The development and implementation of cognitive strategies to facilitate the learning of reading for students with reading difficulties

Judith V. Hall

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The development and implementation of cognitive strategies to facilitate the learning of reading for students with reading difficulties.

A thesis submitted in fulfilment of the requirements for the award of the degree

Master of Arts (Honours)

from

University of Wollongong.

by

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201/EDGA 905
1992
Declaration.

I certify this to be my original work and that it has not been submitted for a degree to any other university or institution,

Judith V. Hall.
Acknowledgements.

I would like to thank my supervisor Prof. Ron King for his valuable assistance and guidance through this study.

I would also like to thank Prof. Ken Gannicott and Dr Ken Russell for their assistance during statistical analysis.

I am indebted to the Department of Education South Coast Region Assistant Director General Dr Terry Burke and to the Director of Personnel Mr Fred Cook for their constant support and encouragement to this study. I am also grateful to Ms. Joan Cobb for her support as Senior Leave Clerk. Furthermore I am indebted to those schools which participated in this research, for this generosity allowed this study to be possible.

I would especially like to thank my Principal and staff for supporting my leave to undertake this work. Furthermore, I would like to thank Ms. Kylie Austin for her invaluable assistance in running my class during this leave.

I would like to thank my best friend and much loved husband of twenty-two years Robert for all his support, encouragement, confidence and enthusiasm in this quest. Finally, but by no means least, I must also thank our wonderful children Andrew, Allan and Jean, for their patience and love throughout the course of this research.
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Abstract.

There are claims that up to twenty per cent of our children are failing to learn to read at a level considered adequate in the wider community.

The problem is compounded by the Great Debate which continues to rage globally between the adherents to the opposing reading models. The debaters seldom acknowledge the vast background of research into learning failure and strategy deficiencies. It is possible that cognitive strategies may well be the facilitating skill potentially capable of enhancing reading for life. There is an urgent need for thorough research to investigate a reading model that would supplement and complement the psycholinguistic approach by teaching active decoding as a step in the application of cognitive strategies.

This research set out to develop and implement a cognitive-interactive program for facilitating reading for students with reading difficulties. The program (CIP) was implemented within the existing classrooms of the participating students. Thirteen schools co-operated, allowing data to be collected from nearly three hundred students. The impact of the program was statistically evaluated.

The purpose of this thesis is to extend existing knowledge by the articulation of a novel approach designed to remedy reading failure.
CHAPTER ONE

INTRODUCTION.

1.0 Background to the problem.

The United Nations Declaration of the Rights of the Child (proclaimed on 20th November, 1959) notes in Principle 5:

The child who is physically, mentally or socially handicapped shall be given the special treatment, education and care required by his particular condition.

However, claims by community groups such as the Australian Association of Special Education (AASE), the Association for Children with Learning Difficulties (ACLD), the Association for Specific Learning Difficulties (SPELD), Teachers Reacting Against Failure (TRAF) and the New South Wales Council for the Intellectually Disabled (NSWCID), persistently re-state the concern that between ten and twenty percent of our children are labouring under massive disadvantages (AASE, 1989b). These are the children who experience reading difficulties. Furthermore, these children are not receiving any special treatment, education or care such as should be mandatory for their particular difficulties. These concerns are notwithstanding apparent contradictory claims that more than 30% of our students fare well enough in basic skills tests to be placed in the top band of competency (see "Private Teachers", 1991).

The result of an unrewarding early reading experience may be a spiralling degeneration relative to other learners- through the combination of poor decoding skills, lack of comprehension resulting in minimal comprehension cues and clues, and lack of practice. This, in turn, can continue to retard the development of automaticity and speed at the word recognition level.

Concern for these children labouring under massive disadvantages is not confined to Australia. Keith Stanovich (1986) from Oakland University, USA, labelled this spiralling
degeneration the Matthew Effect. The Matthew Effect is the outcome whereby the rich readers become richer and the poor readers become poorer. The Matthew Effect occurs when the reader suffers exposure to material which is too difficult. Difficult material makes the chances of learning minimal, for struggling students avoid it and do not gain sufficient practice to develop the speed and accuracy in word recognition that would otherwise enable them to develop comprehension skills.

Public debates on literacy have been focusing on the philosophies of teaching and learning; in particular the development of "wholistic" and "naturalistic" literacy curricula (Kemp, 1987). Public interest in the matter of reading instruction is reflected in daily newspapers. For example, a somewhat alarming article in the Brisbane Courier Mail (see "School Reading", 1990) reports on statements made by a "special education expert" who expressed concern that teachers no longer taught "the basics", and in particular, that teachers no longer taught phonemic skills. The article declares:

More students are leaving school with less [sic] reading and writing skills because the educational system has not read research which shows the school system is wrong.

The writer goes on to report that children were thrown "into the deep end year after year", resulting in hundreds of thousands of children being unable to read. Sadly, the solution advanced in the article suggests that "the best system was the one used 50 years ago". This statement must be viewed as both an oversimplification and a misrepresentation of the problem of reading failure.

Recent research indicates that servicing (i.e. through remediation/special education facilities) to children who fail at reading is provided too long after failure occurs (AASE, 1989a; Andrews & Jardine, 1989; Juel, 1988; Reynolds & Dallas, 1989). For example, children often have to demonstrate two years delay in reading skills before gaining access to any servicing, despite research now documenting the cost-efficacy of prompt servicing,
"when the first indicators of future failure occur" (AASE, 1989a, p.7). Reynolds and Dallas (1989) note that the existing system is a "tow-truck" program, that is, the more breakdowns a child suffers, the more chance that child has of gaining special education services!

The consequential bottom-line is that school pupils who are failing tend to be passed from year to year within the system and join the larger part of one million Australian adults who are for all practical purposes, illiterate (Lloyd & Goyen, 1986). Simply stated, illiterate adults can't read. Furthermore, there is little argument that reading is more than merely gaining meaning from print. Reading is a means of growth and well-being for the individual. This well-being refers not only to the narrow academic field restricted to the classroom lesson, but also growth in the cognitive, social and emotional areas. Reading behaviour "mirrors the processes of thinking in a coordinated expression of human behaviour" (Neale, 1989, p.4).

The search for a "true and correct" method for teaching reading has been elusive, and the current world wide debate has been raging for decades. Nicholson (1986) might well have claimed that "the great debate seems settled" (p.206), but I consider that in the light of the following, the question of classroom-based philosophy which dictates the reading instructional program remains far from resolved.

Many theorists have firmly settled themselves into one of the two main protagonist camps; the psycholinguistic camp\(^1\) (i.e. top-down/whole language approach) and the phonemic camp\(^2\) (i.e. bottom up decoding involving the translation of written elements into language).

During the 1970's, some theorists began proposing the Interactive Model\(^3\) having concluded that in the attempt to develop a "correct" theory of reading instruction, both theoretical approaches (psycholinguistic and phonemic) need to be implemented. Almost a decade earlier, Tendys (1979) questioned

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\(^1\) see Johnson & Louis, 1986.


\(^3\) see Lloyd & Goyen, 1986; also see Andrews & Jardine, 1989.
the adherence by a teacher to one method of reading instruction and suggested that while some readers apply psycholinguistic knowledge to predict and sample, based on semantic and syntactic cues, others may predict on the basis of phonemic cues. Tendys (1979) also points out that differences in cognitive style are accepted in the psychological field, yet differences in reading style have received little attention. This attitude has been reflected more recently by Lloyd and Goyen (1986) who state that teachers should not lock up their students into an exclusive phonemic or psycholinguistic learning situation, "as neither theory is viable in itself" (p.44). Tendys (1979) wisdom also has been supported by the declaration of Stanovich (1986) that in the light of current research:

Phonemic awareness may be induced; it may be acquired through direct instruction; it may be acquired along with or after the build up of a visually based sight vocabulary - but it must be acquired if a child is to progress successfully in reading. (p.363)

Lloyd and Goyen (1986) note while psycholinguistic theory has added much to our understanding of how print is processed, the traditional top-down approach has underestimated the importance of phonemic skill in normal effective reading. These researchers propose that successful readers "are recoding letter and sub-word sounds so rapidly that the technique is repeatedly, though selectively, being used as part of a total spectrum of sentence attack skills" (p.42). This proposal has been supported by others investigating the learning of reading in native languages other than English. For example, the observations of Schreuder and van Bon (1989) show that notwithstanding the fact that in the Dutch education system beginning readers learn to read by way of the "phonological route" (p.61), for many readers this is soon followed by the use of the "lexical route" (p.61). The lexical route is explained by Schreuder and van Bon (1989) as the unit of processing in which the whole word is accessed, rather
than access through the single letter or phoneme. These observations also note however, that this quicker, more typical strategy for experienced readers is not applied for all words.

Torneus (1984) notes that instead of being a prerequisite skill, metaphonological abilities might well be facilitating factors in reading and spelling acquisition (see section 2.3.0). Perhaps the acceptance of phonemic awareness as a facilitating factor rather than a prerequisite skill, helps to resolve the paradox that it is necessary to teach beginning readers skills in phonemics while as skilled readers these same children will have little need of this skill.

1.0.1 Cognitive strategies: adding a dimension.

The interactive model, in being intrinsically paradoxical, in fact suggests another dimension of learning theory. It assumes the existence of executive systems and access to internal multiple coding facilities. This implies cognitive strategies. Siegler and Jenkins (1989) propose that:

A child's mind is like a workshop. This workshop contains a remarkable collection of materials (knowledge) and tools (learning processes) that can be used to make new products (rules, strategies, hypotheses, schema, causal networks, etc). Some of the tools and materials are useful for a great many tasks. Many others are specialized for a particular purpose, but are invaluable when they are needed ... the broader the range of products the workshop ... [child's mind] ... has produced in the past, the greater its potential for meeting future demands. (p.1)

But can we be sure that all students are, in fact, able to use successful cognitive strategies with some degree of consistency? Simply stated, we can be certain that this is not the case! For example, there is ample evidence to suggest
that people with intellectual disabilities lack active strategies for learning or solving problems (see review in Gow and Ward, 1985). Over a decade ago, Havertape and Kass (1978) concluded that students with intellectual disabilities tend to lack attack strategies in problem solving. Their observation was supported by Maker (1981) who argued that this could be related to apparent inability to generalise a previously learned problem solving strategy. Furthermore, in his review of current research deBettencourt (1987) concludes:

In summary, the body of information on metacognitive skills of learning disabled students supports the notion that LD children fail to apply cognitive strategies effectively and consistently. (p.26)

For a reading disabled student, the inability to use strategies to apply multiple approaches can be illustrated by analogy through comparison of a child with a reading disability and a child who is visually impaired or totally blind. A child who is visually impaired or blind may sit in the classroom, surrounded by immersion charts, be given the most exciting of books to read, be shown story maps and sociographs (even be asked to draw one), and be asked to read along with a big book. This child however, is unlikely to gain from these experiences. Unless teaching strategies are employed that include extra large print, raised print, or even Braille, the visually impaired child would gain little from the lesson. Similarly, the child who is reading disabled, although not physically blind, may well be essentially blind to the teaching strategies employed in most classrooms. Children with reading disabilities effectively suffer a visual impairment to the extent that they lack the essential cognitive strategies to note those things in the reading environment which are, to most learners, simple and obvious. The claim by Johnson and Louis (1986), that children learn "usually unconsciously, the regularities between the way
things are written and the way they are spoken" (p.22), may apply in the case of students who are effective readers but, one must accept that this is not the case for those with reading difficulties. The fact that some students remain ineffective readers suggests that they can neither assimilate this knowledge (even at a slower pace than "normal" children) nor perceive these regularities. They are unable to do so because they are cognitively blind in these respects.

The suggestion that students with a reading disability may be cognitively blind follows from the observations and conclusions of cognitive researchers. Nearly three decades ago, Jerome Bruner (Bruner, 1964a; 1964b, 1966) claimed that learning involves the active processing of information. Bruner adhered to the belief that individuals attend selectively to the environment, process and organise the information, then integrate this information into their unique models of the environment. Bruner has had a profound influence on the school curriculum, particularly with regard to his insistence that learning is active and that much learning occurs through discovery.

There were many early attempts at developing and improving the use of cognitive strategies (see Bereiter and Engelmann, 1967; Engelmann and Bruner, 1969; Engelmann and Carnine, 1970; Feuerstein and Jensen, 1980; Meichenbaum, 1977; Meichenbaum and Goodman, 1971). More recent developments in cognitive approaches include those of Gow, known as Self-Instruction Problem Solving (SIPS) (see Gow, 1987; Gow, Burton & King, 1988); the cognitive-behavioural Talk Sense to Yourself program (see Wragg, 1987) and my approach which requires the learner to Observe and Copy (OBCOP) (see Hall and Gow, 1989).

These approaches all teach cognitive strategies which promote adaptive use of knowledge "by providing the learner with a portable and durable strategy for approaching problems" (Gow et al., 1988).

The clear implication for educational programming is that teachers can no longer simply assume that children will somehow pick up, or happen upon, strategies that work.
Where necessary, teachers should teach successful strategies and encourage their application consistently.

1.1 Statement of the problem.
Successful readers appear to be utilising successful cognitive strategies to assimilate simultaneously the interactive cues and clues from text. This includes cues and clues from lexical presentation, illustrations, syntactical information, semantic information, grammatical information and phonemic interpretation of the individual word. To utilise successful cognitive strategies requires the use of executive systems. Yet, it must be accepted that at least a certain proportion of the reading disabled population lack (even to the most basic of application) cognitive strategies.

Students must become independent word learners. Attempts to design direct vocabulary instruction that generalises, leading students to independent learning of non-instructed words however, have failed (Nagy, Herman & Anderson, 1985). It remains a paradox that the best way to improve reading, that is, to produce large scale vocabulary growth, is the activity of reading.

There is an urgent need for thorough research to investigate a reading model that supplements and complements the psycholinguistic approach by teaching active decoding as a step in the application of cognitive strategies. The emphasis on decoding skills would therefore no longer be as the development of an inadequate prerequisite skill, but rather as a facilitating skill potentially capable of enhancing reading for life. Such a program would not simply represent a return to phonic based reading schemes.

1.2 Need for the study.
The need for this study lies in the recognition that up to twenty per cent of our children are failing to learn to read at a level considered adequate in the wider community, and subsequently leaving school to join about one million other Australian adults who are for many practical purposes illiterate.
1.3 The Importance of the problem.

Illiteracy is a major problem in any modern society. It threatens the quality-of-life for all those effected. On occasions illiteracy may even prove life-threatening to individuals. Illiterate people cannot read and therefore cannot use reading as a means of growth and well-being or use text to communicate with society.

The importance of the problem is compounded by the continuing battle that rages globally between the adherents to the opposing reading models, the phonemic based models and the psycholinguistic based models. The debaters seldom acknowledge the vast background of research into learning failure, particularly that which renders the learner cognitively blind because of an absence of cognitive strategies.

The importance of this research cannot be overstated. The Cognitive-Interactive Program (the independent variable in this study) aims to utilise cognitive theory and existing knowledge available from the cognitive approaches for teaching active strategies. This research aims at testing a cognitively-based reading approach designed to remedy reading failure.

1.4 Questions to be examined.

This research sought to determine whether the independent variable, that is, The Cognitive-Interactive Program for Facilitating the Learning of Reading (CIP) facilitated reading for students with reading difficulties.

In particular, this study sought to determine whether CIP was useful to the following populations of students:

Group 1: students whose reading difficulty is defined by the Department of School Education to lie within the aetiology of their learning English as a second language (ESL),

Group 2: students whose reading difficulty is defined by the Department of School Education to lie within the aetiology of a mild intellectual disability (IM),

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4 During 1990, the N.S.W. Department of Education changed its name to the N.S.W. Department of School Education. Throughout this Thesis, post 1990 departmental references will reflect this decision.
Group 3: students whose reading difficulty is defined by the Department of School Education to lie within the aetiology of a moderate/severe intellectual disability (IQ/IS),

Group 4: students whose reading difficulty is defined by the Department of School Education to lie within the aetiology of an unspecified learning disability (LD).

This study determined "successful facilitation" by testing for measurable difference in the following reading-related areas:
- normed reading age in reading rate,
- normed reading age in reading accuracy,
- normed reading age in reading comprehension,
- phonological word processing skills,
- spelling,
- process writing, and
- a cloze exercise. (A cloze reflects the ability to problem solve in the linguistic domain).

1.5 Conceptual assumptions.
This study accepts the prima facie classifications, formally identified by the criteria of the N.S.W. Department of School Education (see Section 2.1.1) for the four groups of students involved. No further testing or classifying was considered.

Also accepted was the existing placement of students into whichever educational setting they have been placed within the Cascade of Services (see Section 2.1.1). The N.S.W. Department of School Education's Cascade of Services is consistent with the current policy of integration (see N.S.W. Department of Education 1987a, 1988, 1988a, 1988b, 1988c, 1988d). This research was undertaken, therefore, in many educational settings (e.g., students with mild intellectual disability in a segregated I.M. class or, students with a specific learning difficulty integrated into regular class with support), and no further organisation was considered.

1.6 Substantive assumption.
Because of the acceptance of the prima facie classifications and their existing placements, the students
continued to be taught by their regular teacher(s) within their regular settings. The only change in the students' regular routine was the implementation of the independent variable (the Cognitive-Interactive Program for Facilitating the Learning of Reading). Any significant difference exhibited by the experimental groups over the control groups was assumed to be due to the independent variable.

1.7 Theoretical framework.

The theoretical framework for this study is provided by cognitive theories of instruction and, in particular, cognitive strategy training which perceives students with learning disabilities as being "strategy-deficient". This study draws from the assertion of Meichenbaum (1977) that "conscious cognitions or self-statements are modifiable" (deBettencourt, 1987, p.24) and from the extrapolation that overt responses are similarly modifiable. This study supports the opinion of deBettencourt (1987) who, in his review of the research related to cognitive strategy training deplored the lack of consistency in the definition of terms. He suggests that perhaps the term "strategy training" should be applied "only to those programs that actually train students to use a step-by-step sequence to approach a specific set of problems" (deBettencourt, 1987, p.29).

Early attempts at improving the use of cognitive strategies were made by Bereiter and Engelmann at the University of Illinois in the mid-1960's (see Bereiter, 1967; Bereiter & Engelmann, 1967; Engelmann & Carnine, 1970). Engelmann and Bruner (1969) developed DISTAR (Direct Instruction System for Teaching Arithmetic and Reading). This system gained considerable acceptance in Headstart which targeted the prevention of environmentally determined educational retardation through a curriculum emphasising language development, motor development, sense training and perception (Kirk & Gallagher, 1979).

Recent developments in cognitive approaches include that of Meichenbaum, known as Verbal Self-Instruction Training (VSIT) (see Meichenbaum, 1977; Meichenbaum & Goodman, 1971); the Feuerstein approach known as Instrumental Enrichment (see
Feuerstein & Jensen, 1980), which is allied to the work of Bereiter and Engelmann; the approach of Gow known as Self-Instruction Problem Solving (SIPS) (see Gow, 1987; Gow et al., 1988) and my approach which requires the learner to Observe and Copy (OBCOP) (see Hall & Gow, 1989).

These approaches all teach cognitive strategies. Cognitive strategies are general plans of action by means of which learners can manage their own behaviour, much of which will be overt and observable. There are clear implications for educational programming in this notion because if cognitive strategy training does enhance learning within the traditional subject domains then potentially we are capable of enhancing performance in a student’s educational career.

1.8 Variables.

The variables for this research are as follows.

1.8.1 Dependent Variable.

The dependent variable (for details of each component refer to section 3.1) was the difference in the scores obtained by the students in their pretests and posttests for each of the following:

1. The Neale Analysis of Reading Ability Revised,
2. The Neal Phonemic Skills Screening Test,
3. A two part spelling assessment test,
4. A writing assessment,
5. A Cloze Exercise.

1.8.2 Independent Variable.

The independent variable was the Cognitive-Interactive Program for Facilitating the Learning of Reading.

As stated in the substantive assumption (section 1.6), the students continued to be taught by their regular teacher(s) within their regular settings. The only change in the students' regular routine was the implementation of the independent variable.

However, it was accepted that it may be possible that
this program was itself intrinsically dependent on the
teacher's interpretation of the implementation of the
program. In order to determine that this was not a factor
capable of invalidating the experiment, the research design
allowed for regular monitoring by the researcher through
direct teaching intervention and observation of both
individual teacher performance and individual students linked
with those specific teachers (see Research Design, section
3.10; Implementation, section 3.13 and Table 3.3.1).

1.9 Delimitations.
This research required schools for both experimental and
control groups. Furthermore, it intended to test the utility of the
independent variable with a variety of aetiologies most likely to
lead to reading disabilities. Therefore the selection of schools
represents students:

a) who have been formally identified as students with
particular special needs by the criteria of the N.S.W.
Department of School Education;
b) who have being taught in the variety of educational settings
offered by the Cascade of Services; and,
c) who are all being taught within the South Coast Region of
N.S.W. and in State Schools.

1.10 Limitations.
The above delimitation generated a total of four major
groups exploring aetiology with a total of seven sub-sections
exploring both aetiology and age-applicability (i.e. high school-
aged students and primary-aged students) (see questions to be
examined, section 1.4 and research overview, section 3.0).

Thirteen schools co-operated. This co-operation allowed for
the study of hundreds of students. The selection was considered
to be representative, so the broadening of the existing
delimitations to include schools outside the South Coast Region
was not considered.
1.11 Definition of terms.
The following definitions have been adopted in this thesis:

1.11.1 Cognitive strategy.
Cognitive strategies are general plans of action by means of which learners can manage their own behaviour, much of which will be overt and observable.

1.11.2 Students with special needs.
Students who have been formally assessed by N.S.W. Department of School Education (see section 2.1.1) and thereby categorised and provided specific special placement or support.

1.11.3 Regular class teacher.
The teacher who, under normal circumstances, is responsible for the classroom program.

1.11.4 Support teacher.
The teacher, who under normal circumstances is responsible for assisting the regular class teacher in programming for a student with special needs.

