 8.

Summary immediate recall. The post-treatment test results for the immediate recall condition indicate there were no differences between the control and experimental populations at either the group (control vs experimental) or text group (control vs experimental, structured vs unstructured, better vs novice readers) level. Significant differences in the mean number of concepts recalled were recorded at the performance group level (control vs experimental, structured vs unstructured, better vs novice readers).

Delayed Recall

The next section reports the mean number of concept items recalled by the students following a three week delay in the presentation of the Cassowary text.

Group level 1. The analysis of variance conducted on the 8 groups involved at the group level (see Figure 5.1) reveals a significant result ($F = 20.62$, $df = 7,69$ $p < .000$).

Analysis of The Student-Newman-Keuls' results reveals there is no difference between any of the control and any of the experimental cohorts. For means see Table 5.10.

Group level 2. The data presented in this analysis shows the mean number of concept items recalled at the text group level (see Table 5.11). ANOVA conducted for this level shows a significant result ($F = 9.94$, $df = 15,69$ $p < .000$).

Examination of the Student Newman-Keuls' results indicates no differences between the control and experimental cohorts (see appendix I).

Group level 3. The number of concept items recalled by the performance group following a three week delay in the presentation of the Cassowary text is reported in table 5.12. ANOVA conducted at the performance level reveals a significant difference ($F = 8.28$, $df = 31,69$ $p < .000$).

The Student-Newman-Keuls' results comparing the control and experimental cohorts (see Figure 5.1) shows that there are no differences between any of the control and any of the experimental groups.

Delayed recall summary. The results of the three post-tests for the delayed recall condition reveal that there were no significant differences between the control and experimental cohorts at either the group (control vs experimental) text group (control vs experimental, structured vs unstructured) or performance group level (control vs experimental, structured vs unstructured, better vs novice readers) in their ability to recall an increased number of concept items.

Post-Test Summary

The results tabled in this section indicate that there were no significant differences between the control and experimental populations in the number of concept items remembered at the group and text group levels in either the immediate or delayed recall conditions. Significant differences were however detected in the performance groups' results at the immediate recall condition, thus indicating a treatment effect. The treatment effect recorded by the experimental performance group at the immediate recall condition was not maintained over time as evidenced in the data presented in table 5.12 and The Student-Newman-Keuls' results.

Summary of Findings of Analysis 1

This section has reported the mean number of concept items recalled by the students in the immediate and delayed recall tests before and after treatment.

Despite precautionary measures, for example, randomization of groups, to ensure a similar distribution of performance levels, some differences between the control and experimental population were recorded prior to the treatment phase. As these differences were found to favour the control group they were not considered a threat to the validity of the experiment.

The post-test results show that the treatment had no effect at the group and text group levels in the immediate and delayed recall condition on the students' ability to improve the recall of concept information. Analyses at the performance group level did indicate a treatment effect at the immediate recall condition. This effect was not maintained over the delay period.

The differences recorded at the performance group level suggest a contrast between performance group 1 (control, structured, novice readers) 3 (control, unstructured, novice readers) and 5 (experimental, unstructured, novice readers) and the remainder of the performance group population. Possible reasons accounting for these differences are explored in the discussion section.

Overall the results suggest that the treatment had minimal impact on improving the students' retention of facts.

Discussion of Analysis 1

The purpose of analysis 1 was to determine if the teaching of the memory based scientific report top-level structure enhanced children's organization of textual information by increasing the number of concept items recalled by students. In essence the investigation sought to determine if students given instruction in the report text structure would recall more concepts than students not given training.

This section of the discussion underpins research questions one and two and the 8 hypotheses relating to these questions. The hypotheses were concerned with differences occurring between the control and experimental groups in the number of concepts recalled at each performance level. Eight of the hypotheses were supported, with a subset of hypotheses 1, 3 and 4, that is, hypothesis 1 (a) 3 (c) and 4 (c) which related to no difference occurring at the group (control vs experimental) and performance group level (control vs experimental, structured vs unstructured, better vs novice readers) being rejected. Generally the results indicate that the teaching of the report text top-level structure had little effect on improving students' recall of factual data.

In the pre-test immediate recall condition differences were detected at the group level. As this difference was found to favour the control group no threat to the validity of the experiment was considered. Moreover if an effect had been detected this would have given greater testimony to the improved recall effects of the treatment.

At the performance group level, post-treatment, immediate recall condition, differences in the number of concept items remembered were detected between performance groups 1 (control, structured, novice readers), 3 (control, unstructured, novice readers) and 5 (experimental, unstructured, novice readers) and the remainder of the performance groups. A possible explanation accounting for these differences is that all three groups consisted of students designated novice readers.

Although performance group 1 worked with structured text it appears that the readers in this group were unable to exploit the report text structure to their processing advantage. That is, these students were unable to use the report text structure as a cognitive hook or organizing device on which to 'hang' the relevant

information. Similarly the novice readers in groups 3 and 5 dealing with the added complication of jumbled text were unable to cluster the data efficiently to assist them in their recall of concept items. Moreover performance group 5 (experimental, unstructured, novice readers) despite training in the report text structure, still experienced difficulty in recalling concept items.

While it is plausible that these novice readers were not sensitized to text structure as a means of clustering data and therefore improving their recall it could also be argued that the novice readers given training in the top-level structure simply were not provided a suitable time frame in which to internalize and consolidate the elements and framework of top-level structure. Research findings (Derry & Murphy, 1986; Armbruster, Anderson & Ostertag, 1987) show that poor readers often require longer periods of training and practice before an effect is determined. Considering this data, it is likely that there may have been insufficient training time for the novice readers in this study.

Novice readers' inability to cluster information may also be related to affect. That is, novice readers' being passive in the reading situation may simply have allowed the text to 'wash over' them and not endeavoured to utilize any strategic processing of the data to assist recall. Such behaviour is consistent with the research in this area. Firstly, poor (novice) readers often do not activate appropriate prior knowledge to process text (Meyer, Brandt & Bluth, 1980; Garner, 1987) and secondly they do not have an adequate text structure schema to assist them in the processing of expository text material (Paris & Jacobs, 1984; Afflerbach & Johnson, 1986). Confronted by various task demands poor readers often resort to non-strategic behaviour in recalling information such as, the random listing of concept items (Meyer, 1980; Morris & Stewart-Dore, 1984; Afflerbach & Johnston, 1986).

In a similar vein the difference in the mean number of concept items recalled by performance groups 2 (control, structured, better readers) and 4 (control, unstructured, better readers) confirms previous research regarding structure awareness and strategic behaviour observed with better readers (Baker & Brown, 1980; Garner & Reis, 1981; Forrest-Pressley & Waller, 1984; Garner, 1987) and offers further insight into the use of top-level structure. The improved performance of the two control sub-groups (better readers: structured and unstructured text) may be attributed to the fact that these students possibly already utilize a text structure schema which assists in the classification and recall of expository text data. Furthermore the 'reading only' situation may have afforded these 'better' readers the opportunity to consolidate their metacognitive skills. This improved performance therefore suggests that for better readers the opportunity to read and reflect (monitor their comprehension) possibly empowers and enhances an already established text structure schema.

Despite what in essence was a saturation of the report text structure for the experimental group, the students in group 5 (unstructured, novice) were unable to exploit the categorization of the data to their processing advantage. The relatively poor performance of these readers could be argued in four ways. Firstly, these designated 'novice' readers may not have possessed a text structure schema and therefore were not sensitized to this aspect of text organization. Secondly the training period may have been insufficient to allow these readers to internalize these metacognitive strategies and apply them to the processing of expository text. The third reason may be due to the fact that the treatment dealt with structured report texts and these readers were exposed to unstructured text in the testing situation. This situation may have proved too complicated for these readers, who possibly possessing an embryonic text structure schema may not have made the connection/generalization to the categorization of the data. Finally these novice readers may have made inadequate use of their memory to organize the data.

While the eight null hypotheses related to the recall of concept information are accepted, the patterns of response noted amongst the performance groups in the control and experimental situations provides data which align with research findings in the field of top-level structure. The findings highlighted in this section support the documented data on the ineffective, non strategic behaviour of poor readers in the processing of expository material as well as the superior performance of better readers in the use of top-level structure.

Summary of analysis 1. This section has examined the results of the teaching of the report text top-level structure on the number of concept items recalled by students. Generally the results show that the teaching of the scientific report text macrostructure had minimal effect on increasing the number of concept items recalled by subjects. Although significant differences were recorded at the post-treatment performance group level immediate recall condition, these results were not maintained over time. Therefore the results are taken to conclude that in this study the teaching of the memory-based report top-level structure had minimal effect on increasing the students' recall of concept items.

Analysis 2: Use of Report Text Structure

The second analysis focused on the subjects' organization of recalled data according to the scientific report text structure. These results were concerned with the students structuring of their written protocols according to the schematic framework of the scientific report text macrostructure.

Reporting of Results

The tables presented in this section show the students' attempts to use the report text framework to organize their written recalls. Assessment of the students' recalls to determine use of the text structure involved a rigorous analysis of the written protocols as described in the methodology section.

Tables for the variable, evidence of text structure are presented as follows. As in the previous analysis, the data is presented for the three group levels: group level, text group level and performance group level.

Table 5.13
Use of Report Structure at Group Level, Pre-treatment, Immediate Recall Condition (Level 1)

Condition	Group	<u>n</u>	Mean	SD
Control	1	35	0.17	0.38
Experimental	2	34	0.14	0.35

Table 5.14
Use of Report Structure at Text Group Level, Pre-treatment, Immediate Recall Condition (Level 2).

	Condition	Group	<u>n</u>	Mean	SD
Control	Structured	1	17	0.17	0.39
	Unstructured	2	18	0.16	0.38
Expl	Structured	3	17	0.11	0.33
	Unstructured	4	17	0.17	0.39

Table 5.15
Use of Report Structure at Performance Group Level, Pre-treatment, Immediate Recall Condition (Level 3).

	Condition	Group	n	Mean	SD
Control	Structured	Novice	1	9	0.22
	Structured	Better	2	8	0.12
	Unstructured	Novice	3	8	0.25
	Unstructured	Better	4	10	0.1
Expl	Unstructured	Novice	5	7	0.00
	Unstructured	Better	6	10	0.20
	Structured	Novice	7	8	0.12
	Structured	Better	8	9	0.22

Note. A mean of 0.00 indicates that students did not produce a structured recall.

Table 5.16
Use of Report Text Structure at Group Level, Pre-treatment, Delayed Recall Condition (Level 1).

Condition	Group	n	Mean	SD
Control	1	35	0.08	0.28
Experimental	2	34	0.02	0.17

Table 5.17
Use of Report Text Structure at Text Group Level, Pre-treatment, Delayed Recall Condition (Level 2).

	Condition	Group	n	Mean	SD
Control	Structured	1	17	0.05	0.24
	Unstructured	2	18	0.11	0.32
Expl	Unstructured	3	17	0.05	0.24
	Structured	4	17	0.00	0

Table 5.18

Use of Report Structure at Performance Group Level, Pre-treatment, Delayed Recall Condition (Level 3).

	Condition	Group	<u>n</u>	Mean	SD
Control	Structured	Novice	1	9	0.00
	Structured	Better	2	8	0.12
	Unstructured	Novice	3	8	0.12
	Unstructured	Better	4	10	0.1
Expl	Unstructured	Novice	5	7	0.00
	Unstructured	Better	6	10	0.1
	Structured	Novice	7	8	0.00
	Structured	Better	8	9	0.00

Note. A mean of 0.00 indicates that students did not produce a structured recall.

Table 5.19

Use of Report Text Structure at Group Level, Post-treatment, Immediate Recall Condition (Level 1).

Condition	Group	<u>n</u>	Mean	SD
Control	1	35	0.22	0.42
Experimental	2	34	0.91	0.28

Table 5.20

Use of Report Text Structure at Text Group Level, Post-treatment, Immediate Recall Condition (Level 2).

	Condition	Group	<u>n</u>	Mean	SD
Control	Structured	1	17	0.23	0.43
	Unstructured	2	18	0.22	0.42
Expl	Unstructured	3	17	0.82	0.39
	Structured	4	17	1.00	0

Table 5.21
Use of Text Structure at Performance Group Level, Post-treatment, Immediate Recall Condition (Level 3).

Condition			Group	<u>n</u>	Mean	SD
Control	Structured	Novice	1	9	0.33	0.5
	Structured	Better	2	8	0.12	.35
	Unstructured	Novice	3	8	0.25	.46
	Unstructured	Better	4	10	0.2	.42
Expl	Unstructured	Novice	5	7	0.85	.37
	Unstructured	Better	6	10	0.8	.42
	Structured	Novice	7	8	1.00	0
	structured	Better	8	9	1.00	0

Table 5.22
Use of Report Text Structure at Group Level, Post-treatment, Delayed Recall Condition (Level 1).

Condition	Group	<u>n</u>	Mean	SD
Control	1	35	0.17	0.38
Experimental	2	34	0.73	0.44

Table 5.23
Use of Text Structure at Text Group Level, Post-treatment, Delayed Recall Condition (Level 2).

Condition		Group	<u>n</u>	Mean	SD
Control	Structured	1	17	0.11	0.33
	Unstructured	2	18	0.22	0.42
Expl	Unstructured	3	17	0.76	0.43
	Structured	4	17	0.70	0.46

Table 5.24
Use of Text Structure Performance Group Level, Post-treatment, Delayed Recall Condition (Level 3).

Condition			Group	<u>n</u>	Mean	SD
Control	Structured	Novice	1	9	0.11	0.33
	Structured	Better	2	8	0.12	0.35
	Unstructured	Novice	3	8	0.25	0.46
	Unstructured	Better	4	10	0.27	0.42
Expl	Unstructured	Novice	5	7	0.85	0.37
	Unstructured	Better	6	10	0.7	0.48
	Structured	Novice	7	8	0.7	0.46
	Structured	Better	8	9	0.66	0.5

Pre-Treatment

This section reports the students' use of the scientific report text top-level structure to organize their written protocols prior to the treatment. Results are presented for the pre-treatment immediate and delayed recall tests for the three group levels.

Immediate Recall

These results report the control and experimental students' use of the report text macrostructure to organize their written protocols immediately following the reading of the Malayan Tapir text

Group level 1. ANOVA conducted at the group level reveals a significant difference between the control and experimental cohorts ($F = 29.06$, $df = 7,69$ $p < .000$). See Table 5.13 for means.

The Student-Newman-Keuls' data for this level shows no differences between any of the control and any of the experimental cohorts in the use of the report text structure to organize the written protocols (see appendix J).

Group level 2. ANOVA conducted at the text group level shows a significant result ($F = 13.60$, $df = 15,69$ $p < .000$).

The Student-Newman-Keuls' results comparing the 8 control and 8 experimental cohorts at the text group level (see Figure 5.1) indicates no differences between any of the control and any of the experimental cohorts. See Table 5.14 for means.

Group level 3. ANOVA conducted at the performance group level reveals significant results ($F = 6.47$, $df = 31,69$ $p < .000$).

Student-Newman-Keuls' multiple comparison procedure comparing the 16 control and 16 experimental cohorts (see Figure 5.1) indicates that there are no significant differences between the control and experimental groups in the use of the report text structure to organize written protocols. See Table 5.15 for means.

Summary immediate recall. Test results from the pre-treatment immediate recall condition demonstrate that there were no differences between the control and experimental populations at any of the three group levels in their ability to structure recalled information.

Delayed Recall

This section presents the data relating to the students' use of the report text structure to organize their written protocols following a three week delay in the presentation of the Malayan Tapir text.

Group level 1. This analysis relates to the data reported in table 5.16. ANOVA conducted for this level reveals a significant result ($F = 29.06$, $df = 7,69$ $p < .000$).

The Student-Newman-Keuls' results for this level indicates no differences between the control and the experimental groups in the use of the top-level structure to organize written recalls (see appendix J).

Group level 2. ANOVA conducted for the text group level reveals a significant result ($F = 13.60$, $df = 15,69$ $p < .000$).

Examination of the Student Newman-Keuls' results indicates that there are no significant differences between any of the control and any of the experimental cohorts at the text group level. See table 5.16 for means.

Group level 3. In this analysis data is presented regarding the performance groups' use of the report text macrostructure following a delay period (see Table 5.18). ANOVA conducted at the performance group level shows a significant result ($F = 6.47$, $df = 31,69$ $p < .000$).

The Student-Newman-Keuls' results reveal that there are no significant differences between the means of the control and experimental groups at the performance group level in their ability to organize their written protocols according to the report text structure.

Summary delayed recall. The test results tabled in this section report the students' use of the report text top-level structure to organize their written recalls following a three week delay in the presentation of the Malayan Tapir text. The data presented shows that there were no significant differences between the control and experimental populations at all three group levels in the use of the scientific report text structure to organize written protocols.

Pre-test Summary

The results of the six pre-tests in the use of the report text top-level structure to organize written recalls confirm the predictions made in the previous chapter. That is, no significant differences between the control and experimental groups are detected at either the group level, text group level or performance group level in the immediate and delayed recall conditions. Thus it appears that subjects showed little awareness of using the scientific report text top-level structure to organize their written recalls.

Post-Treatment

Following the treatment phase students were read a structured or unstructured text on the Cassowary bird and asked to record in writing any information about the bird they could remember (immediate recall). Three weeks later students were asked to recall any information about the Cassowary in a written protocol (delayed recall). Students' written protocols were examined to determine if subjects had utilized the report text top-level structure to organize their written recalls. The results of this analysis are tabled in this section.

Immediate Recall

These results report the control and experimental students' use of the report text macrostructure to organize their written protocols immediately following the reading of the Cassowary text.

Group level 1. ANOVA conducted at the group level reveals significant results between the control and experimental cohorts ($F = 29.06$, $df = 7,69$ $p < .000$). See table 5.19 for means.

The Student-Newman-Keuls' results as displayed in figure 5.4 indicates that there are significant differences between the control and experimental cohorts in the use of the top-level structure to organize written recalls.

