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**THE EFFECT OF EXPOSITORY WRITING AS A PRE-READING  
ACTIVITY ON COMPREHENSION OF EXPOSITORY TEXT**

**BY**

**W. B. Day Bachelor of Arts**

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

**Bachelor of Education (Honours)**

**at the School of Education, Edith Cowan University**

**Date of Submission: 15.01.91**

## ABSTRACT

The purpose of this study was to examine the effect of a pre-reading expository writing task on comprehension of expository text. It was undertaken in order to ascertain the usefulness of writing as a pre-reading activity in the development of schema theoretic reading teaching strategies. The theoretical position of the study was that writing before reading would activate prior knowledge in the form of content and structure in the working memory of the reader and thereby enhance reading comprehension.

The sample, comprised of 51 year 6/7 students, was selected from a small, school in the outskirts of the metropolitan area. These students were systematically allocated to one of three equivalent groups on the basis of standardised reading comprehension test results.

The experiment followed a three group, post-test only design, with two control groups and one experimental. The experimental group participated in a 20 minute writing activity on the topic of animal conservation. One control group participated in a writing activity on the topic of "television", while the other control participated in maths activities, i.e., they did not write. At the conclusion of this 20 minute session, all groups read a text about animal conservation then completed a probe question comprehension test containing explicit and inferential questions relating to the text.

The results of the short answer test were quantified in two sections, i.e., responses to explicit questions and responses to inferential questions, and the results were analysed by one way analysis of variance.

The results of the ANOVA tests showed no significant difference between the groups in explicit or inferential responses. From this it was concluded that the act of writing, either text related or non-text related, was no more effective in activating prior knowledge than the text itself. It was argued that the degree of schema-activation attainable through many pre-reading activities is limited by the subjects' level of background knowledge, and in most circumstances the introductory paragraphs of a well written text will activate that knowledge.

It was asserted that the use in reading teaching strategies of pre-reading activities which seek to activate background knowledge and not introduce text related information is questionable. Furthermore, the effectiveness of pre-reading activities which seek to activate background knowledge and introduce text related information is limited to situations where there is a mismatch between the text and the background knowledge, culture, and/or reading ability of the reader.

"I certify that this thesis does not incorporate without acknowledgement 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 in the text."

---

W. B. DAY

School of Education,

Mount Lawley Campus,

Edith Cowan University , 1990

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W. B. Day

1990



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## CHAPTER I

### INTRODUCTION

#### The Purpose of the Study

In recent years many models of the reading process have been based on schema-theory. These schema-theoretic reading models share a common view that reading is a constructive act whereby prior knowledge in the form of content and structure, i.e., a schema, is activated within the working memory of the reader. When activated, this schema operates as a device which selects relevant information from the text and serves as a context within which the textual information is processed.

The evolution of schema-theoretic reading models has resulted in the development of reading teaching strategies which seek to maximise reading comprehension by the use of specific pre-reading activities. These pre-reading activities facilitate the reader's comprehension of written text by activating schema prior to reading, thus, the reader establishes a context by which s/he can select and process the incoming textual information. Some examples of such strategies are: P.S.S.D.R (Sloan & Latham, 1981), D.A.A.R (Sloan & Latham, 1981).

The development of reading teaching strategies consistent with schema-theoretic models has produced a need for further research into effective methods of activating a reader's schema prior to reading. This study responds to that need by investigating the effect of the writing process on subsequent reading comprehension.

It was the purpose of this study to examine the effect of a pre-reading expository writing task on comprehension of an expository text. This purpose is reflected in the general research question stated below.

#### General Research Question

*Will a text-related expository writing task undertaken before the reading of an expository text enhance the subjects' ability to comprehend that expository text?*

#### Significance of the Study

This study was significant in that it focused on the use of writing as a pre-reading activity in the context of reading teaching strategies. Teachers selecting pre-reading activities to use during a specific reading lesson often do so with little idea as to which activities are likely to enhance reading comprehension in the context of that lesson. Reading lessons vary in

nature according to text type being used and the specific learning objectives set by the teacher, and it is possible that some pre-reading activities may be more effective than others in any of these different reading teaching situations. Much of the available pre-reading research, however, focuses on the theory of schema activation rather than its practical application. Thus, it provides a theoretical base for the use of pre-reading activities in reading teaching but does not help the teacher to select an effective pre-reading strategy in a given situation.

This study aimed to extend the results of several investigations into the effect of writing as a pre-reading activity which have indicated that text-related writing before reading may enhance subsequent reading comprehension, e.g., Marino, Gould, & Hass (1985), Tierney, Soter, O'Flavahan, & McGinley (1989). It aimed to establish the effectiveness of expository writing as a pre-reading activity in enhancing comprehension of expository text. Thus, it could be stated that it was likely, or unlikely, that expository writing would be effective as a pre-reading activity in reading lessons using expository text.



### Definition of Terms

The above sections contain a number of key terms which occur frequently in the following chapter. These key terms are listed and defined as follows:

1. expository text - a non-fiction, logic- ordered text;
2. expository writing - the production of a non-fiction, logic-ordered text;
3. schema - a task specific, dynamic, cognitive structure which is used as a context of understanding and a basis for prediction;
4. schema construction - the process of *building* cognitive structures through the activation and linking together of information held in permanent memory.
5. comprehension - a broad description of the effectiveness of ongoing schema construction;
6. reading comprehension - a description of the extent to which the information and interrelationships conveyed by discourse are represented in activated schema;
7. pre-reading activities - reading teaching activities which seek to enhance reading comprehension by activating text-related schema prior to reading;

8. Predicted Sustained Silent Discourse Reading (P.S.S.D.R.) - a schema-theoretic reading teaching strategy which utilises pre-reading activities to enhance reading comprehension;

9. Discussion-Aided Analytical Reading (D.A.A.R.) - a variation of P.S.S.D.R. designed to enhance reading comprehension of expository texts in content areas such as Science, Social Studies, and Health Education.

#### Limitations of the Study

The factors discussed below should be noted as limitations upon the generalizability of the findings reported in this study.

1. The subjects who took part in this study were year 6/7 students from one primary school in the Perth Metropolitan Area. It is acknowledged that this sample is not representative of all year 6/7 children within and outside the state of Western Australia.

2. The study dealt with expository text only, therefore, the findings cannot be generalised to all reading situations. Changes in reading purpose leads most readers to experience many different text types. The degree to which reading an expository text is the same as reading a different text type is unknown.

3. A number of *reader based* factors, e.g., motivation to read the text, individual interest in the text topic, the degree of familiarity with the text topic, and perceptions of reading purpose, exert an effect on the reading process. These factors can, at best, only partially be controlled in any situation and exist as a limitation on most experimental studies of the reading process.

4. There can be no pure measure of reading comprehension. Reading comprehension exists in the mind of the reader and ,as such, cannot be measured. As with most studies investigating reading comprehension, this study assumes that the ability to communicate text-related concepts is an indication of comprehension. That is, when asked a text-related question the reader demonstrates comprehension by communicating the answer. The basic problem with this assumption is that there can be no assurance that the given answer really reflects comprehension. There is no way to ascertain the level of thought that went into the answer, whether the question was fully understood, or whether the answer indicates comprehension or the respondent's ability to respond appropriately to questions. In reality the link between the processes of comprehension and the product which is measured is tenuous and must be seen as a limiting factor in any study attempting to measure of reading comprehension.

5. It is acknowledged that the researcher designed comprehension test used in this study was not validated, therefore, the results of that test can be challenged. However, the probe question procedure used in the test is an established method of comprehension assessment. It, and the test scoring procedures used, were consistent with the theoretical position of the study. Furthermore, probe question procedure is one of the principle methods of comprehension assessment used during the implementation of reading teaching strategies. Thus, its use is appropriate in the context of this study which focuses on the use of pre-reading-writing in the context of such strategies.

#### Plan of the Investigation

This investigation is reported according to the plan set out below.

Chapter two contains a theoretical discussion of schema activation and semantic processing, and their role in the reading process. In addition, it discusses the nature and function of pre-reading activities in general and focuses specifically on writing as a pre-reading activity.

Chapter three outlines briefly the theoretical position of the study and states the specific research question and hypotheses of the experiment.

Chapter four discusses the methodology of the experiment and includes a description of the sample, instruments, experimental procedures, and data analysis techniques.

Chapters five and six are devoted to reporting and discussing the findings of the experiment, while chapter seven discusses further research suggested by those findings. The last chapter, chapter eight, discusses the implications which may be drawn from the findings.

## CHAPTER II

### A REVIEW OF RELATED LITERATURE

Literature related to this study can be grouped into five topic areas. These are:

1. schema-theory and memory;
2. the reading process according to schema-theory;
3. pre-reading activities;
4. writing as a schema building process;
5. writing as a pre-reading activity.

Each of these topic areas is discussed below.

#### Schema-theory and Memory

As outlined in the preceding pages, many reading teaching strategies are based on schema-theoretic reading models. These models have been derived from various cognitive theories of human memory and semantic processing. This section will outline the unifying features of such theories, and discuss one semantic processing theory, i.e., The Spreading Activation Theory of Semantic Processing (Quillian, 1962, 1967; Collins & Quillian, 1972; Collins & Loftus, 1975).

Theories of semantic processing maintain that individuals comprehend their environment by constructing a semantic representation of that environment. This semantic representation which is constructed from information stored in permanent memory, acts as:

1. a context by which the relevance of sensory data and semantic information are assessed and subsequently selected for processing;
2. a basis for prediction which allows the individual to respond appropriately to environmental stimuli;
3. a context by which individuals can assess the appropriateness and/or effectiveness of their behaviour in relation to feedback provided by the surrounding environment.

Terms used to describe this semantic representation vary among the many semantic processing theories. Schank (1983) describes it as a "script", which for him is "a data structure which is useful for prediction" (Schank,1983,p.7), while Collins and Loftus (1975) use the term "semantic network" to describe a similar structure. The most commonly used term, however, and the one adopted throughout this paper, is that of "schema".