1.11.5 The Cognitive-Interactive Program for Facilitating the Learning of Reading.
The Cognitive-Interactive Program for Facilitating the Learning of Reading (CIP) is a program designed to assist those students failing in their reading acquisition. CIP (see Appendix 2) has been created exclusively by this researcher and was generated and developed through many years of classroom experience teaching students with mild intellectual disabilities.

CIP is set out in a package to assist ease of implementation by the regular class teacher or support teacher. It is considered that CIP offers the flexibility required to meet the many needs of a classroom program.
1.11.6 Psycholinguistics.
Psycholinguistics is the process by which students apply their mental processes to develop their language skills.
This term is often referred to as "top-down" processing and infers that a student takes with him/her much knowledge, (both in terms of a definition information component and a contextual knowledge component, see section 2.5.1) which is applied to and tested against all new language confrontations.

1.11.7 Phonetics.
Phonetics is the science of vocal sounds. (N.B. in the literature, this is sometimes referred to as phonics).

1.11.8 Phonology.
Often used in the literature as an alternative of "phonetics". Pertaining to phono; sounds.

1.11.9 Phonemics.
Pertaining to phoneme; which is one of a (or a set of) speech sound(s) in a language. Phonemics is the aspect of linguistics concerned with the classification and analysis of the phonemes of a language.
This term is often referred to as "bottom-up" processing and infers that a student applies his/her knowledge of phonemics to test against all new language confrontations. In the literature, the application of phonemic knowledge is often referred to as decoding.

1.12 Organisation of this thesis.
This thesis is set out in five chapter format consistent with a quantitative research report. References and appendices (which includes the documentation for The Cognitive-Interactive Program for Facilitating the Learning of Reading) have been collected in a second volume.
Within the text of this thesis, I have followed the American Psychological Association 3rd Edition (1985) system of parenthetical notation. As noted in section 3.14 the print
convention for Appendix 2 (CIP) differs from that adopted for the rest of the thesis. This has been done to allow the reader to discriminate with greater ease between the text of the thesis and the text of the independent variable. (It is acknowledged that most references for CIP again appear in the true reference section of the thesis document but it was considered important to present the independent variable, CIP, in its entirety within the appendices).
CHAPTER TWO

A SEARCH OF THE LITERATURE

2.0.0 Introduction.
This chapter is set out in eight sections to consider issues affecting the development and implementation of a cognitive-interactive program for facilitating reading for students with reading disabilities. The sections will cover: integration issues, including the identification of students with special needs; physiological considerations, including the many theories on dyslexia; teaching philosophies and their implications for students; spelling issues; reading comprehension issues; writing issues; cognitive learning theory issues; and the implementation of an interactive learning model in the classroom.

PART ONE: INTEGRATION ISSUES

2.1.0 Definitions: integration, mainstreaming, least restrictive environment.
There are many misconceptions regarding the definitions of integration, mainstreaming and least restrictive environment. Many so-called definitions are in fact no more than "praiseworthy objectives" (Thomas, 1987, p.11). This thesis adopts the following definitions as detailed by the Australian Association of Special Education Chapter Statement to the Committee of Review of N.S.W. Schools (1989c):

Integration is a process of movement along a continuum from a more to a less restrictive educational environment. Thus the movement of a student from an institution to a special school is defined as integration, as is the movement of a student from a special school to a special class within a regular school. Students who are integrated retain the right to,
indeed require, special education services. Mainstreaming is the placement and maintenance of a student with disabilities in a full time regular class in programs implemented by the class teacher/s, with or without additional support. Education in the least restrictive environment requires firstly and indispensably appropriate quality programs. The least restrictive environment is defined as the most normal open setting in which the child's rights to those programs can be exercised, taking into account his other needs, such as medical services, safety, etc. (p.2)

The continuum of integration has been clearly defined by Thomas (1987). In his "value-free definitions" (p.13), Thomas defines full integration as occurring when a designated child spends at least seventy-five percent of his/her time in a regular classroom; predominant integration as occurring when a designated child spends between fifty and seventy-five percent of his/her time in a regular classroom; partial integration as occurring when a designated child spends between twenty-five and fifty percent of his/her time in a regular classroom; and minimal integration as occurring when a designated child spends less than twenty-five percent of his/her time in a regular classroom.

2.1.1 Special Education Services in the State of New South Wales.

In the state of N.S.W. it is the policy of the government "to provide maximum opportunity to all students to acquire the skills and competencies necessary to participate in and contribute to society " (N.S.W. Dept. of Education, 1987a). Why some students should experience learning difficulties, especially when these same students deviate little from the accepted norms in other factors (e.g. academic behaviour in another domain, physical looks, social behaviour), is a matter of continuing concern.
Nevertheless, it is assumed that such students shall receive the very best of services to help overcome these problems. Therefore, the N.S.W. government sets out guide-lines to which schools should adhere. In "The education of students with learning difficulties from pre-school to year twelve: Policy Statement" the N.S.W. Dept. of Education (1987a) states:

It is the responsibility of the Principal to establish within the school mechanisms for identifying, as soon as possible, those students who experience difficulties with learning.

Identification may be initiated and/or facilitated by teaching and guidance personnel, by parents or by members of the medical and helping professions in the community.

Because it is recognised that learning difficulties may arise at any time throughout the student's life, teachers should regard the identification of students with learning difficulties as a continuing process.

It is the responsibility of the principal to establish within the school sound mechanisms for assessment ... [which] ... should include skilled observation and/or application of appropriate test materials.

In the majority of cases, assessment may be conducted by class teachers independently or with the help of other school personnel. Particular cases may require assistance additional to that available within the school.
Identification and assessment procedures should lead to the provision of quality teaching programs for individual students. (pp.2-3)

Following this statement the N.S.W. Department of Education gazetted another policy, this one on integration (see N.S.W. Dept. of Education, 1988). The Integration Statement notes that it is the policy of the N.S.W. Government that people with disabilities "should be able to live and be educated within their own communities" (p.19), based on the principles of "normalisation". The commitment to "normalisation" was again stressed by Hilder (1991) who defined "normalisation" as:

... the creation for people with disabilities of a lifestyle and set of living conditions which are as close as possible to those enjoyed by the rest of the population. (p.7)

Hilder (1991) notes that the Department of School Education "fosters the integration process through special schools, special classes in regular schools and the education of individual students with disabilities in regular classes " (p.7). Because of the policy of integration, the education of students with disabilities will continue to move away from predominantly segregated educational settings and into the regular neighbourhood school setting through a system of support services (that is, support teachers) and support classes.

There are many types of support classes and services (see N.S.W. Dept. Education, 1990; N.S.W. Dept. Education, 1987), e.g:

Support Class IM Students with mild intellectual disability

Support Teacher/IMJ Early School Support Program (infants)
Support Class/EC  Early childhood, pre-school children with disabilities
Support Class IMO  Students with moderate intellectual disabilities
Support Class IS  Students with severe intellectual disabilities
Support Class HI  Students with hearing impairment

Itinerant Support Teacher Hearing (ISTH)
Itinerant teachers who travel between schools supporting regular staff.

Support Class L  Students with language disorders
Support Class R  Students with reading difficulties
Support Class P  Students with physical disabilities
Support Class V  Students with visual disabilities

Itinerant Support Teacher Vision (ISTV)
Itinerant teachers who travel between schools supporting regular staff.

Support Class W  Students in hospital wards
Support Class ED  Students with emotional disabilities
Support Class BD  Students with behaviour disorders

Itinerant Support Teacher Behaviour (ISTB)
Itinerant teachers who travel between schools supporting regular staff.

Support Class CC  Special classes within special schools for students in Community Care.
Support Class EC  Young students with disabilities
Support Teacher/Learning Difficulties (STLD)

Regular primary school Support Program for within regular classrooms and sometimes within small groups

Furthermore, the Department of School Education has recently introduced a "new concept for helping students with learning difficulties" (Richard, 1991, p.8), being the Special Education Support Centre. The SESC "offer multi-disciplinary assessment and remediation services for students with learning difficulties and support and advice to parents and schools" (Richard, 1991, p.8 and also Richard, 1992, p.14). These centres have arisen in part from the lobbying of parent groups such as SPELD and ACLD (Richard, 1992).

An example of the Department's commitment to "normalisation" can be seen in the Support Teacher/IMJ, Early School Support Program (infants). This new provision has some "unique features which distinguish it from most other provisions for students with mild intellectual disability" (Taylor, 1991, 10). In this program all students are integrated into their regular class in their school and fully identify with the regular class and its teacher" (Taylor, 1991, 10). However, consistent with the policy that offers both support services within the regular classroom and support services within a segregated classroom (also see overview in Doherty, 1985), many students in N.S.W. have gained placement in a support class within a regular school.

To ensure that such placement is in the best interest of the child identification is a lengthy and objective procedure. For example, Comino (1990) notes that to be formally identified as a student with intellectual disabilities the child (in N.S.W.) must be referred to the District School Counsellor (DSC) by one of the following: class teacher, executive teacher, parent or an agency such as the Health Commission. Referral is made because the child is unable to cope with appropriate class programs, that is,

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5 There are at present SESC at Bathurst, Penrith South, Islington, Albury North, Gosford, Sutherland and Campbelltown (Richard, 1992).
it is difficult to modify or develop a suitable program for the child. Once referred, the DSC will then assess the child to establish the nature and magnitude of the child's needs, (noting that parental approval is needed for any individual testing). On individual I.Q. testing the I.M. child must score between 50 and 80 points\(^6\) in order to qualify for placement.

The results are discussed with the Principal and class teacher(s) and parents. If special class placement is recommended, parental approval must be gained. The recommendations then go to the Pupil Placement and Review Committee (PPRC) which is comprised of the Cluster Director (CD), the Principal of the school with the I.M. class facility, the District Guidance Officer (DGO), the Classroom Teacher (CT) of the special class and the DSC who has prepared the case presentation.

The PPRC should then review all the current students in the I.M. class. Deliberations regarding the possible new placement will include a priority for the placement, allowing if necessary a period on a waiting list. Following this meeting, the offer of special placement is then made to the child's parents by the DGO. However, it is worth noting that in special circumstances, a child may be placed in the I.M. class before the PPRC meeting by consultation by the Principal (of the school with the I.M. class) with the CD and DGO. The child may be withdrawn from the I.M. class by a request from the child's parents or a decision by the PPRC.

2.1.2 The great controversy: Who has "special needs"?

Learning Difficulties is a generic term and it is considered that approximately ten to sixteen percent of the student population is affected (National Health and Medical Research Council, 1990). The term Learning Difficulties is one that

\[\text{\textsuperscript{6}}\] This stipulation is notwithstanding Flynn's (1987) findings that data from fourteen nations, (including United States, New Zealand, France and East Germany), reveal I.Q. gains of between five to twenty-five in a single generation. Flynn (1987) suggests that the hypothesis that best suits this finding is that I.Q. tests do not measure intelligence but rather a correlate with a weak causal link to intelligence!
generates controversy, yet, the servicing of children with special needs hinges upon the identification of this problem.

In her article, Blankenship (1989) relates a story "that has some uncanny parallels to the field of learning disabilities" (p.10). This true story follows the "discovery" of atypical X-rays, labelled N-rays. Despite the fact that much data was compiled regarding the N-ray, it was eventually discredited, as the N-ray "never did exist" (p.10). However, just as scientists in the early 1900s managed to compile records on a non-existent phenomenon, Blankenship (1989) claims, researchers today are compiling data on an equally questionable condition relating to children, the so called learning disability. She considers that some educators, in discovering children who do not behave as do (so called) normal children, are labelling these children as being in some way, brain injured. As Blankenship (1989) notes:

Pretty soon, every student who reverses b's and d's, or who experiences academic difficulties, or who was inattentive or fidgety came to be classified as learning disabled. (p.10)

Furthermore, students perceived by teachers as learning disabled are characterised by low reading achievement, with three-quarters of students referred to counsellors recording reading scores that place them below the 15th percentile (Shinn, Tindal & Spira, 1987). In the U.S.A., despite Government legislation requiring mainstreaming (P.L.94-142), each year, three to five percent of the school aged population are referred for special education evaluation, with a resulting seventy-three percent of these children placed in segregated special classes (Blankenship, 1989).

A system that continues to place children into segregated classrooms may be seriously flawed (Blankenship, 1989). It may be doubly flawed where the decision to refer a student is an indication of a teacher's tolerance level, or is a statement about the likelihood of the student profiting instructionally from that teacher (Shinn, Tindal & Spira, 1987). An example can be seen in
the experience of Van der Veen (1991) who discusses the overwhelming advantages of mixed ability teaching. Recalling the days when he was a Principal of a High School, he writes:

While I was dealing with worried parents and anxious students, I still had to spend time convincing the staff that it was possible to manage 9F and 9G - that they would not need riot dogs and shields to enter their respective classes. (p.13)

Tolerance implies subjective judgement on the part of the teacher. Bain (1988) notes that in Australia "many of the students suspended or excluded from school for disruptive behaviour may be socially/emotionally handicapped" (p.19). Similarly, tolerance may well be the reason for student referrals reaching up to eighty percent in some districts of the Mississippi (Blankenship, 1989), for reading performance differs significantly as a function of ethnic background (Shinn, Tindal & Spira, 1987).

It appears that the referral process may reasonably be characterised as an index of teacher tolerance and an attempt on the teacher's part to reduce the range of students in the classroom. The relationship between the high proportion of poor readers and teacher tolerance raises even further concerns, given the "high rates of subsequent placement" (p.38) into special education classes.

While it is true that in the state of N.S.W., the policy of the Government is one of integration, there remains an escape clause embedded in the policy statement: that is, "when it is possible and practicable and in the best interests of the student" (N.S.W. Dept. of Education, 1988, p.19). This will no doubt continue to allow a certain percentage of students to be labelled and segregated. Indeed, classification for placement into an I.M. class (mildly intellectually disabled) hinges on the student scoring less than eighty in an intelligence test such as the Wechsler Intelligence Scale for Children (WISC-R) (Comino, 1990). It cannot be overlooked that nine percent of student populations score less than eighty on such tests!
With regard to those students labelled with "Learning Disability", Blankenship (1989) summarises the situation most aptly thus:

As the number of students classified as LD increases to an astronomical figure, we must face the fact that a significant number of students are failing in school. Classifying all of these students as learning disabled is not helpful or co-effective; providing them with pull-out programs is impractical and inappropriate; and maintaining our isolation from general education is becoming increasingly counter-productive. For these reasons, many special educators are suggesting that we forge a closer alliance with general education and begin to jointly address the following questions:

1. How can we maximise instruction for all students?
2. How can school be structured to serve a wider range of students?
3. How can we better prepare teachers to meet the diverse needs of students?

(p.12)

Doherty (1985) refers to the 1977 N.S.W. document Aims of Primary Education and reinforces that in forging a closer alliance with general education "the aims for education for children with special needs should not be different from those for their non-handicapped peers ...[but rather] ... the means by which they are realised will differ" (p.5). Yet, although the labelling of children generally is not considered educationally necessary, or indeed, educationally sound (see Andrews, 1983; Britton, 1978; Doherty, 1982, 1985; Dunn, 1968; Gow, Balla, Hall, Konza & Snow, 1986; Gow, Snow, Balla & Hall, 1987; Hall Gow & Konza, 1987; Konza, Gow, Hall & Balla, 1987; Thorley & Mills, 1986; Warnock, 1976),
there will always be the need for governments to define such "conditions" in order to plan funding. This need is made most acute in the payments of the Child Disability Allowance (CDA). Parents are eligible to apply for the allowance if their child has a physical, intellectual or psychiatric disability, compounding the need for extra care and attention by the parent(s) on a daily basis, and where such extra care and attention will be needed over an extended period of time (see Association of Children with Learning Disabilities, 1989a).

Furthermore, it cannot be overlooked that there are some who advocate strongly for identification and segregation. Serfontein (1990) considers that a segregated child will benefit by being more able to compete at a realistic and reasonable rate which, in turn, should have positive effects on self-esteem.

2.1.3 The great controversy continues: Who best services those with "special needs"?

Reynolds and Dallas (1989) advocate a preventive model, which suggests the position of a "prevention support teacher" who:
* intervenes during early learning,
* uses the principals of mastery learning,
* identifies children who need instructional support,
* controls early learning through the use of an expectancy (S-S) model of learning (while noting that the use of this model is at variance from current practices).

In providing assistance to the regular class teacher in N.S.W., the support teacher (learning difficulties) is directed to "work with regular class teachers predominantly in a team teaching role within classrooms on the implementation of programs for students with learning difficulties" (N.S.W. Dept. of Education, 1987a, p.5). This policy has been supported by studies such as those by Miles, Foreman and Irvine (1978) and Bochner, Salamon and Richardson (1985) which found that special education students who were failing in reading were serviced best by their regular classroom teacher with the support teacher offering a consultancy and team-teaching model. Furthermore,
this policy is supported by Blankenship (1988) who advocates
teacher related strategies for structuring the classroom for
success. She notes that classroom programs should match
instruction to the needs of the learners while still focusing on
academic content.

Nevertheless Gans (1987) notes that teachers continue to
express dissatisfaction with their current level of expertise and
that this may well be perpetual and may not decrease with
intervention. Research by Hall and Gow (1986) found that
teachers, in general, were not accepting the consultancy/team-
teaching support model as adopted by the Department of Education
(see N.S.W. Dept. of Education, 1987a; Swan, 1976). Furthermore,
on a day-to-day classroom observation Allington (1980) found
that teachers were more likely to interrupt poor readers when
reading than they were to interrupt good readers; perhaps just
another indication of the Shinn et al. (1987) "teacher tolerance".

A widely accepted provider for students with special needs
is the peer tutor. Indeed, for many mainstreamed, mixed ability
classrooms peer tutoring has become synonymous with the
popular classroom management program of "co-operative
grouping". Peer tutoring was first employed in the Bell-Lancaster
Monitorial System during the Industrial Revolution and
subsequently regained popularity in the United States during the
early 1960s precipitated by a then impending teacher shortage
(Wheldall & Mettem, 1985). In a study by Wheldall and Mettem
(1985) it was shown that peer tutoring was an effective
alternative in servicing children with reading difficulties. The
sixteen year old low achieving students were trained in the
'pause, prompt, praise' method and, following training, they then
tutored twelve year old children who were "retarded" in reading.
The experimental group showed statistically significant gains
over the control group.

The study by Wheldall and Mettem (1985) is supported by
the observations of Gow and Heath (1988). They note:

A child with special needs in the regular
classroom can benefit substantially, both
academically and socially, when paired with a "normal" peer. (p.16)

Gow and Heath (1988) describe the peer tutoring relationship as one of "work buddies" (p.16) in which the tutor is able to offer a role model who guides the special needs child to success. These authors also observed that peer tutoring reduced competition and promoted co-operation in the regular classroom.

However, there are those who advocate strongly for segregated classrooms. Serfontein (1990) dictates that for children with Attention Deficit Disorder (ADD)\(^7\) (see section 2.2.1):

The school should have strictly graded classrooms. Children with ADD, because of their immaturity and maturational lag in the cognitive regions of the brain, need to be placed in classrooms where they are graded according to their ability level.... The importance of the graded classroom cannot be overemphasised.... Children with ADD do very poorly if they are placed in open plan classes or in parallel streamed classes or even in composite classes. These children cannot cope with the constant change in the level of work (p.85)

He also considers that a special class would offer more structured activities, remedial facilities, smaller class sizes, a sympathetic (but firm) teacher and, where necessary, be more able to monitor drug therapy. Serfontein (1990) no doubt would support the statement of Orton (1988) that "special teachers

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\(^7\) ADD is the modern medical term for developmental disorders of learning and behaviour. The equivalent educational term is specific learning disabilities. "ADD is an unfortunate one as it describes a medical disorder purely by one of the single symptoms" (Serfontein, 1990, p.15).
bring with them commitment to the education of special children" (p.26).

Indeed, special classes continue to offer service to those with special needs, yet not without some difficulties. Problems associated with I.M. classrooms are discussed by Conway (1986). He notes that the traditional behavioural approach for those students with mild intellectual disabilities may be deleterious. This is due mainly to the fact that many of the behavioural strategies have emerged from clinical and highly controlled experimental procedures. Conway (1986) notes:

One of the major problems facing teachers of the mildly intellectually disabled has been the question of whether to modify upwards the techniques used for the moderately intellectually disabled or to water down the teaching techniques of the regular education programme. (p.12)

Problems associated with IO/IS classrooms are discussed by Thorley, Barisic, Hickling and Clayton (1988). They claim that the provision of educational services for students with severe intellectual disability has been recognised for less than two decades. However, "despite its short history in N.S.W. the progress of education of severely handicapped persons has already progressed quite remarkably" (p.5). Thorley et al. (1988) note that the early developmentally based programs for teaching the severely handicapped were soon found to be lacking. The weakness was self-evident; most severely handicapped students, "even as adolescents, were unable to progress beyond pre-school level content and methods ... [and] ... skill retention was poor, and, there was little generalisation of skills" (p.5). These authors suggest that it was not surprising therefore, that a new top-down curriculum model emerged to supersede the previously preferred developmental approach. This top-down model is often termed "the functional/ecological approach" (Thorley et al., 1988, p.5). However, again this approach is found lacking, and a third, more structured approach has been emerging in our schools. Application
of this newer model has, however, also met with difficulties as it appears to require a highly structured, longitudinally planned scope and sequence which tends to create problems in real-life teacher-based programming. However, through staff development programs such as those advocated by Orton (1988), many of these problems will be overcome. Orton (1988) adheres to the belief that principals should use the variety of "strengths and talents" (p.26) available on staff when implementing staff development programs. In this way, Orton (1988) considers, support to staff in management of time, programming, designing individual educational programs and evaluation are maximised. This in turn allows for an effective School Plan in which "professional change" (p.30) can occur.