	1	2	3	4	5	6	7	8
1								
2	*							
3								
4			*					
5								
6					**			
7								
8							**	

Note: * = Comparison control = odd nos
 ** = Significant difference (.05) experimental = even nos

Figure 5.4 The Student-Newman-Keuls' results indicating the pairwise comparisons for the group level for the variable evidence of structure. Comparisons are shown for the four test conditions ES 1- ES 4.

Group level 2. ANOVA conducted at the text group level indicated a significant result ($F = 13.60, df = 15,69, p < .000$). See table 5.20 for means.

The Student-Newman-Keuls' results detailed in figure 5.5 reveals that there are significant differences between the control and experimental cohorts in the use of the report text structure to organize written protocols. The differences occur between groups 1 and 3, 1 and 4, 2 and 3, 2 and 4, that is, between the control and experimental cohorts.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1																
2	*															
3	*	*														
4	*	*	*													
5																
6					*											
7					*	*										
8					*	*	*									
9																
10									*							
11									**	**						
12									**	**	*					
13																
14													*			
15													**	**		
16													**	**	*	

Note: * = Comparison control = odd nos
 ** = Significant difference (.05) experimental = even nos

Figure 5.5 The Student-Newman-Keuls' results indicating the pairwise comparisons for the text group level for the variable evidence of structure. Comparisons shown are for the four test conditions ES 1- ES 4.

Immediate recall level 3. ANOVA conducted at the performance group level reveals significant differences in the students' use of the report text structure to organize their written protocols ($F = 6.47$, $df = 31,69$ $p < .000$).

The Student-Newman-Keuls' results depicted in figure 5.6 indicates a contrast between groups 1, 2, 3 and 4 and groups 5, 6, 7 and 8 that is, between the control and experimental cohorts. See table 5.21 for means.

	1	2	3	4	5	6	7	8
1								
2	*							
3	*	*						
4	*	*	*					
5	**	**	**	**				
6	**	**	**	**	*			
7	**	**	**	**	*	*		
8	**	**	**	**	*	*	*	

Note: * = Comparison control = odd nos
 ** = Significant difference (.05) experimental = even nos

Figure 5.6 The Student-Newman-Keuls' results indicating the pairwise comparisons for the performance group level for the variable evidence of structure. Comparisons shown are for the post-test immediate recall condition (ES 3).

Summary immediate recall. The results of the three post-tests in the immediate recall condition reveal that there is a significant difference between the control and experimental populations in the use of the report text macrostructure to organize written recalls. As this result is recorded at all three group levels it suggests a treatment effect is in operation.

Delayed Recall

This section presents results regarding the students' use of the report text structure to organize their written retellings following a three week delay in the initial presentation of the Cassowary text.

Group level 1. ANOVA conducted at the group level for the control and experimental groups indicates a significant difference ($F = 29.06$, $df = 7,69$ $p < .000$).

The Student-Newman-Keuls' results shown in figure 5.4 reveals significant differences between the control and experimental cohorts in the structuring of written protocols according to the report text top-level structure following the delay period.

Group level 2. ANOVA conducted at the text group level reveals a significant result ($F = 13.60$, $df = 15,69$ $p < .000$).

The Student-Newman-Keuls' results shown in figure 5.5 shows significant differences between the control and experimental groups at the text group level in the use of text structure to organize written recalls. See table 5.23 for means.

Delayed recall level 3. The final analysis in this section presents the results for the performance group in their use of the report text structure to organize their

written protocols following a delay period. ANOVA conducted at the performance group level reveals significant differences ($F = 6.47$, $df = 31,69$ $p < .000$). See table 5.24 for means.

The results from The Student-Newman-Keuls' procedure as shown in figure 5.7 indicates that there are significant differences between the control and experimental cohorts. Significant differences are shown to occur between groups 1,2,3,4 and groups 5,6,7 and 8, that is, between control and experimental groups.

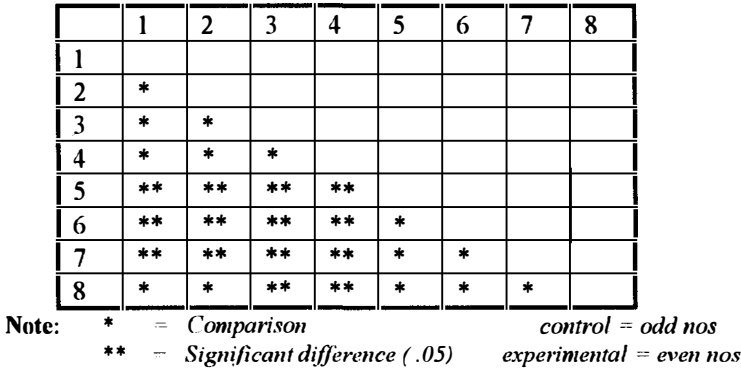


Figure 5.7 The Student-Newman-Keuls' results indicating the pairwise comparisons for the performance group level for the variable evidence of structure. Comparisons shown are for the post-test delayed recall condition (ES 4).

Summary delayed recall. Results from the three post-tests in the delayed recall condition show that there are significant differences between the control and experimental cohorts in the use of the report text top-level structure at all three group levels. The treatment which involved teaching students explicitly about the scientific report text structure appears to have had an impact on the way students were structuring their written recalls.

Post-test Summary

Analysis of the six post-test conditions (immediate and delayed recall) reveal that there are significant differences between the control and experimental populations in the use of the report text structure to organize written recalls. These differences

occur at all three levels that is, group level, text group level and performance group level therefore suggesting a strong treatment effect. This effect is maintained over time.

Summary of Findings of Analysis 2

The second analysis was concerned with the subjects' organization of data according to the report text top-level structure. Results of the six pre-tests presented in this section show that prior to the treatment there were no differences between the control and experimental populations in the use of the report text top-level structure to organize written recalls at either the immediate or delayed recall conditions. This result suggests that the random sampling of students prior to the experimental procedure had ensured homogeneity between the groups and that students were unaware of clustering data according to the scientific report text top-level structure.

Following the treatment phase a dramatic difference between the control and experimental populations was recorded for the experimental cohorts in the immediate recall condition at the group level (control vs experimental) text group level (control v experimental, structured vs unstructured) and performance group level (control v experimental, structured vs unstructured, better vs novice readers). This difference was maintained after a three week delay however the difference was not as dramatic as that recorded in the immediate recall post-test condition.

It is therefore concluded that the teaching of the report text top-level structure does produce an organizing effect on students' ability to structure information. This organizing validity was maintained after a significant delay period.

Discussion of Analysis 2

The results tabled in this section show that the teaching of the memory based report top-level structure did have an effect on the way in which students were organizing the content information. Eight hypotheses were proposed in examining this aspect of the study, that is, hypotheses 9 - 16. Hypotheses 9, 10, 13 and 14 which related to the non use of text structure prior to the treatment were accepted while hypotheses 11, 12, 15 and 16 which were concerned with the non use of the top-level structure following treatment were rejected, as there was a significant difference recorded between the way the control and experimental groups were clustering their recalled information.

Prior to the treatment the results indicated that both the control and experimental groups at all levels (group level, text level performance level) were the same, that is very few of the students were using the scientific report text structure to organize their written recalls. Although it is acknowledged that students may have been using an alternative way of classifying data, there is no evidence to suggest that students were clustering information according to the memory-based scientific report top-level structure.

Following the treatment phase an effect was determined for the experimental group at all three levels, in both the immediate and delayed recall conditions. The Student-Newman-Keuls' statistical procedure indicated a contrast between the control and experimental groups in the way the information was being categorized and recorded.

In the post-treatment immediate recall situation there was a dramatic difference between the control and experimental cohorts at all levels. At the text group level both experimental groups, structured and unstructured text, showed a significant difference in the way they were organizing their written recalls in comparison to

the control groups exposed to structured and unstructured text. This contrast between control and experimental cohorts was replicated in the performance groups results where better and novice readers given structured or unstructured text maintained a significant difference between their control counterparts in the organization of their written recalls.

Further analysis of the experimental groups results at the post-test immediate recall condition for the text and performance group levels reveals that groups given structured texts (text group 4 and performance group 7 and 8) were performing the best overall. This enhanced performance is due to the fact that these groups were explicitly taught the report text top-level structure as well as receiving texts which mirrored the report text structure in the test situation. This amplified exposure obviously assisted these students in their clustering and organization of data according to the report text macrostructure.

The contrast between the control and experimental groups was maintained over the delay period for all group levels. This effect can be taken to suggest that the students in the experimental group having been exposed to the teaching of the report macrostructure were possibly empowered with a metacognitive and metalinguistic advantage which enhanced their processing of content material. This metacognitive advantage as realized in the strategies explicitly taught in the treatment period such as, what information to look for, how to organize and cluster information, appears to have provided the students with a strategic plan of action which assisted them with their processing and organization of the content data.

Moreover at the experimental text group level, delayed recall condition, it is interesting to note that the students exposed to unstructured text recorded the best overall result. This observation confirms the supposition that training in the report

text top-level structure does provide a metacognitive and metalinguistic advantage which assists in the processing of text even if the text is lacking a distinctive organizational framework. The students' ability to recall information and cluster the data according to the relevant dynamic or locative categories suggests that text schema has been refined.

Close scrutiny of the control groups at all levels did not reveal any particular trends. The control group subjects were obviously unaware of the report text structure and the 'reading only' situation did not permit these readers the opportunity to internalize the text structure schema or to use the report text structure to guide and frame their written recalls. It is interesting to note that the better readers given structured text in the control, performance group and who displayed the best mean number of concept items recalled in the first analysis showed no tendency to structure their written recalls according to the report text structure. Although several of these students did write their reports according to the model provided in the testing phase the number of students adopting this approach was not statistically significant. This aspect creates an interesting point of debate, as documented evidence suggests that better readers in recalling expository text generally employ the author's text structure as a framework on which to generate their own text protocols (Meyer, Brandt & Bluth, 1980; Bartlett, Turner & Mathams, 1981, McGee, 1982). However such was not the case in this instance, although it is acknowledged that the better readers may have utilized a different categorizing structure to organize their recalls. Perhaps it could be argued that the explicit teaching of top-level structure provides readers with metalinguistic and metacognitive strategies or 'cognitive hooks' on which to 'hang' relevant information. Without the explicit demonstration of these strategies readers may not be sensitized to these textual elements. As Slater and Graves (1989, p. 145) report, "text structure appears to provide a framework for remembering important ideas and concepts in the passages for readers who are

able to identify and use it." Lack of awareness of these signalling devices will obviously prevent readers from employing them.

Another reason accounting for the control group better readers' non-use of the top-level structure may be that the students were young and not yet sensitized to text structure schema. Research findings (Taylor, 1982; Taylor & Samuels, 1983; Taylor & Beach, 1984; Berkowitz, 1986) suggest that text structure awareness is developmental and that students up to age 10-11 years may be textually unaware. Considering these students were 8-9 years old perhaps they were too young to be sensitive to text structure.

Summary of analysis 2. This section presented the results of the students' use of the report text top-level structure to organize their written protocols. The results indicate that students given training in the organization and use of the text top-level structure do utilize such macrostructures as an organizing framework in their written protocols. The students' ability to categorize information according to the framework following a significant delay period suggests that the permanent memory structures may have been reorganized or refined as part of the explicit demonstrations and consolidation activities provided in the training period.

Analysis 3: Change in Students' Performances Over Time

This section presents an analysis of the change in each groups' performances over the period of the experimental investigation. The data looks at the change occurring within the control and experimental cohorts and their various sub-groups at each of the four test conditions. While analyses 1 and 2 concentrated on comparisons occurring between the groups this third analysis focused on change occurring within the groups. Analysis 3 was included to determine if there was change happening within the groups which may not have been detected from the statistical data presented for the previous analyses. Change data is considered in

relation to the two variables: number of concept items recalled (NCR) and use of text structure (ES).

Reporting of Results

Data regarding the change analysis is presented in graphs for the three group levels involved in the investigation that is, group level, text group level and performance group level. The Student-Newman-Keuls' procedure detailing where differences are located is presented in accompanying figures. The results presented in this section relate to research questions 5 and 6 and hypotheses 17, 18, 19 and 20.

Change Over Time in the Number of Concepts Recalled

The graphs presented in this segment show the results of the analysis of change in the mean number of concepts recalled for the control and experimental cohorts at the three group levels.

Change data for level 1. This analysis details results of the change occurring within the control and experimental groups. The graph detailed in figure 5.8 presents the change data for the group level (control vs experimental).

ANOVA conducted at this level shows a significant result ($F = 20.62$, $df = 7,69$ $p < 0.000$). The Student-Newman-Keuls' procedure (see Figure 5.9) reveals where the differences are located.

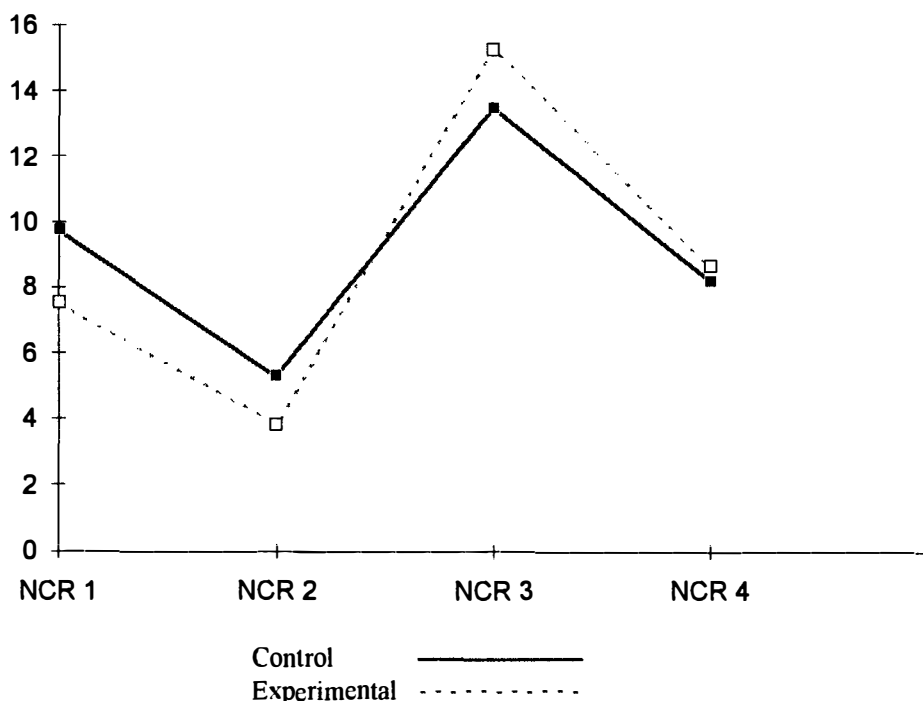


Figure 5.8 Change in the number of concepts recalled for the group level.

Analysis of the data suggests that the 'reading only' of the scientific report text (control condition) over the period of the investigation did have an impact on the students' ability to recall additional facts. This effect was recorded in the post-treatment immediate recall condition and was maintained over the delay period as verified in The Student-Newman-Keuls' multiple comparison procedure presented in figure 5.9.

Control Group					Experimental Group				
	1	3	5	7		2	4	6	8
1					2				
3	*				4	*			
5	**	**			6	**	**		
7	*	**	**		8	*	**	**	

Note: * = Comparison
 ** = Significant difference (.05)

Figure 5.9 Pairwise comparisons within the control and experimental groups at the group level in the number of concepts recalled.

A similar pattern of response is recorded in the analysis of change for the experimental group. The Student-Newman-Keuls' comparison reveals that there is a change in performance at the post-treatment immediate and delayed recall conditions. Thus the treatment effect is maintained over time. Moreover an examination of the experimental groups' results suggest that this group has made significant gains in the mean number of concept items recalled when considered in relation to their initial starting point. Although the recall levelled out in the final test condition (NCR 4) the results suggest there has been an improvement as a result of the treatment.

These results for the group level suggest that both the explicit teaching and the 'reading only' of the scientific report text macrostructure lead to an improvement in the number of concepts recalled by students.

Change data for level 2. This section examines the change occurring within the control and within the experimental cohorts at the text group level (see Figure 5.10). ANOVA conducted within the four control and four experimental groups indicates a significant result ($F = 9.94$, $df = 15,69$ $p < 0.000$). The Student-Newman-Keuls' results depicted in figure 5.11 indicates where these differences occur.

Structured text, control group. The data presented in figure 5.10 indicates that for the control group exposed to structured text in the 'reading only' situation there was an improved performance at the post-treatment immediate recall situation. The Student-Newman-Keuls' results as shown in figure 5.11 verifies this effect.

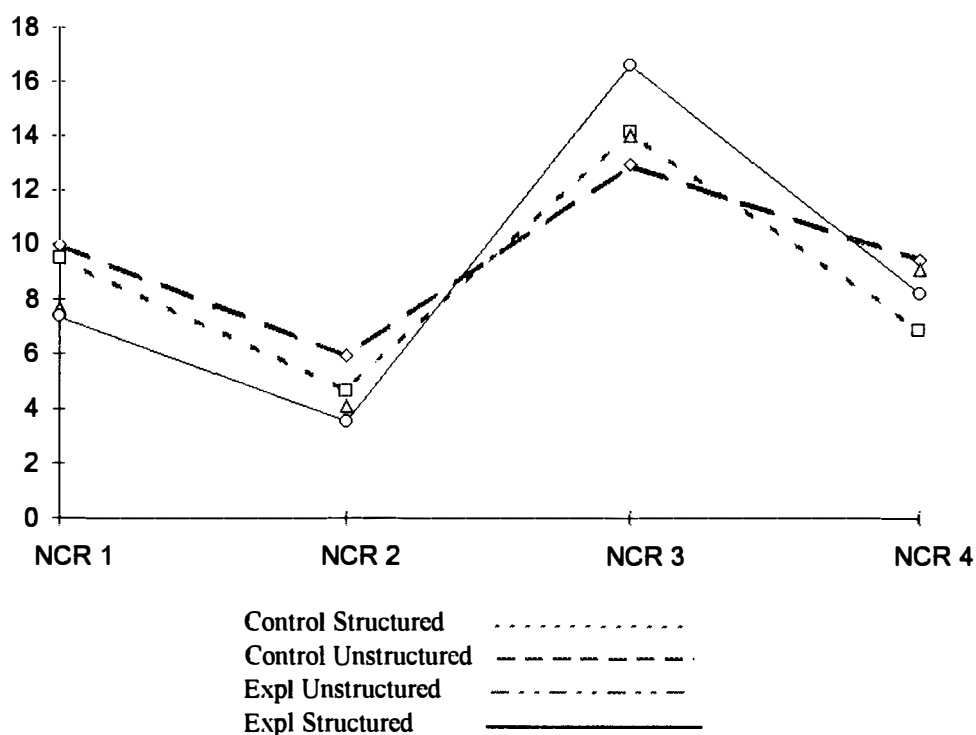


Figure 5.10 Change in the number of concepts recalled at the text group level.