The notion of schema was developed by Bartlett (1932) to explain distortions in recall he recorded in individuals' retellings of the Kwakiutl Indian tale "The War of the Ghosts". Bartlett (1932) found that, during retelling, the original story was "sharpened", "flattened", and "rationalised" to be more coherent and consistent with the retellers' cultural expectations. From this Bartlett concluded that memory retrieval is a reconstructive act whereby prior knowledge stored in passive memory structures is activated to form working schemata. Bartlett's (1932) view of memory is supported by the work of Carmichael, Hogan, and Walter (1932), who found that labels given to simple pictorial figures influenced the way in which subjects reconstructed the images from memory. For example, a diagram of two circles joined by a single line was labelled "glasses" for one group, and "dumbbell" for another. Carmichael et al. (1932) found that, when asked to draw the figure from memory, the "glasses" group drew glasses, and the "dumbbell" group drew dumbbells.

The work of Bartlett (1932) and Carmichael et al. (1932) indicates that memory is a reconstructive process influenced by prior knowledge and individual perspectives. Subsequent research has developed this concept of reconstructive memory through the design of computer based models of semantic processing, e.g., Quillian, 1962, 1967; Collins & Quillian, 1972; Collins



& Loftus, 1975; Miller, 1981; and Schank, 1982. The discussion which follows deals with reconstructive memory, schema, and schema activation in the context of one such theory - the Spreading Activation Theory of Semantic Processing, (Quillian, 1962, 1967; Collins & Quillian, 1972; Collins & Loftus, 1975).

### The Spreading Activation Theory of Semantic Processing

The Spreading Activation Theory of Semantic Processing (Quillian, 1962, 1967; Collins & Quillian, 1972; Collins & Loftus, 1975) views schemata as being the product of memory search which involves the spreading of semantic activation from a number of concept nodes in a semantic network. Central to this theory are the terms: concepts, concept nodes, relational links, criterialities, and priming.

*Concepts* are categorised groups of information and/or feelings about one thing and, as such, can contain an indefinitely large amount of information. Collins and Loftus (1975) cite the noun "machine", the verb "to machine", the phrase "that old car I own", and the notion of "driving a car" as concepts. Concepts can be represented as a *concept node* in a conceptual network (schema), with all concepts within that schema being connected by at least one *relational link*. Quillian (1967) originally described six different types of relational links: superordinate, subordinate, modifier,

disjunctive, conjunctive, and residual. These categories are deficient in that they cannot describe locative, temporal, or causal relationships. A more adequate description of relational links is that proposed by Klix (1980). Klix asserts that there are two categories of relational links, these being:

1. inter-concept relations which reflect dynamic reality and can be perceived by the senses;
2. intra-concept relations, which reflect "relations amongst concepts determined by common properties, or property relations." (Klix, 1980, p.15)

Klix (1980) describes the following types of inter-concept relations:

1. instrument properties, e.g., the knife is for cutting;
2. actor properties, e.g., the motor is running;
3. action bearer properties, e.g., the teacher teaches;
4. location relation, e.g., the boat is in the water;
5. causality relation, e.g., the light makes the leaves grow green;

6. finality relation, e.g., the patient is nursed in order to get cured;
7. time relation, e.g., the sun sets in the evening.

Klix (1980) asserts that inter-concept relations represent perceivable relationships in an individual's environment and are stored in long term memory. In contrast, intra-concept relations are inferred on the basis of prior knowledge and are operatively generated products of semantic processing. Intra-concept relational links are established through a process of cognitive matching, e.g., high - low, invalid - ill, development - deterioration, and allow seemingly unrelated items to be linked by association.

According to Quillian (1962, 1967), Collins and Quillian (1972), and Collins and Loftus (1975), relational links have different *criterialities*, i.e., the degree to which each link is essential to understanding the given situation, and an activated node *primes* or pre-activates a number of relational links. The degree of priming on each link is reflected by its *criteriality*. This means the degree of priming is proportional to the *criteriality* of the link. Concept nodes are created when information in passive, permanent memory is activated. These nodes prime relational links of varied *criteriality* and semantic activation radiates outwards

from the area of initial activation. In this process, links of strong criteriality activate new nodes and a continued priming effect is established. As criteriality is a measure of the essentiality of a link in relation to comprehending the activating stimuli and stronger criteriality results in continued priming, the resulting spread of activation builds a schema which is:

1. dynamic, in that the process of activation is ongoing and accommodates a continuous flow of information;
2. task-specific, in that the criteriality of the relational links match the spread of activation to the context of the given situation;
3. complex, in that unlimited subordinate concepts can be embedded in one node, while a schema contains many nodes.

Collins and Loftus (1975) theorise that activated schema serves the three functions outlined in the preceding section, i.e., it guides an individual's actions, selects relevant information for processing, and allows individual behaviour to be evaluated through external feedback, while the process of schema-construction results in permanent memory retention. Permanent memory retention occurs when frequent or strong priming of newly formed or remembered relational links increases

the criteriality of those links in a given context. These increased criterialities establish or strengthen permanent memory traces which guide the spread of activation given a similar stimulus or situation.

The activated schema allows information to be processed via the drawing of relational links between an almost unlimited number of concepts. However, these concepts and links do not remain active during information processing. Rather, they fade quickly after immediate activation and remain primed for a period of time proportionate to their criteriality. These primed nodes and relational links can easily be retraced if the processing demands of the task require it. In this regard the activated schema, or area of primed and immediately activated nodes and relational links, functions as working memory in that it allows the individual to focus attention onto a task and process a continuous flow of incoming, task relevant data. Therefore, working memory exists as a complex, dynamic, task specific, schema which serves to:

1. build permanent memory structures;
2. allow prediction and guide responses to external stimuli;
3. allow the appropriateness of responses to external stimuli to be measured in relation to feedback;

4. act as a context by which relevant sensory data and semantic information can be selected for attention/processing;
5. provide a framework by which the world can be understood.

Further to the above, Quillian (1962, 1967), Collins & Quillian (1972), and Collins & Loftus (1975) theorise that concept nodes are accompanied by lexical tags (usually nouns or noun phrases) and the relational links are represented by linguistic devices selected to accommodate the processing demand. Thus, activated concepts and relational links are rationalised and communicated through language.

The Spreading Activation Theory of Semantic Processing (Quillian, 1962, 1967; Collins & Quillian, 1972; Collins & Loftus, 1975) is useful in that it explains the dynamic relationship between permanent memory, working memory, schema construction, language, and environmental stimuli. This relationship is central to an individual's ability to comprehend and describe the world through semantic processing. schema-theoretic views of reading translate this and/or other dynamic cognitive theories into reading situations. This translation is outlined in the section which follows.

### The Reading Process According to Schema-Theory

Schema-theoretic views of reading maintain that reading comprehension is the same as *general comprehension* in that both are a product of semantic processing (De Beaugrande, 1981; Neisser, 1976). Just as an individual comprehends his/her environment through schema construction, so a reader comprehends a text through schema construction. Thus, reading is a constructive act whereby the reader constructs a semantic representation of the text from permanent memory structures (Whitney, 1987; Adams, 1982). Given the parallels between reading comprehension and general comprehension, the functions of activated schema should apply in reading situations. However, the presence of written text in reading adds an additional variable which must be considered in an explanation of the reading process. According to Morgan (1983), this variable (text) acts as a "blueprint to meaning" from which readers "must actively construct a representation of the text which is harmonious with their sociocultural context, prior experiences, and situational goals" (Morgan, 1983, p.313) The process which enables a reader to follow this "textual blueprint" is described below.

During reading, readers draw on their knowledge of syntax, letter sequences, and the text topic to predict

meaning and confirm/reject those predictions with reference to the text (Sloan, 1983; Latham & Sloan, 1979). This process equates to the functions of activated schema listed in the preceding section. That is, to allow prediction and guide responses, allow the appropriateness of responses to be evaluated according to external feedback, act as a "framework of understanding", and act as a context by which data is selected for processing. However, in the case of reading, readers use their activated schema to predict ahead in the text, and use knowledge of syntax, letter sequences, and general semantic knowledge to confirm or correct those predictions. This process, when viewed in light of the lexical tags described by Quillian (1962, 1967), Collins & Quillian (1972), and Collins & Loftus (1975), illustrates Morgan's (1983) concept of a blueprint to meaning in that the semantic relationships encoded in the text activate tagged concept nodes and relational links and thereby guide the reader in constructing a semantic representation of the text. This semantic representation serves to:

1. build permanent memory structures, i.e., learning through reading;
2. allow predictions about the text to be made;
3. allow those predictions to be confirmed and corrected according to the coded data represented on the text;



4. act as a context by which the relevant textual data and semantic information can be selected for processing;
5. provide a framework by which the text can be understood.

Given the above, reading comprehension is a description of the effectiveness of ongoing text-related schema construction in that the complexity and appropriateness of the activated schema is reflected in enhanced understanding of the text - as indicated in point 5 above. In this regard, reading comprehension is linked to both reading processes (schema construction) and the product of reading (memory retention). Similarly, as schemata are constructed from permanent memory structures and, in turn, build or strengthen those structures, comprehension is linked with the process of activation and the product of memory retention. This view of reading comprehension is supported by Royer and Cunningham (1978) who assert "...comprehension processes and memory processes are inextricably intertwined.....(Royer et al., 1978,p.36)"; and Johnson (1983), who asserts that "...processes of reading comprehension must utilise or act upon already stored information..." [and, in studying reading comprehension] "...we are forced to study process and product in their interaction". (Johnson, 1983, p.17)

Support for the assertion that reading involves the activation of text-related schema, which is influenced by the reader's background knowledge, situational goals, and cultural context, is offered by studies which indicate text comprehension is influenced by:

1. content familiarity (Taylor, 1979);
2. expectations of "whole text" structures (Mandler & Johnston, 1977);
3. knowledge of text context (Bransford & Johnston, 1972);
4. cultural perspective (Bartlett, 1932; Reynolds, Taylor, Steffensen, Shirley, & Anderson, 1982);
5. perspective at the time of reading the text (Anderson & Pichert, 1978; Goetz, Schallert, Reynolds, & Radin, 1983).