Yet it would appear that in reality, special education services (including integration programs) are often ad hoc (Bochner et al., 1985; Gow, Snow, Balla & Hall, 1988; Hall, Gow & Konza, 1987), and in spite of the existence of many well articulated models (e.g. see Blankenship, 1988; Gow, 1985; Gow & Heath, 1988), many children with special needs "have received less than their fair share of special education services" (Halpern & Benz, 1987). Some, such as Gow (1985) and Conway (1986) feel that many students with special needs require specific teaching strategies. Conway (1986) states:

More attention has needed to be focused on teaching strategies, not only to facilitate acquisition of skills but also the maintenance, generalisation and application of skills. (p.11)

Emphasis on teaching strategies becomes of even more interest when one considers the finding of the study by Tizard, Schofield and Hewison (1982). They found that reading acquisition was favourably influenced by parental involvement. Such a finding should not be overlooked in the planning of any remedial procedure.

Specifically, Gow (1985) recommends the following strategies when programming for generalisation: teach across
settings, ensure ecological validity of task and setting, select task of interest value, teach examples, motivate the students, directly teach the need to generalise, teach a problem solving approach, match the teaching situation to the individual characteristics of the learner. Furthermore, Gow and Heath (1988) recommend Direct Instruction as a means of promoting learning through small group instruction (see section 2.7.0).

However, while focusing on specific teaching strategies it is recommended that such strategies are not "shrouded in an air of mystery" (Gow, McLellan, Balla & Taylor, 1988, p.17). It is sad but true that ad hoc servicing still suffers from the problem that special educators have developed their own jargon "which alienates all but those who have joined the fraternity" (Gow et al., 1988, p.17). And it is fair to add that this apparent exclusiveness has had a long history. Nearing two decades ago Watts (1976) pleaded for the elimination of alienating jargon and entrenched beliefs that "the regular school cannot cope with the mildly mentally handicapped" (p.6) and that there was something special about special education!

2.1.4 The single resolution to this great controversy.

"Who best?" and "how best?" within an education system that offers a cascade of five services to children with special needs, remains a controversy. And there is little doubt that any system will ever solve all problems; there will always remain the realm of individual differences, often treated as learning disabilities, which even the most optimum of environments will be unable to change (Kronick, 1990).

Yet, on one point all agree. There is little doubt that remediation for early reading failure must be addressed at the earliest indication of failure. Learning to read and write are the most basic of skills and indeed, for this author, the most crucial of all educational tasks.
PART TWO: PHYSIOLOGICAL CONSIDERATIONS IN READING DIFFICULTIES.

2.2.0 Introduction.

The following statement by Herrmann (1989) was made in reference to gifted children. Nevertheless, this statement has relevance to all learners, and in particular, to those experiencing difficulties which may pertain from physiological aetiologies:

Neuro-scientists claim that we have learnt more about the brain in the last decade than we have learned throughout all the ages that went before and I predict that in the nineties we will learn more than we have ever known, a development of understanding that will change the course of human history. (p.2)

There is little doubt that while mortality rates have dropped amongst children in need of medical care, morbidity rates remain high, and deficits incurred as a result of early brain trauma can exert lasting and significant effects on a child’s social and educational development (Knight, 1989a). Although recognising that brain injured children only represent a small proportion of those recommended to counsellors (Knight, 1989a), (the first step for special education referral), recognition of this clientele is important in order to ensure correct assessment and treatment programs. Furthermore, Butterfield and Ferretti (1985) have summarised the developmental and cognitive literature and conclude that there is evidence to show that the intellectually disabled:

1. have smaller memory capacities or less efficient memory processes,
2. have smaller and less elaborately organised knowledge bases,

Much of this section appears in Hall (in press) to be published later this year.
3. use fewer, simpler and more passive processing strategies,
4. have less metacognitive understanding,
5. use less complete and flexible executive processes. (p.3)

Thorough assessment of a brain injured/intellectually disabled child is best conducted by the appropriate specialist (Knight, 1989a), in which case the assessment will be geared more for the identification of areas of asset and areas of deficit, providing appropriate baselines, and planning appropriate treatment and rehabilitation (Knight, 1989a).

Factors influencing any remedial program are often complicated by the use of knowledge gained from the adult population. It is now recognised that damage sustained in childhood, to a developing brain, "is likely to result in a very different symptom picture and recovery course to that typically observed in adults (Knight, 1989a, p.34). Paediatric neuropsychology has therefore evolved into a separate discipline, distinct from its adult-based origin (Knight, 1989a). Yet many teachers do not accept the possibility of brain dysfunction. Indeed, many teachers are still coming to terms with learning difficulties which are associated with such common physical problems as asthma and allergies (Hall & Gow, 1988). For example, Kemp (1987) emphatically states that teachers will be more successful in their interventions with children who have special needs if they assume that organic neurological deficits "account for a very small proportion of children who have shaky beginnings in reading and writing" (p.12).

Until recently, it was commonly believed that children recovered more rapidly and more completely from brain injury than did adults. This was termed "brain plasticity" (see Knight, 1989a). However, "it is now acknowledged that the early notions of brain plasticity were oversimplistic and ... [that] ... recovery from damage is less extensive than once thought" (Knight, 1989a, p.36). Furthermore Knight (1989a) states:
Recovery is limited by the type of damage sustained (focal vs diffuse) and may occur at a cost to the child's general level of intelligence (i.e. if language functions transfer to the right hemisphere following early damage in the left hemisphere, subtle language deficits may persist and a significant depression of the child's visuospatial abilities can result). (p.36)

Knight (1989a) also notes that if the damage to the brain is due to infection, irradiation or malnutrition (diffuse), the younger child typically suffers more pervasive problems than do adult counterparts. Furthermore, functional deficits may only become more apparent in the child many years after the actual injury, when the areas of the damaged brain reach functional maturity and the environment begins to impose demands requiring higher cognitive functioning (Knight, 1989a). This is often seen in a child being considered "normal" by parents and peers until the first year at school, in which it then becomes obvious that a language deficit is apparent and manifested by a failure to begin reading.

Knight (1989a) describes what could be termed the neurological "Matthew Effect":

In general, younger children are placed at a greater disadvantage developmentally, as damage, particularly in diffuse forms, tends to interrupt emergent skills and affects the general efficiency of new learning. In addition, severe alterations occurring early in the child's neural network tend to preclude normal interaction with his/her environment, which in turn may compromise the development of related structures/  

9 see Stanovich, 1986.
functions. Not infrequently, the child's adjustment is further compromised by the development of reactive behavioural and/or emotional problems. (p.37)

Most recovery from brain injury occurs within the first six months (Knight, 1989a), but may continue for up to several years at a slower pace.

2.2.1 Definition of Dyslexia.

The term dyslexia suggests many different things to different people: indeed consensus appears to be limited to what dyslexia is not, rather than what it is (see Ables, Aug & Looft, 1971). Vellutino (1987) summarises the situation thus:

Dyslexia is a generic term that has come to refer to an extraordinary difficulty experienced by otherwise normal children in learning to identify words, presumably as the result of constitutional deficiencies. (p.20)

However, a more specific description of dyslexia is given by Ables, Aug and Looff (1971), being:

... a severe and persistent failure in learning specific to reading, and basic to which is some defect or impairment in perceptual cognitive functioning. It is differentiated from reading problems based on more general learning retardation and it is assumed to be not primarily emotionally or culturally determined, nor due to any major intellectual or sensory defect or inappropriate teaching. Implicit in the concept of dyslexia is that there is some basic defect or impairment in one or more of the prerequisite skills assumed
necessary for learning to read: visual and auditory perception and memory. The emphasis is placed on dyslexia as a lack of capacity rather than as being related to motivational factors. (p.409)

Serfontein (1990) states:

Dyslexia is an emotive term which is used to describe those children who have difficulties with reading.... If you are a purist, ... the correct terminology is dyslexia for reading problems, dysgraphia for writing problems, dysphasia for speech and language difficulties and dyscalculia for mathematical difficulties. (p.73)

It is important to recognise that there are no well-defined behaviours that can clearly distinguish a dyslexic reader from other poor readers (Vellutino, 1987). This latter group may have a variety of aetiology (e.g. limited experience, low performance on a general intelligence test). Therefore Vellutino (1987) notes:

Dyslexia is used to define a very specific reading disability in an otherwise normal child. (p.25)

2.2.2 Suggested aetiology of dyslexia.

In the 1970s it was discovered that children with learning difficulties had a dysfunction of various neurochemicals in the cognitive (or learning) regions of the brain. This was found to be a developmental deficiency in the chemical transmitter substances that are necessary to relay messages between cells in the various parts of the brain. However, because of the inference that the brain cells were damaged, the medical nomenclature changed from "minimal brain dysfunction" to "attention deficit disorder" (ADD) (Serfontein, 1990). ADD is the modern medical term for
developmental disorders of learning and behaviour. The equivalent educational term is "specific learning disabilities".

Serfontein (1990) claims that ADD appears to be hereditary and is caused by deficient levels of neurotransmitter substances in the brain. Serfontein (1990) points out that children diagnosed ADD can be expected to exhibit a short attention span and an increased activity level. Being overactive, in comparison to their "normal" peers, ADD children may be particularly liable to aggressive behaviours. They may also be impulsive and poorly co-ordinated (that is, clumsy). Very often, ADD children will have experienced a delay in the onset of expressive language and then continue to experience speech disorders such as articulation problems or stuttering. They may have a diminished short term memory. Furthermore, these children may have "an inflexible personality" (Serfontein, 1990, p.21), thereby resisting change to their environment or routine. Serfontein (1990) considers:

Children with ADD risk developing specific learning disabilities or developmental dyslexia. (p.73)

The Orton Dyslexia Society (1987) supports the theory that dyslexia is neurologically based rather than psychologically based. In their research using a brain donor program that sections human brains into more than 3000 sections for microscopic examinations, differences from similarly sectioned brains from dyslexic and non-dyslexic brains are noted. These experiments have disclosed two consistent findings among the brains of male dyslexic individuals:

The first relates to the manifestation of cerebral asymmetry, which deviates from the expected norms; and the second relates to some details about the pattern of development of cellular architectures concerned with language, which differs from the pattern in nondyslexics. (p.7)
It must be noted that the brains of two female dyslexics have also been analysed, but the findings differ from those of the male brains, and further research is continuing. However, this research is so time consuming that only three to five brains can be completed in any year. Some of the research under current investigation involves the actions of sex hormones (dyslexia is more common in males) and immunological processes.

There is some evidence that, at least for some pupils, reading difficulties are associated with a simple physiological dysfunction. Irlen (1983) proposed that a visual problem which caused a blurriness of print, movement of print and general distortions of print is associated with an excessive sensitivity of the retina to particular frequencies of the light spectrum. She identified this particular visual dysfunction as "scotopic sensitivity" and proposed that the effects of scotopic sensitivity could be minimised by tinted, non-optical lenses, claiming that these filter out frequencies of the light spectrum to which the person is uniquely sensitive. While research into these tinted glasses is at an early stage, (and research findings are equivocal), there are some researchers claiming success for these lenses (see Chan & Robinson, 1989; O'Connor, & Sofo, 1988; Robinson & Miles, 1987; Whiting, 1985). While there is need for much more research, these findings, along with the findings of the Orton Dyslexia Society (1987) may provide the key to at least some pupils' future success in the elusive quest to master reading.

However, Vellutino (1987) claims that his research is finding that dyslexia is far from a mere visual problem, but rather a "subtle language deficiency" (p.20) which has its roots in:

1. deficit phonological-coding,
2. deficient phonemic segmentation,
3. poor vocabulary development,
4. difficulty in discriminating grammatical and syntactical differences among words and sentences,
5. a symptom of dysfunction during storage and retrieval of linguistic information (e.g. Vellutino refers to the common
symptom of was/saw as a result of this difficulty rather than a dysfunction in visual-spatial processing).

Vellutino (1987) also notes that dyslexia is NOT caused by an attention deficit, nor by a cross-modal transfer (that is, the ability to relate stimuli perceived through one sensory system to stimuli perceived through another system), nor by deficiencies in associative learning, nor by trouble in detecting patterns. Vellutino (1987) argues that individuals who have difficulty in reading but who nevertheless score well on intelligence tests, could not conceivably "suffer from such pervasive handicaps" (p.24). He concludes:

Poor readers, then, appear to have difficulty with association and rule-learning tasks only when the tasks require them to store and retrieve the auditory representations of words and syllables. (p.24)

2.2.3 Reading programs for dyslexic readers.

Commitment to a particular definition of dyslexia, differing opinions about aetiology and uncertainty about diagnosis apparently need not impair the effectiveness of remediation and treatment (Ables, Aug & Looff, 1971; Slingerland, 1988). The teaching program is far more important. For example, the Slingerland Adaption for Classroom Use of the Orton-Gillingham Approach to Language Arts (see Slingerland, 1988) is a model designed specially for teaching children with reading difficulties (and particularly for those termed dyslexic). The basic principles underlying the instructional approach is to begin with single units of sight, sound and feel (the letters of the alphabet) and to expand their use into larger units (words, sentences, paragraphs) and "to teach through the intellect" (p.5). This model exemplifies a specific and prescriptive model that is very phonemic in nature. The steps include: teacher training, followed by a strongly visual approach to implementation in the classroom (of alphabet cards and unlocking or decoding practice), preparation for reading using
words and phrases, structured reading from books and, finally, independent reading. This approach uses the stimuli of sight, sound and feel through the V-A-K association (visual, auditory, kinetic sensory input).

Vellutino (1987) also supports a systematic classroom program. He claims that the remedy for dyslexia is "proper instruction in reading" (p.20). Vellutino (1987) suggests that as printed words can be identified either through whole-word processing (e.g. based on their salient visual features, context cues) OR through "part-whole" (p.20) processing (e.g. based on alphabetic mapping, phonemic cues), beginning readers must be able to adopt both strategies to identify words.

Vellutino's (1987) claim finds support from many (see Andrews, 1989; Andrews & Jardine 1989; Lloyd & Goyen, 1986; Stanovich, 1986). Indeed Serfontein (1990) supports Vellutino (1987) in prescribing a reading system which allows for the development of both phonetic skills and Whole Language and states:

School systems that teach only the phonics system or the visual (look and say) system in isolation of each other are erring in their teaching of the child. The development of both systems is essential for the child's proper acquisition of spelling and reading fluency. (p.75)

The search for an underlying cause for reading problems continues but it may well be that while modern medical knowledge will assist teachers in programming for poor readers, teachers cannot hope for an "easy way out" (see Hall, 1992). As Knight (1989a) warns, the evidence supporting a deficit based reason for reading difficulties remains "tenuous" (p.41), and the assumption of a "subtle, biologically based deficit" (p.39) causing difficulties with specific subjects at school is to be treated with caution.
PART THREE: TEACHING PHILOSOPHIES
(THE GREAT DEBATE).

2.3.0 Introduction.

There are many different ways through which an individual may learn to read. There are also many ways to teach reading. Obviously, children who learn to read successfully in a psycholinguistic-based classroom program will follow a different path from the child who successfully learns to read in a phonemic-based classroom program; and very clearly, children who learn to read in English will follow a different course of acquisition from the child who learns to read in Chinese or Arabic (Perfetti, 1984). Yet, no matter what path a child takes (or is led along), the successful reader still eventually gains automaticity in word recognition. As Mercer and Mercer (1981) noted:

Authorities disagree about the sequence for teaching reading skills, and research results about sequence are inconclusive. Thus, a teacher should use a reading scope and sequence skills list in a flexible way and should tailor the sequence for assessing and teaching reading skills according to logic and experience. (pp.253-254)

However, it must be remembered that the N.S.W. Reading K-12 curriculum has been heavily influenced by particular interpretations of psycholinguistic theory. Psycholinguistics is the study of the psychological representation of language (Andrews, 1989), in which the reader actively applies familiar associating cues to comprehend the author’s message (Andrews & Jardine, 1989). Thus a reader unable to recognise the word "boy", may guess "boy" from the picture that stands with the text. There is little doubt that psycholinguistic models have made important contributions to the teaching of reading; some of them, such as Cambourne’s Model of Literacy Learning (see Cambourne, 1986a;
Cambourne, 1986b) maintaining currency and high profile in our classrooms. This is as it should be, for there is little argument that the number of words to learn is too enormous to learn word by word through word instruction. Children learn between 600-6,000 words per year (Nagy, Herman & Anderson, 1985), and the superiority of skilled readers' psycholinguistic (or top down) processes has been demonstrated by a number of researchers (see Andrews, 1989).

Johnson and Louis (1986), proponents of a whole language approach, make the following assumptions about language and its acquisition, being:

* Children grown in their capacity to use language that is somewhat more mature than that which they currently use.
* Children increase their capacity to use language by trying to use it.
* Language is used to communicate.
* Children do not increase their capacity to use language by being taught about language. (p.11)

The first assumption is based on research findings on the acquisition of oral language. It follows that a child is born surrounded by relatively expert speakers, all of whom make the assumption that the newcomer will gradually learn the system. Beyond simple labelling, very few "lessons" are given; certainly none are given in formal phonetics or grammar. Yet it is apparent that by the age of five, the normal child has a good grasp of many of the rules of oral language.

Johnson and Louis (1986) admit that their second assumption "sounds like one of those aphorisms that have become the slogans of whole language advocates: Children learn to read by reading; they learn to write by writing!" (p.12). Johnson and Louis (1986) do concede however, that in reality the truer statement would be rather; by trying to read or by trying to write. These advocates of the psycholinguistic approach are emphatic that "reading and writing are skills, not subjects" (p.12); that such
skills are acquired through practice and not through instruction.\textsuperscript{10}

Johnson and Louis's (1986) third assumption is a principle that "is so universal that it has gone beyond the obvious to the invisible" (p.12); every member of society uses language to communicate, and it is only during reading and writing lessons that language sometimes becomes meaningless. This, they say, is exemplified by mechanical lessons such as "indicating whether a 'long' or 'short' vowel is heard, spelling tests, parsing sentences, or indicating whether a certain 'c' is 'soft' or 'hard'." (p.12).

Closely related to their third assumption is a fourth assumption; that it is ineffective to teach children about language, as abstract knowledge about language is only useful \textit{to teachers} for the purpose of guiding children wisely.

Johnson and Louis (1986) suggest that "one of the happiest ways of introducing children to literacy in school is through shared reading experiences with big books" (p.18). There is little doubt that the idea of shared reading, based on the principle of the much favoured bed-time story, is an important part of any early (and not so early) reading lesson. Stories and poems presented are read by all, are rhythmic and predictable. During their reading, no attempt is made to isolate any aspect of the language, and continuous modelling is considered crucial to the shared book experience.

There is little disagreement between the advocates of phonemic-based teaching and psycholinguistic-based teaching on the theory of big books and shared reading experiences, but the statements of Johnson and Louis (1986) regarding the acquisition of a basic sight vocabulary highlights a contentious issue:

Some teachers argue that it is necessary for the child to develop a 'sight vocabulary'- a body of words, usually of

\textsuperscript{10} To emphasis their point, Johnson and Louis (1986) give the analogy of a child trying to walk. They note that the child gradually learns in a caring environment in which no one ever doubts that the child will eventually succeed, and that "few children are sent to remedial walking schools" (p.12).
high frequency, which are recognised immediately in a variety of contexts without any recourse to word identification procedures. It cannot be denied that skilled readers do have such a stock of words, but it has not been demonstrated that they become skilled readers because they possessed a large sight vocabulary. We would argue, rather, that a large sight vocabulary is a by-product of becoming a skilled reader. (p.20)

Johnson and Louis (1986) later concede that there is a need for children to develop a sight vocabulary and understanding of phonics. They state:

We have no argument with those who would claim that children must develop a sight vocabulary and have an understanding of phonics. It is the manner of their acquisition that we would disagree ... knowledge of phonics, like a sight vocabulary, is a by-product of trying to make sense of written language, and of noting, usually unconsciously, the regularities between the way things are written and the way they are spoken. (p.22)

As an instructional approach to phonemic awareness Johnson and Louis (1986) "hold the Spoonerism to be one of the most valuable strategies in teaching phonics that we have encountered" (p.29). Presented in the same manner as lies or errors, Spoonerisms are a source of delight for the child. A teacher may write up on the board (or any other alternative presentation):

Old King Cole was a *serry* old *moul*. 
Johnson and Louis (1986) argue that the children, in the careful reading and consequent correction of such Spoonerisms are in fact engaging in phonemic awareness exercises through familiar and meaningful language, plus while maintaining a "proper orientation towards print" (p.30).

But exactly what is phonemic awareness? The literature search reveals three precise definitions. These definitions overlap, but are sufficiently exclusive as to warrant mention.

**Definition: Phonemic Awareness.**

"Phonemic awareness is the ability to identify sounds, and their sequence, in words, and the ability to compare words on this basis. Phonemic awareness is part of the phonics process, which is the knowledge and use of phoneme-grapheme correspondences for independent word recognition" (AASE, 1989a, p.5).

"Phonemic awareness refers to the ability to explicitly separate and manipulate the separate sounds in words. Phonemic awareness is not the same as phonemic discrimination: a child who can choose the correct picture when asked to distinguish between the spoken word boy and toy can obviously discriminate the sounds b and t, but may not be sufficiently aware of the separate phonemes to be able to point to the picture whose name starts with b or say that there are two sounds in boy. Thus, phonemic awareness refers to the ability to consciously attend to a word's separate phonemes" (Andrews and Jardine, 1989, p.3).

Phonemic awareness refers to "the ability to perceive a spoken word as a sequence of individual sounds ...[making]... a transition from speech, which consists of sound waves, to the unfamiliar discrete symbols which are our written language" (Reynolds & Dallas, 1989, p.22).

**Definition: Metaphonological Tasks:**

Metaphonological tasks are tasks "requiring a redirection of attention from the meaning of the words to their sound properties. This shift is supported to be dependent on the child's level of cognitive development" (Torneus, 1984, p.1347).

Perfetti (1984) encapsulates the issue by noting and asking:
It may be that, within a given orthographic system, the underlying word representation systems of different readers are more similar than they are different at a given level of skill ... the question for reading acquisition then becomes; How does a child come to have such a representation? (p.44)

It would appear that many beginning readers solve the teacher's dilemma. The observations of Schreuder and van Bon (1989) (noted in section 1.0), that in the Dutch education system beginning readers learn to read by way of the "phonological route" (p.61) but for many readers this is soon followed by the use of the "lexical route" (p.61).