Unstructured text, control group. Figure 5.10 indicates that the control group exposed to unstructured text in the 'reading only' of the scientific report text macrostructure demonstrated little change in the number of concepts recalled over the period of the experiment. A treatment effect was detected at the immediate recall post-treatment condition and is depicted in The Student-Newman-Keuls' multiple comparison procedure shown in figure 5.11. Analysis of the final testing situation (NCR 4) reveals there was no change in the control unstructured text groups' overall performance.

Structured text, experimental group. The experimental group taught the top-level structure and tested on structured text demonstrated a treatment effect at the post-treatment immediate and delayed recall conditions, as evidenced in The Student-Newman-Keuls' results (see Figure 5.11). Therefore the teaching of the

report text structure did bring about a change in the mean number of concept items recalled by the experimental group exposed to structured text.

Control Group					Experimental Group				
Structured Text					Structured Text				
	1	5	9	13		4	8	12	16
1					4				
5	*				8	*			
9	**	**			12	**	**		
13	*	*	**		16	*	*	**	
Unstructured Text					Unstructured Text				
	2	6	10	14		3	7	11	15
2					3				
6	*				7	*			
10	*	**			11	**	**		
14	*	*	*		15	*	*	**	

Figure 5.11 Pairwise comparisons within the control and experimental groups in the number of concepts recalled for level 2 (text group level).

Unstructured text, experimental group. For the experimental cohorts exposed to unstructured text the data suggests that the teaching of the report text structure enabled the students' to improve the number of concepts recalled. The treatment had a significant effect on the experimental, unstructured text groups' ability to increase the number of concepts recalled. This change was maintained over the delay period and the final test condition (NCR 4) reveals that the experimental group demonstrated an improved performance in the number of concept items recalled over the period of the study.

Change data for level 3. The graphs shown in figures 5.12 and 5.13 report the analysis of change for the control and experimental groups involved at the performance level. ANOVA conducted for the performance group level indicates a significant result ($F = 8.28$, $df = 31,69$ $p < 0.000$). Student-Newman-Keuls'

results reported in figure 5.14 indicate where the differences within the groups are located.

Structured text, novice readers, control group. The results reveal that for novice readers in the 'reading only' of the scientific report text structure there was no change in their recall of concept items over the period of the investigation.

Structured text, better readers, control group. Data presented in the graph in figure 5.12 shows that better readers tested on structured text demonstrated a change in their performance in the immediate recall condition. This change was not maintained over the delay period. See figure 5.14 for The Student-Newman-Keuls' comparisons.

Unstructured text, novice readers, control group. For novice readers in the control group exposed to unstructured text there was no change within this group over the duration of the study.

Unstructured text, better readers, control group. For the better readers exposed to unstructured text in the control condition there was there was no change in the groups' ability to recall an improved number of concepts.

Structured text, novice readers, experimental group. Novice readers given training in the report text top-level structure and tested on structured text did demonstrate an improvement in their ability to recall additional facts. This change occurred at the post-treatment, immediate recall condition but was not maintained

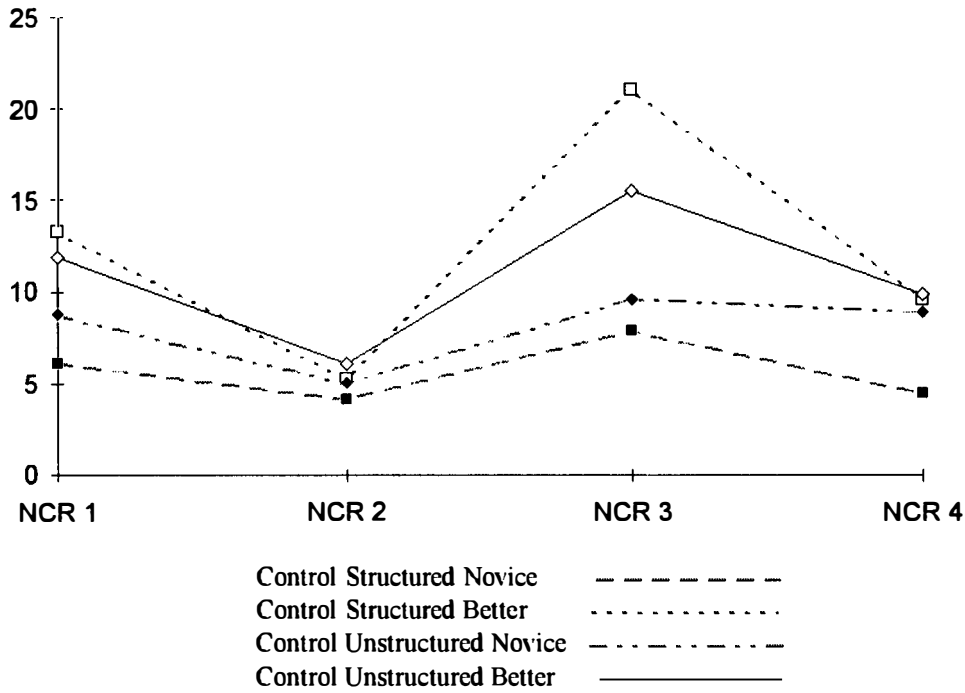


Figure 5.12 Change in the number of concepts recalled at the performance group level for the control students.

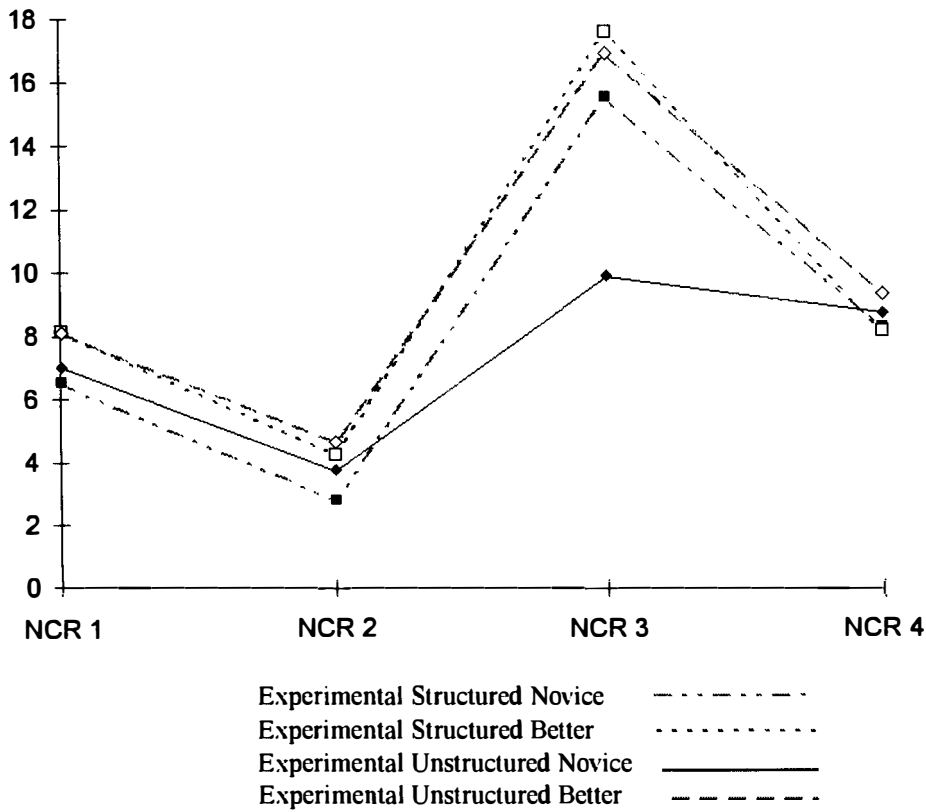


Figure 5.13 Change in the number of concepts recalled at the performance group level for the experimental students.

over the delay period. These findings are confirmed in The Student-Newman-Keuls' multiple comparison procedure detailed in figure 5.14.

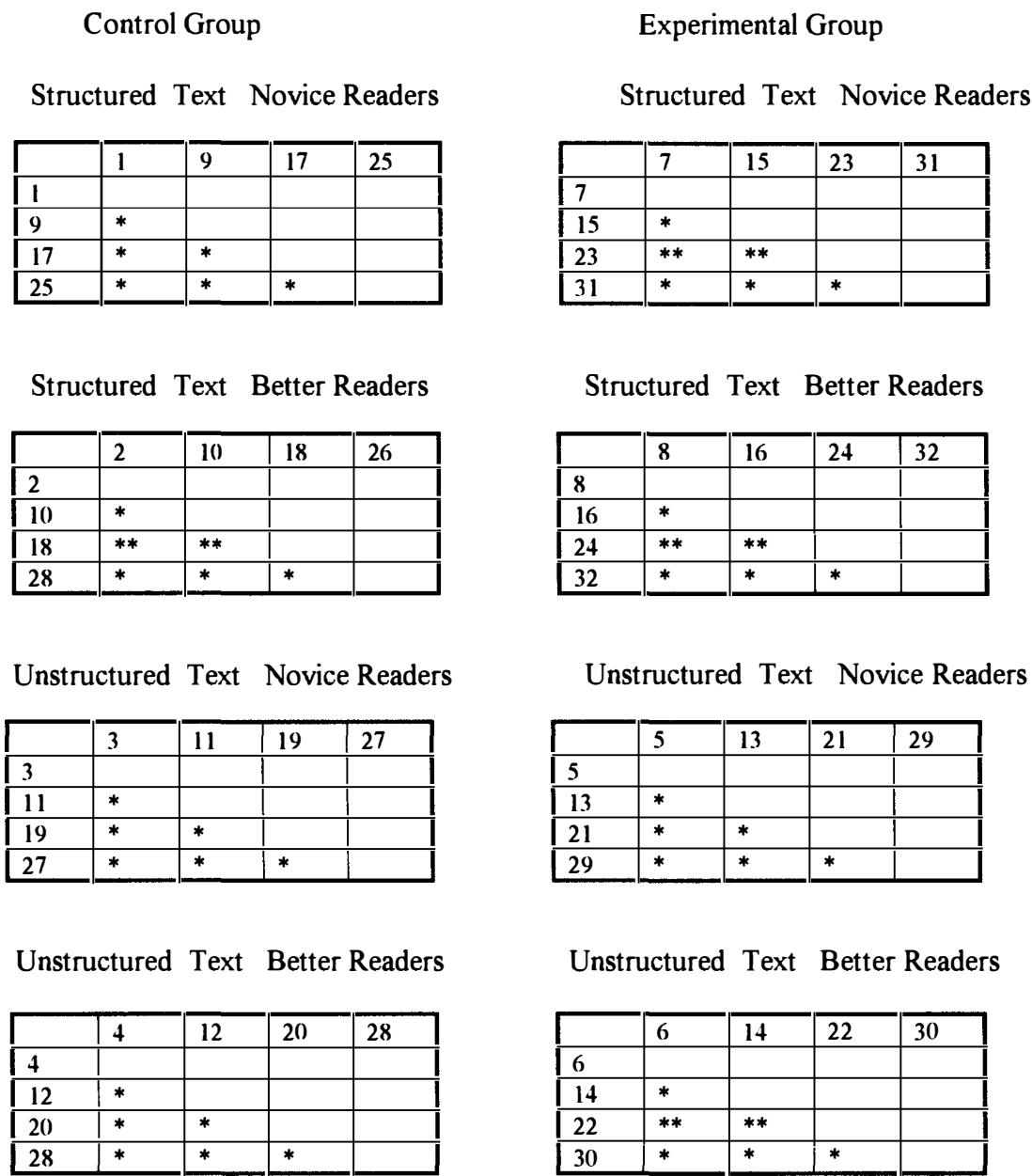


Figure 5.14 Pairwise comparisons of the control and experimental groups in the number of concepts recalled.

Structured text, better readers, experimental group. For the experimental group given training in the report text macrostructure and tested on structured text the results reveal a change in their ability to recall an increased number of concept

items following the treatment period. However this change was not maintained over the delay period.

Unstructured text, novice readers, experimental group. Novice readers in the experimental group exposed to unstructured text mimicked the response of their control counterparts, that is, no discernible difference is detected for this group over the period of the investigation.

Unstructured text, better readers, experimental group. The experimental group given training in the report text macrostructure and exposed to unstructured text demonstrated a change in performance in the number of concepts recalled at the immediate recall condition. This effect was not maintained over the delay period.

Summary of Results for the Change Variable in the Number of Concept Items Recalled

This section reviewed the results for the three groups levels related to change in performance in the mean number of concept items recalled. The results presented show that significant differences were recorded within the groups at the three levels of analysis. A synopsis of the results is reported below.

Group level. For the group level, the data shows that the 'reading only' of the scientific report text structure and the explicit teaching of the report text top-level structure did appear to bring about an improvement in the number of concept items recalled at the immediate recall, post-treatment situation for both the control and experimental groups. This effect was maintained over time for both the control or experimental cohorts.

Text group level. Control and experimental subjects exposed to structured text showed an improvement in the number of concepts recalled at the immediate and

delayed recall conditions. This finding suggests that the reading only and the explicit teaching of the report text top-level structure was having an effect on the students recall of concept information within their groups.

Both the control and experimental subjects tested on unstructured text revealed a change in performance following the treatment phase. For the control group 'reading only' situation, this change was temporary occurring at the post-treatment, immediate recall situation (NCR 3). The experimental group recorded an increased mean number of concept items at the post-treatment immediate recall situation, with the treatment effect being maintained over the delay period (NCR 4).

Performance group level. The results of the change analysis for the eight sub-groups in the number of concepts recalled reveals some change occurring within the groups. For novice readers in the control group exposed to structured text there was no change in their performance throughout the duration of the study whereas the experimental novice readers given explicit instruction in the top-level structure of text did reveal a dramatic difference in their ability to recall concept items in the post-test immediate recall situation. However this effect was not maintained over the delay period.

The better readers exposed to structured text in the control situation displayed a change in their ability to improve their recall of concept items at the immediate recall condition. Likewise their experimental counterparts revealed a change in performance at the immediate recall post-test condition but this effect was not maintained over time.

The change analysis for novice readers in both the control and experimental groups exposed to unstructured text revealed no improvement in their ability to increase

the number of concept items recalled. This pattern of response is replicated by the better readers (control group) exposed to unstructured text. The better readers unstructured text, experimental group did however show an improvement in the mean number of concepts recalled at the post-treatment immediate recall condition. This effect was not maintained.

Discussion of Change Analysis for Number of Concepts Recalled

The purpose of this analysis was to determine if there were any changes occurring within the control and experimental populations at each of the group levels. This section of the study relates to research question 5 and hypotheses 17 and 18 which were concerned with differences occurring within the control and experimental groups.

The results reveal that change occurred within both the control and experimental groups. It appears that the 'reading only' of the scientific report text was having an effect on the control groups' recall of concept items. Similarly the explicit teaching of the report text structure also appears to have assisted in the improved recall of concept items within each group. While evidence of this change is observed at the group level it is also noted at the text group level where subjects exposed to structured and unstructured text also demonstrated improved recall of concepts within their groups. Therefore hypotheses 17 (a) and (b) and 18 (a) and (b) which forecast no significant differences between the control or experimental cohorts at the group and text group levels are rejected. Hypotheses 17 (c) and 18 (c) which predicted no significant difference within the control and experimental populations at the performance group level is conditionally accepted.

Results from the text group level indicate that both the control and experimental students exposed to structured text showed improvement in the mean number of concepts recalled at the immediate recall condition. This effect was maintained by

the experimental group at the delayed recall condition. The control groups' improvement may be explained by the fact that the 'reading only' situation which involved (a) the modelled reading of the scientific report text (b) the opportunity to read and reread several report text structures adhering to the report macrostructure, may have afforded control students the time to monitor and reflect on their comprehension. The application of these metacognitive strategies may have assisted them in the clustering and organizing of data in a more efficient manner.

These monitoring strategies may have enabled the control students to determine the categorization of data in the report text or possibly afforded students time to establish their own organizing framework which in turn assisted in the improved recall of concept information. Improved recall could also be attributed to the superior organization of the texts the control students were reading.

In addition the fact that the 'practice texts' and the 'test texts' were structurally identical that is, utilized the scientific report text macrostructure also supports the above supposition. It is possible that the repeated readings of the report texts provided sufficient exposure to allow the internalization of some of the components of the report text top-level structure schema by the control students. An alternative interpretation could be argued that the improvement is due to a practice effect. This suggestion is plausible given that students were exposed to approximately 240 minutes silent reading of the texts throughout the treatment phase. Thus by the time students were tested at the post-treatment assessment point it is quite likely that students would have been well prepared in the reading of the report text structure.

Improvement in the mean number of concept items recalled is also demonstrated by the control and experimental groups (text group level) tested on unstructured

text at the immediate recall condition (NCR 3). However the improved recall of content information is not maintained by the control group over the delay period. The experimental groups' improved recall of concept information (NCR 3 and NCR 4) while also dealing with the added complication of scrambled text, can be debated in favour of text schema acquisition.

It appears that the explicit teaching of the report text macrostructure in which the global organization of the text was highlighted and the component features were appropriately tagged provided the experimental students with a text structure schema which assisted them in the clustering and chunking of data in the permanent memory structures. These results support the findings established by Taylor (1982) and Brooks and Dansereau (1983) which assert that text schema training significantly facilitated the processing of expository text. The explicit teaching of the report text top-level structure provided experimental students with metalinguistic and metacognitive strategies in which they were able to monitor their processing of the incoming data and which may have lead to the refinement of connections within the students' permanent memory structures (text structure schema) resulting in the improved recall of concepts.