These studies indicate that reading is a constructive act whereby the reader constructs a semantic representation of the text from permanent memory structures. Given this, the basic principles of spreading activation, schema construction, and priming apply in reading situations. Thus, it is likely that activities which activate text-related background knowledge and focus reader attention prior to reading will influence reading comprehension in that they will

activate concept nodes and prime relational links before reading commences. This pre-activation should construct a complex text-related schema prior to reading and this schema should aid reader prediction and establish a useful context of understanding. This notion of pre-activation is supported by numerous studies (Bartlett, 1932; Mandler & Johnston, 1977; Goetz, Schallert, Reynolds, & Radin, 1983; Bransford & Johnston, 1972) which indicate reading comprehension is influenced by the activation of text-related schemata. These studies highlight the effect of "in-head" knowledge on the reading process and support schema theoretic views of the reading process. In addition, they support the idea of aiding reading comprehension through the deliberate activation of text-related schema prior to reading. As such they represent a theoretical base for the use of comprehension-enhancing, pre-reading activities in reading teaching strategies.

The nature and function of such strategies is described in the section which follows.

#### Pre-Reading Activities

Many pre-reading activities stem from the work of Ausubel and his colleagues (Ausubel, 1960, 1963; Ausubel & Fitzgerald, 1961, 1962; Ausubel & Youssef, 1963; Fitzgerald & Ausubel, 1963), which supports the use of *advance organisers* to facilitate learning from text. In

a summary of this work, Ausubel defines advance organisers as "appropriately relevant and inclusive introductory materials.....introduced in advance of learning....and presented at a higher level of abstraction." (Ausubel, 1986, p.148) Ausubel asserts that problems in learning occur when the learner does not possess, or does not activate, topic relevant prior knowledge to which new information can be linked, and advance organisers facilitate learning by providing and/or activating that knowledge. The work of Ausubel and associates is supported by Mayer (1979) and Mayer and Bromage (1980), who assert that advance organisers actively integrate new information with existing prior knowledge. In addition, Mayer (1979) describes two types of advance organiser: *comparative* and *expository*. Comparative organisers serve to activate existing prior knowledge while expository organisers provide text-related knowledge which the readers do not possess.

Both the effectiveness of advance organisers and the reliability of Ausubel's advance organiser research is challenged by Barnes and Clawson (1975) and McEneaney (1990). Barnes and Clawson (1975) reviewed 32 advance organiser studies and concluded that the efficacy of advance organisers was not supported. Similarly, McEneaney (1990) examined the assumptions, research methods and data analysis procedures of four advance organiser studies, i.e., Ausubel, 1960; Ausubel &

Fitzgerald, 1961; Ausubel & Fitzgerald, 1962; Ausubel & Youssef, 1963, and criticised both the lack of control exercised over the variable of content familiarity, i.e. the possibility that some subjects were familiar with the content of the experimental texts, and the consistent use of correlational argument to imply causal relationships.

Despite the above criticisms of advance organiser research, the concept of comprehension enhancing pre-reading activities has been extended beyond Ausubel's original advance organisers, and the effect of a variety of pre-reading activities on reading comprehension have been investigated. These investigations include:

1. Townsend and Clarihew's (1989) use of verbally presented comparative advance organisers combined with text-related pictures to enhance reading comprehension. Townsend and Clarihew used a combination of pictures and dialogue to achieve positive gains in reading comprehension in children with both weak and strong prior knowledge of the text topic.
2. Denner's (1986) use of *story-impressions* to elicit text based predictions and enhance reading comprehension. Denner used a series of one word cues, i.e., story impressions, to elicit extensive predictions about the plot of narrative texts prior

to reading. Denner recorded significantly enhanced text comprehension in subjects completing the story impression activity, and asserted that the *hypothetical story* generated during this activity forms a strong basis for predicting, confirming, and correcting during subsequent reading.

3. Rowe and Rayford's (1987) use of purpose questions presented in written form to enhance reading comprehension. Rowe and Rayford (1987) investigated the effectiveness of purpose questions as pre-reading activities in reading comprehension testing. They concluded that purpose questions were most effective when they set reader purpose and provided a number of relevant details about the text.

4. Marino, Gould, and Haas' (1985) use of written composition as a pre-reading activity to enhance recall of narrative texts. Marino et al. described a positive gain in delayed recall of narrative text where subjects composed a text-related experiential text prior to reading.

Of the above pre-reading activities, the purpose question and/or picture/dialogue format seems to be most commonly used in classroom situations, while written composition is less often used. Given that an effective pre-reading activity is concerned with

activating extensive schema prior to reading, this "non-use" of writing as a pre-reading activity may not be consistent with recent research (see below) which indicates that written composition is a complex schema building process which promotes comprehension. This research is discussed in the section which follows.

#### Writing as a Schema Building Process

Written composition differs from other pre-reading activities in that it is an outgoing, communicative, process requiring thorough cognitive processing. Smith (1983) described the writing process as follows:

"Writing is not simply a matter of putting down on paper ideas that we already have in our heads. Many ideas would not exist if they were not created on paper.....and ideas that would never have seen the light of day are born in this dynamic interaction called writing." (p. 79)

Smith takes the view that writing is more than representing thought, rather writing builds thought, or, in terms of schema-theory, writing is a schema-building process. This view is supported by a small, rapidly growing body of research literature which investigates and discusses the relationship among writing, thinking, and learning (Newell, 1984; Marshall, 1987; Tierney, Soter, O'Flahavan, & McGinley, 1989; McGinley & Tierney,

1989; Newell & Winograd, 1989; Flower, 1989). Newell's (1984) study compared the effect of three different post-reading-writing activities on recall and comprehension of prose texts. These post-reading conditions were analytical essay writing, note-taking, and responding to study questions. The subsequent effect on reading recall and comprehension was tested by immediate written retelling. In Newell's study the essay writing group scored significantly higher in recall and understanding than either the note-taking or question-answering groups.

A study by Marshall (1987) generated similar results to those of Newell (1984). Marshall's study investigated the extent to which personal analytic, formal analytic and restricted analytic (responses to short answer questions) writing enhances eleventh grade students' comprehension of literary texts. The results of Marshall's (1987) study showed that personal and formal analytic writing was associated with higher comprehension scores than restricted writing. Marshall suggested that extended writing encourages students to "frame an argument, locate the supporting evidence, and choose the language that will carry it....". p(.59) He concluded that the students are constructing both a written and intellectual representation of the story.

Extending Newell's (1984) and Marshall's (1987) studies, the study of Newell and Winograd (1989) examined the



effect of various writing tasks on learning from expository texts. This study indicated, yet again, that extended essay writing contributes to greater understanding than does note-taking or responding to study questions.

The work of Newell (1984), Marshal (1987), and Newell and Winograd (1989) demonstrates the schema constructive power of extended writing and supports Smith's (1983) view of the writing process.

In addition to supporting Smith's view that writing is a schema building process, these studies have implications for the investigation of writing as a pre-reading activity. In the above studies, the comprehension gains achieved by extended writing groups were not achieved by restricted writing groups. This indicates that written composition activates more extensive schema than does restricted writing. If extended writing (written composition) activates more extensive schema than restricted writing, then it follows that extended writing should be more effective as a pre-reading activity than any activity which utilises restricted writing.

The possibility that extended writing may prove effective as a pre-reading activity is explored in the studies discussed below.

### Writing as a Pre-Reading Activity

One study by Tierney, Soter, O'Flahavan, and McGinley (1989) investigates "whether writing in combination with reading prompts more critical thinking than reading alone, or either activity combined with a knowledge activation (pre-reading) activity." (p. 134) This study compares students' evaluative comments about expository texts after various combinations of pre-reading, reading, and post-reading conditions. These combinations involved the following conditions: an introductory activity (either extended writing or a pre-reading activity), reading expository text, answering open-ended and multiple choice questions, and a written retelling of the text (which was analysed to assess the students' evaluative comments). The results of this study showed the pre-reading/writing groups offered more evaluative comments at the point of final writing than the groups exposed to other pre-reading or post-reading activities. This result indicates that "perhaps writing supports more evaluative thinking when it precedes rather than follows reading." (p.163).

One limitation to the Tierney et al. (1989) study was the similarity between the text-related pre-reading-writing activity completed by the pre-reading-writing group and the independent variable, i.e., a written retelling of the text. Both the pre-reading-writing

activity and the written retelling required the pre-reading-writing group to write about the text topic. Thus, the pre-reading-writing group spent significantly more time writing about the text topic than did any other group. This allowed them more time to clarify their ideas about the topic and refine the presentation of those ideas in written form. This difference brings into question the positive conclusion offered by Tierney et al. (1989) in regard to the effectiveness of writing as a pre-reading activity.

Another study which investigated the effectiveness of writing as a pre-reading activity is that of Marino, Gould, and Haas (1985). The Marino, Gould, and Haas (1985) study investigated the effect of pre-reading/writing on delayed recall of narrative texts by comparing the delayed recall of an experimental writing group and a control group. That is, the experimental group wrote an experiential text related to the narrative and the control group wrote on a subject of free choice. Both groups read the same narrative text then completed a recall-assessment-cloze activity. The results of this experiment showed that the experimental group demonstrated significantly higher recall than the control group. Thus, this study indicates that experiential writing is effective in enhancing delayed recall of narrative texts, and supports the use of writing as a pre-reading activity.

Further to indicating the effectiveness of writing as a pre-reading activity, the Marino et al. (1985) study poses four questions relevant to the present investigation. The first of these questions arises from the lack of a "no writing" control group in the experiment, the second from the text type used in the experiment, and the third from whether the recall tested by Marino et al. (1985) adequately represents reading comprehension. The fourth relates to whether there may have been immediate rather than delayed recall gains elicited by the pre-reading-writing. Each of these questions is discussed below.