2.3.1 Phonemic Awareness, The Great Debate:
To teach or not to teach!
Successful reading students learn between 600 and 6,000 words per year. There is little doubt that students cannot learn such an enormous vocabulary word by word. As noted in section 1.1, it remains a paradox that the best way to improve reading is the activity of reading! Nagy, Herman and Anderson (1985) state:

Our results call to mind the fable of the tortoise and the hare. For any given small set of words, it is easy to show that direct vocabulary instruction is superior to learning from context. It would be a poor method of instruction indeed that gave a student only a 1-in-10 chance of learning an instructed word! But if one asks a different question - what approach to vocabulary can more effectively lead to the acquisition of several thousand words per year - our results indicate that learning from context would be an easy winner.
Instruction dealing with words one at a time simply cannot cover that much ground.
(p.251)

Lloyd and Goyen (1986) summarise the theoretical stages of the traditional phonemic approach (also see Mercer & Mercer, 1981, pp.283-286) which include: the *icon* (the initial unprocessed view of the print), the *scanner*, (which allows for the previously mastered shapes to be processed into phonemes), the *mental lexicon* (in which the phonemes and strung into words), the *primary memory* (in which the words are processed for comprehension), the *secondary memory* (allowing for oral presentation of the text). These stages are controlled by the *automaticity element* which determines how closely the reader has to concentrate on the decoding processes at all levels (e.g. from basic lines and circles to recognition of same as print, to recognition of spelling patterns and words).

The causal interpretation for the elements of reading continue to fuel the current world wide debate. Mercer and Mercer (1981) noted that the debate centred around the code emphasis approach versus the meaning emphasis approach. Questions of causal direction remain far from resolved (Torneus, 1984). Even unresolved are studies that have attempted to improve just one element of reading, such as comprehension, through just one recognised approach (vocabulary knowledge) (McKeown, Beck, Omanson & Perfetti, 1983). And, in spite of this debate, such questions as the following also remain largely unanswered:

*are metaphonological abilities a prerequisite for spelling and reading, or the reverse?*  
*are metaphonological abilities a facilitating factor for spelling and reading?*  
*is there another mediating factor, such as cognitive ability?* (Torneus, 1984).  
*are we helping or hindering poor readers by giving them challenging material to read? And when does "challenging" really mean "frustrating"?* (see Forell, 1985).
is the classroom offering a double standard, for, while the good reader enjoys a battery of context cues to identify new words the poor reader experiences a rising amount of unknown words which thereby allow context cues to melt away and comprehension to suffer?

My experience in special education suggests that we do know the answer to the last question. Most of the poor reader's effort is taken up in the task of word identification. A double standard exists in every classroom. Support for this view is found in the findings of Forell (1985) that grade readers were appropriate for only the top half of a grade. Forell (1985) found that the other half of the students were suited to readers one to three years below their grade level.

However the debate continues; for example, Johnson and Louis (1986) state:

We feel that the deliberate simplification of language used in teaching children to read, while laudably motivated, is misconceived. Clearly War and Peace would be unsuitable for initial reading instruction, but more because the ideas dealt with are beyond the apprehension of the young child than because of the language. There are many anecdotes about children who have learned to read from the Bible, which used language that is comparable in its complexity to that employed by Tolstoy. (p.11)

The work of Jeanne Chall (1967) convinced the policy makers and teachers of U.S.A. to teach phonics. The success of Chall's arguments are reflected in the inclusion of phonemic teaching approaches even in television programs such as Sesame Street. This has resulted in an unusual outcome, at least in Australia and the United States of America; that very few children receive no phonemic training because very few toddlers
and pre-schoolers do not watch Sesame Street (at least once a day!)

The arguments against a traditional phonemic approach are no better stated than by Carbo (1988). Carbo (1988) raises serious questions regarding the quality and accuracy of Chall's conclusions. Carbo (1988) emphatically contradicts many current claims of phonics effectiveness. Furthermore she notes:

Instead of being one of the many possible reading methods, phonics became a reading goal for millions of American students, regardless of whether they needed phonics instruction or whether mastery of phonics was a reasonable expectation for some of them ... what is important is not knowledge of phonics per se - but rather, the ability to read and understand connected text. (p.227)

Supporting Carbo's (1988) conclusions, Johnson and Louis (1986) denounce much early reading material in Australian classrooms, claiming that "it is difficult to over-emphasise the damage that the language in some early reading material does" (p.12), and that when given many an early primer, it is little wonder that children find television and video games easier and certainly a source of more interesting stories! They assert:

The virtually ubiquitous workbook also distorts the child's view of language. If they spend considerable time marking whether vowels are glided or unglided, deciding whether 'b' or 'd' goes at the beginning or end of a tattered remnant of a mutilated word rendered meaningless by its isolation, or huffing and puffing at letters, can children be blamed for being puzzled as to what all this is for? Such Kafka-esque activities are not likely to
motivate the learner, nor will they provide an inkling of the vast repertoire of pleasure and the increase in social power that literacy provides. (p.12)

However, many argue for a traditional phonemic approach. Researchers such as Andrews, 1989; Andrews and Jardine, 1989; Juel, 1988; Reynolds & Dallas, 1989; Stanovich, 1986 and Torneus, 1984 have concluded that the primary specific mechanism that enables early reading success is phonological and metaphonological awareness. The argument for a traditional phonemic approach is well stated by Perfetti (1984), who concludes:

The consequences of not gaining word coding fluency are reading comprehension processes that are at risk. Although high-level components of reading (schemata) are very important, they have no privileged status in explaining overall reading skill. Coding remains the central acquisition for reading skill, the one component unique to reading. (p.57)

Perfetti's (1984) statement has found recent support from Vellutino (1987) who notes that "impressive support" (p.23) for teaching phonemic awareness comes from studies showing that children trained to identify phonemes "have an increased ability to map alphabetically and therefore an enhanced capacity to identify printed words" (p.23). Andrews and Jardine (1989) suggest that phonemic awareness offers a "self-teach mechanism" (p.10) in that children use their knowledge of sound symbol correspondence to sound out unfamiliar words, which will upon repetition and exposure eventually become sight words. They state:

Children who have acquired this self-teach mechanism can engage in the massive
amounts of practice necessary to be a good reader throughout the years. Good readers do exactly this, and consequently become better readers, with large vocabularies, greater word knowledge and more sophisticated language skills. (p.11)

There is little doubt that a child must gain automaticity in lexical access. While some approaches to reading may address the problem of word recognition as a matter of inconvenience, it is increasingly clear that reading cannot occur without reading words (Perfetti, 1984). Lexical access is the central recurring reading process and requires decoding skills. Therefore, phonemic awareness "may be induced; it may be acquired through direct instruction; it may be acquired along with or after the build up of a visually based sight vocabulary - but it must be acquired if a child is to progress successfully in reading" (Stanovich, 1986, p.363).

The idea that a skilled reader processes a text by skipping over words and/or groups of words has been shown to be false. Perfetti's (1984) findings have clearly shown that skilled readers such as college students directly fixate on most words when reading a text. This allows one to detect spelling errors, even when the misspelled words are very predictable in their context. Stanovich (1986) also debunks this "scanning" theory of psycholinguistic origin. Stanovich (1986) reviews research that uses the latest technology to measure eye movement, and concludes that eye movement is determined by the level of difficulty of the text, "with the number of regressions and fixations per line increasing as the material becomes more difficult ... [and notes that] ... this is true for all readers, regardless of their skill level (p.365).

Skilled reading undoubtedly is driven by frequent and rapid access to words, but the overall rate is set by the reader's purpose, and once set, it will remain sensitive to the current text conditions, such as word predictability (Perfetti, 1984). Context is important, but it does not change the fact that lexical access
is central to reading, and reading is most definitely not a guessing game (Perfetti, 1984).

2.3.2 Phonemic Awareness and the Poor Reader.

Andrews and Jardine (1989) warn that decoding training will only be effective for children who have achieved phonemic awareness, but note that "phonemic awareness does not develop as a natural consequence of increasing maturity" (p.6). Studies of competently spoken but nevertheless illiterate adults led Andrews and Jardine (1989) to conclude that "one factor leading to the development of phonemic awareness is exposure to written language" (p.6). Just as pre-literate children have very low levels of phonemic awareness, studies have shown that illiterate groups of adults have similarly low levels of phonemic awareness, for phonemic awareness "is not a prerequisite for spoken language acquisition" (p.6). Andrews and Jardine (1989) agree with the earlier conclusions of Stanovich (1986) and conclude that the relationship between phonemic awareness and reading acquisition is:

... one of "reciprocal causation": phonemic awareness facilitates the development of reading skills; and exposure to written language during reading instruction facilitates the development of phonemic awareness. (pp.6-7)

However, children who become poor readers enter first grade with little phonemic awareness. Juel (1988) found that the mean score of the poor readers on a test for phonemic awareness, did not approach ceiling (or indeed did not approach the good readers' end of first grade mean score) until the end of third grade. Vellutino (1987) supports this finding and notes that kindergarten and first-grade children who have some ability "to segment spoken words into syllables and phoneme-size units" (p.23) learnt to read better that those children who cannot.

Such findings prompt Andrews and Jardine (1989) to stress that it is important to develop good phonemic awareness and to
disagree with the psycholinguistic model's reading/language assumptions. They state:

It is from third grade up that the links between reading ability and language ability are found - though which is the cause and which the effect remains a matter of conjecture. (p.11)

The "links" between reading ability and language ability are addressed by Stanovich (1986) in his discussion on the phenomenon of "word calling" (p.372). Word calling is considered, by the psycholinguistic proponents, to be "a characteristic strategy of poor readers" (Smith, 1982, p.145), indicating that the child does not understand the true purpose of reading, for in his/her over-reliance on phonemic strategies is failing to extract meaning from the text. However, Stanovich (1986) found no research evidence for such a claim. He found that decoding a word into phonological form rarely takes place without meaning extraction, even in poor readers, but rather that word decoding automatically led to semantic activation when the meaning of the word was already adequately established in the child's memory. Stanovich (1986) notes that if the meaning of the word(s) is/are not known in the child's aural vocabulary, then decoding strategies can hardly be blamed when the child does not understand the written words! Similarly, Juel (1988) addressed the phenomenon of word calling and found that:

Although there are many references in the literature to poor readers who are "word-callers", they were not found in this sample. (p.440)

The findings of Juel (1988) revealed that poor readers in the fourth grade were neither competent decoders nor competent listeners and that the impact of listening comprehension steadily rose with each grade level. Therefore the "word-caller" suffers
the Matthew Effect\(^{11}\) on word understanding, generating further disadvantage because the knowledge base is not being effectively broadened via reading.

Furthermore, there is agreement in the research findings that conclude the need for early detection of poor readers (Andrews and Jardine, 1989; Juel, 1988; Stanovich, 1986). Juel's (1988) findings aptly support the Matthew Effect. Juel (1988) found that poor readers in Grade 1 were most likely still poor readers in Grade 4, and summarises her research findings thus:

The probability that a child would remain a poor reader at the end of fourth grade, if the child was a poor reader at the end of first grade, was .88; the probability that a child would become a poor reader in fourth grade if he or she had at least average reading skills in first grade was .12. The probability that a child would remain an average reader in fourth grade if the child had an average ability in first grade was .87; the probability that a child would become an average reader in fourth grade if he or she was a poor reader in first grade was only .13. The evidence in this sample of children indicates that the poor first-grade reader almost invariably remains a poor reader by the end of fourth grade. (p.440)

... a vicious cycle seemed evident. Children who did not develop good word-recognition skill in first grade began to dislike reading and read considerably less than good readers, both in and out of school. They thus lost the avenue to develop vocabulary, concepts, ideas, and so on that is fostered

\(^{11}\) see Stanovich, 1986.
by wide reading. This in turn may have contributed to the steady widening gulf between the good and poor readers in reading comprehension and written stories. This cycle seems to illustrate the "Matthew Effect" described by Stanovich. (p.445)

Similarly, from a more global viewpoint, there is little doubt that the "cognitive consequences of the acquisition of literacy may be profound" (Stanovich, 1986, p.374). Such is the disadvantage that by the end of the first grade, the good readers in Juel's (1988) study had encountered in their basal readers an average of 18,681 words. This compared to the poor readers encountering only 9,975 words via the same mode. By the end of fourth grade, the good readers' average word experience (from their basal readers) was 178,000, compared to the poor readers only sighting (from their basal readers) 80,000 words. This difference in word confrontation is compounded by the fact that these figures are excluding the reading done at home, for even after the end of second grade there was a wide difference in the amount of reading done at home. The good readers frequently read after school while poor readers do so very rarely. It became apparent that poor readers read little voluntarily.

Juel (1988) claims that her findings are supported by other research from around the world, in spite of different schooling procedures and different starting ages. Juel (1988) notes the earlier study in New Zealand by Clay which in 1979 found that a student's reading percentile standing at the end of the first year at school (aged between five and six) was roughly the same standing at age seven or eight. Juel (1988) also notes similar results found in a Swedish study by Lundberg who in 1984 linked poor reading ability to early poor phonemic awareness.

2.3.3 The great paradox.

However, there remains a problem as to how long a teacher should continue to teach phonic awareness. Andrews and Jardine (1989) note that it appears to be a paradox to teach beginning
readers' skills in phonemics because they are useful, yet, as skilled readers, these same children will have little need of this skill. They state:

The paradox arises because mature readers identify words mainly by visual means yet heavy reliance on a sight approach in early reading is not sufficient. (p.9)

This paradox has been addressed by Torneus (1984) who notes that instead of being a prerequisite skill, metaphonological abilities might well be facilitating factors in reading and spelling acquisition (see discussions regarding the interactive model; section 8). This paradox also intrigued Perfetti (1984). He resolves this issue by offering two quite different definitions for literacy. The first he calls the "thinking definition", being;

Reading is thinking guided by print. (p.40)

The second definition he terms the "decoding definition", being;

Reading is the translation of written elements into language. (p.41)

Perfetti's (1984) "thinking definition" considers reading as a complex higher-level mental activity (in which print plays a role) which includes elements of problem solving and the availability of higher level structures (schemata or executive structures) to organise comprehension and memory activity.

Perfetti (1984) admits that his "decoding definition" is very narrow, and indeed it is hard to find anyone today who defines reading this narrowly. This is probably due in part to the emphasis on meaning. The definition seems to imply that written elements are not language, yet, the internal structure of written elements do constitute part of the language once it has been learned, and although the skilled reader may rely less on the orthographic structures of the speech units, the initial
acquisition of this system requires decoding (Perfetti, 1984). As Perfetti (1984) aptly states:

> The decoding definition applies to learning to read ... the thinking definition applies to skilled reading. This in fact seems quite reasonable. In the acquisition of fundamental literacy, the decoding definition is predominant. In the acquisition of intelligent literacy, the thinking definition becomes central. (p.42)

There is little argument that before a child can begin to read, s/he must have first gained a communicative control of language, but, prior to learning to read, children show low levels of phonemic awareness (Perfetti, 1984). However, as the child develops early phonemic awareness, the ability to demonstrate explicit phonemic knowledge is highly predictive of early reading achievement (Andrews and Jardine, 1989; Juel, 1988; Perfetti, 1984; Reynolds and Dallas, 1989). Andrews and Jardine (1989) emphasise:

> ... [phonemic awareness] is a stronger predictor of subsequent reading achievement than measures of intelligence, vocabulary or listening comprehension ... [and] ... is a stronger predictor not only of individual word recognition, but also of reading comprehension even in longitudinal studies that use measures of phonemic awareness in kindergarten to predict reading skill up to second grade ... [and] ... the fact that phonemic awareness is causally related to reading acquisition has been further confirmed by demonstrations that children trained in tasks designed to induce phonemic awareness improve their
reading skills more than children given no such training. (p.3)

Perfetti (1984) proposes that as only a reader "with skilled decoding processes can be expected to have skilled comprehension processes" (p.43), in effect, decoding is important no matter what definition of reading one accepts.

2.3.4 The alphabetic principle.
"Learning to read in an alphabetic system entails discovery of the alphabetic principle" (Perfetti, 1984, p.49). Learning to break the code of written text is partly dependent on being aware that words are composed of meaningless but somewhat distinct sounds, that is, phonetic awareness (Juel, 1988). This realisation is not necessary for understanding or producing speech. An otherwise meaningless written symbol is associated with a meaningless unit of speech or phoneme. Yet, within the alphabetic system, the logographic scripts provide maps between print units and word meaning (Perfetti, 1984), or otherwise stated, "print decoding depends on mapping phonemes to graphemes" (Juel, 1988, p.437). Andrews and Jardine (1989) explain that because the English language is alphabetic in nature, children who fail to realise this alphabetic nature by recognising that spoken words can be segmented into phonemes, "are forced to rely on a visual or logographic strategy in which each word is memorised on the basis of its individual features" (p.4). Such a system of word memorising is inefficient due to the enormous memory demands consequent on increasing vocabulary (600-6,000 words per year; see Nagy, Herman & Anderson, 1985), and "because it fails to take advantage of the sound-meaning relationships already stored in memory during speech acquisition" (p.4). Andrews and Jardine (1989) state:

Once children do crack the alphabetic code, they have the skills necessary for independent reading: they can match newly encountered written words with known spoken words, and generate the spoken
form of entirely novel words. But this is not the final stage of print translation. Beyond the "alphabetic stage", readers appear to move to an "orthographic stage" in which recognition relies not on single letters but on larger units such as letter clusters and morphemes.... At this stage reading is not "phonological" in the sense that visual words need to be converted into their spoken form to allow access to memory.... Rather, skilled readers appear to develop representations of words that "amalgamate" their orthographic and phonological characteristics ... and allow words to be recognised automatically with minimal demands on attention or working memory.... Progress from the alphabetic to the orthographic stage probably depends on experience with words that allows realisation of multiletter spelling-sound rules, and practice at individual word decoding to develop automaticity. (pp.4-5)

The problems associated with the alphabetic system are well known and obvious, and indeed have attracted much criticism over the years. The phonemes, especially the consonants, are abstract and acoustically are inconsistent. Furthermore, the alphabet does not supply unique letter codes for vowels. However, the problems are "not insurmountable" (Perfetti, 1984, p.50), and indeed are overcome by everyone who learns to read. Perfetti (1984) states:

Even children who have trouble learning to read can be helped to discover the mapping principle. (p.50)
2.3.5 Ways to acquire the alphabetic code.

There is little doubt that the psycholinguistic model has made important contributions to the teaching of reading and writing in our classrooms today. Adherence influences the very organisation of space and materials within an every-day classroom. Brown (1988) recommends that the teacher ensures sufficient printed matter; for immersion that is of interest to the child, that reflects a great variety (especially in terms of genre), that is of high quality, that is presented in such a way as to ensure maximum use by the child. She suggests the use of resources such as the creation of a library within the classroom which is frequently supplemented from the regular school library, and the use of technology resources such as photocopied overhead projections of the children's favourite poems and stories. Brown (1988) suggests the daily "print walk" as a routine introduction to the language session to ensure that the children know where the print is displayed. Brown (1988) also suggests a classroom organisation that allows for; individual work space, co-operative group areas, floor space for reading quietly, silent work area, floor space for whole class learning, whole class view of the chalk board, and resources arranged so that the children can find them easily.

Andrews and Jardine (1989) note that "failure to develop efficiency in reading has dramatic consequences for an individual's achievement in other educational and vocational contexts" (p.1) and that failure to read is a self-perpetuating process in which failure produces more failure (that is, the condition termed by Stanovich in 1986 as the Matthew Effect). Cambourne (1986b) notes the difference between a-literate and illiterate writers. Many students at university are in fact a-literate, that is, they can read and write at a level accepted by society, but they choose not to do so.

Research into classroom application of the psycholinguistic model is creating much debate. Cambourne (1976) suggests that because Goodman's model of reading arose out of research undertaken at the naturalistic end of the research spectrum, only similarly naturalistic research should be used to evaluate it. However, this claim is disputed by Tendys (1979) who notes that
because the model has been proposed as a model for reading it should be evaluated under various conditions, including under the "manipulative end of the research spectrum" (p.19), lest the psycholinguistic model be seen as a model for reading under certain circumstances only. Recent research which attempted to follow the naturalistic prescription still failed to bring the same results found by Goodman's 1965 study (see Nicholson, Lillas & Rzoska., 1988).

Once again, the paradox of "reading to learn to read" (see Nagy, Herman & Anderson, 1985) must be addressed. Perfetti (1984) states:

There is a paradoxical problem for the learner, however. Pattern induction is a powerful mechanism for learning to read, but it is only available to the child through reading. It helps the pattern induction process if the learner has part of the representation system. Clearly, the mapping system would be a tremendous advantage to the learner. It is the one representation system that allows the acquisition of the other representation systems. This mapping system, indeed, can be taught successfully in a very direct manner with no known negative consequences and some obvious advantages.... There are many superficially different ways to learn to read. However, only those that lead to learning of speech mappings and orthographic patterns will be successful in an alphabetic system. (p.53)

Perfetti realises that "ignoring the [alphabetic] code may seem justified by the difficulty of teaching it, however the alternative to not learning the code is not attractive, if the child is to advance to a stage of true reading" (1984, p.51). However,
there is no correctly prescriptive path to follow in the teaching of the phonemic code as each child will follow an individual path, and most will acquire this knowledge "right along with learning to read" (Perfetti, 1984, p.51). This suggestion is supported by Juel (1988) who notes that while some phonemic abilities appear to be pre-requisites for learning to read (such as phonetic blending), other phonetic abilities will be outcomes of learning to read. For example, many high frequency incurred words (such as "the", "of", "you"), require the learning of specific unique patterns and are therefore often treated as "sight words" (that is, words learned as whole words from flash cards or from encountered meaningful sentence context). Other longer words may also reflect this acquisition of specific word forms through letter strings, and many words will be more reflective of context-free decoding rules (Perfetti, 1984).