The contrast in results between the control and experimental groups also indicates that while control students are able to pick up the general gist of the data from the repeated readings, the effects are not maintained. The control students in not receiving explicit information regarding the function and structure of the text were consequently unaware of the report text components and thus lacked the appropriate linguistic labels by which to tag or categorize the data.

At the performance group level the control group demonstrated negligible change occurring over the training period. The little change that was noted occurred within the control, structured, better readers group. Conversely the experimental

performance groups' demonstrated an improvement in the number of concepts recalled at the immediate recall condition. This effect was found for the structured text, novice and better readers, as well as for the unstructured text better readers.

The control structured better readers' improved performance is explained by their 'reading achievement' and their practice with structured texts during the training period. As reasons accounting for the practice effect were elaborated in the discussion at the text level, this obviates the need to restate the reasons in this section.

Improved comprehension was noted at the immediate recall condition for all experimental groups except the unstructured, novice readers. These comprehension gains suggest that the training was effecting a change in text structure schema, resulting in improved comprehension. As these positive effects are not maintained at the delayed recall level, it is suggested that the training period was not long enough.

While analysis of the number of concepts recalled across groups revealed no significant differences between the control and experimental groups this analysis has revealed a change in recall of content information within groups. This change suggests that students' recall of concept information can be improved through exposure to text structure frameworks. Both the 'reading only' and explicit teaching of the report top-level text structure appears to impact upon readers' text schema.

Change in Evidence of Structure

The following graphs present the change in performance within the control and experimental groups at each of the three group levels in the use of the report text top-level structure to organize written protocols. The Student-Newman-Keuls'

procedure detailing where the differences are located are shown in the accompanying figures.

Change data for level 1. This section reports the change in performance within the control and experimental subjects' in the use of the report text structure at the group level (control vs experimental). ANOVA conducted at the group level indicates a significant result ($F = 29.06$, $df = 7,69$ $p < .000$). The Student-Newman-Keul's procedure shown in figure 5.16 indicates where the differences within the groups are located.

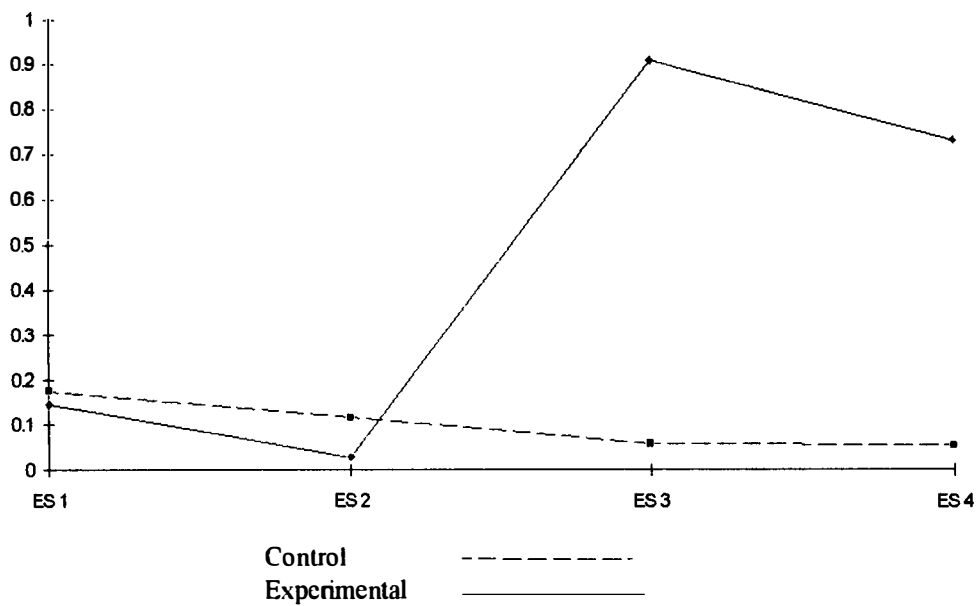


Figure 5.15 Change in evidence of structure for the group level .

The results depicted in the graph in figure 5.15 and the comparisons highlighted in The Student-Newman-Keuls' procedure presented in figure 5.16 indicate that there was a significant change in performance for the experimental group over the period of the study. The change is recorded at the post-treatment immediate recall condition thus indicating a treatment effect. The change is maintained over the delay period and can be attributed to the internalization of the text structure schema by the experimental group.

Control Group					Experimental Group				
	1	3	5	7		2	4	6	8
1					2				
3	*				4	*			
5	*	*			6	**	**		
7	*	*	*		8	**	**	**	

Figure 5.16 Pairwise comparisons of the control and experimental groups for the change variable evidence of structure.

Change data for level 2. This section considers the change in the students use of the report text structure to organize their written protocols at the text group level. Subjects in this category were tested on either structured or unstructured text. ANOVA conducted at this level shows a significant result ($F = 13.60$, $df = 15,69$ $p < .000$). The Student-Newman-Keul's results detailed in figure 5.18 indicates where the differences between the groups are located.

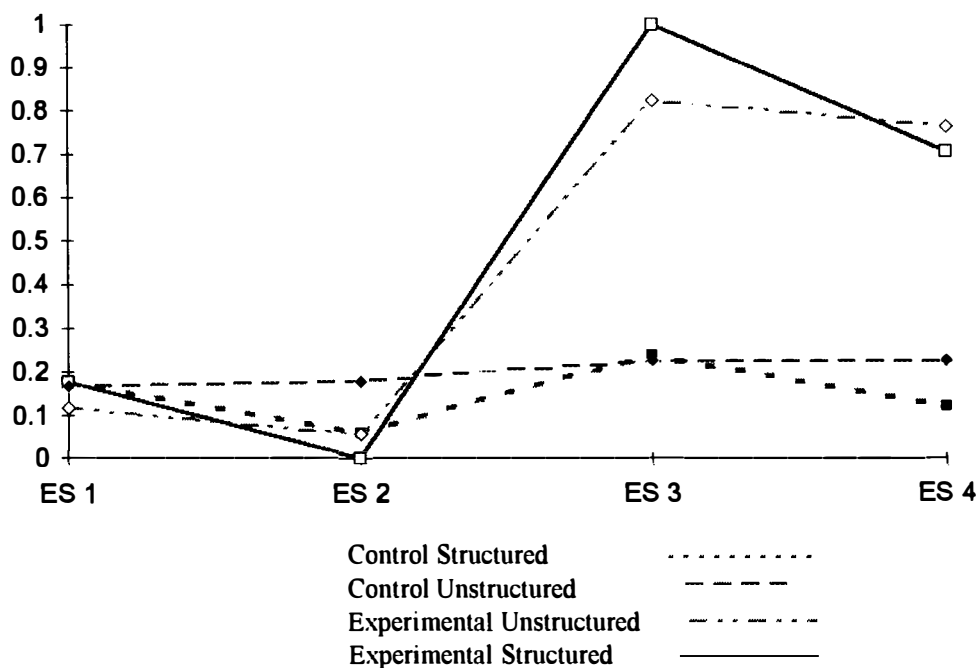


Figure 5.17 Change in evidence of structure for the text group (level 2).

Structured text control and experimental groups The data depicted in figure 5.17 shows that for the experimental cohorts tested on structured text there was a significant contrast in performances before and after treatment. The Student-

Newman-Keuls' procedure (see Figure 5.18) shows that there was a significant change over the period of the study in their structuring of data according to the report text top-level structure. The control groups' performance over the period of the study however did not reveal any significant change.

Unstructured text control and experimental groups. A similar pattern of response is recorded for the unstructured text group. While the control group reveals no change in the organization of written recalls the experimental group demonstrates a significant change in their use of the report text top-level structure to organize written recalls. This change is maintained over the delay period.

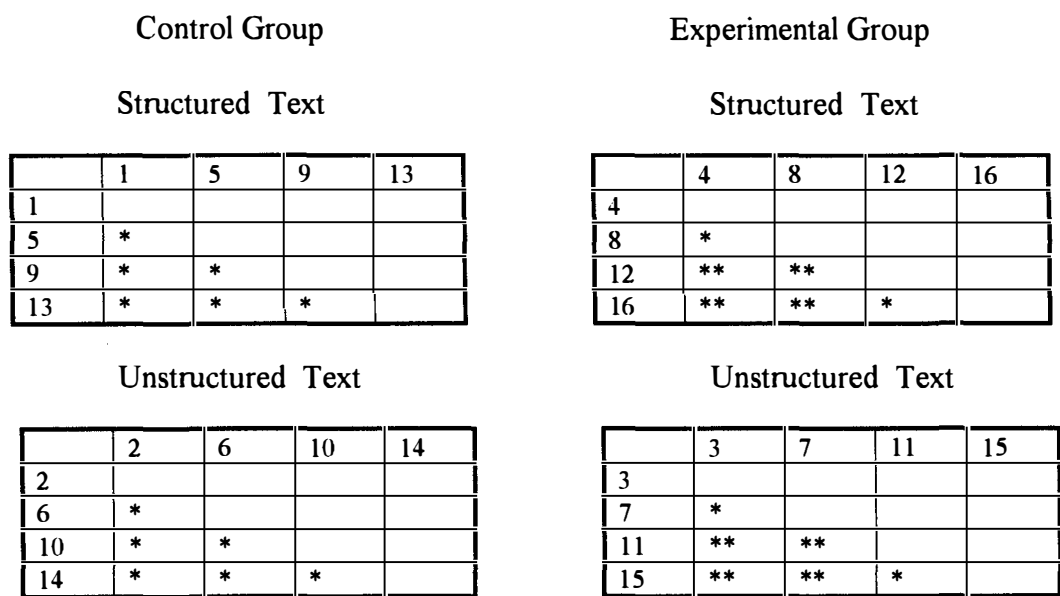


Figure 5.18 Pairwise comparisons of the control and experimental groups regarding the change variable in the use of the report text structure for the text group.

Change data for level 3. Results tabled in this segment report the change in performance within the control and experimental cohorts, better and novice

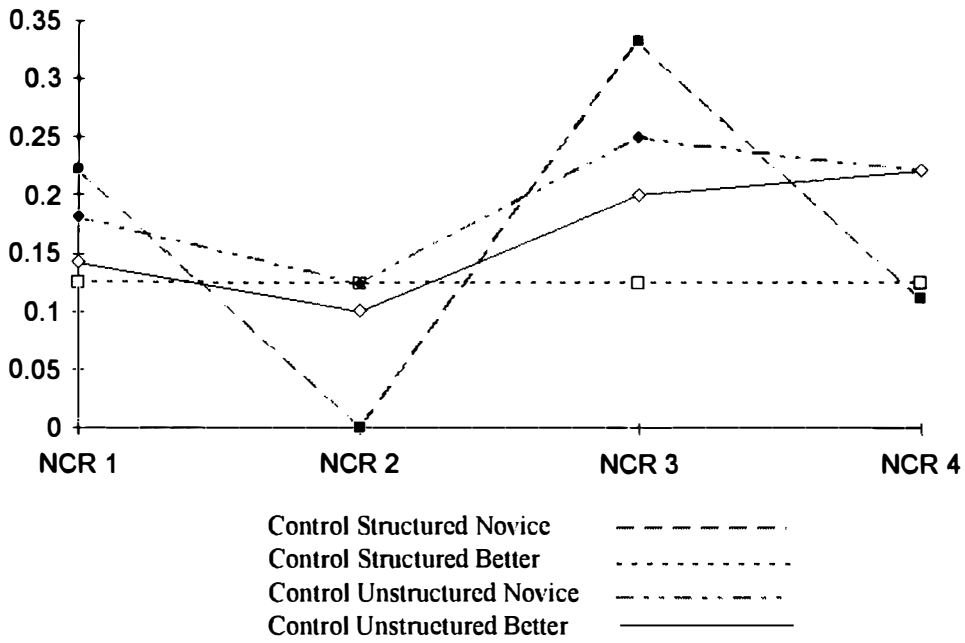


Figure 5.19 Change in evidence of structure for the control group in the performance group level (level 3).

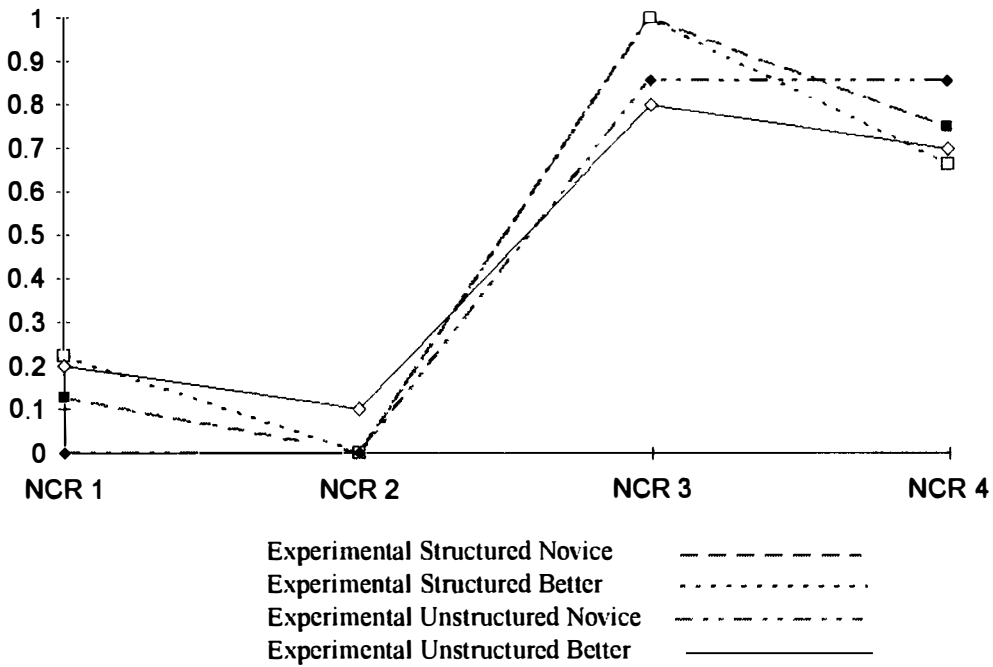


Figure 5.20 Change in evidence of structure for the experimental group in the performance group level (level 3).

readers exposed to structured and unstructured text. ANOVA conducted at this level shows a significant result ($F = 6.47$, $df = 31,69$ $p < .000$). The Student-Newman-Keuls' results detailed in figure 5.21 indicates where the differences between the groups are located.

Structured text, novice readers, control and experimental groups. The results presented in figure 5.19 reveal that for novice readers in the control group, exposed to structured text there was no change in performance. Although the graph suggests a change effect this unusual configuration is due to the fact that students in the control, novice readers' group did not produce a structured recall at the pre-test delayed recall condition. Therefore a score of zero tends to distort the figure. As indicated in The Student-Newman-Keuls' procedure there was no change recorded for this group. Conversely a significant change in performance was recorded by their experimental counterparts (see Figure 5.20). The experimental groups' change is evidenced at the post-treatment immediate recall situation and is maintained over the delay period. Figure 5.21 detailing The Student-Newman-Keuls' results confirms these findings.

Structured text, better readers, control and experimental groups. For the better readers in the control group exposed to structured text the results indicate no change in their ability to utilize top-level structure to organize their written recalls. The experimental group revealed a significant change in their ability to use the report text top-level structure to organize written protocols. This effect was maintained over the delay period.

Unstructured text, novice readers, control and experimental groups. For the novice readers, control group exposed to unstructured text the results show no change over the period of the study. Conversely the experimental group demonstrated a significant change in their utilization of the report text

macrostructure to organize their written recalls. This change was maintained over the delay period. See Figure 5.21 for The Student-Newman-Keuls' results.

Unstructured text, better readers, control and experimental groups. Better readers in the control group exposed to unstructured text revealed no change in their performance while the experimental group demonstrated a significant change in their ability to structure texts according to the report text top-level structure. This change was maintained over the three week delay period.

Control Group

Structured Text Novice Readers

	1	9	17	25
1				
9	*			
17	*	*		
25	*	*	*	

Structured Text Better Readers

	2	10	18	26
2				
10	*			
18	*	*		
26	*	*	*	

Unstructured Text Novice Readers

	3	11	19	27
3				
11	*			
19	*	*		
27	*	*	*	

Unstructured Text Better Readers

	4	12	20	28
4				
12	*			
20	*	*		
28	*	*	*	

Experimental Group

Structured Text Novice Readers

	7	15	23	31
7				
15	*			
23	**	**		
31	**	**	*	

Structured Text Better Readers

	8	16	24	32
8				
16	*			
24	**	**		
32	*	**	*	

Unstructured Text Novice Readers

	5	13	21	29
5				
13	*			
21	**	**		
29	**	**	*	

Unstructured Text Better Readers

	6	14	22	30
6				
14	*			
22	**	**		
30	*	**	*	

Figure 5.21 Pairwise comparisons of the control and experimental groups for the variable change in the use of the report text structure at the performance group level.

Summary of results for the change variable in the use of text structure. The results presented report the change occurring within the control and experimental populations' performance over the period of the investigation in the use of the report text top-level structure to organize written recalls. The results indicate that there is a significant difference within the control and experimental cohorts at all three group levels.

Group level. The control and experimental population display a sharp contrast in their use of the report text structure to organize their written protocols. While both groups showed no difference in their ability to structure text according to the report text macrostructure at the pre-treatment condition, this situation was contrasted in the post-treatment situation. The experimental group showed a marked improvement in the ability to organize their written protocols according to the top-level structure and this trend was recorded in the post-treatment delayed recall situation.

Text group level. For subjects exposed to structured text the data reveals that there is a significant difference within the control and experimental populations. The control group remained static throughout the study while the experimental group demonstrated a sharp contrast in the organization of their written recalls following the treatment phase, therefore indicating a teaching effect. Moreover this effect was maintained over the delay period.

This pattern of response is replicated for the control and experimental subjects exposed to unstructured text, further validating the treatment effect.