The first question arises from the lack of a *no writing* control group in the Marino et al. experiment. (1985) This lack of control makes it impossible to ascertain if the non-text-related writing group attained a higher score than would a similar group who did not write. This raises the question of whether non-text-related pre-reading-writing could activate concepts and knowledge relating to language structure prior to reading and thereby elicit recall gains.

The second question arises from the narrative texts used in the Marino et al. experiment. The experiential writing task and narrative text type used in this experiment are both time ordered. Would similar results be achieved if the writing task and text type were logic ordered and expository in nature?

The third question relates to whether the recall measured by Marino et al. represents reading comprehension. The assertion that a reader must comprehend a text in order to recall facts, concepts, and relationships represented in that text is basically sound, but recall does not necessarily indicate *high level* comprehension. Reading comprehension is described in most schema-theoretic reading literature as existing at a number of hierarchical levels, each level representing a more thorough cognitive processing of the text, e.g, Barret's "Taxonomy of Reading Comprehension" (1976), Pearson and Johnson's "Propositional Level Comprehension" (1978). These hierarchical representations of reading comprehension use varied categories to describe levels of comprehension. Most agree, however, that understanding information stated explicitly in a text represents a *lower level* of comprehension than does inferring relationships between that information. The close procedure recall test used in the Marino et al. study only measured the subjects' recall of explicitly stated information. This raises the question of whether the pre-reading-writing task used in the Marino et al. experiment could have enhanced reading comprehension at a *higher than recall*, or inferential, level of comprehension.

The fourth question relates to whether the pre-reading/writing condition in the Marino et al. study

could have elicited immediate, rather than delayed recall gains. The purpose of this study was to ascertain the usefulness of writing as a pre-reading activity in the development of schema-theoretic reading teaching strategies. In such strategies, pre-reading activities are most often used to elicit immediate comprehension gains which the teacher then extends through group discussion and related activities, e.g. "Predicted Sustained Silent Discourse Reading" (Sloan & Latham, 1981). The delayed recall gains recorded by Marino et al. (1985) are significant to this study in that they indicate that text-related writing does have an effect on schema construction during reading, but this does not indicate whether writing is a useful pre-reading activity in the context of strategies such as P.S.S.D.R..

The four questions discussed above form the focus of this study and the basis of the study question, hypothesis, and experimental design addressed in the chapters which follow.

## CHAPTER III

## THE THEORETICAL POSITION, STUDY QUESTION, AND HYPOTHESES

Theoretical Position

As stated above, the purpose of this study was to investigate the effect of pre-reading-writing on reading comprehension. In this paper it is asserted that such a relationship can be described in terms of schema-theory in that text-related-writing undertaken before reading should activate prior knowledge within the working memory of the reader and, thus, aid the comprehension of that text.

Study Question

The general question under investigation in this study is:

Will a text-related expository writing task undertaken before the reading of an expository text enhance the subjects' comprehension of that expository text?

From the above general research question, and the discussion of the preceding section, the following specific research question is derived:

Does text-related expository writing undertaken before the reading of an expository text elicit greater text comprehension than either non-text-related expository writing before reading or reading alone?

This research question translates into the hypotheses stated below.

### Statement of Hypotheses

The hypotheses of this experiment are as follows:

#### Hypothesis One

*Subjects in an experimental group exposed to a text-related expository writing task prior to reading an expository text will exhibit significantly greater comprehension of that text than subjects in a control group not exposed to writing before reading.*

#### Hypothesis Two

*Subjects in an experimental group exposed to a text-related expository writing task prior to reading an expository text will exhibit significantly greater comprehension of that text than subjects in a control group exposed to a non-text-related writing task prior to reading.*



### Hypothesis Three

*Subjects in a control group exposed to non-text-related writing before reading an expository text will not exhibit significantly greater comprehension of that text than a control group not exposed to writing before reading.*

The methods used to test these hypotheses are described in the following chapter.

## CHAPTER IV

### METHODOLOGY

The above hypotheses were tested by experimental methods in October, 1990. The population sample, experimental design, instruments, procedures, and data analysis techniques of that experiment are described and discussed throughout this chapter.

#### The Sample

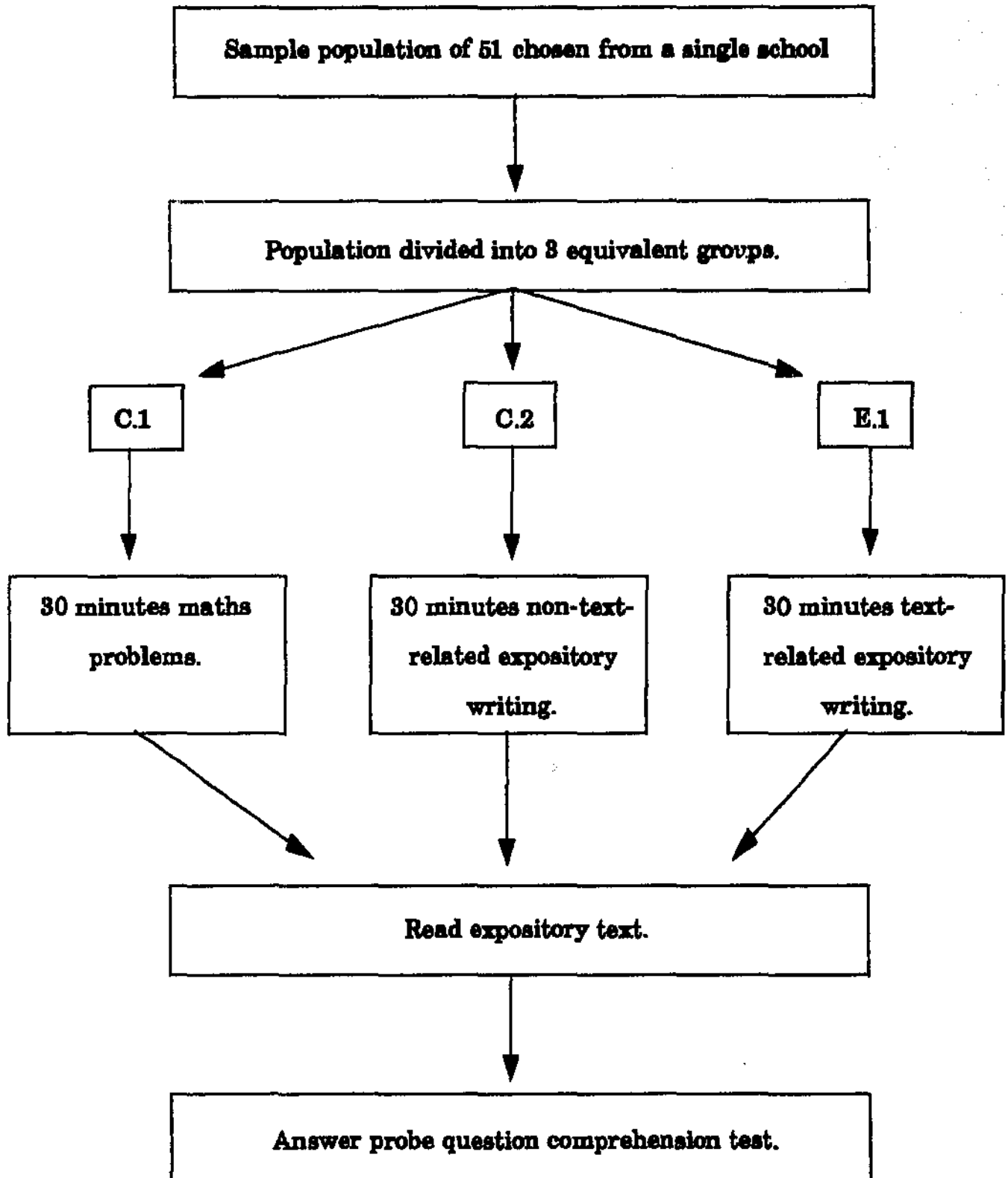
A mixed-sex sample of 51 students aged between ten and twelve years was selected from a small primary school situated in the Caversham/North Midland area of the Perth Metropolitan Area. The majority of the subjects were first or second generation Australians of European descent, with most being associated with the vineyard and orchard industries of the area.

#### The Experimental Design

A three group, post-test only experimental design was selected to test the hypotheses. Three groups were required to meet the need for two control and one experimental group in this study, while a post-test only design was selected to minimise disruption to the school programme and eliminate the possibility of the pre-test interacting with the independent variable.

The design of this three group, post-test only experiment is outlined in the following diagram.

Fig. 1 Diagram of Experimental Design



### The Instruments

Two instruments were used in this study. These were:

1. An 1100 word expository text dealing with the topic of animal conservation; This text was modified from an article entitled "Wildlife" (Gough, 1986), and covered issues such as evolutionary processes; human intervention in evolutionary processes; the effect of various forms of human intervention, with a focus on habitat destruction; extinction; and the Australian problem of kangaroo population management.

2. A researcher designed comprehension assessment test comprised of fifteen probe questions; The use of a researcher designed test was necessary because a commercially produced test using a suitable expository text of the required length which the subjects had not previously encountered could not be located. A rationale for the use of probe questions to measure reading comprehension, and an explanation of the test and its scoring procedures are provided in the sections which follow.

#### A Rationale for Probe Questions as a Measure of Reading Comprehension

As stated in the above literature review, reading comprehension is a description of the effectiveness of ongoing schema construction, and is inextricably linked

to the process of schema construction and the product of permanent memory. As effective schema construction in reading equates to *following the meaning blueprint* to construct a semantic model of the text, it follows that reading comprehension is a description of the extent to which the information and interrelationships conveyed by discourse are represented in activated schemata. Given this, it also follows that true reading comprehension cannot be measured directly as it exists in the form of cognitive structures and semantic processes in the mind of the reader. This view is supported by Johnson (1983) who states "All assessment of reading comprehension is indirect, in that we cannot actually see the processes 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." (Johnson, 1983, p. 74) In the absence of a direct measure of reading comprehension, a reader's ability to communicate the information and interrelationships conveyed as discourse, stands as the only reasonable indicator of comprehension.