Like many other theorists, Perfetti (1984) asks the question:

How does the learner achieve these multiple representations ... how is the code learnt? (p.52)

Similarly Andrews and Jardine (1989) ask;

What does a child need to know in order to learn to read? (p.1)

and conclude that in the attempt to develop a "correct" theory of reading instruction, both the theoretical approaches of psycholinguistic and phonemic bases need to be implemented. However, in trying to develop a theory that implements the implications of both theories, it is important to realise the differences of the two, (usually opposing), views. The psycholinguistic approach "models strong similarities between reading and listening ... [with instruction focusing] ... on high level language skills common to both reading and listening" (1989, p.2). The phonological or phonemic approach however emphasises "the operations involved in dealing with printed symbols and suggest
that some different skills may be required" (1989, p.2). Andrews and Jardine (1989) state:

While in no way denying the importance of higher level language skills, especially for children who already have some reading ability, recent research into the relationship between phonemic awareness and reading acquisition would suggest that there are some skills over and above general language competency that children need to acquire. In fact, evidence now clearly demonstrates that decoding training is a crucial element of initial reading instruction. (p.2)

In a similar conclusion to Andrews and Jardine (1989), Perfetti postulates that in the matter of how an individual learns to read "the most plausible scenario is that, depending in part on instructional practices, the learner acquires all three representation systems [word forms, letter patterns and mapping] at the same time" (1984, p.52). For many children, the first step in learning to read may well be the stage of specific word learning. This then activates the "most powerful mechanism for learning how to read" (Perfetti, 1984, p.53) as human beings are prolific pattern learners, and active exposure to print "provides a powerful condition for learning the orthographic patterns in reading" (Perfetti, 1984, p.53).

PART FOUR: SPELLING ISSUES IN READING DIFFICULTIES AND THE GREAT DEBATE

2.4.0 Introduction.

Juel (1988) found that poor readers appear to become poor writers, and that poor writers exhibited either, or both, poor spelling and poor story ideas. Andrews and Jardine (1989) stress
that phonemics alone is simply not enough; to be successful instruction must include the "alphabetic knowledge" to see the morpheme and realise the rules. Furthermore, Goyen (1989) observed that there are discrepancies in psycholinguistic assumptions. The belief that we learn to spell through reading is otherwise contradicted in that one does not attend to individual letters or letter sequences when reading. Serfontein (1990) explains that spelling has a similar cognitive processes to reading but that it is more taxing due to the necessity to recall the word and to hold that mental image while writing down the letters. This means that a child with spelling difficulties has to contend with all the problems faced in reading and have the "added need for good short term memory" (p.78).

There are many who advocate an active spelling program. Sweeney (1989) found that, contrary to the popular belief that excessive attention to spelling will quash writing attempts, the children in his study "wrote more, not less as their skills improved and spelling became easier and almost automatic" (p.28). Sweeney (1989) is adamant that good spelling programs rest on good teaching programs. He states:

Good spellers practise getting the word right every time they write the word. Poor spellers don't. Poor spellers don't even know if they have the word right or not ... [a poor speller] ... needs multiple correct presentations and multiple practices to ensure that s/he gets it right. (p.28)

In summary, Sweeney (1989) recommends the following steps:
* Tell the children that spelling is important and that getting it right is essential.
* Reinforce heavily.
* Over-correct whenever the opportunity arises.
* Practise spelling whenever the opportunity arises.
2.4.1 Spelling developmental progress definitions.
Gardner (1986) defines the stages of spelling as:

1. the pre-communicative Deviant stage in which the child recognises that s/he needs to use the alphabet letters but does so in a random order and maybe copies a few conventional words, but again in random,
2. the Pre-phonetic stage in which the child begins to make the correspondence between the sound and the letters,
3. the Phonetic stage in which the child begins to match the long vowel sound to the letter e.g. "bot" for boat, or uses articulation e.g. "cwt" for cute,
4. the Transitional stage in which the child relies less on sound and more on the visual aspects of the word, and includes vowels in most syllables,
5. the Correct stage in which the child realises that spelling has elements of sound, meaning and grammatical structure, and can apply these when spelling new words.

2.4.2 Spelling and metaphonological skills.
Developmental theories infer that a child should naturally progress with maturation. However, what of the child who seems static in the early stages? Torneus (1984) found that early spelling ability is primarily dependent on metaphonological skills, and only indirectly affected by linguistic and cognitive development. This finding led her to ask the question:

Are metaphonological abilities a prerequisite for spelling and reading or is the causal direction the reverse? (p.1346)

Torneus (1984) found that the largest causal influences on spelling are imposed by metaphonological abilities which in turn are dependent on both cognitive and language development. However, spelling has no causal influence on metaphonological ability. Torneus (1984) concluded that metaphonological abilities are of crucial importance for the development of spelling and
reading, and that metaphonological training improved the child's metaphonological abilities.

It may well be difficult to determine or differentiate empirically between a facilitating skill and a prerequisite skill. Nevertheless, the distinction is quite important when reflected in a teaching philosophy that will affect teaching method and approach.

2.4.3 The interrelation between reading and spelling and the Great Debate.

Contrary to the opinion that spelling merely serves the writing process, the AASE Chapter Committee (1989a) state:

> Children should engage in spelling practice when beginning to read to help them learn how to segment words into phonemes and to represent phonemes with letters. (p.9)

Research by Hohn and Ehri (1983) found that teaching segmentation with alphabet letters (rather than mere oral sounds) appeared to provide learners with a mental symbol system for representing and thinking about specific phonemes. This finding led Hohn and Ehri (1983) to state:

> Those who regard speech as primary and writing as parasitic on speech often assume that phonetic segmentation is a prerequisite for learning to read and that it should be taught as an oral analytic skill before children are introduced to print. However, ... [it is] ... suggested that the reverse may be more true, that children may learn much about the phonetic structure of words when they learn how to interpret spelling as maps for pronunciation. (p.752)
Hohn and Ehri (1983) note that the exposure to letters in the pre-reading stages actually facilitates learning by "clarifying the nature of the task and how to proceed" (p.759). This is so because letters help learners "distinguish the correct size of the sound units to be segmented" (pp. 759-760) and that phonetic analysis with letters "enabled learners to acquire a visual sound-symbologizing [sic] system that they could use to distinguish and represent the separate phonemes in memory" (p.760). Hohn and Ehri (1983) conclude:

Learning to segment with letters promotes not only phonetic segmentation skill but also knowledge of the alphabetic principle, which is especially difficult to acquire but central to progress in learning to read.... We conjecture that one advantage of using spellings to teach phonetic segmentation over teaching segmentation as a separate oral skill is that the skill gets integrated with other aspects of the reading/spelling process early on during learning.... If component processes such as phonemic segmentation, letter-sound relations, and print-speech mapping, can be integrated from the outset of acquisition, the learner should move a bit closer to the attainment of reading proficiency. (pp.760-761)

The conclusions of Hohn and Ehri (1983) are supported by the findings of Cattley (1988). In her observations of children experiencing spelling difficulties, Cattley (1988) notes that while it is acknowledged that spelling is learned best through the writing process, there are many who need to "focus on the internal structure of words ... [because] ... many children benefit by having the relationship between internal structures of words pointed out to them" (p.38). According to Cattley (1988), student motivation is stimulated because the words are no longer blanketed as "correct" or "wrong", but rather the child is
encouraged through "noticing the similarities and differences between the child's spelling approximations and standard spellings" (p.38).

Blending phonemes requires the child to make use of the spelling/sound relationship. Andrews and Jardine (1989) therefore suggest a program beginning with simple and regular spelling/sound relationships and moving to exposure to irregular words. They note:

Although there is general agreement among researchers that early reading instruction should include the explicit teaching of phonics, and that it should be taught for as long as necessary, but no longer ... the relationship between sound and printed symbol is best approached from two directions: learning to spell can assist in learning to read ... as well as the reverse. (p.9)

Should a child be static in the early stages of Deviant and/or Phonetic, Torneus (1984) suggests, metaphonological facilitating skills need to be taught. As these early stages are mastered it seems logical that the child will progress to the higher stages defined by Gardner (1986). Once in these higher stages the child is able to apply more advanced spelling rules that reflect sound, meaning and grammar (Gardner, 1986), and also reflect history (e.g. past pronunciations, derivations from words no longer in use), and the many other reasons which cause the spellings of many words to deviate "widely from their phonetic realization" (Torneus, 1984, p.1348). Torneus (1984) notes too that more advanced spelling is also dependent on other metalinguistic abilities "such as metasyntactic and metamorphological abilities" (p.1348), and that final spelling mastery might well be "directly dependent on cognitive development" (p.1348).
2.5.0 Introduction.

There is little doubt that children learn to read through reading (see Nagy, Herman & Anderson, 1985) but there exists a double standard within the classroom as to the readability of materials (Forell, 1985). The fluent readers, having no difficulty with the material, read along "at a merry pace", using their "full battery of context cues to identify words and have enough left over to think about what they are reading" (Forell, 1985, p.857). Meanwhile, the poor readers are frequently challenged "to the point of frustration" (Forell, 1985, p.858), and as the incidence of unknown words grows, context clues become elusive and dissolve into inevitable frustration.

The irony lies in the fact that most teachers believe that children need to be challenged, yet in truth, the most successful readers, those who have cracked the code, are rarely challenged by reading material. The adherence to the accepted reading experience lesson is a factor in the perpetuation of the Matthew Effect (see Stanovich, 1986), along with the "illusion of knowledge" (see Goyen, 1989) that continues to insist that everyone can learn if stimulated to do so. It is worth remembering too the findings by Forell (1985) that grade basal readers were appropriate for only the top half of the grade, with the remaining half requiring basal readers which were one to three years "below" grade level. Forell (1985) concludes:

> Whether we are teaching decoding strategies or comprehension strategies, children are much more likely to discover how reading works, and make it work for them, if the book is not too hard. (p.862)

Therefore it can be suggested that the Stanovich (1986) "Matthew Effect" is perpetuated through poor readers often finding themselves in materials that are too difficult for them.
This results in an unrewarding early reading experience and a self-enclosed system of failure. The combination of lack of practice, deficient decoding skills, lack of comprehension and minimal comprehension cues and clues persistently continue to retard the development of automaticity and speed at the word recognition level.

2.5.1 Definitions of comprehension.
Stahl and Fairbanks (1986) define two categories of comprehension. These authors claim that comprehension includes both a definition information component and contextual knowledge. They state that:

**Definitional information** is "knowledge of the relations between a word and other known words, as in a dictionary definition or in a network model of semantic memory" (p.74).

**Contextual knowledge** is "a core concept and how that knowledge is realized in different contexts" (p.74).

Stahl and Fairbanks (1986) suggest that a person who "knows" a word has both definitional and contextual information about that word.

2.5.2 Implications of definitional and contextual comprehension.
In their study to establish the effectiveness of vocabulary instruction, Stahl and Fairbanks (1986) found that vocabulary instruction had a significant positive effect on children's comprehension in both "near" and "far" posttesting. They also found that vocabulary instruction appeared to have a slight but significant general facilitating effect on reading comprehension of passages in standardised tests not designed to contain taught words. Not surprisingly, they also found that the most effective vocabulary teaching methods were those which included both definitional knowledge and contextual knowledge of the word.

These findings are consistent with those of Nagy et al. (1985). These researchers concluded that contextual knowledge must be included in any vocabulary instructional method. The Nagy
et.al. (1985) results indicate that learning from context is the only possibility. Instruction dealing with words one at a time simply cannot cover the content needed to expand a child's vocabulary at the level of 600 to 6,000 words per year.

2.5.3 Implications of strategy training in reading comprehension.

Palincsar and Brown (1984) researched the effects of cognitive strategy training on reading comprehension and noted "impressive findings" (p.167). Indeed, the success of strategy training in improving reading comprehension in children with comprehension difficulties has been well documented (see Brown & Palincsar, 1982; Jenkins, Heliots, Stein & Haynes, 1987; Stevens, 1988). Comprehension is the process by which the meanings of words are integrated into sentences and text structure (Juel, 1988). Reading comprehension implies that, given perfect word recognition, a child "will read and comprehend a written text exactly as well as he or she would comprehend the text if it is spoken" (Juel, 1988, p.438). However, children who come from backgrounds that are less than rich in language experiences (e.g. from a home in which language is used almost exclusively to direct) may have difficulty with the decontextualised nature of communication in schools and in books (Juel, 1988).

Researchers have begun to examine ways of encouraging children with learning difficulties to use active learning strategies, through examining the dual goals of teaching for superior learning and retention and teaching for spontaneity and independence (Jenkins et al., 1987). Jenkins et al. (1987) trained thirty-two elementary-aged children with learning disabilities the strategy of paragraph restating (that is, writing a quick summary or point about each paragraph as it is read). Every child was tested for success of training, near transfer and remote transfer. In all instances, the strategy trained students exhibited better comprehension than did the control students. Somewhat

12 Specifically Palincar and Brown (1984) researched the effects of comprehension fostering and comprehension monitoring.
similar results had previously been achieved by Brown and Palincsar (1982) in their earlier developed procedure called reciprocal teaching, which instructs adolescents in four strategies designed to foster reading comprehension, being: self-questioning, summarising, predicting, and clarifying.

However, while these findings lend support to the role played by active processing during reading by showing that students with learning disabilities "exhibited better comprehension when they read under a condition designed to induce increased text processing" (Jenkins et.al. 1987, p.59) their methods (that is, paragraph restating) still required that the student be able to read at least some text.

2.5.4 The interrelation between reading and comprehension and the Great Debate.

Current theories assume that successful readers use good reading comprehension-based predictive processes to reduce the amount of material that must actually be read. However, Andrews and Jardine (1989) support the N.S.W. AASE chapter committee (1989a) and Stanovich (1986) in noting that this assumption is simply not supported by research.

Stanovich (1986) discusses the eye movement patterns of both good and poor readers and concludes that eye movement patterns are the same for all readers, and that "the level of reading determines the nature of the eye movement patterns, not the reverse" (p.365). Andrews and Jardine conclude that skilled readers' comprehension must therefore be derived partly from efficient decoding:

They [skilled readers] can access the meanings of words more quickly, efficiently and effortlessly than less skilled readers, skilled readers are able to devote their attention to the higher cognitive processes important to comprehension. (pp.5-6)
Somewhat similarly, Stanovich (1986) states:

It is quite possible for accurate decoding to be so slow and capacity-demanding that it strains available cognitive resources and causes comprehension breakdowns ... comprehension fails not because of an over-reliance on decoding, but because decoding skill is not developed enough. (p.373)

In fact, it is not that the good reader relies less on visual information, but that the visual analysis mechanisms of the good readers use less capacity. That is, good readers are efficient processors in every sense: They completely sample the visual array and use fewer resources to do so. (p.368)

Beveridge and Edmundson (1989) discuss the "alternative explanations" (p.10) placed by researchers on results from various experiments which seek to explain comprehension and reading ability. The obvious explanation is that good readers, because they use the phrase as a unit of meaning, read at a much faster rate than do slow readers, who in turn plough through each phrase word by word. Some have adopted the "more reasonable" (Beveridge & Edmundson, 1989, p.10) view that poor readers do have the ability to use the phrase as a unit of meaning but are less likely to use the strategy to the same extent as good readers.

Yet another alternative explanation has been mooted. Beveridge and Edmundson (1989) note that others derive the explanation that "poor readers in fact make more use of syntax when processing text than good readers" (p.10) in an attempt to aid memory for comprehension purposes and "hence their reading time on each phrase is slowed down" (p.10). This explanation goes on to propose that good readers concentrate more on lexical items
in each phrase "rather than devoting extra processing time on working on the phrases as a meaningful unit" (p.10).

Nicholson et al. (1988) note doubts about the study carried out by Goodman (1965) which found that there was a sixty to eighty percent improvement in reading accuracy when children read words in a story rather than from a word list. These researchers investigated whether Goodman's (1965) finding applied to "everyday reading, where context clues vary a great deal in richness" (Nicholson et al., 1988, p.6). To help eliminate a false finding created by a practice effect (a major criticism of the earlier Goodman study), Nicholson et al. (1988) gave half the children the word list before the story, and the other half the word list after the story. Nicholson et al. (1988) also included both good and poor readers. The results of this study showed that although all the youngest pupils (six year olds) read better in context, amongst the eight year olds only the poor readers showed better scores when reading in context (and in fact the good readers scored seven percent worse). The results of this study also support the research which says that poor readers use context to help with reading, whereas good readers who are skilled at decoding, do not need to do so (see Andrews & Jardine, 1989; Stanovich, 1986). Nicholson et al. (1988) conclude that it is merely a matter of what a teacher is "trying to achieve" (p.9) when deciding to ask children to read either a whole story or words in a list.

PART SIX: WRITING ISSUES IN READING DIFFICULTIES AND THE GREAT DEBATE.

2.6.0 Introduction.

Dwyer (1986) laments that the teaching approach in the U.S.A. is influenced heavily by promoters of behaviourist packages, commercial testers of competence and conservative lobbies. This has resulted in the pressurising of teachers to mechanise and standardise their approaches which, in turn, trivialises the "basics". This approach is contrasted with the
schools of Australia. Dwyer (1986) claims that teachers in Australia have been improving the standards of literacy without expensive machinery, without batteries of tests and without soul-destroying drills and routines; simply by believing in the assumption; *if you want your pupils to be better readers and writers, give them stimulating books, pieces of paper and pens, and encourage them to use them every day.*

The N.S.W. curriculum documents support Cambourne's Conditions of Learning (see Cambourne, 1986a), and indeed, most teachers agree on this matter (see Brown, 1988, Dwyer, 1986, Hopkins, 1986, Johnson & Louis, 1986). Cambourne's conditions include:

* **Immersion** (flooding the room with meaningful print),
* **Demonstrations** (daily, continual, and variety of use),
* **Expectations** (of success, no limitations to child),
* **Responsibility** (child responsible for own work, child owns their own work), and,
* **Use** (write as many times a day as possible, and then more!).

However, there are many who would suggest that this is rather too simplistic (or even an evangelical) approach for all writers. Indeed, Goyen (1989) suggests that this insistence that everyone can learn if stimulated to do so, is merely an illusion of knowledge is a very real danger to effective teaching. The illusion of knowledge advocates that learning is easy; that all a teacher has to do is have a good relationship with the students, help them to learn what they want to learn, make the task interesting and comprehensible, and convince the student that s/he will succeed. This does little for the exceptional student who has learning difficulties.

### 2.6.1 The writing process.

The writing process is nonlinear and consists of several overlapping sub-processes. For the skilled writer this includes:

* **planning** when the writer applies strategies to decide the writing purpose or goal, discovers and collects ideas, and decides on the presentation and organisation of the text;
*drafting* when the writer may revise a previous draft (or drafts) while continuing to translate ideas into printed sentences complete with enriching details; and,

*editing* when the writer revises the draft through monitoring it to ensure that the article meets the writing goals and plans, and that it will also meet the needs of the intended audience (Englert & Raphael, 1988).

Writing is a complex process in which the writer engages in both task-specific strategies (plan, monitor, revise) and executive control functions. These executive functions include the ability to self-instruct, to consider and choose among alternate strategies or sub-processes and to modify or correct performance on the basis of intended goal. Englert and Raphael (1988) state:

> With the complexity of the writing process, it is not surprising that many exceptional students who are poor writers experience difficulties in one or more of the writing subprocesses [sic]. (p.514)

### 2.6.2 The interrelation between speech, reading and writing.

Writing and speech interact and reinforce each other in a total process of language development, and the teacher needs to offer a model of the way to gain control over meaning, not merely in the sense that linguistics equates to correctness of usage but rather to meaning, or rather, what is meant by language (Halliday, 1986). Writing brings language into the consciousness, and allows children to reflect on language in the process of their learning. Halliday (1986) states:

> Speaking and writing are different ways of meaning, but behind both is the common system we call language. Writing evolved not simply to duplicate the functions of
spoken language but to carry out the new functions that arose in advancing cultures.
(p.6)

Regarding this relationship between writing and reading, Juel (1988) found:

Through the years the good readers' proficiency in producing ideas steadily grew, whereas poor readers made no apparent progress in their ability to tell an oral story from first to fourth grade ... most poor readers were still telling and writing descriptions rather stories in the fourth grade. These descriptions usually amounted to little more than an expanded list of what was seen in the animal picture. (p.443)

Goyen (1989) concedes that in fact, for many learners, especially those with a long history of failure, learning is difficult, time-consuming and very demanding.

2.6.3 Poor cognitive strategies and its implications for the poor writer.

Students who have developed poor speech habits, and then further compounded the problem with poor reading habits, are at risk for developing good writing processes. Englert and Raphael (1988) detail three areas of writing in which poor writers experience difficulties, a summary being:

Idea Generation.

This involves the initial planning, the ability to access ideas from background knowledge (such as note taking), to think about the topic and to organise oneself for and to the task at hand. Poor writers tend to spend less time than do skilled writers in this planning stage. Furthermore, while skilled readers seem to possess and exhibit the necessary metacognitive skills (see
section 7) to recall chunks of associated background knowledge, poor writers either do not have this ability, or fail to realise (and therefore utilise) their metamemory processes. (Metamemory refers to "knowledge a person has about the factors influencing memory activities", see Borkowski & Kurtz, 1984, p.193). This results in poor employment of strategies for self-directed memory searches as indicated by their inability to sustain their thinking about a given topic and the generation of a product that falls far short of the relevant knowledge they have in memory. Obviously this leads to a lack of strategies to develop more complete knowledge.

Text Organisation.

Once the ideas are generated, the writer must cull the ideas and arrange them to create an organisational plan which includes categorisation and decision making. Poor writers exhibit great difficulty in categorising ideas into sets of related ideas and providing conceptual or superordinate labels. Furthermore, poor writers appear less able to make decisions about such things as the overall presentation and ordering of the ideas. Poor writers seem to lack an understanding of story schema that is essential not only to writing stories, but to comprehending them.

Metacognitive Knowledge.