Performance group level. Analysis of the performance groups' results reveals that the control group in each of the various sub-groups remained unchanged in their ability to use text schema throughout the period of the study. This

performance was contrasted by the experimental subjects' significant change in performance following the treatment phase. The experimental groups' change in performance is recorded at both the immediate and delayed recall situations thereby confirming a significant change within the experimental groups' ability to utilize the report text top-level structure.

Discussion of Change Analysis for Evidence of Structure

This analysis relates directly to research question 6 and hypotheses 19 and 20 which were concerned with changes happening within the treated and untreated population regarding the use of text structure. The data presented suggests that hypothesis 19 predicting no differences in the structural organization of written protocols for the control group is accepted while hypothesis 20 which relates to the experimental population is rejected.

The data examined in this section confirms that the explicit teaching of the report text top-level structure does have an organizing effect on children's written protocols. Comparisons across groups (analysis 2) and within groups (analysis 3) provide testimony for the organizing validity of the report text top-level structure.

Although the experimental group were given instruction in the organizational framework of the report text structure the students' ability to utilize the text macrostructure following a substantial time delay suggests that the textual components of the report top-level structure were possibly internalized by the students as part of their text structure schema. The students' ability to activate this schema and apply the report top-level structure as an organizing framework on their written recalls suggests that the explicit teaching of the report framework may have given the students knowledge of what to look for and how to apply this framework (monitoring strategies) when encoding thought to print.

This finding is especially significant when the other variables are taken into account. The added complication of jumbled text and the grouping of students according to reading ability did not appear to interfere with the students' ability to structure texts according to the report text top-level structure. This utilization of the report top-level structure across the 3 group levels testifies to the organizing validity of the report text top-level structure.

Moreover the delay interval did not distort the children's clustering of information according to the report text top-level structure as the results indicate that despite a three week break children were able to organize written recalls according to the report text schema. It seems most likely that the report top-level structure in this case was acting as a blueprint to guide the reactivation of the report framework.

While this third analysis is designed to observe change occurring within the groups it also confirms the findings reported in analysis 2 and provides support for the teaching of the top-level structure as an organizational device on children's writing.

Overall Summary

This chapter has presented the results and discussion of the three levels of analysis conducted on data gained from the experimental investigation. Essentially the data was used to determine if the teaching of the memory-based report top-level text structure had an organizing effect on children's recall and organization of written protocols.

The first analysis reveals that there was generally no difference between the control and experimental cohorts in the mean number of concepts recalled. Despite a treatment effect recorded at the post-treatment immediate recall condition by the performance group, the results generally suggest that the treatment did not lead to an enhanced recall of concept items.

The second analysis investigated the organizational effect of the scientific report top-level structure on students' written protocols. These results demonstrated a significant difference between the control and experimental groups in the ability to structure written recalls. As the differences were maintained following a delay period it is taken to signify the positive organizing effects of the report text top-level structure.

In the third analysis which looked at the change occurring within the control and experimental groups for both variables - number of concepts recalled and use of text structure, some rather interesting trends were noted particularly for the number of concepts recalled variable. The change analysis shows that both the 'reading only' group (control) and the instruction group (experimental) recorded a change in their performances at the group and text level over the investigation period. Although the change could be partly due to a practice effect, the results could also be taken to indicate the powerful organizing effects of the top-level structure.

The ramifications of these results and their significance in relation to current literacy initiatives are discussed in the conclusions presented in the next chapter.

CHAPTER 6

CONCLUSIONS

Top-level structure is a metacognitive strategy which can assist readers and writers to construct meaning from expository text. Knowing how to exploit textual organization at its various levels can empower readers to process and synthesize informational text more effectively. It has been suggested that the teaching of top-level structure can make a significant difference in the processing of informational text (Brooks & Dansereau, 1983; Richgels, McGee, Lomax & Sheard, 1987).

Results outlined in the previous chapter show that the teaching of the scientific report text structure does have an organizing effect on children's written protocols. It appears that explicitly teaching students about text structure organization helps children to learn structure and to apply this structural knowledge in their written recalls. Given that the teaching of text structure is a significant part of the writing component of the First Steps literacy program as well as other genre based initiatives, for example, Content Area Literacy and Learning program (1993) these findings support the inclusion of these strategies in these programs.

As expository text becomes a major part of students' reading and writing assignments as they move through the educational system, an awareness and sensitivity to these textual elements will facilitate the reading and writing demands students encounter across the curriculum. Knowing the purpose and function of expository text as well as the characteristic macrostructures of the various text-types provides students with a range of metacognitive and metalinguistic strategies which may facilitate reading and writing in the content areas

Structural Advantages

The positive organizing effects of the report text schema was demonstrated in the experimental students' use of the scientific report text macrostructure to structure and organize their written recalls. This finding was evidenced at all levels (group, text and performance) for all conditions (structured and unstructured) at both the immediate and delayed post-test conditions. Moreover novice and better readers who were explicitly taught the report top-level structure displayed a strong treatment effect in the use of text structure to organize their written protocols. These results suggest that making explicit the structural components of expository text structure and teaching students how these elements are linked and interrelated can have beneficial effects on students' generative tasks. A noteworthy point is that the control group's 'reading only' situation also provided indirect evidence to support the organizing effects of the report top-level structure. This further substantiation of the organizing validity of the scientific report text structure thereby adds testimony to the organizational effects of the memory based top-level structure.

As well as providing evidence for the efficacy of teaching the top-level structure of the scientific report, the results also corroborate the work previously conducted in the area of top-level structure. The literature review highlighted the work conducted by Meyer and others (Meyer, Brandt & Bluth, 1980; Taylor, 1982; Brooks & Dansereau, 1983; Slater, Graves & Piche, 1985; Richgels, McGee, Lomax & Sheard, 1987; Armbruster, Anderson & Ostertag, 1987; Kletzein, 1992; Selenger, 1993) which documented the positive organizational effects from studies of text based top-level structure instruction. This present study substantiates that research and further demonstrates that children given explicit instruction in the structure and organization of the memory based top-level scientific report text can utilize this knowledge to organize written protocols.

Knowledge of text organization whether it is at the sentence level, paragraph level or top-level (in-head) will assist students in both the reading and writing process. It assists readers to process text more efficiently by reducing the uncertainty of the predictions they are required to make in reading. This reduction in processing time frees up working memory so that readers can focus their attention on the composing of meaning. Similarly, knowledge of the distinctive and characteristic ways texts are organised assists writers in clarifying the purpose for which they write. Knowledge of the conventions required at each level provides writers with a framework for organizing what they intend to say.

Earlier research into the use of Meyer's text frameworks suggests that use of these organizational structures in written retellings helps readers remember more information than readers who are not structure aware (Bartlett & Briesse, 1979; Meyer, Brandt, & Bluth, 1980; Taylor & Beach, 1984; Berkowitz, 1986). However the patterns of writing proposed by Meyer are not easily discernible and do not have a generalizable structure which can be imposed on all expository content thereby limiting their application.

Knowledge of more generalizable, overarching structures as proposed in Sloan and Latham's memory based top-level structure, may assist readers to construct meaning from informational text by providing them with a top-level structure that they can apply to all texts and contexts. According to Sloan and Latham (1989, 1990) this schema matching enables readers to match incoming information with data stored in permanent memory. This schema matching is meant to enhance the recall and comprehension of text.

Recall Advantages

This study was partly designed on the assumption that recall of text is facilitated by knowledge of text structure. That is, students who are aware of the scientific

report text structure would be more likely to utilize the 'structure strategy' when reading. The assumption being that awareness of text structure and use of the 'structure strategy' would result in improved recall of concept items. Previous research (Meyer, Brandt, & Bluth, 1980; Taylor & Samuels, 1983; Richgels, McGee, Lomax & Sheard, 1987; Selenger, 1993) reports that students who are structure aware recall more information as well as more superordinate ideas than students who are not structure aware. Sloan and Latham assert that the teaching of the report text top-level structure would not only lead to improved structuring of expository text but also result in improved comprehension. However while positive organizational effects were recorded in this study there was minimal improvement noted in comprehension.

Some evidence of improved recall was indicated at the performance group level in the immediate recall post-test condition however this result was not maintained over the delay period. Reasons accounting for the lack of improvement in comprehension may be attributed to the nature of the training period, the measure selected to assess comprehension and the lack of a classroom-related purpose for the training.

The training period included 2 x 40 minute sessions per week for the three week treatment phase. This situation was somewhat "decontextualized" and may have proved too fragmented and isolated to allow students to synthesize the information presented. Moreover the noted improvement in comprehension by the performance group in the immediate recall situation suggests the time frame may have been insufficient to effect a change in students' recall. Perhaps the training period should have been more frequent and on-going to ensure the maximum benefit from the sessions.

Assessment of comprehension was restricted to one measure only, that is the number of concepts recalled. Baumann (1986) suggests various comprehension methodologies report different findings. While no exact measure of comprehension is available (Johnston, 1983) research suggests that recall protocols provide a good indication as to how well readers encode textual information into memory (Meyer, Brandt & Bluth, 1980; Taylor & Beach, 1984; Slater, Graves, Scott & Redd-Boyd, 1988; Olsen & Gee, 1991). The restriction of the comprehension measurement to the number of concepts recalled may have proved too narrow to detect comprehension gains. This suggestion is substantiated when analysed in the light of the third analysis conducted in this study.

This analysis concentrated on the change occurring within the control and experimental groups. Specifically these results provide statistical substantiation that there was some growth within both the control and experimental groups in the number of concept items recalled which was not highlighted in the statistical analysis comparing the two groups.

The improved comprehension recorded by the control group in the change analysis may be attributed to the fact that the control group was exposed to 240 minutes of sustained silent reading (apart from the reading aloud of the texts) in which students read various report text structures which matched the Sloan and Latham scientific report text structure. This intense and consistent exposure to the report text structure may have permitted the control students to internalize aspects of the report text structure. The repeated readings of the scientific report text macrostructure may have alerted readers (especially structure aware students) to the major elements of its structure; that is classification, description, location and dynamics paragraphs. Their discovery of the structure may have been supported by sensitization to the micropropositional aspects of the text (that is the use of signal words and descriptors typical of the report text top-level structure, for

example the use of relational verbs in the classification paragraph(s) and the attributional descriptors employed in the description and dynamics paragraphs). Sensitivity to these discourse markers could have signalled metacognitive processes within the readers which allowed them to derive the text's macropropositional components. This sensitization to elements of the scientific report text may account for the control groups' improved recall of concepts over the period of the investigation.

Closely associated with the control groups' improvement is the quality of the texts the students were reading. Control students were involved in reading an "idealized" report text structure. The reading of such well structured texts contrasts strongly with the usual report texts encountered in everyday year four science and social studies textbooks. These texts often lack a definitive text structure and generally present ideas in seriation format. In reading the scientific report text structure students were processing a 'considerate text' (Armbruster, 1988) which indirectly appears to have enhanced their comprehension.

Validity of the Sloan and Latham Top-Level Structure

The successful structure effects and the indirect comprehension benefits recorded in this study indicate that Sloan and Latham's memory based text top-level structure model is well founded. The extensive research conducted in schema theory (Shank, 1973; Minsky, 1975; Shank & Abelson, 1977; Rumelhart, 1977, 1980; Smith, 1988) and associative memory network models (Collins & Quillian, 1969; Collins & Loftus, 1975; Anderson, 1976, 1983) provides a strong theoretical base from which the text purposes and structures are developed.

While the theoretical base is established, Sloan and Latham's proposal that readers store information in permanent memory in the frameworks outlined in their top-level structure model may represent an overgeneralization of their theoretical

underpinnings. Therefore the notion of schema-matching which was exemplified in the 'fit' between the written text (report text structure) and the psychological text (in-head text schema) is challenged.

Rather than a schema-matching process the notion of a schema-imposing process is a more tenable proposition. In this proposal it could be asserted that the memory based top-level frameworks offer a more generalizable text schema than relying on random recall. The Sloan and Latham frameworks if explicitly taught can be used to effect a change in the way students organize their text structure knowledge. This text structure knowledge could then be used as a template or organizing mechanism which could be imposed on all expository information as a means of processing content information in a more efficient manner.

A well developed text schema enables readers to anticipate the likely purpose and direction a text will take as well as the possible discourse structures to be encountered in reading such text. Moreover this knowledge alerts readers to the relationships existing at the overall structural level (purpose/function of text) and how the information presented at the lower levels (sentence, paragraph) will support and link back to the overall message.

The schema imposing function of the Sloan and Latham report text structure is highlighted in the results recorded by the experimental subjects exposed to unstructured text. These students were able to sort through the disjointed information and reorganize the data to produce recall protocols structured according to the scientific report text macrostructure. The experimental groups ability to impose order upon the jumbled concepts suggests that students had internalized the structure and were using it as basis for categorizing data. This internalization represents a refining of the memory structures within the students long term memory, that is, text schema. The training in the report top-level

structure had enabled these readers to enhance and reorganize the way they were processing the content information.

Particularly noteworthy were the results produced by the experimental novice readers exposed to jumbled text. These students demonstrated that knowing the structure of expository text and having the appropriate metalinguistic 'tags' enabled these novice readers to label and organize the text more efficiently. Indeed this appears to be a distinct advantage in teaching the top-level structure of text. Not only does it provide an understanding of the purpose and function of the text structure but it also allows readers to develop metacognitive strategies which enable them to become more strategic in their processing of text. This is a particularly encouraging response given that the research regarding poor readers acknowledges their distinct lack of purpose and non-strategic behaviour in processing expository text (Marshall & Glock, 1979; Meyer, Brandt & Bluth, 1980; Paris & Jacobs, 1984; Afflerbach & Johnston, 1986; Taylor, 1992; Loranger, 1994).

In teaching students overall text organization they are acquiring a more efficient and effective way to organize textual data. It seems that knowing why text structure is being used and how to apply such information (metacognitive) is an important aspect in learning how to deal with expository text (Kletzein, 1991, 1992).

These findings are particularly encouraging given the prominence of the Sloan and Latham top-level structures as promoted in the First Steps Literacy initiative in W.A primary schools. The inclusion of these text-types, combined with the focus on genre theory coming through in pedagogical literature and Student Outcome Statements (1994) supports the explicit teaching of text structure.

While the teaching of expository text structure is gaining greater prominence and emphasis in the primary domain caution must be exercised that these top-level structures do not merely become 'recipes' that children are able to churn out at the command of the teacher. The possibility of the memory based top-level structure frameworks adopting a formulaic approach is a real danger as the purpose and function of the text is eroded in the quest to 'master' the components of the text structure.

To be effective, the teaching of top-level structure or genres must occur in a purposeful content-based literacy program which incorporates the conditions necessary for optimum learning (Cambourne, 1988). Teachers must be involved in doing much more than inviting students to write a report or exposition. A one-off guided discovery tour through top-level structure, in which the structure is highlighted and the associated macropropositional and micropropositional links are discussed, may not be sufficient. A functional approach where the micropropositional, macropropositional and top-level components of text are explicitly and simultaneously taught is essential if students are to apply text structure knowledge in their learning.

Teaching students to know and understand the purpose and function of expository text provides them with a basis for the effective reading and writing of content material. Providing primary school students with an instructional program in text structure enables them to develop well grounded and effective strategies which will facilitate learning in future schooling.

Significance of the Study

This study is significant in that it has provided some preliminary experimental research on the teaching of the memory based report top-level structure to younger students.

As noted previously, there are few research studies validating the use of the memory based top-level structure frameworks. Despite positive feedback from teachers using the memory based top-level structures in the classroom (ACER evaluation, 1993; Deschamp, 1995) such validation has not been conducted using base-line data. This study provides some preliminary experimental research on the impact of using one of the eight memory based top-level structures as proposed by Sloan and Latham.

Further significance is highlighted by the fact that this study investigated the impact of teaching top-level structure to younger cohorts. As previous research in top-level structure concentrated on adolescent and adult populations this investigation targeted the impact of teaching a top-level structure to a younger population (i.e., year four students). The results from this study indicate that the teaching of the report top-level structure to younger learners is effective. Consequently other studies with even younger students and other text-types is warranted.

Limitations and Recommendations for Future Research

There are three limitations associated with this study. They are concerned with the duration of the training, the difficulties related to the experimental research design and the small number of students in sub-groups for performance level analysis.

The tight time frame produced a rather clinical situation which was somewhat removed from the authenticity of the classroom context. Moreover three weeks may not be long enough to show ongoing comprehension benefits. Further research could be conducted with a longer training time frame to discover whether comprehension gains can be maintained.

A second limitation is related to adopting an experimental research design in which it was impossible to consider the socio-cultural settings which operate in the

writing situation in the classroom context. The removal of charts and draft and modelled writing pieces at the conclusion of each session also detracted from the authenticity of a genuine writing situation. Moreover, the nature of the text designed for experimental purposes was not related to an integrated classroom program.

Associated with the second limitation is the small number of students comprising the sub-groups (i.e., better and novice readers). As these groups averaged nine students any replication of this study would require larger populations of better and novice readers to verify the results found in this study.

Third, this study was limited to one text-type, the scientific report text structure. Further research is required to validate the effectiveness of teaching the other text-types described by Sloan and Latham in their memory based top-level structure model.

Finally, this study provides some empirical evidence to support teaching report top-level structure to younger primary school children, which is current practice in most Western Australian schools.

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Appendix A

Pre-test Structured Text: The Malayan Tapir

PRE-TEST ONE

Control and Experimental Groups

Structured Text

THE MALAYAN TAPIR

The Malayan Tapir is a member of the Tapir family. Tapirs are mammals and are related to horses and rhinoceros. The scientific name is *Tapirus indicus*.

The tapir looks like a pig. It is about one metre high and has a short, heavy body and a thick neck. The Malayan Tapir's nose is stretched out like a trunk with the nostrils on the end. This short trunk is moveable.

The tapir has stocky legs and hoofed feet. The fore feet have four toes and the hind feet have three toes. The tapir's body is covered in short, bristly hairs. The back and rump of the tapir are white. The rest of the tapir's body is glossy black or dark brown. The body of young tapir are camouflaged with white spots and stripes which disappear when they are about six - eight months.

Three species of tapir are found in South America and one species in Malaysia. The Malayan Tapir lives deep in the forest or mountain areas, usually near water.