Given that a reader's ability to communicate the information and interrelationships conveyed as discourse stands as the only reasonable indicator of comprehension, the problem of selecting the most effective and appropriate method of initiating this

communication remains. Johnson (1983) describes free recall, multiple choice test items, true/false statements, and probe questions as the principle indicators of reading comprehension. However, free recall, multiple choice items, and true/false items were found to be less appropriate in the context of this study than were probe questions. Free recall procedure elicits from the subjects an oral or written retelling of all information and interrelationships they can remember from the text. The constraints of operating in a school environment and the need for all subjects to be tested at the same time precluded oral retelling as a viable indicator of comprehension in this context. The problems discussed in relation to the Tierney et al. (1989) experiment, i.e., the use of written composition to measure the effect of written composition, precluded the use of written retellings. True/false statements and multiple choice items were rejected as suitable comprehension indicators in this context because they do not reveal the logic behind given answers. This need to examine respondent logic was vital if complex, i.e., inferential, comprehension was to be identified. Clearly, if a semantic representation of the text is constructed from permanent memory, then the nature of comprehension will vary according to the background knowledge and individual perspective of the reader. Thus, it was necessary to employ a reading comprehension indicator which provided sufficient response freedom to

allow for these differences. Probe questions provided such an indicator in that the individual logic behind each response could be analysed in relation to both the question and the text. One limitation to this *response freedom approach* is that it does not allow discrimination between familiarity with the text topic (prior knowledge) and knowledge extracted from the text. This limitation was addressed in the limitations section, chapter one, above.

#### An Explanation of the Comprehension Test

As stated in the preceding literature review, reading comprehension is described in most schema-theoretic reading literature as existing at a number of hierarchical levels, each level representing a more thorough cognitive processing of the text. These hierarchical representations of reading comprehension use varied categories to describe levels of comprehension. However, most agree that understanding information stated explicitly in a text represents a *lower* level of comprehension than does inferring relationships between that information. Thus, it was important in the context of this study to construct probe questions which would elicit responses that indicated inferred relationships between text based information. This view that it is important to elicit *inferential responses* is supported by Johnson (1983) who states that the real interest in reading comprehension

"lies in the degree of integration, inferencing, and general tying together of the textual information possessed by the reader." (p.44)

Given the above, a prototype comprehension test containing inferential questions was constructed and administered to a group of four, year six students. At the conclusion of this trial it was found that some subjects, presumably the subjects with a low comprehension of the text, could not respond to the inferential questions but could answer some *on the spot* explicit questions presented by the researcher. From this it was concluded that inferential questions alone could preclude some subjects from demonstrating their level of comprehension. Thus, a test which contained both explicit and inferential questions was developed. The explicit questions of this test were designed to elicit responses that indicated understanding of information stated explicitly in the text and were *closed* questions in that there was one perfect response. The inferential questions were designed to elicit indications of integration, inferencing, and general tying together of the textual information possessed by the reader. These were open questions in that there were many possible answers which varied in sophistication as more text based information was *tied together*.



The fundamental difference in the responses which could be given to the two question types necessitated that each test section be scored in different ways. The scoring procedures for the explicit and inferential questions are described below.

#### The Scoring Procedure for the Explicit Questions

As stated above, the explicit questions were closed in that there was one perfect response. Thus, they were scored according to having/or not having the required textual information of that perfect response. Eight explicit questions were included in the comprehension test. These questions were constructed by analysing the text and isolating items of information given in explanations of single concepts. As an example, the question "Why was the bison shot to near extinction?" relates to the text segment "The bison, which once roamed America's west in its millions, was shot to extinction to make way for cattle.". This text segment contains two items of information which are relevant to the question, one being the bison was shot to "make way" for land use, the other being the "making way" was for cattle. One point was given for each information item represented in the given response. Therefore, using the above example, an answer of "To make more room." scored one point, while an answer of "To make room for cattle." scored two points which was the maximum score for this question. The highest possible score for the totalled eight items was fifteen points.

### The Scoring Procedure for the Inferential Questions

Unlike the explicit questions, responses to the inferential questions could not be assessed in terms of having/not having the required information. Rather they varied in complexity as more, and/or different, propositions were used in the response. As a result, the responses to each inferential question were classified according to the sophistication of the concept being conveyed, the number of text based propositions supporting the response, and the relevance of the response to the text. The product of this classification process was a hierarchy of progressively more complex categories which collectively represented all responses to one question.

As an example of the above classification process, the question "Why is it unlikely that a ban will be put on kangaroo shooting?" related to the latter section of the text. The main point of this section was that there are more Grey and Red Kangaroos in Australia now than there were before farming began, therefore, the balance of evolution has been upset and kangaroos are not an endangered species. Furthermore, they pose a threat to farming in that they destroy crops and fences, therefore, there are both economic and conservation based reasons to continue the culling of certain kangaroo species. A sophisticated response to the

*kangaroo question* would include most of the above points in a logically presented assertion, however, the actual responses given to this question varied considerably in sophistication. These responses were classified according to their level of sophistication. This classification procedure resulted in the following categories being generated:

1. responses which were not relevant to the question or text, e.g., "Because they sort of help people.";
2. responses which gave literal reasons, e.g., "Because men want the meat.";
3. responses which described a concept of there being too many kangaroos, e.g., "Because there are lots of kangaroos around.";
4. responses which described a concept of there being more kangaroos than there is supposed to be, e.g., "Because the government knows there are more kangaroos today than there was when the early settlers came.";
5. responses which described a concept of too many kangaroos being a threat to farming, e.g., "Because the kangaroos eat all the farmers crops. So to make them less they shoot them.";
6. responses which described a concept of there being more kangaroos than there are supposed to be

and this being a threat to farming, e.g., "Because there are so many kangaroos they eat the farmer's grazing land where there should be sheep. There are more kangaroos now than when the first settlers came to Australia."

As can be seen above, the response classification process resulted in six response categories, each being more sophisticated than the other. In light of the above assertion that a reader's ability to communicate the information and interrelationships conveyed as discourse stands as the only reasonable indicator of comprehension, it is reasonable to assume that the most sophisticated responses to the kangaroo question, i.e. level six, communicated more information and interrelationships than did level five and, therefore, indicated a greater comprehension of the text. Similarly, level five communicated more than level four, level four more than level three, and so on. Thus, these categories represented a hierarchy of comprehension levels for the kangaroo question.

The method used to generate suitable categories was as follows:

1. Each response was transferred onto a small card and the subject and question number were recorded on the back of this card.

2. Dealing with one question at a time, the researcher grouped and ordered the responses according to the sophistication of the concept being conveyed, the number of text based propositions supporting the response, and the relevance of the response to the text. The resulting categories were described by category headings and the subject numbers under each heading were recorded.

3. The above process was repeated by an independent, suitably qualified researcher and the two sets of results were compared. The two researchers then discussed their categories and generated new categories, where necessary, by negotiation.

4. The negotiated categories were reviewed by Dr. P. Sloan, an expert in the field of reading education and reading comprehension assessment.

In the above example, i.e., the kangaroo question, the process of response classification resulted in six hierarchical levels. However, the same classification process generated a different number of categories for different questions, e.g., question one produced nine categories, question two produced six, question three produced five, and so on. This difference across

questions presented a significant problem in that it was difficult to score the responses and combine them to a total score for the inferential test component. Gilmore (1981) asserts that, when combining a number of scores, a decision must be made as to the weight, or proportion of the total mark, each score will be given. Thus, a minor test question should be assigned a lower proportion of the total mark than a major question. However, in the case of the inferential component of the comprehension test, all questions were of equal importance and, therefore, demanded an equal proportion of the total mark.

The classification process resulted in a different number of response categories for each question, and, therefore, it was difficult to score the questions in a way which allowed each question to represent an equal proportion of the total mark. In response to this difficulty a decision was made to apply the following criteria to the response categories described above:

1. Categories indicating no evidence of inference were assigned zero points. Evidence of inference could be shown by the communication of question related, super-ordinate concepts represented in the text.
2. Categories indicating some inference were assigned one point. Indications of *some inference* being the communication of one question-related super-ordinate concept represented in the text.

3. Categories indicating sophisticated inference were assigned two points. Indications of *sophisticated inference* being the communication of more than one question-related super-ordinate concept represented in the text where those concepts related together to convey an idea relevant to both the text and question.

In the above criteria the term *super-ordinate* refers to concepts which tie together a number of *smaller* concepts to represent a significant component of the main idea of either the text or a question-related text segment. Referring to the *kangaroo* question, the response "Because there are more kangaroos around than there is supposed to be." is an example of a super-ordinate concept as it ties together the concepts of *evolutionary balance* and *kangaroo population numbers* to state that the kangaroo population is in a state of imbalance, and, therefore, must be controlled.

In the *kangaroo* question example the criteria were applied as follows. Responses which were not relevant to the question or text and responses which gave literal reasons were given a score of zero points as there was no evidence of the tying together of text based information by the reader. Responses which described a concept of there being *too many kangaroos* and responses which described a concept of there being *more kangaroos*

than there are supposed to be, were given a score of one point as they contained one super-ordinate concept represented in the text. Responses which described a concept of *too many kangaroos being a threat to farming* and responses which described a concept of *there being more kangaroos than there is supposed to be and this being a threat to farming*, were given a score of two points as they contained more than one super-ordinate concept and described a question-relevant relationship between those concepts.

The above scoring method allowed each question to be assigned an equal proportion of the total score for the inferential component of the comprehension test. That is, each question had a maximum possible score of three points and a minimum of zero. There were seven inferential questions represented in the test, thus, the maximum possible total was twenty one and the minimum was zero.