Metacognitive knowledge includes the ability to self-instruct, to consider and choose among alternate strategies or sub-processes and to modify or correct performance on the basis of intended goal. Poor writers tend to lack the metacognitive control related to strategy awareness, implementation and regulation. Students with learning difficulties are less successful in regulating their comprehension and fail to monitor or correct the potential confusions in their own and other's texts, and thus fail to detect inconsistencies.

Furthermore, poor writers are less able to utilise their own internal resources and are therefore more dependent on external resources such as the teacher for such tasks as monitoring their texts. Englert and Raphael (1988) claim, (somewhat emphatically):
Although research suggests that exceptional students have specific strategic deficits in idea generation, text organisation, and metacognitive control, most remedial writing programs have focused on mechanical or transcription skills because of the tendency of educators to focus on the written products rather than the cognitive activities that underlie the production of text. (p.516)

In many classrooms, writing is also the primary tool in information gathering and processing. This perpetuation of the widening gap between the "rich" and "poor" is clearly exemplified by the following statement by Hopkins (1986):

> The importance of the students' making their own notes can't be overstated ... [because] ... when students make their own notes they are involved in an active form of learning. (p.7)

For the poor writer lacking the necessary cognitive strategies to proceed in such an endeavour, the task of writing one's own notes is so frustrating, that instead of "an active form of learning", the student may be frustrated beyond being capable of any learning. The belief that students should not be "merely passive recipients of the teacher's note-making" (Hopkins, 1986, p.7) simply illustrates the illusion of knowledge described by Goyen (1989).

Perhaps it was the recognition of this illusion and the subsequent perpetuation of the Matthew Effect\(^\text{13}\) that led Stuckey (1986) to add to Cambourne's Conditions of Learning. Stuckey (1986) has added "Support". Support includes meeting the needs of each child. This may require the teacher to help one child find the model of a required work in a published book. Support may require

\(^{13}\) see Stanovich, 1986.
the teacher to ask questions that lead another child to find a necessary word on an immersion chart, or even to supply part of the spelling of a word. To yet another child, support may require the entire word. Most importantly, Stuckey (1986) states that support requires the teacher to "hasten slowly" (p.21).

2.6.4 Successful writing programs.

Walshe (1986) feels that the best approach to teaching writing is by the teacher actively engaging in writing, to let it be known that s/he writes too. This action by the teacher helps to reinforce that the process of writing and the product of writing are inseparable. Furthermore, by modelling the writing process, the teacher demonstrates that when the process is suitable to the task, the product will be good, and that when the process stops, the product is finished. Walshe (1986a) notes that there are two sides to writing, for while the student is learning to write, s/he is also engaged in writing to learn. Walshe (1986a) states:

A successful written Product is only Possible when there is an adequate Process of composing being thought through by a deeply involved Person – 4 Ps! And the teacher must care for them all. (p.15)

This approach is very much child centred and there is little argument against the idea that the best learning environment is just so (Cambourne, 1986a; Hopkins, 1986). A child centred environment is one in which the teacher assists during, not after, the writing process. (Let's hope that the days of comments such as "Good ideas, but spelling needs to improve" are gone forever!).

However, while adherence to this belief might be commendable, for some students, especially those lacking the necessary strategies to Proceed (a necessary fifth P!), this approach merely perpetuates the Matthew Effect addressed by Stanovich (1986).

Englert and Raphael (1988) suggest that there are three instructional approaches that have promise in overcoming the
writing difficulties of poor writers; process writing, schema-building, and dialogic approaches.

Process writing is well known to most infant/primary teachers in Australia (see Cambourne, 1986a; Johnson and Louis, 1986; Walshe, 1986) with daily writing, student selected topics, group sharing, drafting, editing, reworking, writing, conferencing, and publication of student's work. There are many advantages of the process approach for all students including those who are poor writers.

However, for many, daily process writing is simply not enough. The major problem of the process approach lies in its fundamental assumption that writing processes are self-learned (Englert & Raphael, 1988). Practice alone is insufficient for students to acquire more advanced writing strategies.

Schema Building is a teacher-directed approach that focuses directly on teaching the organisational structures in text. Schemas are the building blocks of cognition and the term used to describe the particular concepts available in memory that serve as "hooks" on which to "hang" new knowledge (Englert & Raphael, 1988).

The Dialogic Approach views literacy learning as an extension of earlier child language processes, and focuses on modelling writing strategies related to text structures directly in the writing context through the use of teacher dialogue or "think-alouds". As part of the writing modelling procedure, teachers verbalise the steps of the strategy, revealing their own thinking and self-questioning as they show how to implement relevant strategies in the context of the writing process (Englert & Raphael, 1988).

Englert and Raphael (1988) conclude:

The teaching of writing, therefore, needs to be guided by teachers' knowledge of the writing process, and the strategy or metacognitive deficiencies of exceptional students. (p.519)
Englert and Raphael (1988) detail the instructional program best suited to accomplish writing development in students. Effective instructional strategies must enhance writers' metacognitive knowledge and control of the writing process by increasing knowledge of the writing process. Furthermore, successful teaching must simultaneously teach specific planning, drafting, editing, and revising strategies. Englert and Raphael (1988) state that a successful writing program must include the following instructional features:

* immersion of students in the entire writing process,
* instruction in the organisational strategies and text structures for composing and revising,
* emphasis on self-instruction, self-questioning and self-evaluation, and,
* a dialogic approach to the presentation and modeling of writing strategies.

**PART SEVEN: COGNITIVE LEARNING THEORY ISSUES IN READING DIFFICULTIES AND THE GREAT DEBATE.**

2.7.0 Introduction.

In recent years there has been a great interest in the possibility of teaching "thinking skills" (Yates, 1987, p.15) because research has led to the conclusion that many learning disabled students are "strategy-deficient, inactive learners" (deBettencourt, 1987) and that "learning deficits are, in part, attributable to failures to implement appropriate task strategies" (Borkowski & Kurtz, 1984, p.208). Indeed, Wragg (1987) stresses:

In order to direct his behaviour we must train his thinking. (p.2)

Cognitive strategy training, or cognitive behaviour modification is a combination of behavioural and cognitive
therapy (Gow & Heath, 1988). Metacognitive processes are thought to be critical determinants of success across a variety of tasks and activities and it has become a major research goal to lead to the understanding of a child's development of the ability to self-monitor, to plan, and to self-regulate (Harris, Graham & Freeman, 1988). It is the conscious efforts to organise the cognitive process which lay the ground for metacognitive theory (Borkowski, 1985; Butterfield & Ferretti, 1985). One of the most basic of metacognitive skills in terms of knowledge about cognition is the ability to know that one has a problem, yet, perhaps not surprisingly, children with learning disabilities appear less capable in predicting their own performance than do their normally achieving peers (Harris et al., 1988). This inability to predict with consistency possibly reflects a lack of metacognitive understanding. Metacognitive understanding "is information about one's self as a thinker and his or her own base knowledge and strategic repertoire" (Butterfield & Ferretti, 1985). Research has indicated that younger, less sophisticated learners and children with learning problems are typically less able to assess or predict their readiness to retrieve and tend to overestimate their memory ability, yet sparse attention has been directed towards understanding how differing learning experiences may facilitate metamemory (Harris et al., 1988). Research has however, revealed that there is an "extensive difference" in the metamemory of gifted children when compared to the metamemory of average children and it is suggested that metamemory "provides the context in which strategy acquisition takes on a more general, durable character" (Borkowski & Kurtz, 1984, P. 205).

Borkowski and Kurtz (1984) state:

A strategy, by definition, must be goal-orientated ... [and therefore] ... used to enhance performance on a particular task. (p.208)

Cognitive strategy training approaches have been used in an effort to improve the probability of a correct outcome but it is
well to remember that cognitive strategy training cannot offer a guaranteed result in specific circumstances (Hall & King, in press). In relation to reading, this increased probability of a correct outcome has been termed by Gaskins and Baron (1985) as "something extra" (p.390) that is needed in a remedial reading program. A successful training program in cognitive strategy acquisition should make students aware of the factors that affect their thinking (e.g. motivation, expectations) and convince students that there is value in using these strategies. Furthermore, training should help students to be more self-directed (Gaskins and Baron, 1985).

Current research supports the conclusion that early intervention has a significant effect on young children with intellectual and learning disabilities (Dale & Cole, 1988). However, which program to follow in any early intervention is still an issue of current debate.

In their study into the effects of teaching approaches for early intervention, Dale & Cole (1988) contrasted two distinctly different programs:

**Direct Instruction**, developed by Engelmann and his colleagues during the 1960s and 1970s (see Becker, Engelmann & Thomas, 1975; Bereiter, 1967; Bereiter & Engelmann, 1967; Carnine & Silbert, 1979; Engelmann & Carnine, 1970). Direct Instruction involves the selection and modification of commercial programs and the presentation of daily lessons "in the most efficient manner possible" (Carnine & Silbert, 1979, p.11). Direct Instruction is based on extensive task analysis and academic skills and retains utility in modern classroom (see Gow & Heath, 1988). The essential teaching principles of Direct Instruction are: work with small groups, pitch the lesson to challenge the lowest functioning child who is placed in the centre of the group, give immediate feedback, use short demonstrations which present one unambiguous concept at a time, give adequate practice, and use evaluation strategies that in turn become a motivational factor (such as charts on the wall) (Gow & Heath, 1988).
*Mediated Learning*, based on the work developed by Feuerstein following his observations of the resettled peoples of Israel after World War II (see Feuerstein & Jensen, 1980; Messerer, Hunt, Meyers & Learner, 1984; Yates, 1987) and modified for the pre-school level by Haywood and his associates (see Dale & Cole, 1988). The success of programs based on the Feuerstein Instrumental Enrichment (IE) have been widely reported (see overview of eighteen such reports in Yates, 1987). Feuerstein saw the problem of generalisation as central to a wide variety of poor learners. The IE model is based on the belief that "the cognitive behaviour of the human organism represents an open system amenable to meaningful structural change" (Feuerstein & Jensen, 1980, p.402). Mediated Learning therefore has a great emphasis on the generalisation process (Dale & Cole, 1988).

Dale and Cole (1988) found that the two programs, while resulting in some differential effects consistent with the programs philosophies, were nevertheless both clearly effective.

The findings of Dale and Cole (1988) were supported by the findings of deBettencourt (1987). deBettencourt (1987) reviewed three areas of research concerning strategy training, being; memory, selective attention and metacognition. This review concluded that notwithstanding the fact that there is "much confusion surrounding the definition of "strategy training" (p.29), the research clearly supports the need to teach learning disabled students "task-appropriate strategies" (p.29).

An example of a well researched strategy training program is the Gow Self Instruction Problem Solving (SIPS). Gow (1987, 1988) has developed an instructional technique which can be seen

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14 Yates (1987) summarises the six main goals of the Feuerstein Instrumental Enrichment Model thus:

1. To correct weaknesses and deficiencies in cognitive functions.
2. To help students learn and apply the basic concepts, labels, vocabulary, and operations essential to effective thought.
3. To produce sound and spontaneous thinking habits.
4. To produce in students increasingly reflective and insightful thought processes.
5. To motivate students towards task-orientated abstract goals.
6. To transfer poor learners from passive recipients ... into active generators of new information. (p.17)
as an evolution from the Meichenbaum (1977) VSIT. The SIPS approach has evolved from many years of research with adolescents and adults with mild to severe intellectual disabilities (Gow, 1987). Gow (1987) claims that SIPS is simple to implement as it requires no sophisticated equipment and it can be mastered quickly by instructors.

The training procedures are based on verbal self-instruction, with the main purpose being to provide the learner with a portable and durable strategy to promote generalisation of a plan to a specific plan of action (Gow, 1987; Gow, Burton & King, 1988). SIPS minimises external reinforcement and feedback. The Gow SIPS approach is somewhat revolutionary in its determination to use a minimum of external reinforcement. This approach is based on the belief that a desired outcome of any program of instruction should be autonomous behaviour (Gow, 1987).

The SIPS approach requires that learners take responsibility for their own learning (Gow et al., 1988), with each new task being presented as a "problem" which must be solved with minimal intervention by the instructor. To work out a solution, the learner must self-instruct using two broad types of self-instructions, general and specific (Gow, 1987). A general self-instruction, or process component (e.g., "Stop! What am I going to do? How am I going to do it?") serves to focus the attention of the individual on the task. These general self-instructions prompt the specific verbalisations, or substantive components (e.g., "I pick up these two pieces first.") that are required to guide performance through the task.

Gow's approach stresses the need for the verbalisations to be comparable with the cognitive-processing style of the individual learner. Therefore, the learner is encouraged to use his or her own language rather than to repeat the specific verbalisations given by the model/instructor.

Gow (1988) discusses the principles of instruction for teaching the SIPS technique. In summary, these latter principles are: intervene only when necessary, select tasks of interest to the learner, minimise external rewards, ensure ecological validity (that is, teaching in an appropriate setting), ensure the
learner knows what the task is about, teach across settings, teach rules or general principles, encourage a problem solving approach, help the learner to make the necessary links between tasks, encourage self-monitoring, provide practice and use small groups.

2.7.1 Neurolinguistic programming: a very general process-orientated approach to learning.

Grinder (1988) has developed a programming system for teaching reading which he terms Neurolinguistic Programming. For Grinder (1988), the early years of schooling, children are very body orientated; that is, they operate kinesthetically. In order to learn, they need to move around and to touch. By grades three and four they tend to become more auditory in their learning; that is, they begin to use their ears while their brain "operates like a tape recorder ... [but] ... to access a particular piece of information the whole pattern needs to be recalled" (p.1). By grades five and six, learning becomes much more centred on the eyes, and is therefore termed visual learning. In this stage, things can be 'seen' in the mind's eye, even when the concrete object is removed. A feature of visual learning is that it is much faster than either of the other two types of learning.

Grinder (1988) explains that these are not stages that all children go through, but rather, in any grade six class of thirty children, there will be approximately twenty-two who are VAK learners, (that is, these children can learn through all three modes), there will be four to six children who are predominantly one mode learners, and there will be possibly one or two who are not learning at all "due to other psychological problems" (p.1).

The implication of Grinder's (1988) neurolinguistic programming is that teachers must be aware of the type of learners in the classroom, and "watch and be perceptive of what is going on around them in order to respond appropriately" (p.2). Kinesthetic learners need to move around (e.g. turning pages of big print etc), while visual learners require less movement and smaller print. Interestingly, the more visually orientated a child becomes, the more polite and socially appropriate will be their
behaviour as this stage allows one to be more aware of others and of social rules.

Neurolinguistic programming is very process orientated rather than content orientated, however, Grinder (1988) does point out that with a kinesthetic learner, movement does not always equal productivity. Grinder (1988) claims that those children who succeed in our educational system are those children who are predominantly visual learners and who are also left-brain orientated. Such children "can break concepts down and see the individual parts - letters, words, sentences, numbers, etc" (p.1).

It is clear however, that this program does not offer the "something extra" advocated by Gaskins and Baron (1985, p.390). There is little doubt that early remediation would benefit those "four to six" grade six children who are "predominantly one mode learners" and surely no teacher should merely accept that "there will be possibly one or two who are not learning at all" (Grinder, 1988, p.1).

2.7.2 A child's mind: a crossed referenced/ highly sophisticate library system.

The importance of cognitive strategy training within the classroom is illustrated by the warnings of Watson (1991). She claims that many students will not be cognizant of the meaning of many conventional symbols in those classrooms. For example, Watson (1991) points out:

As teachers present a new concept they use the language register which matches that of the specific subject to which the concept belongs .... words that may have quite a different meaning in ordinary English may have quite another meaning in other subjects, e.g. volume, count, odd. (p.13)

Watson's (1991) warnings illustrate students' problems in retrieval of their base knowledge. Base knowledge is thought to
be organised into domains (Butterfield and Ferretti, 1985), (e.g. a person learns that a collie and a shepherd are both dogs; a siamese and a persian are both cats; a shepherd and a Persian are both people). It is thought to be the superordinate executive system that initiates and regulates the retrieval of base knowledge, modifies it for the new challenge and then facilitates problem solving through diagnosing and monitoring strategy implementation (Butterfield and Ferretti, 1985). Vellutino (1987) describes a child's mind as being as complicated and as successful as a well referenced library system. In this system, knowledge can be: a specific piece of information, a rule, a specific or a general strategy; but all are accessible to assist in processing new experiences.

If, indeed, strategies are the "procedures for processing pieces of base knowledge" (Butterfield & Ferretti, 1985, p.5) it is little wonder that when a child fails to construct a strategy to diagnose and monitor retrieval, problems emerge in the classroom. Glaser and Pellegrino (1982) exemplified such a problem by showing that low ability children often fail to solve analogies successfully. These researchers claimed that this failure occurs because the students do not construct a strategy for an "analogue" solution of analogies. Glaser and Pellegrino (1982) claim that analogical processes (encoding, identification and generation of relational features, rule assembly and monitoring, comparison and matching) are general across both induction tasks and contents. This is consistent with the claims of Sternberg (1982) that executive processing seems to play a key role in task performance "probably without regard to the particular task being studied" (p. 143).

There is consensus in the literature that generalisation outcomes are dependent on the availability of executive skills (Butterfield & Ferretti, 1985: Gow, 1985). Borkowski (1985) claims that executive skill components (e.g. strategy awareness, selection, initiation, monitoring, revision, modification and co-ordination of strategic routines that guide the deployment of specific control processes) are "highly modifiable" (p.111). As noted in section 1.0.1, Siegler and Jenkins (1989) describe a child's mind as being a workshop. They describe this workshop as
one containing a remarkable collection of knowledge, (which they term "materials") and learning processes (which they term "tools"). Siegler and Jenkins (1989) comment that:

New strategies do not emerge in a vacuum. Instead, they seem to be constructed from the materials of previous strategies. (p.7)

Some believe that by understanding executive processing we will come to understand intelligence (Sternberg, 1982; Sternberg, Ketron & Powell, 1982). Siegler and Jenkins (1989) claim that the "broader the range of products" (p.1) that the child has produced from this workshop in the past, "the greater its potential for meeting future demands" (p.1). Learning processes, like workshop tools, are some more specific and specialised than others. A "tool" may be simple, or it may represent a complicated routine, rule or strategy. The application of these existing knowledge and learning processes allow the child to formulate new "rules, strategies, hypotheses, schema, causal networks, etc" (p.1) (which they term "products").

However, Siegler and Jenkins (1989) note that many children do not access these tools, in spite of their availability. Furthermore, some children access the wrong tool. Borkowski and Kurtz (1984) note that many learning disabled children do not lack attention or memory abilities as much as they lack task-approach skills and strategies. Such cognitive action, by being inappropriate, retards full potential. In such a case, what should be an efficiently organised diversity of tools "simply represent clutter" (Siegler & Jenkins, 1989, p.1).

An example of "clutter" was evident in a pretest sample from this research. A student presented the word *droppes* in the writing sample. The inappropriate access of knowledge and learning processes is exemplified by this student's inappropriate application of two mere situation-specific spelling rules, rather than the application of a general strategy. The difference between a strategy and a mere situation-specific rule is one of considerable importance. In this case the learner has applied the situation-specific rules:
double the final consonant to add a suffix to words having a Consonant-Vowel-Consonant word map, e.g. run, running.

*add es to alter tense or case for words ending in a vowel (e.g. goes) or to a word ending in s (e.g. glasses).

However, neither of these situations is presented in the word drop, and therefore, in reality, neither of these situation-specific rules need to be applied.

Clearly a strategy that would allow the writer of droppes to overview all of the available situation specific rules and to choose the correct one (and in this case the most simple one) is urgently needed. This matter is aptly discussed by Siegler and Jenkins (1989):

> Understanding both how they [learners] come to use a single consistent rule in some situations and how they come to use multiple approaches in others seems important for understanding cognition in general. (p.6)

Siegler and Jenkins (1989) comment that it is easier to understand the use of single strategies to solve complex problems involving scientific reasoning rather than to understand the use of multiple strategies on simple tasks such as addition and subtraction of small numbers. With regard to the example of the spelling of droppes, Hall and King (in press) have illustrated how the teacher might raise the probability that this student would access the correct strategy from the "tools" available in the "workshop". Hall and King (in press) suggest the cognitive strategy programs of any one of SIPS (see Gow, 1987), VSIT (see Meichenbaum, 1977) or OBCOP (see Hall and Gow, 1989).

Hall and King's (in press) suggestions are consistent with the findings of Harris et al. (1988) and Hall (1988). Hall (1988) provided evidence that it is possible to teach an active learning strategy to primary-aged school children with mild intellectual disabilities. Hall (1988) found a significant improvement amongst these children in basic problem solving techniques following a six
week course in SIPS (f=0.009). Results of research by Harris et al. (1988) suggest that strategy training, even without explicit metacognitive skill training, can produce important metacognitive improvement. Metacognitive skills (e.g. metamemory) are an important component of performance. In particular, these researchers noted the importance of developing metacognitive skills in the development of spelling. Metamemory tasks are critical in spelling because spelling tasks require both immediate recall and retention (Harris, et al. 1988).

In a somewhat similar study of students from grades six to eleven, Stevens (1988) found that strategy training improved overall (or far generalisation) performance. Stevens' (1988) also found that mere classification training improved performance only for some content (or near generalisation) material. The research of Stevens (1988) is also consistent with the findings of Siegler and Jenkins (1989) who note that in the acquisition and implementation of appropriate strategies, the process of actual strategy construction is divided into two parts: "strategy discovery and strategy generalization" (p.2).

The understanding of strategy discovery and strategy generalisation is important for educators who seek to teach cognitive strategies. The difference lies in the subtle difference between student imitation and student modelling. While some texts refer to these as the same behaviour, in actuality, there is a distinction between the two teaching strategies. Mercer and Mercer (1981) explain that imitation refers to mimicry, a one-to-one literal matching response for each stimulus statement. Modelling however, involves acquiring the more abstract strategy without giving an immediate and exact response to the stimulus. This therefore requires the learner to observe the teacher modelling a strategy several times before being required to then use the strategy.