The tapir is a shy, solitary animal. It searches for its food at night. The tapir eats twigs, leaves, fruit and vegetables which grow in or near water. This animal has a very good sense of smell and hearing. Tapirs are good swimmers. The female tapir gives birth to a single young after a gestation period of 190 days.

People hunt tapirs for their flesh and thick hides. As a result of both hunting and the destruction of forests, tapirs have become very rare.

Appendix B

Pre-Test Unstructured Text: The Malayan Tapir

PRE-TEST ONE

Control and Experimental Groups

Unstructured Text

THE MALAYAN TAPIR

The Malayan Tapir is a mammal.

The tapir's body is covered in short, bristly hairs.

It searches for its food at night.

The tapir has a very good sense of smell and hearing.

The tapir looks like a pig.

People hunt tapirs for their flesh and thick hides.

The hind feet have three toes.

The tapir is a shy, solitary animal.

Three species of tapir are found in South America.

It is about one metre high.

The tapir has a short, heavy body.

The scientific name is *Tapirus indicus*.

The nose is stretched out like a trunk.

Tapirs are related to the horse and rhinoceros families.

The back and rump are white.

The Malayan Tapir lives deep in the forest or mountain areas.

The nostrils are on the end of the trunk.

The female gives birth to a single young.

The fore feet have four toes.

The Malayan Tapir is a member of the Tapir family.

As a result of hunting and the destruction of forests the tapirs have become rare.

The young are born after a gestation period of 390 days.

The tapir has a thick neck.

Tapirs usually live near water.

The tapir has stocky legs and hoofed feet.

It eats twigs, leaves, fruit and vegetables which grow in or near the water.

Tapirs are good swimmers.

One species of tapir is found in Malaysia.

The body of young tapirs are camouflaged with spots and stripes which disappear when they are six - eight months.

The tapir's short trunk is moveable.

The rest of the tapir's body is glossy black or dark brown.

Appendix C

Post-test Structured Text: The Cassowary

POST-TEST TWO

Control and Experimental Groups

Structured Text

THE CASSOWARY

The Cassowary is a *ratite* or flightless bird. It belongs to the Casuariidae family.

The cassowary looks like an emu but its body is shorter and stockier than the emu. It stands 2m high when fully erect but it normally holds its head about 1.2m above the ground. The cassowary can weigh up to 60kg. This flightless bird has black, glossy feathers which hang loosely on its body looking more like hair than feathers. The cassowary has no feathers on its neck or head, just skin. This skin is blue with a bright red wattle (loose skin folds) hanging from its throat. On top of its head is a blade-shaped bony growth called a casque. This horny crown grows up to 15cm above the head and looks like a helmet. The cassowary has three toes. The inner toe has a long, tapering claw like a dagger. This claw is about 15cm long.

Three species of cassowary are found in the dense, lowland rainforest of northern Australia and Papua New Guinea.

The cassowary is a solitary animal. It searches for its food on the rainforest floor where it eats snails, insects, fungi and leaves. The main diet of the cassowary is tropical fruit such as figs and

quandongs. Occasionally a cassowary will eat dead rats or birds.

The cassowary is a fast runner and moves quickly through the rainforest undergrowth using its bony casque to ram its way through the leaves and vines. This bird is a good swimmer and often bathes in the streams and rivers of the rainforest.

The female cassowary lays three to six eggs in a nest on the forest floor. The male cassowary guards the eggs and looks after the chicks for about nine months. Cassowary chicks are brown when hatched. The wattles do not appear until the bird is an adult, about two to three years.

If frightened the cassowary will raise itself to full height, spread its wings and hiss sharply. Sometimes the cassowary will stamp its feet noisily to show its discontent. If provoked it will attack, jumping on the enemy and using its dagger-like claws to injure the aggressor. The cassowary has been known to attack humans and dogs, causing deep wounds and massive bleeding.

At one time the cassowary was hunted for its skin and feathers. These were used as doormats and rugs.

Appendix D
Post-test Unstructured Text: The Cassowary

POST-TEST TWO

Control and Experimental Groups

Unstructured Text

THE CASSOWARY

The cassowary looks like an emu.

The cassowary has been known to attack humans and dogs.

The tapering claw is like a dagger.

Female cassowaries lay three to six eggs.

The cassowary is a solitary animal.

The skin and feathers were used as doormats and rugs.

The cassowary is a *ratite* or flightless bird.

It is a fast runner.

The cassowary has no feathers on its neck or head, just skin.

If frightened the cassowary will raise itself to full height spreading its wings and hissing sharply.

Cassowaries are found in northern Australia

On top of its head is a blade-shaped bony growth called a casque.

This bird is a good swimmer.

The cassowary reaches adulthood at two to three years.

The male cassowary looks after the chicks for about nine months.

There are three species of cassowary.

The cassowary is 2m high when fully erect.

Cassowary chicks are brown when hatched.

It eats snails, insects, fungi and leaves.

These black, glossy feathers look more like hair than feathers.

At one time the cassowary was hunted for its skin and feathers.

The cassowary's attack can cause deep wounds and massive bleeding.

It searches for its food on the rainforest floor.

The cassowary has three toes.

Cassowaries are found in Papua New Guinea.

The cassowary's skin is blue, with a bright, red wattle (loose skin folds) hanging from its throat.

If provoked the cassowary will attack.

This horny crown grows up to 15cm above the head.

The inner toe has a long, tapering claw.

The main diet of the cassowary is tropical fruit such as figs and quandongs.

The wattles do not appear until the bird is an adult.

The female cassowary makes a nest on the forest floor.

It often bathes in the streams and rivers of the rainforest.

The cassowary normally holds its head about 1.2m above the ground.

It belongs to the Casuariidae family.

Sometimes the cassowary will stamp its feet noisily to show its discontent.

This claw is about 15cm long.

Cassowaries are found in dense, lowland rainforests.

These black feathers hang loosely on its body.

The cassowary moves quickly through the rainforest undergrowth.

The cassowary jumps on its enemy using its dagger-like claws to injure the aggressor.

The cassowary uses its bony casque to ram its way through the leaves and vines.

The cassowary can weigh up to 60 kilograms.

The male cassowary guards the eggs.

The casque looks like a helmet.

This flightless bird has black, glossy feathers.

Occasionally a cassowary will eat a dead rat or bird.

Its body is shorter and stockier than the emu.

Appendix E
Test Instructions: Trials 1-4

Instructions for Trial 1 Immediate Recall

This is not a test. It is an experiment to show the different types of information children use when writing reports.

On your desk you have two pieces of paper

(a) a lined pad sheet

(b) a typed text (face down). Keep this paper facing down until you are asked to turn it over.

Please record your name at the top of the lined paper now.

When I tell you I want you to turn over your blank sheet and listen and follow along while I read the text on the page.

When I've finished reading the information I will give you a few minutes to read over the text, then I will ask you to turn over the typed text and write down all the information you can remember on your lined paper.

Turn over the typed text now and follow along as I read. (Read passage and allow five minutes for students to reread text)

Please place the typed text face down on your desk. (Check all texts facing down). On your lined paper write down all the things that you can **remember** about the Malayan Tapir.

Instructions for Trial 2 Delayed Recall

Three weeks ago I read you a text on the Malayan Tapir. I then asked you to write down all the information that you could remember about the animal. Today I want you to write down any information about the Malayan Tapir that you can remember.

Please place your name on the top of the lined paper.

REMEMBER this is not a test. It is an experiment to show the different types of information students use when they write reports.

You may start writing now.

Instructions for Trial 3 Immediate Recall

This is not a test. It is an experiment to show the different types of information children use when writing reports.

On your desk you have two pieces of paper

(a) a lined pad sheet

(b) a typed text (face down). Keep this paper facing down until you are asked to turn it over.

Please record your name at the top of the lined paper now.

When I tell you I want you to turn over your blank sheet and listen and follow along while I read the text on the page.

When I've finished reading the information I will give you a few minutes to read over the text, then I will ask you to turn over the typed text and write down all the information you can remember on your lined paper.

Turn over the typed text now and follow along as I read. (Read passage and allow five minutes for students to reread text)

Please place the typed text face down on your desk. (Check all texts facing down). On your lined paper write down all the things that you can remember about the Cassowary.

Instructions for Trial 4 Delayed Recall

Three weeks ago I read you a text on the Cassowary. I then asked you to write down all the information that you could remember about the animal. Today I want you to write down any information about the Cassowary that you can remember.

Please place your name on the top of the lined paper.

REMEMBER this is not a test. It is an experiment to show the different types of information students use when they write reports.

You may start writing now.

Appendix F
Scientific Report Texts Utilized in Treatment Phase
(Texts reproduced with permission of the authors)

The Honey Bee

The honey bee is an insect.

The honey bee is bright yellow and orange. It is 12mm long and has six legs. The honey bee has three separate parts to its body.

This insect lives in all parts of Australia.

These bees collect nectar for honey. They dance on the honeycomb to show the other bees where the best flowers for nectar are. Honey bees may fly 20 000km to collect enough nectar for 500g of honey.

Most people like the honey that the honey bees work so hard to make.

The Rabbit-Eared Bandicoot

The rabbit-eared bandicoot is a small marsupial.

This animal is as big as a rabbit. Its ears are long like those of a rabbit.

The rabbit-eared bandicoot lives in the hot areas of Australia.

This bandicoot hunts during the day and night. It eats insects and other small animals. When in danger it coughs or hisses.

The rabbit-eared bandicoot is a very rare animal.

The Common Wombat

The common wombat is a large nocturnal marsupial. It is the largest burrowing marsupial in Australia.

This marsupial is as big as a medium-sized dog and weighs between 19 and 40 kilograms. The common wombat has a powerfully built body. Its head and rump are flat. This animal has a large, hairless nose. Its grey fur is coarse and thick.

The common wombat lives in the wet and dry forest regions of south-eastern Australia.

All wombats are good burrowers. They are strong and have claws which work like shovels. The pouches of female wombats face backwards so that no dirt gets into them when the animals burrow. The wombat has one offspring every two years.

Wombats feed on grass, roots, fungi and the bark from trees. Wombats can go for a long time without water. They are nocturnal animals, sleeping in the daytime and searching for food at night.

Wombats have two upper and two lower teeth. These must grow continuously because they never wear down, even though they are used to chewing very tough food.

Sometimes the wombat builds large burrows, up to 20 metres long. These burrows are found on the slopes above creeks and gullies.

The Dingo

The dingo is a canine mammal. It is the Australian wild dog.

The dingo is about as big as a medium-sized dog. It has an alert face, sharp, erect ears and a bushy tail. The teeth of the dingo are longer and slimmer than the teeth of other canines.

This canine is usually ginger in colour with the white points, e.g., the feet, the snout and the tip of the tail. Sometimes the dingo is black with tan points. It is seldom white.

Dingoes are found all over the Australian continent, but not in Tasmania.

The dingo is a diurnal hunter. It hunts alone or in packs. If the small prey are plentiful the dingo will hunt alone. In order to capture large animals dingoes work in groups. Sometimes livestock such as sheep are attacked but farm animals are only a very small part of the food eaten by dingoes.

The female can give birth to between one and eight pups, three or four times a year.

Dingoes can make good pets if properly trained. Unlike most other dogs, dingoes never bark. They do howl, however.

The One-Humped Camel

The one-humped camel is a large desert animal. It is found in Australia although it originally came to Australia from the Middle East and parts of Asia. The one-humped camel is a herbivorous mammal.

This mammal is tall and has long legs. It has one hump on its back and a short hairy coat that is brown to grey in colour. The one-humped camel has thick, heavy eyelids which it uses to keep the sand out of its eyes. This animal is able to close its nostrils to protect them from sandstorms. The upper lip of the camel is split. This helps it to choose and eat just the food it wants.

The one-humped camel is found in the sandy ridge dunes of central Australia

Camels can travel many kilometres across hot dry deserts with only a little food and water. They are able to walk easily in sand because of the soft broad pads on their feet. The camel's hump holds a store of fat. This is a reserve supply of food and can last up to six months. After a long trip with little food, the camel's hump almost disappears. With plenty of food it soon grows again. Camels can drink 100 litres of water at a time.

The female camel gives birth once every eighteen months to two years. The young camel is called a calf.

The camel is not a native of Australia. It was brought here from the 1850s onwards because it was ideal for Australia's desert areas. Camels were used to carry heavy loads in areas where there were no roads and where it was too hard to take horses or bullock teams. Herds of wild camels bred from animals that escaped or were set free in the outback. There are now up to 25 000 one-humped camels in Australia.

The Kangaroo

The Kangaroo is a marsupial.

The kangaroo is a large, furry animal. There are two types of kangaroo- the red kangaroo and the grey kangaroo. This marsupial has long pointy ears, short front legs and long hind legs. It has a long, strong tail which helps it to balance. The female kangaroo has a pouch to carry her baby in.

Kangaroos are found throughout the Australian continent.

The kangaroo eats grass and leaves. This animal jumps from place to place. Sometimes the male kangaroos will fight over a female kangaroo. The male raises itself up onto its tail and uses its hind legs to kick the other kangaroo. The kangaroo also uses its small front legs to punch its enemy.

Kangaroos often ruin farmers' crops. Many farmers and hunters kill the kangaroos as they consider this animal a pest.

Salt Water Crocodile

The salt-water crocodile is a huge carnivorous reptile. It is found in Australia, Africa, Asia and America.

This large reptile can grow up to 8 metres long, but the average length is 5 metres. The salt-water crocodile has a long, low, lizard-shaped body. It has short strong legs and a long hide, a long snout and many sharp teeth. The crocodile's jaws are extremely powerful. They can easily bite a heavy wooden board in two.

The salt-water crocodile lives in the warm, tropical waters off the northern coast of Australia. It is also found in coastal rivers and swamps. Often it reaches far inland, travelling up large rivers.

The crocodile is a nocturnal hunter, but it will also hunt during the day, if it has to. This large beast will eat any animal it can catch, including fish, birds and mammals of all sizes. It has been known to attack and kill cattle and people. The crocodile seizes its prey in its strong jaws and often swallows it whole.

Like most reptiles, the crocodile lays eggs. These look like hens' eggs but are longer and have stronger shells. Crocodiles hide their eggs in nests of plants or rubbish, or bury them in sand. Every summer, during the wet season, the female lays about 50 eggs. She guards them until they hatch out.

The salt-water crocodile is now a protected species. Because of this, the numbers of this fierce predator are growing rapidly.

The Echidna

The echidna is an unusual animal. It is an insectivorous monotreme.

The echidna is a small animal but is very heavy. It looks like a spiny bundle, about the size of a football. The back and tail of this animal are covered with sharp spines. It has a long tubular snout and a very long sticky tongue.

This animal is found all over Australia. It lives by itself and is often found under thick bushes, in hollow logs or in burrows.

The echidna eats only ants or termites. It breaks open ant and termite nests with its forepaws or snout, then mops up the insects with its long, sticky tongue. Echidnas are nocturnal and search for food at night.

This monotreme lays one soft-shelled egg every year. The egg is laid into the pouch on the belly of the female. It hatches after ten days but the young echidna stays in the pouch for three months.

The spiny coat of the echidna protects it very well from its enemies. When attacked or threatened in the open on hard ground, it curls into a ball of sharp spines. If attacked when on soft soil, the echidna can dig itself into the ground like a ship going down.

The Mushroom

The mushroom is a fungus. It belongs to the *Agaricaceae* family.

Mushrooms are umbrella shaped. They have a creamy, white top and are pinkish brown underneath. There are two types of mushroom. The cultivated mushroom and the field or wild mushroom. The field mushroom is much larger and darker than the cultivated mushroom.

This fungus grows throughout the world in damp, moist places. The mushroom feeds on dead or living matter and grows very quickly.

Mushrooms are used in cooking and have a distinctive 'earthy' flavour.

The Bottle-Nose Dolphin

The bottle-nose dolphin is a marine mammal. It belongs to the same family as the whale and porpoise.

The bottlenose dolphin looks a bit like a whale but is much smaller. The snout of this animal forms a sort of beak. This 'beak' is between 7 and 8 centimetres long and has between 80 and 88 teeth. The dolphin's dorsal fin is hooked. It is silvery-grey on top and lighter below. There is a clear line between the upper and lower body.

This sea mammal is found in all oceans of the world.

The bottlenose dolphin drives itself through the water by beating its flukes up and down with its powerful body. Dolphins use their built-in echolocation system to guide them.

Baby dolphins are called calves. They are born live, after being carried inside the mother for eleven months. Dolphins give birth to one calf, once every two years. They live in herds and look after their young. Dolphins eat all sorts of fish, even sharks.

The bottlenose dolphin seems to smile. It is a clever, friendly mammal and after humans it is considered the most intelligent animal in the animal kingdom. Dolphins communicate (talk) with each other by making different sounds. They can whistle, click, and bark.

The Little Mastiff-Bat

The Little Mastiff-Bat is an Australian animal. It is an insectivorous flying mammal. (Bats are the only mammals that fly.)

This bat looks rather ugly and savage. It has long, narrow wings. These wings are formed by a thin skin stretched between its long forearms and its hind legs and tail. The Little Mastiff-Bat is tiny: about the size of a mouse. Its fur is dark grey on top and much lighter grey underneath. It has large triangular ears and a very flat head and body.

This tiny mammal is found all over the southern half of Australia. It roosts in small tree-hollows and rock crevices.

The Little Mastiff-Bat is a nocturnal hunter. It can fly fast and skims above the treetops catching insects for food. Sometimes it scurries along the ground to catch other insects. Although it is not blind, this bat like all bats has small weak eyes. It makes high pitched squeaks and uses echolocation to find its way and to catch its prey

The female gives birth to one offspring, once a year.

In spite of its appearance, this little bat is gentle to handle. It is only savage towards other bats.

Appendix G

Lesson

Lesson Plans Utilized in the Experimental and Control Group Treatment Sessions

Experimental Group Treatment

Session 1

Preparation

- students seated in groups of four/five
- pencils
- think (scribble) pads
- overhead projector
- overhead of Honey Bee report text
- flashcards detailing labels and definitions of report text framework
- report text labels printed on card for group work.