#### Data Gathering and Analysis Procedures

The above instruments were used to gather data which was subsequently analysed. The procedures used during this data gathering and analysis process are listed and described below.

#### Selection of the Sample

The selection of the 51 subject sample has been described above.



### The Systematic Allocation of Subjects to Equivalent Groups

The reading ability of the subjects was determined on the basis of their results in the "Torch Tests of Reading Comprehension". (Mossenson, Hill, & Masters, 1987) Each subject was assigned a rank on the basis of these results and systematically allocated to one of three stratified groups ( $n = 17$ ) on the basis of this rank. An analysis of variance applied to these standardised test scores showed a high degree of similarity between these three groups, ( $F = 0.00$ ,  $df = 2/48$ ).

### The Assignment of Groups to One of Three Conditions

The above groups were randomly assigned to one of the following three conditions:

1. experimental group 1 (E.1) - text related expository writing;
2. control group 1 (C.1) - non-text related expository writing;
3. control group 2 (C.2) - non-text related/non-writing activity (i.e. mathematics activities).

### The Allocation of Rooms and Research Assistants

The groups were assembled in a common area and randomly allocated a room and research assistant. They accompanied that assistant to the allocated room and there was no further contact amongst groups or research assistants.

### The Treatment Phase

Each group received the appropriate treatment as follows:

E.1 : 30 minutes expository writing related to the text topic, i.e., animal conservation.

C.1 : 30 minutes expository writing on the topic of "television".

C.2 : 30 minutes mathematics activities.

The writing activities required the subjects to compose a letter stating and supporting their views on the importance of television/animal conservation in today's society. In order to reduce the effect of the researcher on the writing task, the researchers used a minimum of pre-writing priming to initiate the writing. In order to set the writing purpose, each researcher explained the writing task and answered any questions asked by the subjects.

The mathematics activity consisted of a number of problems, each requiring planning and thinking to solve. These were selected in an attempt to maintain an equal amount of semantic activity and researcher/subject interaction between the non-writing and writing groups.

#### The Reading Phase

The subjects read the given text at the conclusion of the 30 minute pre-reading phase. Prior to reading they were given an outline of the comprehension task they would be undertaking and were told they should aim to understand the text rather than "just remember what's in it". These instructions were given to set a common reading purpose for all subjects.

Each subject was given as much time as s/he needed to read the text and was encouraged to read the text at least twice. At this stage, it was made clear to the subjects that they would not have the text to refer to when answering the comprehension questions.

#### Administration of the Comprehension Test

The subjects received a copy of the comprehension test and proceeded to answer the comprehension questions immediately after reading the text. They were encouraged to answer each question and told to guess if they didn't know the answer. This encouragement to

guess was given to ensure those with a vague idea of the answer, i.e., a low-level of comprehension, would frame some form of response. Without this encouragement it is possible that some subjects may have felt the need to *get the right answer* and opted for a non-response rather than a possibly *incorrect* one. Such a situation would reduce the effectiveness of the test by filtering out indications of low-level inferential comprehension.

Each subject was given as much time as needed to complete the comprehension test which was collected by the researcher on completion. The completed tests were labelled appropriately and given to the experimenter for subsequent scoring and analysis. This scoring and analysis are described below.

#### Scoring and Analysis

The scoring of the probe question reading comprehension test is described above. A copy of the test is provided in the appendices of this document.

A one-way analysis of variance was applied to the totalled explicit and inferential scores. The results of these analyses are discussed in the chapter which follows.

CHAPTER V  
FINDINGS

As stated above, an analysis of variance was applied to the totalled textually explicit and implicit scores. The group means and standard deviations, results of these analyses of variance, and the implications of these findings in relation to the hypothesis are discussed in the sections which follow.

The Analysis of the Test Scores

The group means and standard deviations, and the results of the analyses of variance, are displayed and discussed below.

Explicit Results

The group means and standard deviations for the explicit responses are displayed in the table below.

Table 1

Group Means and Standard Deviations - Explicit Comprehension Scores

	Group (n = 17)		
	C.1	C.2	E.1
M	5.53	5.24	5.94
SD	3.56	4.00	3.87

The one-way analysis of variance indicated no significant difference in explicit comprehension scores between the three groups at a significance level of  $p < 0.05$ , ( $F = 0.15$ ,  $df = 2/48$ , n.s.).

### Inferential Results

The group means and standard deviations for the inferential comprehension scores are displayed in the table below.

Table 2

#### Group Means and Standard Deviations - Inferential Comprehension Scores

	Group (n = 17)		
	C.1	C.2	E.1
M	3.52	4.18	5.00
SD	2.67	3.36	3.72

The analysis of variance indicated no significant difference in inferential comprehension scores between the three groups at a significance level of,  $p < 0.05$ , ( $F = 0.86$ ,  $df = 2/48$ , n.s.).

### Analysis of Findings in Relation to the Hypotheses

The above findings indicate no significant difference between the groups E.1, C.1, and C.2 on measures of explicit or inferential comprehension. These results do not support hypotheses one and two of this study, but do support hypothesis three. Thus it is concluded that:

Subjects in the experimental group exposed to the text-related expository writing task prior to reading the expository text did not exhibit significantly greater comprehension of that text than subjects in the control group not exposed to writing before reading.

Subjects in the experimental group exposed to the text-related expository writing task prior to reading the expository text did not exhibit significantly greater comprehension of that text than subjects in the control group exposed to a non-text-related writing task prior to reading.

Subjects in the control group exposed to non-text-related writing before reading the expository text did not exhibit significantly greater comprehension of that text than the control group not exposed to writing before reading.

In addition to indicating no significant difference, the statistical analyses revealed a high degree of similarity between the comprehension scores of the three groups. This high degree of similarity indicates that the manipulation of the independent variable exerted little, or no, effect on the dependent variable. Possible reasons for this failure of the treatment to effect a significant beneficial impact on comprehension are discussed below.



## CHAPTER VI

### DISCUSSION OF FINDINGS

This study was concerned with the use of pre-reading activities to enhance reading comprehension in reading teaching strategies. It investigated the effect of expository writing as a pre-reading activity on comprehension of expository text. As shown above, the results of the experiment indicate that expository writing had no effect on subsequent reading comprehensions. The hypotheses of significant difference among the groups is, therefore, rejected.

The failure of this experiment to generate significant findings suggests that some of the assumptions upon which pre-reading activities are incorporated into many reading teaching strategies should be questioned. Mayer (1979) describes two forms of advance organiser: comparative and expository. The pre-reading-writing activity used in this study was designed to serve the same function as Mayer's (1979) comparative advance organiser in that it sought to activate existing prior knowledge but did not provide the readers with text related knowledge, i.e., it sought to activate general prior knowledge only. These "prior knowledge only" (P.K.O.) pre-reading activities are used on the assumption that the activation of existing prior knowledge elicits reader predictions about the text, and

those predictions better prepare the reader for comprehending the coming text. This study suggests that the act of writing which, it was argued, should activate existing prior knowledge, was no more effective in eliciting comprehension than was the text alone. There are three possible explanations for this result.

1. The text contained an extensive number of concepts with which the subjects were not familiar. That is, the text was conceptually beyond the comprehension of the subjects.
2. The nature of the writing task was too broad in that it focused on animal conservation in general and not on the specific concepts represented in the text.
3. Any existing prior knowledge activated by the pre-reading-writing activity was equally well activated by the text itself.

These possibilities are discussed below.

#### Possible Explanations for the Results

As stated above, there are three possible explanations for the non-significant results. Each of these explanations is discussed below in terms of the schema-theoretic position of this study.

### Unfamiliar Concepts in the Text

As P.K.O. pre-reading activities are concerned with activating knowledge already possessed by the reader, it is logical to assume that they cannot be effective in the absence of that knowledge. The pre-reading-writing activity used in this study may have attempted to activate permanent memory structures which the subjects simply did not possess. Given this, it is probable that a "text-related knowledge imparting" (T.R.K.I.) pre-reading activity would have achieved a result. In terms of pre-reading-writing, a writing activity involving text-related research, summarization of a related text abstract, or text-related pre-writing discussion could be used as a T.R.K.I. pre-reading-writing activity which should enhance reading comprehension.

### The Writing Task

It is possible that some subjects possessed the required text-related prior knowledge but the writing task did not activate that knowledge in a way which was useful to reading the text. One possible reason for this is that the unstructured writing task did not focus on specific concepts represented in the text, therefore, the writing may have activated "conservation-related" but not necessarily text-related prior knowledge. In such cases, to enhance comprehension, P.K.O. pre-reading activities would need to closely mirror the text in

terms of content. Mirroring in terms of text structure could strengthen this effect. Again, in terms of pre-reading-writing, a more directed and topic-focused writing activity is needed to activate the appropriate text related knowledge. Activities involving text-related research, summarizing related text abstracts, or text-related pre-writing discussions could prove effective. Thus, in this case T.R.K.I. pre-reading-writing activities are appropriate, even though the reader possesses the relevant background knowledge.

#### Prior Knowledge was Equally well Activated by the Text

Given that reading is the construction of meaning through schema activation, a well written text must activate appropriate prior knowledge if it is to be read. If it does not activate appropriate prior knowledge, then meaning cannot be made and it is not a well written text. That is, if a text is well written and matched to the reader in terms of information load, cultural appropriateness, and readability, the findings of this study suggest that a pre-reading activity cannot activate any background knowledge that the text cannot. Therefore, the assumption that activating background knowledge prior to reading can enhance comprehension may only hold true where the text is deficient in ways which cloud its meaning.

As discussed above, P.K.O. pre-reading activities are of questionable value where the text is not matched to the reader as they cannot activate background knowledge not possessed by the reader. Similarly, when a well written text is matched to the reader there is generally no need for a pre-reading activity. Thus, it seems feasible to suggest that P.K.O. pre-reading activities may offer no advantages in either situation.