The steps of SIPS are an example of cognitive-strategy training that begins with mimicry and develops to modelling. Gow, Burton and King (1988) note these steps, being:
1. the instructor models the task while verbalising the task aloud (cognitive modeling).
2. the student performs the task under the direction of the instructor (overt and covert guidance).
3. the student performs the task while instructing him/herself aloud (overt self-guidance).
4. the student whispers the instructions to him/herself while completing the task (faded overt self-guidance).
5. the student completes the task while guiding his/her performance using private speech (covert self-instruction). (p.19)

Furthermore, the strategy generalisation stage is self-motivating because through strategy generalisation students become responsible for managing their own learning. Once a child has mastered a cognitive strategy, s/he has effectively entered the realm of self-instruction and self-monitoring, that is, s/he has achieved autonomy (Gow & Heath, 1988). The advantages of self-motivation have long been appreciated by teachers. Nearly three decades ago, Bruner (1964a) stated:

Much of the problem in leading a child to effective cognitive activity is to free him from the immediate control of environmental rewards and punishments ... [which] ... readily develop a pattern in which the child ... [seeks] ... to conform to what is expected of him. (p.341)

Strategy generalisation frees the learner to discover, and Bruner (1964a; 1964b; 1966) has always advocated the importance of discovery learning, the principles of which, continue to form the foundations of curriculum development. Therefore, generalisation of learnt skills from one situation to
another, without teacher intervention, should be the ultimate goal of education (Gow & Heath, 1988).

PART EIGHT: THE GREAT DEBATE AND THE IMPLEMENTATION OF A COGNITIVE-INTERACTIVE LEARNING MODEL.

2.8.0 Introduction.

As noted in section 1.0, much of the Great Debate is defused by distinguishing the pre-requisite skill from a skill that is a facilitating factor. Much of the apparent conflict is resolved by an interactive model. Interactive models represent a combination of both psycholinguistic and phonemic models, suitably combining and relating the strengths of the two opposing models in a manner that allows for its adaption to changing circumstances and individual needs (Lloyd & Goyen, 1986). The problem of teaching phonics per se is resolved as phonics is treated, not as a prerequisite skill, but rather as a facilitating factor. This relieves the pressure on teachers created by the "paradox" of teaching a skill to a beginning reader that s/he will most likely not need as s/he advances to a skilled reader (see section 2.3.3). Andrews (1989) resolves:

Reading involves the simultaneous operation of a number of processes. We must at some level analyse the visual features of the text, we must access the meanings of words or phrases, and we must integrate these to form a coherent understanding of what we have read. If it was possible to reduce the demands of any of these component operations, that would leave more resources available for the others, and presumably, as a consequence the efficiency of these other operations would be increased. (p.17)
Similarly Cattley (1988) notes that children should not be locked in to only one strategy for spelling. She states:

As with reading, some children have only one strategy at their fingertips when spelling. (p.38)

The teaching of only one strategy (be it psycholinguistic or phonemic) has clear detrimental effects on the ability to spell correctly. These detrimental effects are especially so in English because English is so consistently irregular. Cattley (1988) declares:

It behoves teachers to employ a variety of strategies when helping children (p.38)

While both psycholinguistic and phonemic processes are being carried out, it is assumed that they are available to some central executive system "which co-ordinates both information sources to arrive at the best interpretation of the word or phrase being read" (Andrews, 1989, p.16). Andrews also notes other research findings that for skilled readers, visual presentation of the word results in automatic activation of its meaning and pronunciation, implying that for skilled readers "multiple codes are accessed" (1989, p.17).

2.8.1 Why do we need yet another reading model?

There are some teachers who are disciple-like in their adherence to a particular approach without being consciously aware of the actual theoretical basis of that approach. Lloyd and Goyen warn that such a teacher, in not being conscious of the reading theory, may "unconsciously be used by a theory" (1986, p.37).

The N.S.W. Department of Education Reading K-12 Curriculum Policy Statement is currently under review. During the course of this review, many interested individuals and groups were approached for their comments and statements of concern.
It would appear that there is great need for concern, particularly in the many areas of teaching which service those students who experience difficulty in learning to read. Indeed, the N.S.W. Australian Association of Special Education (AASE) Chapter Committee (1989a) noted:

The Reading K-12 Curriculum Policy Statement, with its emphasis on a whole language experimental approach, creates a serious problem for children learning to read ... [making] ... scant provision for a decoding stage ... [and] ... little concern for the kind of accuracy required in technical and scientific reading. (pp.8-9)

Furthermore, the Association for Children with Learning Disabilities (ACLD) support the concern of AASE (and in particular the N.S.W. Chapter) "when they state that the methods used in schools for the teaching of reading are inappropriate for the specific educational needs of the students whose interests they advocate" (The Association of Children with Learning Disabilities, 1989, p.6).

ACLD and its sister organisation SPELD (Specific Learning Difficulty) support the contention of AASE that students who have difficulty learning to read, irrespective of aetiology, (or presumed aetiology), require more "powerfully structured systematic instruction" (The Association of Children with Learning Disabilities, 1989, p.6). ACLD states that its organisation does not accept that the Department's curriculum of Reading K-12 and its support documents address the instructional needs of all learners. Recently, a joint letter was sent (see AASE, 1989b) to the N.S.W. Minister of Education stating the case for a revision of the Reading K-12 document that would provide for the instructional needs of students with disabilities and learning difficulties, and noting that:
Research has clearly demonstrated the power of structured systematic instruction in the teaching of reading skills to students most at risk of reading failure. (p.7)

This letter was undersigned by AASE, ACLD, SPELD, The N.S.W. Council for Intellectual Disability (NSWCfID) and Teachers Reacting Against Failure (TRAF) (AASE, 1989b, p.7-8).

2.8.2 An analogy for interactive processing.

Reading interactively is often illustrated through the analogy of a driver of a car (see Andrews, 1989; Lloyd & Goyen, 1986). The driver may be a novice or experienced. The novice driver may need to concentrate closely on steering, braking and accelerating, but the experienced driver carries out these functions more automatically, and is thus able to devote time to higher level tasks (such as navigation). However, if the driving conditions change (e.g. heavy fog or peak hour traffic) the experienced driver then needs to concentrate more on the lower order elements.

This analogy, when applied to reading, supports an interactive model (see Andrews & Jardine, 1989; Lloyd & Goyen, 1986); it is not that good readers need to rely less on the lower elements of phonemic interpretation, but that the visual analysis mechanisms of the good reader use less effort in doing so.

There is little doubt that grammar conveys meaning. Good readers gain meaning from text even if the sentence is absurd. Kronick (1990) recognises that "if it is grammatical, it will be understood" (p.7) however, Kronick's (1990) conclusions support those of Andrews and Jardine (1989), Lloyd and Goyen (1986) and Stanovich (1986) in that both contextual and graphemic dimensions of text are important. Kronick (1990) states that while accepting that "structure, form, rule and schematic aspects of knowledge are rich with meaning" (p.7), we cannot overlook the fact that:
Just as knowledge of the parts does not necessarily lead to knowledge of the whole, the reverse is also true. Young children learn to speak long before they have the metalinguistic awareness to appreciate that 'hurtyourknee' is not one word. (p.7)

Knowledge of the whole through strategies such as immersion will not necessarily lead to mastery. Kronick (1990) points out that an adult may have read a great many books, yet remain unaware of the "structure and parts" (p.7) that would enable that same adult to undertake the authorship of a book by himself. Similarly she notes that an adult may have written in his diary every day of his life, but that unless that same adult takes notice of "those aspects of other's writing that are worth emulating" (p.7) that writer will not become a better writer.

Good readers are efficient processors in every sense (Stanovich, 1986). Similarly, until the lower order processes of spelling are somewhat automatic, at least in the high frequency words, the attention of the writer may be diverted from the higher order composing processes (Juel, 1988).

2.8.3 A timely reminder.

Lloyd and Goyen. (1986) criticise the conclusions of studies that claim that graphophonic skills did not serve to distinguish between the "proficient readers", the "average readers", the "low ability readers" and the "special readers" (that is, with specific learning difficulties). Lloyd and Goyen (1986) argue that if the more proficient group had more demanding material, then it could be assumed that such material exhibited greater phonographic complexity, and on this basis alone it ought not to be concluded that the groups were equally competent with graphophonic skills.

Research by Nagy, Herman and Anderson (1985) supported the theory that a substantial proportion of the vocabulary growth that occurs during the school years is gained through incidental learning from reading text. However, it is important to note that this study concerned itself with average and above average
students from the eighth grade, and in view of the Stanovich "Matthew Effects" (1986), this study bears little relevance to children experiencing early reading failure. Indeed, the findings of this study remain a timely reminder that it is unnecessary to interfere with the reading attainments of a child exhibiting no failure. The Nagy et al. (1985) study, while finding that reading is the best way to gain vocabulary, fails to address the problem of how to lead children to become independent readers. As noted in section 2.3.0, the Reading K-12 curriculum has been heavily influenced by psycholinguistic theory. Yet, the AASE Chapter Committee (1989a) state:

While psycholinguistic models may have made some important contributions to the teaching of reading; such as an emphasis on the importance of including interesting texts in reading programs, the distinctive assumptions of the model for teaching reading which is espoused by Smith (1978) and the Goodmans (Goodman and Goodman, 1979) are no longer tenable. (p.8)

We cannot continue to assume that students notice the consistencies of speech and text.

CONCLUSIONS

2.9.0 Summary.

The concerns of community support groups cannot be ignored, especially when considering the vast number of students directly affected by an inability to learn to read. AASE states that "between 10 and 20 percent of our children have been labouring under massive disadvantages" (AASE, 1989a, p.5). These "massive disadvantages" are then subsequently exacerbated by what Stanovich (1986) termed "Matthew Effects", whereby the rich readers become richer and the poor readers become poorer
through exposure to material which is too difficult (AASE, 1989a, p.7).

Resolution of the Great Debate appears possible through the acceptance of an interactive approach for teaching reading (and its associated literacy domain subjects) in the classroom. However, to date, interactive approaches have failed to address the cognitive and metacognitive aspects of utilising executive systems to assimilate simultaneously the interactive cues and clues from text. As noted in section 1.1, this includes cues and clues from lexical presentation, illustrations, syntactical information, semantic information, grammatical information and phonemic interpretation of the individual word. Three aspects of metacognitive training are noted by Ellis (1986), being; the teaching of students to consider the many variables involved, the teaching of students to regulate the processes involved (planning, checking, testing) and, the increasing of student effectiveness in the use of specific cognitive skills. There can be little doubt that these aspects of cognitive training would most certainly facilitate the simultaneous assimilation of the interactive cues and clues from text.

2.9.1 Conclusion.

There is little doubt that our school system urgently requires a reading system that meets the needs of both camps involved in the Great Debate. Furthermore, such a reading system should offer the "something extra" that Gaskins and Baron (1985) describe; cognitive strategy training. Cognitive strategy training is designed to improve learning effectiveness and frequently some steps within a cognitive strategy cue students to use metacognitive skills (Ellis, 1986). Cognitive strategy training within a systematic program based on an interactive approach would allow students to utilise executive systems, for it must be accepted that at least a certain proportion of the reading disabled population lack cognitive strategies.
This researcher has developed such a program. It has been developed after many years of classroom experience with students experiencing reading failure. However, there is need to validate such a reform.

The purpose of this research is to do just this. As noted in section 1.3, "the importance of this research cannot be overstated".
CHAPTER THREE

METHODOLOGY

3.0 Research overview.

This research sought to determine whether the independent variable (the Cognitive-Interactive Program for Facilitating the Learning of Reading) would facilitate reading for students with reading difficulties. As noted in Chapter 1 (section 1.4), this research compared four major groups of students with different aetiology (Groups 1-4) and furthermore, compared another six sub-groups which allowed for the comparison of difference in chronological age (i.e. high school-aged students and primary-aged students).

Analyses of Variance were undertaken with the data from these ten groups:

i) students with an ESL classification.
ii) high school ESL students.
iii) primary school ESL students.
iv) students with an IM classification.
v) high school IM students.
vi) primary school IM students.
vii) IO/IS students.
viii) students with an LD classification.
ix) high school LD students.
x) primary school LD students.

3.1 Variables.

As noted in chapter one (section 1.8) the variables for this research are as follows:

3.1.1 Dependent Variable.

The difference in the scores obtained by the students in their pretests and posttests for each of the following tests:
3.1.1.1 The Neale Analysis of Reading Ability Revised was used to assess the student's Normed Reading Age in Reading Rate, Reading Accuracy and Reading Comprehension, thus satisfying Knight's (1989) stipulations of assessing miscue analysis and the efficiency of higher order integrative skills involved in reading for meaning.

3.1.1.2 The Neal Phonemic Skills Screening Test was used to assess the student's phonological word processing skills through word attack skills, including phonemic awareness, segmentation, decoding and blending skills.

3.1.1.3 A two part spelling assessment test was used to specifically record word attack skills, being:

   Part A. Visual discrimination of whole words through a simple matching test, based on the recommendations of Heaton, (1988, p.107) and following the word sequence of the Macquarie Expressive Word Attack Skills Test.

   Part B. Spelling test adapted from the Mann-Suiter Developmental Spelling Inventory Levels I-III.

3.1.1.4 A writing assessment was used to further assess the efficiency of higher order integrative skills. This test was in two parts, (as were the recommendations of Heaton, 1988), being:

   Part A. Story using picture stimulus,
   Part B. Diary report,

and marked on a rating schedule adapted from the recommendations of Henning (1987) (see Hall & King, 1992).
3.1.1.5 A cloze exercise based on the joint recommendations of Heaton (1988) and Henning (1987) and influenced by the GAP Reading Comprehension test (see McLeod, 1975) and the St. Lucia Reading Comprehension Test (see Elkins & Andrews, undated). The reading passages were taken from the original Neale Analysis of Reading Ability (Neale, 1970). The Cloze was designed to assess general linguistic ability and in particular, ability to problem solve in the linguistic domain.

3.1.2 Independent Variable.

The independent variable was the Cognitive-Interactive Program for Facilitating the Learning of Reading. As stated in the Substantive Assumption (section 1.6) and in the Chapter 1 (section 1.8.2.) the only change in the students' regular routine was the implementation of this variable. Details of this treatment are to be found in Implementation (section 3.13). An outline of this variable is to be found in Documentation (section 3.14). Full presentation is to be found in Appendix 2.

3.2 Data components: deliberations.

In choosing the various test components for the Dependent Variable, the following deliberations were made.

3.2.1 Deliberation: The needs of the clientele; student and teacher.

a) student.

Recent research indicates that servicing to children (i.e. through remediation/special education facilities) who fail at reading is occurring too long after failure occurs (AASE, 1989a; Andrews & Jardine, 1989; Juel, 1988; Reynolds & Dallas, 1989). For example, children often have to demonstrate two years delay in reading skills before gaining access to any servicing, despite research now documenting the cost efficacy of prompt servicing, "when the first
indicators of future failure occur" (AASE, 1989a, p.7).

To be assured of special education services, one must be formally tested. Yet there are many who actively warn teachers of the evils of testing, stating that testing of children's learning has social contexts as well as detrimental educational outcomes (see Kemp, 1987). For example, the Rosenthal effect (or self-fulfilling prophecy) (see Hallahan & Kauffman, 1986, p.430) continues to plague the consciences of many teachers. Therefore careful and sensitive assessment of children with learning difficulties is essential. In stressing this need Knight (1989) states:

The assessment of learning difficulties in children is rarely a simple or clear cut process. Indeed, it is not uncommon to find a complexity of difficulties affecting the one child, any or all of which could be contributing to his/her academic problems. This is particularly true for children who have experienced many years of academic failure and who present with reactive behavioural and emotional problems. Assessment ... is generally sought to help unravel a number of questions regarding the child and to aid in planning intervention. (p.16)

Furthermore, it is important to understand the effects of sustained failure. In drawing attention to this aspect that might bias a test score Knight (1989) explains:

Research evidence over the last decade clearly indicates that the child's attributions concerning the causes of his/her academic difficulties has high predictive value in terms of response to later intervention.... It is not uncommon to encounter children who entertain strange
beliefs about the cause of their learning problems ... which, unless addressed and challenged on interview, can function to hamper the child's achievement effort. (p.20)

In the light of Knight's (1989) warnings, it would seem imperative to ensure that the child understands, as far as developmentally possible, the reasons for the tests and program that will be undertaken while participating in this research.

b) teacher.

In addition to consideration of the student, it is also necessary to consider the teacher. Research by Gans (1988) noted that teachers of children with special needs continue to feel dissatisfied with their level of expertise, and research by Cherniss (1988) concluded that in order to lessen teacher burn-out in special education appointments, then the supervisors of the teachers need to be thoroughly trained in aspects of special education.

Therefore, when planning the school intervention component of this research I concluded that it was necessary to carefully discuss the tests and program with the child, the teachers, and the teachers supervisor.

3.2.2 Deliberation: the aims of assessment.

Baker (1989) discusses the shift in perspectives which has occurred over the past decade. Baker (1989) suggests that teachers have undergone a great change in the way they cogitate language in the classroom and therefore, in the way they teach it. Gone are the days when one could boldly publish a *Literacy tests for schools* (see Diack, 1975) and produce a 62 page booklet offering fifty word lists. In the 1990s teachers are deciding whether a test is necessary at all and searching as to why a test is being pressed upon the student. Furthermore teachers debate whether such a test should be performance-referenced (e.g. how good is this girl at using
her literacy to find specific information in a library-based research project?) or, system-reference (e.g. how good is this boy in his ability to control certain tenses?).

Testing is invariably associated with the making of decisions. Once, the decision might well have been that of placement for the following year (to repeat or not to repeat). More likely in this enlightened age, the decision (or decisions) should rather reflect the learner's development and need for individualised care in the treatment of specific syllabus areas (e.g. need for E.S.L. intervention, or need for support learning difficulty intervention).

Finally, it must be remembered that the schools participating in this research are all serviced by the New South Wales Department of School Education. It cannot be overlooked that any test chosen for this research must therefore be acceptable to this Government Body. With this necessity in view, the suggestions of Knight (1989) (specifically in a N.S.W. Department of School Education publication) as to the aims for assessment are summarised:

*to assess the aetiological factors of the problem (e.g. sensory, physical, intellectual, inappropriate instruction, lacking practice),
*to provide a comprehensive evaluation of child's functioning level,
*to provide guide-lines for future instruction,
*to provide valid baselines measures (see pp.16-17).

The students participating in this research already had been thoroughly assessed by their school counsellor to determine aetiological factors related to their reading difficulties (see Comino, 1990) and thereby classified into their special education category. In view of this preceding thorough assessment (albeit one month or two years prior to this research), the recommendation of Knight (1989) lies somewhat outside the requirements of this research. Furthermore, although the results of the tests should be of assistance to the teacher in providing guide-lines for future instruction, it must be recognised that my intervention within the school was on limited time, and therefore, this
recommendation too lies outside the requirements of this research.

The two remaining recommendations of Knight (1989) were adequately met. In this study, testing served the purpose of providing a comprehensive evaluation of the child's functioning level and, testing was used to establish a valid baseline.

3.2.3 Deliberation: purpose of language tests.

Once the aims of any assessment have been adopted, it is necessary to clarify purpose. The purpose of testing in this study was to provide information about the effectiveness of the independent variable. Henning (1987) states:

There could be no science as we know it without measurement. Testing, including all forms of language testing, is one form of measurement. (p.1)

The focus of the test scores was not the individual student but rather the actual program provided to teachers in the CIP package. The group mean scores were seen as being of greater interest to this research than the isolated scores of individual students. The pretests assessed the students' "entry behaviour", and the posttests assessed the post-instructional levels, or "exit behaviour" (Henning, 1987). The difference, or "gain scores" were analysed for significant differences (see Data Analysis, section 3.9).

3.2.4 Deliberation: the ideal assessment.

a) the format.

To meet the above criteria, the ideal test should be objective. Yet Henning (1987) and Heaton (1988) both warn that language tests may be inaccurate or unreliable because repeated measures may give different results. It is important to ensure that the scoring of the tests is objective and "a testee will score the same mark no matter which examiner
marks the test" (Heaton, 1988, p.25). Heaton (1988) goes on to warn:

All test items, no matter how they are devised, require candidates to exercise a subjective judgement.... Furthermore, all tests are constructed subjectively by the tester, who decides which areas of language to test, how to test those particular areas, and what kind of items to use for this purpose. (p.25)

In her quest for an ideal assessment format, Knight (1989) proposes the psychoeducational assessment model which includes:
* an interview with parents (this research met this requirement by way of written parental permission to include their child in this project),
* an interview with the teacher,
* an interview with the child,
* a direct observation of the child's classroom, particularly noting the child's general social behaviour,
* formalised testing.

Yet another consideration in selecting an ideal and appropriate test(s) is that there is no one perfect test. Knight (1989) concludes:

Although opinions vary as to which tests are best ... certain basic conditions must be satisfied when considering test selection if the assessment is to achieve its purpose. Above all, the test must be valid and reliable, well normed (where appropriate) and sufficiently familiar to the examiner to ensure smooth and errorless presentation. (p.22)

However, when in search for a test that is valid and
reliable, Cherniss (1988) suggested that there may be a need to modify some tests to cater for the needs of some children. For example, such modifications may include the re-typing of the original into large print or Braille.

A final deliberation in the quest for the ideal test materials was the consideration that much test material has been designed to screen the "average" child in regular class placement. Such tests are thereby not valid for children with special needs. Cherniss (1988) warns that the mere documentation of the important fact that many test developers do not provide validity related information on the use of their instruments with children with handicaps, does not absolve the researcher/tester from this responsibility.

Knight (1989) lists the following components of a reading test. These recommendations were adopted for the present research.

*examination of whole word vocabulary,
*analysis of word attack skills, including phonemic awareness, segmentation, decoding and blending skills,
*miscue analysis,
*assessment of the efficiency of higher order integrative skills involved in reading for meaning,
*awareness of pupil task anxiety throughout the testing as this can affect the results.

b) the feedback.