Teacher Class I want to share an informational text with you today about an insect. Before we read the text I'd like you to use your think pads to jot down any information you know already about this insect (*Teacher reveals title of report text on overhead and provides a minute for students to record their thoughts.*)

Students Record information in think pads.

Teacher In your groups share one idea/fact you wrote about the Honey Bee.

(*Students share ideas around the group.*) Would anyone like to share some of the information they heard about the Honey Bee? (*Teacher selects several students to share information with class.*)

Teacher We've heard some information about the Honey Bee, let's have a look at what this report text is telling us. How do you think the

information will be presented in this text? Will it begin with 'Once upon a time? Why/Why not? (*Clarifies purpose of informational text*) While you are reading this text on the Honey Bee I'd like you to think about this question-: Why do Honey Bees dance? (*Checks students understanding of discourse question before revealing Honey Bee text for students to read.*)

Students Read report text silently.

Teacher (*Reviews discourse question and elicits several suggestions from students. Uses guided questioning component of DSR to discover/highlight the schematic structure of the report text.*) Suggested questions include:

What class/group of animals does the Honey Bee belong to?

What are some of the physical features of the Honey Bee?

How do bees use the nectar produced by the flowers?

What are some of the jobs performed by the Honey Bee?

Describe some of the ways we use honey.

(*Students selected to answer and substantiate responses.*)

Teacher (*Focuses on the specific components of report text.*) We know that the Honey Bee text is an informational text, that is, it tells us information about something, in this case the Honey Bee. Informational texts which tell us lots of facts and ideas about animals or objects are called reports. Information reports are written about living things, like plants or animals and non-living things, like buildings or bikes. You have probably heard or seen the word report used to describe lots of different things. In your think pad jot down some of the different ways that you've heard/seen the word report used.

Students Record ideas.

Teacher (*Elicits answers/suggestions from class. Clarifies any confusion/misunderstanding of report text. Continues discussion of report text focussing on the structural components of the report framework.*) Discussion and questioning framework proceeds as follows:

The Honey Bee text is a report text which tells us information about the Honey Bee. If we look closely at this report text we can see that each part or paragraph in the text tells us a certain type of information. (*Highlights first paragraph on overhead.*) If we look at the first paragraph in the Honey Bee report we can see that it is telling us what type of creature the Honey Bee is. It tells us that the bee is an insect.

(*Highlights second paragraph on overhead.*) . If we look at the second paragraph what type of information are we being told? (*Elicits answers from students*). Confirms paragraph provides descriptive information

(*Highlights third paragraph.*) What are we told about the Honey Bee in this paragraph? Jot down your answer in your think pad. (*Elicits answers from several students*). Teacher confirms locative information being presented in this section of the report.

What are we told about the Honey Bee in the fourth paragraph? Jot down your thoughts in your think pad. (*Elicits answers and confirms dynamic information presented in this paragraph.*)

What does the last paragraph tell us? (*Elicits answers, discusses the opinion/comment information given in the last paragraph of the report text.*)

Teacher (*Recapitulates information through use of flashcards highlighting textual elements and their function.*) We can see that each paragraph is telling us a certain type of information. The first paragraph tells what the animal is. We call it classification information because it describes what family or group of animals, the animal belongs to. (*Teacher places flashcards with the label classification and its definition on the blackboard.*)

Teacher repeats labelling procedure for descriptive, locative, dynamics and opinion/comment information.

Referring to display of report components teacher states:

We can see that there is a pattern used to write a report text. We have -:

Classification information - that is an opening statement telling us what the object or animal is or what family of animals it belongs to. The classification part is often written very much like a definition, for example, 'the mushroom is a fungus' or the 'crocodile is a reptile.'

Descriptive information - this part tells what the animal has, its colour, shape, length etc. It describes the special features of the animal or object.

Locative information - which tells where the animal/object can be found.

Dynamic information - states how the animal moves, what it can do.

Opinion statement - this is a general comment or opinion about the animal. Reports do not have a formal ending or conclusion but sometimes they are rounded off with a general statement or comment about the

animal or object. For example in the Honey Bee text we read, 'Many people like the honey that the Honey Bee works so hard to make.'

Teacher (*Checks understanding of the schematic structure of the report through reference to Honey Bee text.*) Questioning sequence as follows:

Who can read the locative information in the Honey Bee report text

(*Student substantiates from text*).

Who can find the opinion/comment part of the report text?

(*Student substantiates from text*).

Where is the part in the text that describes the features of the Honey Bee?

(*Student substantiates from text*).

What do we call that part?

(*Student substantiates from text*).

What part of the text tells us some general information about the Honey Bee?

(*Student substantiates from text*).

Teacher (*Removes flashcards from blackboard*). I'm going to jumble these cards up and select one card to show you, when I do, I want you to write down in your think pads what the label means or what label matches the description. For example, if I hold up this card "tells what the animal can do" you would write down "dynamic" information. If I hold up "locative" you would write "it tells where the animal is found." OK let's have a go. (*Teacher selects various labels and descriptions of the report text structure to share with the class, giving specific feedback and clarification after each card displayed.*)

Teacher Explains test/retest method (a) to students. (*Distributes a set of jumbled report text structure cards - labels and definitions to selected*

students. Students with report labels go to the front of the room and sequence themselves according to the report text framework. Students with definitions match up with the appropriate label. Teacher and remaining class members check matches.)

Concludes session by revising report text scaffold and its component parts.

Experimental Group Treatment

Session 2

Preparation

- students seated in groups of four/five
- overhead projector
- overheads of Rabbit Eared Bandicoot and Common Wombat report texts
- semantic grid based on Rabbit Eared Bandicoot report text (individual copies)
- overhead transparency of semantic grid
- report text flashcards (from previous session)
- text reconstruction activity on Common Wombat (one set per pair of students).

Teacher You'll recall last time we met we read the report text on the Honey Bee insect and looked at what type of information a report text tells us. We also looked at the special way that the information in a report text is written. Can anyone remember the special pattern/way a report text is organized? *(Elicits answers from students and uses information generated to review the structural elements of a report text. Incorporates use of flashcards to review the concepts.)*

Teacher Presents semantic grid on Rabbit Eared Bandicoot, explains how the grid is used *(Demonstrates activity on overhead.)*

Students Complete grid placing a tick (✓) in the appropriate grid square or question mark (?) in grid square if they are unsure of a particular category.

Teacher (*Reviews semantic grid activity with students using the overhead.*) Clarifies any misunderstandings regarding the structure and function of the report text framework. Asks students to share how they decided where the information fitted on the grid.

Students Volunteer information.

Teacher (*Shows overhead of Common Wombat report text.*) Conducts DSR on the text using the following framework questions:

Discourse Question: How do Wombats spend their nights?

What type of animal is the Wombat?

Imagine you have a friend visiting from England who has never seen a Wombat what would you tell him/her it looked like?

Are wombats found in Western Australia?

What special features make the wombat a good burrower?

Do you think farmers would consider the wombat a pest?

Who could read the part in the text that tells us the classification information?

What type of information does paragraph six tell us?

What different types of information does this report text tell its readers?

Teacher (*Distributes each pair of students an envelope containing the jumbled paragraphs of the Common Wombat report text. Directs students to put the report text back together so that it matches the report*

framework discussed previously. Teacher moves around room monitoring students' understanding of the task/report framework.)

Teacher Uses the report text flashcards as a guide to checking the Common Wombat text reconstruction activity. Concludes session.

Experimental Group Treatment

Session 3

Preparation

- students seated in groups of four/five
- think pads
- pencils
- class set of text labels and definitions
- Common Wombat report text (individual copies)
- report text flashcards (from previous session).

Teacher Explains test/retest method (b) to students. (*Distributes report text cards to students.*)

Students Mill around room swapping cards until "match" called. At this time students match up with appropriate descriptor/description and form circle at the back of the room.

Teacher Checks and clarifies matches with assistance of students. Repeats procedure.

Teacher Distributes copy of Common Wombat report text to students. Choral reading of text. Teacher directs class to circle word(s) in first paragraph which indicate/give a clue that the information is classification information. (*Discusses suggested answers with class, referring to report text structure flashcards displayed at front of room.*)

Teacher Repeats process for descriptive, locative and dynamic information. Discusses the discourse markers/specific verbs which provide clues.

Teacher (*Selects student to adopt the role of the Common Wombat.*)

Teacher assumes role of current news identity and conducts interview with the animal. Suggested interview questions include:

Tell me Mr Wombat what sort of an animal are you?

How big are you?

What type of skin covering do you have? Can you tell me some more about your fur?

Where do you live?

I notice you have very strong claws Mr Wombat, what do you use those for?

Can you show me how you use your claws to burrow?

How does Mrs Wombat stop the dirt from getting into her pouch when she is busy digging?

Tell me what are your favourite foods?

Mm! With all that chewing and gnawing, don't your teeth get damaged?

Finally Mr Wombat, tell us, how do you spend your evenings?

Teacher Debriefs interview activity, drawing students attention to the report text framework as a guideline for the questions to be asked in the interview. Invites another student to partake in interview, this time reversing the roles, student becomes interviewer and teacher assumes role of animal.

Teacher Informs students they will each have a turn at being the interviewer and interviewee. *(Allow 5 minutes for students to operate in one role before switching to other role.)*

Students Work with their partner and conduct an interview.

Teacher Debriefs interview activity with class. Directs students to get their think pads ready. Holds up flashcard stating "dynamics" and asks students to record in their pad the type of information given in the dynamics part of a report text.

Students Record answers

Teacher Checks and reviews answers. Shows flash card stating "tells what features the animal has." Asks students to record what part of the report text details that information.

Students Record answers

Teacher Checks and reviews answers.

Teacher repeats process using other labels and descriptions of the report text structure.

Teacher Concludes session.

Experimental Group Treatment

Session 4

Preparation

- students seated in groups of four/five
- pencils
- think pads
- sentence completion worksheets (individual copies)
- coloured chalk or whiteboard pens
- large sheets of paper for shared writing

Teacher Explains the sentence completion activity and asks students to complete the task on the elements of the report text framework

Students Complete worksheets.

Teacher Directs students to swap their worksheets with partners and mark answers, discussing alternative responses where applicable.

Teacher Checks and reviews any confusion/misunderstanding re the report text structure.

Teacher Informs students that they are going to write a class report text on the kangaroo. Discussion proceeds as follows:

In order to begin this writing process we need to find out what we already know about kangaroos. Teacher invites students to brainstorm ideas, recording suggestions on the blackboard. *(Teacher and students read through list of generated ideas.)*

Teacher We seem to have lots of ideas recorded about kangaroos. How could we group this information? *(Elicit suggestions, if report text framework not suggested then teacher suggests class organize the information according to the report text framework. Using different coloured chalk for each section of the report framework, teacher assists students to classify the information according to classification, description, locative, dynamic and opinion categories.)*

Teacher Following classification of the information according to the report text framework, teacher models the writing of a report text. The following questions offer a format for this interactive activity.

How could we begin the report?

What is another way we could say that?

Let's begin with...

(Teacher stops after the composition of the first paragraph and selects student to read the classification information recorded in class text.)

OK we have the part of the text that tells us what a kangaroo is, what do we need next? What does descriptive information tell us?

How could we record that in our text?

What's another way we could say that?

Who could give me some ideas about what a kangaroo looks like?

Remember we can refer to our list of ideas.

(Encourages exchange of ideas/suggestions about the features of the kangaroo. Teacher records ideas/sentences suggested by students.)

Teacher *(Invites class to read report text constructed thus far.)*

We've got classification and descriptive information what do we need to include next? *(Elicits responses from students.)*

Next we need to talk about where the animal is found. Who can use the information from the location list on the blackboard to suggest an idea? *(Teacher invites several suggestions then selects one/two ideas to complete locative section of the report.)*

So far we've recorded classification, descriptive and locative information. What's next? *(Teacher invites students to offer ideas and suggestions to portray dynamics information. Teacher records ideas suggested.)*

Teacher and students read draft report text constructed thus far.

Teacher Invites suggestions for a final comment. Canvasses ideas presented and takes a vote on most favoured response. Records students' preferred suggestion.

Choral reading of completed draft text.

Conclude lesson.

Experimental Group Treatment

Session 5

Preparation

- students seated in groups of four/five
- think pads
- pencils
- copy of ideas brainstormed in previous session
- copy of draft report text from session four.

Teacher *(Presents draft copy of class generated text on the kangaroo.*

Teacher and students cooperatively proofread and edit kangaroo text.

Selects student(s) to read text.) Teacher asks selected students to substantiate textual elements using the following guide questions.

Find the part which tells us what features the kangaroo has?

What part of the report text tells us about the things/features the kangaroo has?

Find me the part in the text which reports dynamics information.

Show me the part of the text which expresses the comment/opinion aspects of the text.

Teacher Selects a student to adopt the role of the kangaroo and a second student to assume the role of reporter. Invites students to role play an interview with the kangaroo.

Students Observe role play activity.

Teacher Highlights the link between report text questions as guidelines for interview questions. Selects two other students to present kangaroo interview. Concludes session.

Experimental Group Treatment

Session 6

Preparation

- students seated in groups of four/five
- pencils
- think pads
- report text flashcards (class set)
- Mushroom report text (individual copies)
- text reconstruction activity on Bottle Nose Dolphin (individual copies).

Teacher Reviews instruction for test/retest (b). Distributes class set of report text cards (labels and definitions). Directs students to mill around room swapping cards until "match" is called at which time students must partner up with appropriate label or description. (*Teacher and students cooperatively check matches.*)

Teacher Distributes Mushroom report text to students. Conducts DSR on text using questioning framework outlined below.

Discourse question: What are some of the appealing/interesting aspects of this fungus?

Review discourse question.

What type of plant is the mushroom?

Describe some of the ways the mushroom can be used in cooking.

Where can you find mushrooms? What would be the best time to go looking?

What's the difference between a cultivated and a field mushroom?

Teacher (*Distributes envelopes containing jumbled Bottle Nose Dolphin text to each pair of students.*) Directs students to work together to sequence the text according to the report text framework. (*Teacher moves around room checking and clarifying students understanding of the task.*)

Teacher Enlists students assistance to check sequencing of Bottle Nose Dolphin text. Asks students to substantiate the following parts of the text.

Who can read the part of the text that describes the locative information?

Who can read the dynamic information for us? Which words help us to know that the information in these paragraph(s) is telling us what the animal can do?

How can you tell the difference between a whale and a dolphin?

(Teacher concludes experimental phase of project).

Over the past couple of weeks we have been looking at a certain type of informational text called a report. We learnt that a report is written to provide information about animals, plants or objects. From our work we noticed that there was a special pattern that could be used to organize the information contained in a report. This pattern gave us information about what type of animal it is (*show classification flashcard*). What it looked like (*show description card*). Where it could be found (*show location card*). How the animal moved and what food it ate? (*show dynamics flashcard*). We discovered that sometimes there was an opinion or general comment made about the animal to conclude the report (*show opinion/comment card*). We also learnt that using this framework could help us find out about an animal when reading informational text. Remember the information we discovered from reading about the Honey Bee, the Wombat and the Bottle Nose Dolphin texts?

While working on these report texts over the past couple of weeks we also learnt that if we are writing about an animal, we could use the framework questions (i.e., What is it? What does it have? Where is it found? How does it move?) as a way of helping us to organize our ideas about what to write, just as we did when constructing our report text on the kangaroo. So in our short time together we have learnt some important things about how to organize information in a report text. Thank you for your interest and cooperation over these last few weeks.

Control Group Sessions

Students in the control group were given the same texts as the experimental group for each session, including several additional report texts. The additional texts were given to overcome time difficulties between the instruction (experimental) group and the reading only (control) group. Moreover, it was considered that interest would be maintained through exposure to a variety of report texts rather than thirty five minutes focused on a specific text (Additional report texts are located in appendix F.) The control group received no instruction. That is, the control group were read the texts by the teacher and then directed to read the material silently. Control group sessions were conducted as follows.

Session 1

- (1) Welcome and outline of purpose and procedure involved in the sessions.
- (2) Distribution of the Honey Bee report text to students.
- (3) Oral reading of the Honey Bee text by the teacher to students.
- (4) Silent reading of Honey Bee text by the students.
- (5) Collection of Honey Bee report texts.

Session 2

- (1) Distribution of Rabbit Eared Bandicoot report text to students.
- (2) Oral reading of the Rabbit Eared Bandicoot text by teacher to the students.

- (3) Silent reading of Rabbit Eared Bandicoot text by students.
- (4) Distribution of Common Wombat report text to students.
- (5) Oral reading of Common Wombat text by teacher to students.
- (6) Silent reading of Common Wombat report text by students.
- (7) Collection of report texts.

Session 3

- (1) Distribution of Dingo report text to students.
- (2) Oral reading of the Dingo text by teacher to the students.
- (3) Silent reading of Dingo report text by students.
- (4) Distribution of One-Humped Camel report text to students.
- (5) Oral reading of One-Humped Camel text by teacher to students.
- (6) Silent reading of One-Humped Camel report text by students.
- (7) Collection of report texts.

Session 4

- (1) Distribution of Echidna report text to students.

- (2) Oral reading of the Echidna report text by teacher to the students.
- (3) Silent reading of Echidna report text by students.
- (4). Distribution of Salt Water Crocodile report text to students.
- (5) Oral reading of Salt Water Crocodile text by teacher to students.
- (6) Silent reading of Salt Water Crocodile text by students.
- (7) Collection of report texts .

Session 5

- (1) Distribution of Kangaroo report text to students.
- (2) Oral reading of the Kangaroo report text by teacher to the students.
- (3) Silent reading of Kangaroo report text by students.
- (4). Distribution of Little Mastiff-Bat report text to students.
- (5) Oral reading of Little Mastiff-Bat text by teacher to students.
- (6) Silent reading of Little Mastiff-Bat text by students.
- (7) Collection of report texts .

Session 6

- (1) Distribution of Mushroom report text to students.

- (2) Oral reading of the Mushroom report text by teacher to the students.
- (3) Silent reading of Mushroom report text by students.
- (4) Distribution of Bottle Nose Dolphin report text to students.
- (5) Oral reading of Bottle Nose Dolphin text by teacher to students.
- (6) Silent reading of Bottle Nose Dolphin text by students.
- (7) Collection of report texts .