The results of this study, while not supporting the use of text-related-writing as a P.K.O. pre-reading activity, challenge the use of P.K.O. pre-reading activities in reading teaching strategies. Clearly the value of P.K.O. pre-reading activities in reading teaching strategies warrants further examination. This need for further examination is discussed in the chapter which follows.

CHAPTER VII  
RECOMMENDATIONS FOR FURTHER RESEARCH

The discussion of the preceding chapter suggests research possibilities in the areas of:

1. the use of P.K.O. pre-reading activities to enhance immediate comprehension in reading teaching strategies;
2. the use of pre-reading-writing to enhance immediate comprehension in reading teaching strategies.

These possible research topics are discussed below.

P.K.O. Pre-Reading Activities in  
Reading Teaching Strategies

The discussion of the preceding chapter challenges the value of "prior knowledge only" pre-reading activities in reading teaching strategies. It is asserted that a well written text, which is appropriate to the background and interests of the child, will activate any available background knowledge required for comprehension. Therefore, pre-reading activities may be ineffective unless the reader lacks adequate background knowledge. As pointed out above, however, P.K.O. activities probably will make no difference where the

reader is lacking in background knowledge. This assertion could be tested by investigating the effect of one, or many forms of P.K.O. pre-reading activities on immediate reading comprehension where:

1. the text is matched to the reader;
2. the reader is lacking in prior knowledge;
3. the text lacks a suitable context building introduction but is otherwise matched to the reader, i.e., an simulation of a poorly written text.

The above assertion would be supported if the P.K.O. pre-reading activities elicited comprehension gains in the "no context" group, but not in the "lacking prior knowledge" and "matched to text" groups.

#### Pre-Reading-Writing in Reading Teaching Strategies

As discussed above, it is probable that appropriately designed, directed writing activities could prove effective as T.R.K.I. pre-reading activities. It was asserted that a T.R.K.I. pre-reading-writing activity may elicit comprehension gains where P.K.O. pre-reading activities may not, and that T.R.K.I. activity should closely mirror the text in both content and structure. This assertion could be tested by investigating the

effect of one, or many forms of T.R.K.I. pre-reading-writing activities on immediate reading comprehension where:

1. the text is matched to the reader and the activity mirrors the text content and structure;
2. the reader is lacking in prior knowledge and the activity mirrors the text content and structure;
3. the text lacks a suitable context building introduction but is otherwise matched to the reader, and the activity is matched to the text content and structure.

The above assertion would be supported if the T.R.K.I. pre-reading activity elicited gains in the "no context" group and the "lacking prior knowledge" groups, but not the "matched to text" group.



## CHAPTER VIII

## CONCLUSION

The data generated in this experiment were collected under carefully controlled conditions and its hypotheses were derived from established semantic processing and reading theory. Furthermore, the problem under investigation was derived from common practice as shown in established reading teaching strategies. Given this, and the strength of the results, there is a clear need for further investigation into the use of pre-reading activities in reading teaching strategies.

The general research question under investigation in this study was: Will a text-related expository writing task undertaken before the reading of an expository text enhance the subject's ability to comprehend that expository text? In regard to this question it is clear that text-related expository writing undertaken before reading an expository text did not enhance comprehension of that text in the context of the experiment. It is distinctly possible that other, similar writing tasks would also not enhance comprehension in a different context. However, further research is needed to ascertain if different forms of pre-reading-writing activities can achieve a result where the unstructured activity used here did not.

The most significant result of this experiment is its challenge to the use of "prior knowledge only" pre-

reading activities to enhance immediate reading comprehension. If the activation of background knowledge requires a more structured approach than was used in this experiment, then the effectiveness of common pre-reading practices such as discussing text titles and pictures, setting directing questions, and "brainstorming" concepts must be questioned. Furthermore, if the texts given to students are well written and suitable to the individual there is the distinct possibility that there is no need to activate background knowledge before reading. It is possible, however, that the real function of such pre-reading activities is to motivate the readers and focus their attention, in which case a different perspective than schema activation is required to justify the use of pre-reading activities in reading teaching strategies.

Given the results of this experiment and the above discussion, it may be true that the activation of background knowledge is not so relevant to the teaching of reading as is the degree to which the text matches the reader. Thus, it is possible that the value of pre-reading activities lies not in the activation of knowledge, but in strengthening the match between the reader and the text by providing the reader with prior knowledge s/he does not possess. Perhaps a different perspective to that of schema activation is needed to describe adequately the effect of pre-reading activities

on reading comprehension, one that is more oriented towards the interaction of the reader with the text. Such a perspective would allow pre-reading activities to be used selectively and more appropriately, rather than as a required pre-cursor to instructional reading teaching strategies.

REFERENCES

- Adams, M. J. (1982). Models of reading. In W. Kintsch (Ed.) Language and comprehension (pp. 193 - 205). Amsterdam : North-Holland Publishing Company.
- Anderson, R. C., & Pichert, J. W. (1978). Recall of previously unrecallable information following a shift in perspective. Journal of Verbal Learning and Verbal Behaviour, 17, 1-12.
- Ausubel, R. C. (1960). The use of advance organisers in the learning and retention of meaningful material. Journal of Educational Psychology, 51, 267-272.
- Ausubel, R. C. (1963). The psychology of meaningful verbal learning. New York: Grune and Stratton.
- Ausubel, R. C. (1980). Schemata, cognitive structures, and advance organisers: A reply to Anderson, Spiro, and Anderson. American Educational Research Journal, 17, 400-404.
- Ausubel, R. C., & Fitzgerald, D. (1961). The role of discriminability in meaningful verbal learning. Journal of Educational Psychology, 52, 266-274.
- Ausubel, R. C., & Fitzgerald, D. (1962). Organizer, general background, and antecedant learning variables in sequential verbal learning. Journal of Educational Psychology, 53, 243-249.

Ausubel, R. C., & Youssef, M. (1963). Role of discriminability in meaningful parallel learning. Journal of Educational Psychology, 54, 331-336.

Barnes, B., & Clawson, E. (1975). Do advance organisers facilitate learning? Recommendations for further research based on an analysis of 32 studies. Review of Educational Research, 45, 637-659.

Barrett, T. (1976). Taxonomy of reading comprehension. In R. Smith & T. Barrett (Eds.), Teaching Reading Comprehension in the Middle Grades (pp. 105-118). New York : Addison Wesley.

Bartlett, F.C. (1932). Remembering. Cambridge: Cambridge University Press.

Bransford, J.D., & Johnson, M.K. (1972). Contextual prerequisites for understanding: Some investigations of comprehension and recall. In J. D. Bransford (ED.), Human cognition : Learning, understanding and remembering (pp.131 - 134). California : Wadsworth Publishing Co.

Carmichael, L., Hogan, H. P., & Walter, A. A. (1932). An experimental study of the effect of language on the reproduction of visually perceived forms. Journal of Experimental Psychology, 15, 73-86.

Collins, A. M., & Loftus, E. F. (1975). A spreading activation theory of semantic processing. Psychological Review, 82(6), 407-428.

Collins, A. M., & Quillian, M. R. (1972). Experiments on semantic memory and language comprehension. In L. W. Gregg (Ed.), Cognition in learning and memory (pp 201 - 220). New York : Wiley.

Denner, P. R. (1986). Story impressions : A pre-reading writing activity. Paper presented at the spring conference of the Idaho Council of the International Reading Association. Idaho. (E.D. 269743).

De Beaugrande, R. (1981). Design criteria for process models of reading. Reading Research quarterly, 26 (2), 261-309.

Fitzgerald, D., & Ausubel, D. P. (1963). Cognitive versus affective factors in the learning and retention of controversial material. Journal of Educational Psychology, 54, 73-84.

Flower, L. (1989). Cognition, context, and theory building. College Composition and Communication, 40, 282-311.

Gilmore, A. (1981). Combining scores. Set : Research Information for Teachers, 2, 3-13.

Goetz, E.T., Schallert, D.L., Reynolds, R.E., & Radin, D.I. (1983). Reading in perspective : What real cops and pretend burglars look for in a story. Journal of Educational Psychology, 75, 500-510.

Gough, S. (1986). Issues in conservation. Sydney : Martin Educational.

Johnston, P. (1983). Reading comprehension assessment: A cognitive basis. Delaware : International Reading Association.

Klix, F. (1980). On structure and function of semantic memory. In F. Klix & J. Hoffmann (Eds), Cognition and memory (pp. 11 - 26). Amsterdam : North-Holland Publishing Company.

Latham, R. & Sloan, P. (1979). A modern view of reading. Australia : Thomas Nelson.

Mandler, J., & Johnson, N. (1977). Rememberance of things parsed. Cognitive Psychology, 9, 111 - 151.

Marino, J.L., Gould, S.M., & Haas, L.W. (1985). The effect of writing as a pre-reading activity on delayed recall of expository text. The Elementary School Journal, 86, 199-205.

Marshal, J.D. (1987). The effects of writing on student's understanding of literary texts. Research in the Teaching of English, 21(1), 30-63.

Mayer, R. E. (1979). Can advance organisers influence meaningful learning? Review of Educational Research, 49, 371-383.

Mayer, R. E., & Bromage, B. K. (1980). Different recall protocols for technical texts due to advance organisers. Journal of Educational Psychology, 72, 209-225.

McEneaney, J. E. (1990). Do advance organisers facilitate learning? a review of subsumption theory. Journal of Research and Development in Education, 23(2), 89-95.

McGinley, W., & Tierney, R.J. (1989). Traversing the topical landscape. Written Communication, 6(3), 243-269.

Miller, J. R. (1981). Constructive processing of sentences: a simulation model of encoding and retrieval. Journal of Verbal Learning and Verbal Behaviour, 20, 24-45.

Morgan, A. L. (1983). Context: the web of meaning. Language Arts, 60(3), 305-314.

Neisser, U. (1976). Cognition and reality. San Francisco : Freeman.

Newell, G.E. (1984). Learning from writing in two content areas: a case study / protocol analysis. Research in the Teaching of English, 18(3), 265-287.

Newell, G.E., & Winograd, P. (1989). The effects of writing on learning from expository text. Written Communication, 6(2), 196-217.

Pearson, D., & Johnson, D. (1978). Teaching reading comprehension. New York : Holt, Rinehart, and Winston.

Quillian, M. R. (1962). A revised design for an understanding machine. Mechanical Translation, 7, 17-29.



Quillian, M. R. (1967). A theory and simulation of some basic semantic capabilities. Behavioral Science, 12, 410-430.

Reynolds, R., Taylor, M., Steffensen, M., Shirley, L., & Anderson, R. (1982). Cultural schemata in reading comprehension. Reading Research Quarterly, 27(3), 353-365.

Rowe, D., & Rayford, L. (1987). Activating background knowledge in reading comprehension. Reading Research Quarterly, 22(2), 160-176.

Royer, J.M., & Cunningham, D.J. (1978). On the theory and measurement of reading comprehension (Report No. 91). University of Illinois, Centre for the Study of Reading.

Schank, R.C. (1983). Dynamic memory : A theory of remembering and learning in computers and people. Cambridge : Cambridge University Press.

Sloan, P. (1983). Primed and unprimed representational associative semantic memory structures and the reading performance of year seven children. Unpublished doctoral dissertation, Murdoch University, Perth.

Sloan, P., & Latham, R. (1981). Teaching reading is. Australia : Nelson.

Smith, F. (1983). Essays into literature. New York : Heinemann Educational Books.

Taylor, B. (1979). Children and adult's recall of general concepts and details after reading. In Kamil, M., & Moe, A. (Eds.). Twenty eighth yearbook of the national reading conference (pp 123-128). Washington D.C. : National Reading Conference.

Tierney, R. J., Soter, A., O'Flavahan, J.F., & McGinley, W. (1989). The effects of reading and writing on thinking critically. Reading Research Quarterly, 22(2), 134-173.

Townsend, M. A., & Clarihew, A. (1989). Facilitating children's comprehension through the use of advance organisers. Journal of Reading Behaviour, 21(1), 15-29.

Whitney, P. (1987). Psychological theories of elaborative inferences: implications for schema theoretic views of comprehension. Reading Research Quarterly, 22(3), 299-309.

## **Appendices**

# WILDLIFE:

## HERE TODAY, GONE TOMORROW.

During the history of life on earth, some species of animals have become extinct. There were once dinosaurs all over the world, mammoths and sabre-tooth tigers roaming through Europe and, in Australia, giant kangaroos and wombats, and marsupial lions. They all died out as part of the natural process of evolution and this usually happened over thousands, or sometimes millions, of years. At the same time other creatures were evolving into different forms. The evolution rate and extinction rate were similar. Animals spread to all the habitable places on the planet and adapted to them in all their wonderfully different ways.

In more recent times, animals are becoming extinct more quickly, but the evolution rate has not kept pace. The major cause of this has been man. Some animals have been hunted into extinction, but what has threatened wildlife species most has been the destruction of their habitat, and the introduction of new, exotic or domestic animals that compete with them for food and living space. Sometimes the animals were destroyed so that we could take over their habitat. The bison,

which once roamed America's West in its millions, was shot to virtual extinction to make way for cattle. Today it exists only in zoos.

The rate at which animal species are becoming extinct is alarming. Some 250 animals, mammals, birds and reptiles, are listed as endangered species. The seas are no safer. Marine scientist, Jacques Cousteau, estimates that ocean life has decreased by one half during his lifetime.

Among the animals threatened are some of the world's most magnificent creatures: our largest mammal, the whale, despite the formation of the International Whaling Commission, is hunted ruthlessly for its oil. The elephant is hunted for its ivory tusks, and by farmers who want to protect their crops from destruction. The Bengal tiger is threatened because his jungle habitat is becoming smaller.

Among the creatures lost forever are the dodo in Mauritius, the passenger pigeon in the United States and the wolf in Britain. When an animal becomes extinct its unique genetic make-up, which it has carried and developed from the very beginnings of life on earth, is lost forever.



Dodo

### What is being done to save endangered animals?

In Africa, where animals of the savannah lands were being hunted towards extinction, game parks have been established so that the animals are protected from hunters and tourists can come and view them.

Most countries have passed laws which limit hunting to certain species and then only at times or in numbers that will not threaten the species.

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) sets out rules which control the import and export of plants and animals. Some animals that are close to extinction have been bred in zoos, sometimes in great enough numbers to send back to the wild. Scientists can now provide fishermen with estimates of how many fish of each species they may catch without overfishing.

### **In Australia**

Many of Australia's unique animals became threatened species as soon as the Europeans arrived. The thylacine, or Tasmanian tiger, was almost extinct on mainland Australia when the first white settlers arrived but it still flourished in Tasmania. There the settlers shot it on sight because they thought it would kill their sheep. In 1910 the few thylacine left caught a disease possibly introduced by domestic dogs, and by 1930 they were thought to be completely extinct, although tracks and sightings are sometimes reported.

On mainland Australia settlers hunted the koala and the brushtail possum for their fur. Millions of them were killed and their skins shipped overseas. Sometimes cyanide was used to poison the possums and this killed many other birds and animals too. Public outcry stopped this slaughter by the end of the 1920s.

White settlers introduced other animals which threatened native species: rabbits were the most destructive because they bred to plague proportions and used up all the available grazing food, but sparrows, starlings, foxes and ferrets also caused problems. Domestic cats ran wild and killed small bush creatures. Goats, camels, donkeys, buffalo and brumbies competed with native animals for food and water, and increased erosion. Wild pigs and buffalo destroyed wildlife habitats and polluted the wetlands.

The yellowfooted rock wallaby had to compete with sheep and goats in inland eastern Australia and now is very rare. Other creatures fighting for survival are the freckled duck, the helmeted honeyeater of southern Victoria and the northern hairy nosed wombat and bridled nail tail wallaby of central Queensland.

Now most native animals are protected, but some are still threatened, not only because their habitat has been cleared to make way for farming and housing, but because of chemical pollution. One example is the platypus, whose numbers have been reduced because of the effect of pesticides used by farmers, which have drained into the streams and creeks where the platypus lives.

### **The kangaroo controversy**

Conservationists and graziers disagree about the kangaroo. Some conservationists argue that kangaroos are being slaughtered by shooters in huge numbers and because of this some species of kangaroo are threatened.

The graziers, whose cattle compete with the kangaroo for feed, tell a different story. They say, "If you want to know whether or not the kangaroo is a threatened species, come and look at our properties. You will probably see more kangaroos than stock." They say they could be forced to abandon their land if kangaroo shooting is stopped.

The Australian Government acknowledges that there are probably more kangaroos now than there were at the time the first white settlers arrived, so they allow a controlled reduction in numbers. The products of this kangaroo kill, meat and skins, are sold in Australia and overseas.

Conservationists have tried to stop overseas trade. At one stage they persuaded the Americans that the kangaroo was endangered and that they should prohibit the import of all related products. However, the seven kangaroo species which are killed commercially are not listed as endangered species.

(Gough, 1986)

**WILDLIFE : HERE TODAY, GONE TOMORROW**

**Why was the bison shot to near extinction?**

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**Why is the Bengal tiger endangered?**

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**What does the Convention of International Trade in Endangered Species control?**

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**In this article it says elephants are killed for their tusks. Why are whales killed?**

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**WILDLIFE : HERE TODAY, GONE TOMORROW**

**Why was the Thylacene (Tasmanian tiger) shot to extinction?**

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**What did fur traders use to kill koalas and brush tailed possums?**

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**What stopped the killing of koalas and possums for fur?**

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**Why are platypus numbers declining?**

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**WILDLIFE : HERE TODAY, GONE TOMORROW**

**For millions of years animals have been dying, why is this a problem now?**

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**What does "the natural balance of evolution" mean?**

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**Why are introduced animals such as rabbits, foxes, cats, and pigs such a threat to Australian native animals?**

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**Why is it unlikely that a ban will be put on kangaroo shooting?**

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**WILDLIFE : HERE TODAY, GONE TOMORROW**

**Why is this article called "Wildlife: Here Today, Gone Tomorrow?"**

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**National parks are places where the natural bush is preserved.  
Many people want to mine for minerals in national parks.  
Why would this endanger the park animals?**

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**What things must we do to protect the world's animals?**

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Appendix 3 : Table of Torch Scores Used for Equivalent Grouping

No.	Scores		
	C.1	C.2	E.1
1	20	22	23
2	29	25	25
3	35	31	37
4	41	41	41
5	41	41	42
6	46	44	42
7	47	47	47
8	48	48	48
9	48	50	50
10	52	51	50
11	53	53	55
12	55	55	55
13	56	56	56
14	59	59	59
15	61	61	64
16	66	66	64
17	67	70	64

Appendix 4 : Table of Explicit Comprehension Scores

No.	Subject Scores (out of 15)		
	C.1	C.2	E.1
1	02	00	03
2	01	00	00
3	02	02	05
4	00	02	01
5	06	07	04
6	06	03	01
7	05	07	02
8	09	03	05
9	02	05	12
10	11	06	07
11	08	03	10
12	04	08	10
13	11	12	07
14	10	01	08
15	08	07	07
16	03	13	06
17	06	10	13

Appendix 5 : Table of Inferential Comprehension Scores

No.	Subject Scores (out of 21)		
	C.1	C.2	E.1
1	00	00	00
2	02	00	01
3	01	03	04
4	01	08	00
5	01	05	04
6	02	04	01
7	03	03	02
8	05	02	06
9	01	03	11
10	06	03	06
11	04	01	05
12	06	00	06
13	07	06	07
14	10	05	02
15	03	07	10
16	05	10	09
17	03	11	11