Appendix H
Genre text-types

Genre Text -Types

Narrative

Purpose: to entertain
 Focus: sequential specific events.
 Framework:
 * orientation
 * initiating events
 * complications/problems
 * resolution (may be repeated in episodes)

Procedure

Purpose: to deal with the way to do things.
 Focus: sequential general events.
 Framework:
 * goal
 * materials
 * method
 * evaluation (optional)

Report

Purpose: to classify and describe a class of things.
 Focus: general things.
 Framework:
 * generalisation/classification
 * description...
 * summary (optional)

Recount

Purpose: to retell events.
 Focus: sequential specific events.
 Framework:
 * orientation
 * events in time-order
 * reorientation
 * evaluation.

Description

Purpose: to describe particular things.
 Focus: particular participants, eg, a cat rather than cats.
 Framework:
 * introduction to participant
 * details about participant
 * concluding statement (optional)

Exposition

Purpose: to argue or persuade.
 Focus: a thesis presented from a particular point of view.
 Framework:
 * thesis
 * argument
 * reiteration.

Explanation

Purpose: to explain phenomena.
 Focus: general processes.
 Framework:
 * phenomenon
 * explanation sequence.

Appendix I
ANOVA Results for Number of Concepts Recalled

ANOVA RESULTS FOR THE NUMBER OF CONCEPTS RECALLED

ANOVA RESULTS FOR GROUP LEVEL

File: NCR TIME ALL TABLE.ex1
Include all cases

size: 276 * 4 MISS=-9999.

STATISTICA GENERAL MANOVA	MAIN EFFECT: V1 1-V1					
	Univar. Test	Sums of Squares	df	Mean Square	F	p-level
Effect		3595.207	7	513.6010	20.62202	.0000000
Error		6674.663	268	24.9055		

File: NCR TIME ALL TABLE.ex1
Include all cases

size: 276 * 4 MISS=-9999.

STATISTICAL MANOVA	Means
	V1
	V4
1	9.71429
2	7.50000
3	5.26471
4	3.80000
5	13.48571
6	15.29412
7	8.17143
8	8.61765

ANOVA RESULTS FOR TEXT GROUP LEVEL

File: NCR TIME ALL TABLE.exl
Include all cases

size: 276 * 4 MISS=-9999.

STATISTICAL GENERAL MANOVA	MAIN EFFECT: V2 1-V2					
	Univar. Test	Sums of Squares	df	Mean Square	F	p-level
Effect		3744.984	15	249.6656	9.948535	.0000000
Error		6524.886	260	25.0957		

File: NCR TIME ALL TABLE.exl
Include all cases

size: 276 * 4 MISS=-9999.

STATISTICAL GENERAL MANOVA	Means
	V2
1	9.47059
2	9.94444
3	7.64706
4	7.35294
5	4.64706
6	5.88235
7	4.05556
8	3.52941
9	14.11765
10	12.88889
11	14.00000
12	16.58824
13	6.88235
14	9.38889
15	9.05882
16	8.17647

ANOVA RESULTS FOR THE NUMBER OF CONCEPTS RECALLED

ANOVA RESULTS FOR PERFORMANCE GROUP LEVEL

File: NCR TIME ALL TABLE.exl size: 276 * 4 MISS=-9999.
Include all cases

STATISTICA GENERAL MANOVA	MAIN EFFECT: V3 1-V3				
	Univar. Test	Sums of Squares	df	Mean Square	F
Effect	5266.569	31	169.8893	8.285131	.0000000
Error	5003.300	244	20.5053		

File: NCR TIME ALL TABLE.exl size: 276 * 4 MISS=-9999.
Include all cases

STATISTICAL MANOVA	Means
	V3 V4
1	6.11111
2	13.25000
3	8.72727
4	11.85714
5	7.00000
6	8.10000
7	6.50000
8	8.11111
9	4.11111
10	5.25000
11	5.00000
12	6.10000
13	3.71429
14	4.60000
15	2.75000
16	4.22222
17	7.88889
18	21.12500
19	9.62500
20	15.50000
21	9.85714
22	16.90000
23	15.50000
24	17.55556
25	4.44444
26	9.62500

STATISTICAL GENERAL MANOVA	Means
	V3 V4
27	8.88889
28	9.88889
29	8.71429
30	9.30000
31	8.25000
32	8.11111

Appendix J

ANOVA Results for Evidence of Structure

ANOVA RESULTS FOR EVIDENCE OF TEXT STRUCTURE

ANOVA RESULTS FOR GROUP LEVEL

File: KERRY TABLES STRUC.XLS.ex1
Include all cases

size: 276 * 42 MISS=-9999.

STATISTICAL GENERAL MANOVA	MAIN EFFECT: CEXP 1-CEXP					
	Univar. Test	Sums of Squares	df	Mean Square	F	p-level
Effect		25.38381	7	3.626258	29.06329	.0000000
Error		33.43866	268	.124771		

File: KERRY TABLES STRUC.XLS.ex1
Include all cases

size: 276 * 42 MISS=-9999.

STATISTICAL GENERAL MANOVA	Means
	SCORE
CEXP	
1	.1714286
2	.1470588
3	.0882353
4	.0285714
5	.2285714
6	.9117647
7	.1714286
8	.7352941

ANOVA RESULTS FOR EVIDENCE OF TEXT STRUCTURE

ANOVA RESULTS FOR TEXT GROUP LEVEL

File: KERRY TABLES STRUC.XLS.exl
Include all cases

size: 276 * 42 MISS=-9999.

STATISTICAL GENERAL MANOVA	MAIN EFFECT: STUN 1-STUN					
	Univar. Test	Sums of Squares	df	Mean Square	F	p-level
Effect		25.86168	15	1.724112	13.60007	.0000000
Error		32.96078	260	.126772		

File: KERRY TABLES STRUC.XLS.exl
Include all cases

size: 276 * 42 MISS=-9999.

STATISTICAL MANOVA	Means
	SCORE
STUN	
1	.176471
2	.166667
3	.117647
4	.176471
5	.058824
6	.117647
7	.055556
8	.000000
9	.235294
10	.222222
11	.823529
12	1.000000
13	.117647
14	.222222
15	.764706
16	.705882

ANOVA RESULTS FOR EVIDENCE OF TEXT STRUCTURE

ANOVA RESULTS FOR PERFORMANCE GROUP LEVEL

File: KERRY TABLES STRUC.XLS.exl
Include all cases

size: 276 * 42 MISS=-9999.

STATISTICAL GENERAL MANOVA	MAIN EFFECT: GP				
	1-GP				
Univar. Test	Sums of Squares	df	Mean Square	F	p-level
Effect	26.55356	31	.8565665	6.476892	.0000000
Error	32.26890	244	.1322496		

File: KERRY TABLES STRUC.XLS.exl
Include all cases

size: 276 * 42 MISS=-9999.

STATISTICAL GENERAL MANOVA	Means
	SCORE
GP	
1	.222222
2	.125000
3	.181818
4	.142857
5	.000000
6	.200000
7	.125000
8	.222222
9	.000000
10	.125000
11	.125000
12	.100000
13	.000000
14	.100000
15	.000000
16	.000000
17	.333333
18	.125000
19	.250000
20	.200000
21	.857143
22	.800000
23	1.000000
24	1.000000
25	.111111
26	.125000

STATISTICAL GENERAL MANOVA	Means
	SCORE
GP	
27	.222222
28	.222222
29	.857143
30	.700000
31	.750000
32	.666667

Appendix K

Student-Newman-Keuls' Results for Control and Experimental Groups

Student-Newman -Keuls' Multiple Comparison Procedure for the Number of Concepts Recalled

	1	2	3	4	5	6	7	8
1								
2	**							
3								
4			*					
5								
6					*			
7								
8							*	

Note: * = *Comparison*
 ** = *Significant difference (.05)*

Level 1. The Student-Newman-Keuls' results for the group level (control vs experimental) for the variable number of concepts recalled. Comparisons are shown for the 4 test conditions NCR 1 - NCR 4.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1																
2	*															
3	*	*														
4	*	*	*													
5																
6					*											
7					*	*										
8					*	*	*									
9																
10									*							
11									*	*						
12									*	*	*					
13																
14													*			
15													*	*		
16													*	*	*	

Level 2. The-Student-Newman-Keuls' results for the text group (control vs experimental, structured vs unstructured) for the variable number of concepts recalled. Comparisons are shown for the 4 test conditions NCR 1 - NCR 4.

**Student-Newman -Keuls' Multiple Comparison Procedure for the
Number of Concepts Recalled**

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1																
2	*															
3	*	*														
4	*	*	*													
5	*	*	*	*												
6	*	*	*	*	*											
7	*	*	*	*	*	*										
8	*	*	*	*	*	*	*									
9																
10									*							
11									*	*						
12									*	*	*					
13									*	*	*	*				
14									*	*	*	*	*			
15									*	*	*	*	*	*		
16									*	*	*	*	*	*	*	

	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
17																
18	**															
19	*	**														
20	**	*	*													
21	*	**	*	*												
22	**	*	**	*	**											
23	**	*	*	*	*	*										
24	**	*	**	*	**	*	*									
25																
26									*							
27									*	*						
28									*	*	*					
29									*	*	*	*				
30									*	*	*	*	*			
31									*	*	*	*	*	*		
32									*	*	*	*	*	*	*	

Level 3. The-Student-Newman-Keuls' results for the performance group level (control vs experimental, structured vs unstructured, better vs novice readers) for the variable number of concepts recalled. Comparisons are shown for the 4 test conditions NCR 1 - NCR 4.

Student-Newman Keuls' Multiple Comparison Procedure for the Evidence of Text Structure

	1	2	3	4	5	6	7	8
1								
2	*							
3								
4			*					
5								
6					**			
7								
8							**	

Note: * = *Comparison*
 ** = *Significant difference (.05)*

Level 1. The-Student-Newman-Keuls' results for the group level (control vs experimental) for the variable evidence of text structure. Comparisons are shown for the 4 test conditions ES 1 - ES 4.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1																
2	*															
3	*	*														
4	*	*	*													
5																
6					*											
7					*	*										
8					*	*	*									
9																
10									*							
11									**	**						
12									**	**	*					
13																
14													*			
15													**	**		
16													**	**	*	

Level 2. The-Student-Newman-Keuls' results for the text group level (control vs experimental, structured vs unstructured) for the variable evidence of text structure. Comparisons are shown for the 4 test conditions ES 1 - ES 4.

Student-Newman Keuls' Multiple Comparison Procedure for the Evidence of Text Structure

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1																
2	*															
3	*	*														
4	*	*	*													
5	*	*	*	*												
6	*	*	*	*	*											
7	*	*	*	*	*	*										
8	*	*	*	*	*	*	*									
9																
10									*							
11									*	*						
12									*	*	*					
13									*	*	*	*				
14									*	*	*	*	*			
15									*	*	*	*	*	*		
16									*	*	*	*	*	*	*	

	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
17																
18	*															
19	*	*														
20	*	*	*													
21	**	**	**	**												
22	**	**	**	**	*											
23	**	**	**	**	*	*										
24	**	**	**	**	*	*	*									
25																
26									*							
27									*	*						
28									*	*	*					
29									**	**	**	**				
30									**	**	**	**	*			
31									**	**	**	**	*	*		
32									*	*	**	**	*	*	*	

Level 3. The-Student-Newman-Keuls' results for the performance group level (control vs experimental, structured vs unstructured, better vs novice readers) for the variable evidence of structure. Comparisons are shown for the 4 test conditions ES 1 - ES 4.

Student-Newman-Keuls' Multiple Comparison Procedure for the Change Analysis in the Number of Concepts Recalled.

Control Group
Group

	1	3	5	7
1				
3	**			
5	**	**		
7	*	**	**	

Experimental

	2	4	6	8
2				
4	**			
6	**	**		
8	*	**	**	

Note: * = *Comparison*
 ** = *Significant difference (.05)*

Level 1 Pairwise comparisons of the control and experimental groups in the number of concepts recalled.

Control Group

Structured Text

	1	5	9	13
1				
5	*			
9	**	**		
13	*	*	**	

Experimental Group

Structured Text

	4	8	12	16
4				
8	*			
12	**	**		
16	*	*	**	

Unstructured Text

	2	6	10	14
2				
6	*			
10	*	**		
14	*	*	*	

Unstructured Text

	3	7	11	15
3				
7	*			
11	**	**		
15	*	*	**	

Level 2. Pairwise comparisons of the control and experimental groups in the number of concepts recalled, structured and unstructured text.

**Student-Newman-Keuls' Multiple Comparison Procedure for the
Change Analysis in the Number of Concepts Recalled.**

Control Group

Structured Text Novice Readers

	1	9	17	25
1				
9	*			
17	*	*		
25	*	*	*	

Structured Text Better Readers

	2	10	18	26
2				
10	**			
18	**	**		
26	*	*	*	

Unstructured Text Novice Readers

	3	11	19	27
3				
11	*			
19	*	*		
27	*	*	*	

Unstructured Text Better Readers

	4	12	20	28
4				
12	*			
20	*	*		
28	*	*	*	

Experimental

Structured Text Novice

	7	15	23	31
7				
15	*			
23	**	**		
31	*	*	*	

Structured Text Better

	8	16	24	32
8				
16	*			
24	**	**		
32	*	*	*	

Unstructured Text Novice

	5	13	21	29
5				
13	*			
21	*	*		
29	*	*	*	

Unstructured Text Better

	6	14	22	30
6				
14	*			
22	**	**		
30	*	*	*	

Level 3. Pairwise comparisons of the control and experimental groups in the number of concepts recalled, structured and unstructured text, better vs novice readers.

Student-Newman-Keuls' Multiple Comparison Procedure for the Change Analysis in Evidence of Structure

Control Group

	1	3	5	7
1				
3	*			
5	*	*		
7	*	*	*	

Experimental Group

	2	4	6	8
2				
4	*			
6	**	**		
8	**	**	**	

Level 1. Pairwise comparisons of the control and experimental groups for the change variable evidence of text structure.

Control Group

Structured Text

	1	5	9	13
1				
5	*			
9	*	*		
13	*	*	*	

Experimental Group

Structured Text

	4	8	12	16
4				
8	*			
12	**	**		
16	**	**	*	

Unstructured Text

	2	6	10	14
2				
6	*			
10	*	*		
14	*	*	*	

Unstructured Text

	3	7	11	15
3				
7	*			
11	**	**		
15	**	**	*	

Level 2. Pairwise comparisons of the control and experimental groups regarding the change variable in the use of the report text structure, structured vs unstructured text.

Student-Newman-Keuls' Multiple Comparison Procedure for the Change Analysis in Evidence of Structure

Control Group

Structured Text Novice Readers

	1	9	17	25
1				
9	*			
17	*	*		
25	*	*	*	

Structured Text Better Readers

	2	10	18	26
2				
10	*			
18	*	*		
26	*	*	*	

Unstructured Text Novice Readers

	3	11	19	27
3				
11	*			
19	*	*		
27	*	*	*	

Unstructured Text Better Readers

	4	12	20	28
4				
12	*			
20	*	*		
28	*	*	*	

Experimental

Structured Text Novice

	7	15	23	31
7				
15	*			
23	**	**		
31	**	**	*	

Structured Text Better

	8	16	24	32
8				
16	*			
24	**	**		
32	*	**	*	

Unstructured Text Novice

	5	13	21	29
5				
13	*			
21	**	**		
29	**	**	*	

Unstructured Text Better

	6	14	22	30
6				
14	*			
22	**	**		
30	*	**	*	

Level 3. Pairwise comparisons of the control and experimental groups for the variable change in the use of the report text structure.

Appendix L
Professional Development Programs

PROFESSIONAL DEVELOPMENT PROGRAMS

The following discussion describes professional development programs and educational initiatives with an emphasis on expository text. The programs have developed as a result of recent trends in literacy theory and research.

CONTENT AREA LITERACY and LEARNING (CALL)

Tempe, P (Ed.), Melbourne: Curriculum Corporation (1993).

Call is a national program developed by Curriculum Corporation for the professional development of teachers of years five - ten. Its aim is to emphasize the impact of literacy development on learning. The program was developed for both specialist and generalist teachers. CALL consists of 10 x 2hr weekly sessions plus between session assignments. The assignments aim to consolidate and extend topics/issues covered in the weekly sessions. A key feature of the program is the reflective practice procedures in which teachers keep journals for reflection and analysis of their teaching.

EFFECTIVE READING IN THE CONTENT AREAS (ERICA)

Morris, A. and Stewart-Dore, N. (1984).

An approach to teaching reading and writing in the content areas which incorporates a variety of strategies (i.e., three level guide, think sheets, graphic organizers and top-level structure writing patterns) designed to enhance student understanding of expository text. Originally developed

for use with secondary teachers, this approach is now used in both primary and secondary contexts.

FIRST STEPS

Ministry of Education, Western Australia (1992).

The First Steps program is designed to focus on the teaching of literacy and numeracy in primary schools. The aim of the project is to assist schools to help students make measurable and observable progress in language and mathematics.

The literacy program is based on wholistic language philosophies and offers schools support through the following three components:

- Teacher Development which includes eight days inservicing in 'best practice' in the areas of reading, writing, spelling and oral language.

- Curriculum Development incorporating the use of developmental continua (literacy maps) which map students' progress in the areas of reading, writing, spelling and oral language. In addition to the continua there are 13 support modules detailing developmentally appropriate strategies and activities in each of the four language areas.

- School Development this aspect of the program involves the adoption of a school focus (i.e., reading) in response to observed student need and the development of a strategic plan to address identified needs.

STEPPING OUT

Ministry of Education, Western Australia (1992).

A Ministry of Education project designed to focus on the teaching of literacy in the lower secondary school. The Stepping Out project builds upon the ideas and strategies promoted in the First Steps program.

This 30 hour (10 x 3hrs) professional development program aims to support teachers in the teaching of literacy within their specific curriculum areas. Stepping Out focuses on the integration of the four language modes and presents ideas and strategies to enhance the teaching of literacy across all curriculum areas.