Not only must one carefully deliberate upon the test format, one must consider the assessment report, as Campbell and Mackay (1989) suggest. They note that while a "perfectly objective report is unattainable" (p.31) (as it remains the tester's decision to select which observations will actually go into the report), nevertheless, the "onus remains on the writer to clarify at what point the publicly observable is left behind and the realm of professional judgement, adequately justified, is entered" (p.31). Although mostly outside the requirements of this research (again because the students have been already categorised by the Department of School Education), the need for feedback to
teachers and schools participating in the study dictated that assessment reports be available.

Campbell and Mackay (1989) suggest that a good report contains the following:
*Identification of the client,
*Reason for referral (outside the requirements of this research),
*Dates of assessment,
*Brief statement on relevant historical facts (e.g. family background, school history) (largely outside the requirements of this research),
*Tests used,
*Behaviour during assessment,
*Brief description of the results of the test,
*Conclusions,
*Recommendations.(largely outside the requirements of this research).

These components (sections 3.2.1-3.2.4) clearly show that assessment of reading ability is a complicated matter. Reading is integrated into all aspects of education. Reading is more than merely gaining meaning from print. Reading is a means of growth and well-being for the individual, not only in a narrow academic field restricted to the classroom lesson, but growth in the cognitive, social and emotional areas too (Neale, 1989). Reading behaviour "mirrors the processes of thinking in a coordinated expression of human behaviour" (Neale, 1989, p.4). All stages of reading should be seen in the wider context of literacy (Neale, 1989), and development of modern linguistic theory is making testers more careful in the selection and implementation of tests (Heaton, 1988).

Following all the above deliberations the following tests and assessment devices were chosen.
3.3 Data component: the Neale Analysis of Reading Ability Revised.

Since the Neale Analysis of Reading Ability was first published in 1958, it has become one of the most widely used tests in the United Kingdom, Australia and New Zealand, with three broad fields of psychology providing the theoretical framework (child development, social psychology and perceptual psychology) (Neale, 1989). The original Neale Analysis of Reading Ability claimed a validity coefficient .95 (Neale, 1970) and had a proven reliability in keeping with tests like the Vernon Word Reading Test and the Revised Stanford-Binet Intelligence Test. Between the alternate tests, the original Neale claimed a correlation between .96 and .98 for accuracy and, between .92 and .98 for comprehension (Neale, 1970).

The Neale (Revised) validation studies were carried out "with the rigour usually accorded the construction of an intelligence test" (1989, Preface) "by correlating its subtest scores with criterion tests that enjoy a wide degree of acceptance among professionals as measures of reading or verbal ability" (1989, p.51). The validity correlations to the Schonell range from .76-.78 for Reading Rate, .95-.96 for Reading Accuracy, and .88-.88 for Reading Comprehension. The validity correlations to the WISC subtests for Vocabulary and Similarities range from .41-.50 for Reading Rate, .56-.62 for Reading Accuracy, and .60-.68 for Reading Comprehension. The correlations between the original Neale given at the end of Year 1 and the Revised Neale given to the same group of children at the end of Year 2 are given as .73 for reading Rate, .83 for Reading Accuracy and .78 for Reading Comprehension.

The standardisation of the original Analysis was done in the United Kingdom and included two thousand children tested individually on either Forms A and B or Forms A and C, together with other reference tests, to establish the norms (Neale, 1989). The standardisation procedures for the Revision sampled approximately eleven hundred children from the two Australian States of Victoria and South Australia, (from both Government and Independent schools, randomly selected and including boys
and girls, plus an ethnic mix typical of the current Australian culture) making this Revised Neale Analysis very suitable for the Australian student, and therefore this study.

As was the case for the original Neale, the Reliability Coefficient for the test using Form 1 and Form 2 is again very acceptable, ranging from an average of .89 for Reading Rate, .95 for Reading Comprehension, and .98 for Reading Accuracy, making this a reliable test for the experimental design (pretest/posttest) followed in this research. The Internal Consistency Reliability Co-efficients (using the Kuder-Richardson reliability co-efficient, KR 20) range from .81 to .83 for Reading Accuracy, and .89 to .90 for Reading Comprehension.

Also, consistent with the philosophical standing of this study, Neale adopts the position that reading is part of a language system interacting with and serving the adaptive needs of the individual "in conjunction with the physical, sensorimotor, and emotional systems" (Neale, 1989, p.2). Neale (1989) states:

While debate can be assured on any one issue ... [of contemporary educational discourse] ... the common denominator is a recognition that literacy, and more specifically the art of reading, is crucial to the cognitive development of the individual and to cementing the diverse networks of a modern society. (Preface)

Consistent with the needs of this study, Neale (1989) stresses that individual appraisal is important if valid information is to be obtained and therefore, the test(s) were given individually.

3.4 Data component: the Neal Phonemic Skills Screening Test.

The Neal Phonemic Skills Screening Test has been constructed as a curriculum based assessment device to gauge the reader's use of phonological word processing skills (Neal, 1988a, 1988b). This test has been designed to identify specific
difficulties that may require remediation, however it is not standardised, and Neal (1988a) explains that it does not discriminate readers with difficulties who obtain a reading age of approximately ten years and above. (However, it was considered that this difficulty should not affect this study, as CIP was designed for students with reading difficulties and it was anticipated that the students would score Reading Ages of less than five years to about nine years).

Neal developed her test in 1984 and has continued to refine it in order to "determine an accurate instructional entry point, as well as monitor the effectiveness of instructional interventions" (Neal, 1988a, p.49), and she claims that this test has proven useful to teachers undertaking postgraduate Special Education training courses at both College of Advanced Education and University level. Neal (1988b) claims that this test best serves the purpose of baselining.

In noting that the assessment of phonemic awareness is a "complex affair" Knight (1989, p.23) recommends this test and states that the Neal Phonemic Skills Screening Test is very suitable as it "focuses specifically on the assessment of phonemic awareness" (p.24).

3.5 Data component: the two part spelling assessment test.

Knight (1989) recommends that spelling (and writing) skills should be assessed through "the use of both standardised and informal procedures, taking care to identify regular patterns of errors" (p.25). However, the testing of spelling, and indeed, the very teaching of spelling, is at the least, a controversial subject (see chapter 2, section 4). Nevertheless, this study assumes a commitment to the teaching of "spelling". This commitment is supported by Andrews and Jardine (1989) and by Torneus (1984). Phonemics only is simply not enough; to be successful in reading instruction one must include the "alphabetic knowledge" and allow the student to see the morpheme and realise the rules. Torneus (1984) found that early spelling ability is primarily dependent on metaphonological skills but indirectly affected by linguistic and cognitive development. Blending phonemes requires
the child to make use of the spelling/sound relationship.

A search for an adequate existing spelling test, designed for students with reading difficulties, proved fruitless. Therefore the recommendations of Cherniss (1988) were adopted (i.e. that in the search for a test that is valid and reliable there may be a need to modify some tests to cater for the needs of some children). Therefore the following tests were designed and/or modified for selection.

**Part A** of the spelling test was a visual discrimination of whole words through a simple matching test. This test was based on the recommendations of Heaton, (1988, p.107) and followed the sequence of the whole words (as opposed to the isolated phonemes and nonsense words) in the Macquarie Expressive Word Attack Skills Test. (It should be noted that in making her phonemic test, Neal (1988b) too based her sequence on the Macquarie Expressive Word Attack Skills Test reflecting the wide recognition of this assessment tool).

This test was concerned purely with assessing whether the student could discriminate visually between words that were spelt in fairly similar ways. The students were required to mark the word which was the same as the word on the left. Within each selection, the format for word's distractors were consistent, being: choice of five words, one being correct. The distractors consisted of one word with initial letter change, one word with final letter change, one word with a middle letter (vowel) change, and one word bearing no relation to the test word except that it belonged to the same sequence in the Macquarie Expressive Word Attack Skills Test.

Scoring noted the achieved correct number of answers over the possible correct number of answers and this score was calculated as a percent for the purpose of analysis.

It must be noted that a posttest was designed, however, as most students scored 100% in their pretest, it was not considered necessary to run the different posttest format. This finding was consistent with the findings of Vellutino, (1987) and of Wagner and Torgesen (1987) in that only a very small percentage of the total population of children with
reading/spelling problems exhibit difficulties with visual processing.

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Part B of the spelling test was adapted from the Mann-Suiter Developmental Spelling Inventory using only the sections Levels I-III. (It was considered that students involved in this research project, due to the nature of their disabilities, would be unable to spell the higher sections of this test, and therefore it would not be productive to impose those levels upon them).

The Mann-Suiter Developmental Spelling Inventory is comprised of samples of several basal and linguistic spelling
lists (Mann-Suiter, undated). It parallels the word sequence of the Armidale Word Frequency List\textsuperscript{15} (Armidale Inspectorate, 1980). All words in the Mann-Suiter Developmental Spelling Inventory Level 1 are represented in the Armidale Word Frequency List Groups 1 and 2. Furthermore, the Mann-Suiter Developmental Spelling Inventory parallels the progression of the Macquarie Expressive Word Attack Skills Test which was an influence on the formation of the Spelling Test Part A (see above).

The Mann-Suiter Developmental Spelling Inventory was validated by testing approximately two hundred and fifty students in grades one to six. The students' results were compared to their teachers' estimate of each student's level of functioning. In approximately eighty percent of cases there was agreement in comparing performance to estimate (Mann-Suiter, undated).

Considering the nature of the student's disabilities, the length of time between the tests and the fact that the CIP program does not teach specifically these words (or any words for that matter!), practice effect on such a test was considered a minimal problem. Therefore, the same test was given in both the pretest and posttest.

Scoring noted the correct number of answers over the

\textsuperscript{15} The Armidale Word Frequency List was compiled from the reading series used in infants' classes in the Armidale Inspectorate around 1980. It is considered typical for most areas of N.S.W. A survey revealed that the most commonly used series at this time was the Breakthrough Reading Books, the Endeavour Basic Readers, Jacaranda Books, Ladybird Key Words Readers, Methuen Caption Books, N.S.W. Department of Education readers, Ready to Read, SRA Basic Reading Series, and, Young Australia Basic Readers. The text of the ninety-three books from these series were typed onto computer and the seventy-two thousand, one hundred and ninety-six words were counted and arranged in descending order of frequency. Thus, the most frequently used words were revealed resulting in a list of one hundred and ninety-two words which account for eighty percent of all words counted (Armidale Inspectorate, 1980). The Armidale Word Frequency List is then further divided into three groups, with groups one and two representing fifty percent of all words counted.
possible correct number of answers (total of fifty-five words) and this score was calculated as a percent for the purpose of analysis. For marking purposes, the following decisions were made:

*letter or word reversals were not accepted as correct,
*capital letters within words were accepted as correct.

The Mann-Suiter levels used in this research are as follows:
Level 1: cat, no, red, see, and, you, the, we, it, yes, dog, big, like, have, was.
Level II: nod, jug, get, sip, table, sled, clap, ship, drop, think, sing, little, home, ask, father, doll, morning, pretty, boat, said.
Level III: sheep, each, third, catch, drank, lake, stick, duck, child, bath, wash, puppy, train, laughing, short, swing, walk, uncle, right, because.

3.6 Data component: the writing assessment.

a) the required products.
To assess the efficiency of higher order integrative skills (and on the recommendations of Heaton, 1988), the writing assessment was designed in two parts. Two writing products were required, as "two or more compositions usually provide more reliable guides to writing ability than a single composition, enabling the testing of different registers and varieties of language" (Heaton, 1988, p.138).
Furthermore, control of the writing product was seen as desirable. Heaton (1988) warns, "composition titles which give the students no guidance as to what is expected of them should be avoided (p.137). Therefore, guidance as to what was expected was given:

Part A: The story was to be about a given picture stimulus depicting a fictional character
Part B: This story was to be a diary report beginning "Yesterday I"

A final consideration in the setting of the writing assessment was the factor of time limits. Heaton (1988) warns
that time constraints "may prove harmful in tests of writing" (p.138) for it is deleterious to students when they "are expected to produce a finished piece of writing at their very first attempt" (p.138). Therefore students were encouraged to produce preliminary drafts of whatever they wrote and sufficient time was allowed for editing and final drafting within a normal time-tabled writing session. However, it was recognised that many of the students involved would be unable to edit and draft without heavy teacher intervention. For these students, assurances were given that their writing product (whatever they produce) would be accepted.

b) assessing the products.

The assessment of writing skills is complex as writing skills are themselves complex and often difficult to teach per se. Heaton (1988) attempts to group the many and varied skills necessary for writing good prose into five general components thus:

- language used: the ability to write correct and appropriate sentences;
- mechanical skills: the ability to use correctly those conventions peculiar to the written language, e.g. punctuation, spelling;
- treatment of content: the ability to think creatively and develop thoughts, excluding all relevant information;
- stylistic skills: the ability to manipulate sentences and paragraphs, and use language effectively;
- judgement skills: the ability to write in an appropriate manner for a particular purpose with a particular audience in mind, together with an ability to select, organise and order relevant information.

(p.135)
At the elementary stages of writing, (and in spite of chronological age, most of the students participating in this research must still be considered elementary writers), the actual conventions that affect the assessment of the writing product are usually punctuation and spelling (Heaton, 1988). Yet, of even greater importance in assessment are those skills that involve judgement, and in particular, in the selection of the appropriate genre for each of the writing tasks (Heaton, 1988).

In assessing such skills, it is important that consistency (albeit through subjective judgement) be ensured. Consistency is necessary for reliability between the pretest and posttest, and for possible future replication. The marking of the products followed a rating scale which was based on an adaption and modification of the rating schedule proposed by Henning (1987, p.33) (see Hall & King, 1992).

### TABLE 3.1 Consistent observation of writing product.

<table>
<thead>
<tr>
<th>MECHANICS</th>
<th>CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>AREA</td>
<td>WEIGHT</td>
</tr>
<tr>
<td>Spelling</td>
<td>1</td>
</tr>
<tr>
<td>Grammar</td>
<td>1</td>
</tr>
<tr>
<td>Punctuation</td>
<td>1</td>
</tr>
<tr>
<td>Orthography</td>
<td>1</td>
</tr>
<tr>
<td>Paragraphing</td>
<td>1</td>
</tr>
<tr>
<td>TOTAL</td>
<td>1</td>
</tr>
</tbody>
</table>

Determination of mastery was based on a thorough experience of marking writing products of students with intellectual and learning disabilities. Mastery for each skill was defined thus:
spelling: to score one point, the writing must exhibit words that are recognisable as words. That is, words will be presented with a space between them and each word will display a phonemic element in its formulation (e.g. "bcs" equating to "because"; "grl" equating to "girl").

grammar: to score one point, the writing must exhibit correct word usage within 95% of sentences. In particular, this will apply to word person and tense.

punctuation: to score one point, the writing must exhibit correct use of full stops, capital letters, speech marks and question marks for 95% of the true need of the writing product.

orthography: to score one point, the writing must exhibit spelling which is at least 90% correct. This is irrespective of the actual amount of words used in the product. A short product must be spelt correctly at least 90%, and similarly, a long product must be spelt correctly 90%.

paragraphing: to score one point, the writing product must exhibit at least two paragraphs. A long story without paragraph indentation does not receive this point.

organisation: to score one point, the writing must exhibit a title, text and evidence of effort to present the product in an appropriate published form (e.g., neat presentation, no untidy corrections or gross errors!).

relevance to topic: to score one point, the writing must exhibit vocabulary and story content appropriate to the set writing task (relevant to the picture stimulus or relevant to a diary entry).

creativity and interest: to score one point, the writing must exhibit the use of at least one adjective (or adjectival phrase/clause) or one adverb (or adverbial phrase/clause) per paragraph. (This applies to "true" paragraphs, regardless of student's presentation of paragraphs. If the student has presented a long story without paragraph indentations, but in fact the story should contain multiple paragraphs, then to score one point for creativity and interest, the work must meet this criteria for each paragraph as edited for paragraphs by the marker).
range of syntax: to score one point, the writing must exhibit correct word order within each sentence to meet a criteria that for 100% of sentences the meaning has been made perfectly clear to the reader. Missing words will be judged as a syntax error (e.g. He going to get on plane). However, syntax problems of split infinitives (e.g. "to quickly go") and loose prepositions at the end of a sentence (e.g. "it was a plane to be proud of"), indeed themselves somewhat controversial, will not be marked incorrect, unless such an error causes the meaning to become unclear.

richness of vocabulary: to score one point, the writing must exhibit a variety of words such as nouns, pronouns, verbs, adverbs and adjectives. These words must reach at least two of the three criteria for orthography, grammar and syntax.

By allowing only one point for each of the listed elements, the marking involved only the relatively objective observation of whether in fact the skill was demonstrated. If the writing product demonstrated the mastery of a skill, then the score gained one point (or if not demonstrated, no point).

Scoring noted the total out of twenty calculated as a percentage average for the purpose of analysis. (Note however, that some students only completed one of the two writings in either the pretest or posttest. This was due to unavoidable complications with school timetables. Whenever this situation arose, only the same writing test was compared and, where necessary, the pretest score was amended for the one-genre score to be taken as the percentage "average").

3.7 Data component: The cloze exercise.

The final assessment selected was a cloze exercise. A cloze test "is one that requires filling in the blanks in a passage from which there have been systematic or random deletions. Usually every fifth or seventh word has been removed from the passage beginning at a random starting point" (Henning, 1987, p.189).

In his recommendation to include a cloze exercise in any language assessment Heaton (1988) notes:
Research studies have shown that performances on cloze tests correlates highly with the listening, writing and speaking abilities. In other words, cloze testing is a good indicator of general linguistic ability. (pp.16-17)

It is also argued that cloze measures an underlying global linguistic ability ... rather than simply those skills associated with reading comprehension. (p.132)

There are many cloze assessments available, including the Paragraph Understanding Test (N.S.W. Department of Education, 1982). However, it is typical in its unsuitability for the students in this research because it was normed for regular mainstreamed students in grades three to ten (i.e. reading ages of around eight years to sixteen plus years). Many of the students participating in this research could be expected to have reading ages far lower than catered for by such norms.

Therefore the cloze passages for this assessment were modified from the original Neale Analysis of Reading Ability (Neale, 1970) as these were normed for reading ability ages as low as five and a half years (see data component: the Neale Analysis of Reading Ability Revised, section 3.3). The design for the cloze assessment was influenced by the widely used (but, for this research, unsuitable) GAP Reading Comprehension test (see McLeod, 1975) and the St. Lucia Reading Comprehension Test (see Elkins & Andrews, undated). Like the GAP and St. Lucia tests, the cloze exercise was given as a group test.

The format of the cloze followed the first four passages of the original Neale (1970) Form C with every seventh word deleted.
A robin hopped up to my ____. I gave her some bread. She ____ a nest in my garden. Now ____ look after her little birds.

A ____ parcel for Jane and Peter arrived ____ Saturday. Peter looked at the strange ______ Jane undid the string. Then they ______ with delight. Uncle had sent some _____ for Jane and an electric train _____ Peter. They were what the children _____ wanted for a long time.

As Ali ______ in a ruined temple, his shoulder ______ against a secret spring. Instantly he ____ thrown into an underground room. In _____ darkness the walls appeared to be ______ with precious jewels. Ali rested awhile. ______ remembered that desert travellers often imagined ______ things. Later he explored the place ______ means of escape. To his amazement ______ treasure did not vanish. He had ______ a buried palace of former times.
Susan ______ to the starting position for the ______ race. Last year her team had ______ disqualified for not transferring the baton ______. Now they were determined to avenge ______ defeat. But what was this? Susan ______ one shoe. The sole had broken ______ in the obstacle race. Her heart ______. The track was unsuitable for running ______.

Her plight, however, had been observed. "_______ mine," insisted Phillip, a reserve runner, ______ his shoes. Luckily they fitted, and ______, Phillip shared the honours when his ______ was awarded the athletic shield.

To be accepted as a correct answer, the student's submitted word must be correctly spelt, be in correct tense, and have the appropriate punctuation (unlike the spelling test criteria, capital letters within words were not accepted). Synonyms were accepted.

Scoring noted the achieved correct number of answers over the possible correct number of answers (thirty-three) and this score was calculated as a percentage for the purpose of analysis.

3.8 Selection of subjects for this research.

The intention was to test the utility of the independent variable, CIP, with a variety of students' aetiologies for reading disabilities. As Bentler and Chou (1988) remind us, the sample of subjects had to be "relevant to the theoretical ideas being evaluated" (p.163) and ensure that the data being gathered were under appropriate conditions.16.

16 These recommendations were made in regard to setting criteria for selection and evaluation of computer programs. However, it was felt that they were also applicable to this selection of subjects.
Consistent with an experimental design, schools were found for both experimental and control groups. The following schools and classes reached criteria for the delimitations set (see section 1.9) and they therefore were offered an invitation to participate.

**Group 1:** For the purpose of testing students whose reading difficulty was identified by the Department of School Education to lie within the aetiology of their learning English as a second language (ESL).

<table>
<thead>
<tr>
<th>Experimental</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Smith Hill High School (2.8)</td>
<td>Warilla High School (1.4)</td>
</tr>
<tr>
<td>Lake Illawarra H/School (2)</td>
<td>Wollongong H/School (1.4)</td>
</tr>
<tr>
<td>Port Kembla H/School (2)</td>
<td>Warrawong H/School (4)</td>
</tr>
<tr>
<td>Total Classes = 6.8</td>
<td>Total Classes = 6.8</td>
</tr>
</tbody>
</table>

| b) Fairy Meadow Primary (1.4)    | Conston Primary (2)          |
| Barrack Heights P/S (1.4)        | Cringila Primary (4)         |
| Mt. Warrigal P/S (1)             | Warilla Primary (1)          |
| Port Kembla P/S (2)              |                              |
| Total Classes = 6.4              | Total Classes = 7            |

**Group 2:** For the purpose of testing students whose reading difficulty was identified by the Department of School Education to lie within the aetiology of a mild intellectual disability (IM).

<table>
<thead>
<tr>
<th>Experimental</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>c) Keira High School (2)</td>
<td>Warilla High School (2)</td>
</tr>
<tr>
<td>Berkeley High School (1)</td>
<td>Oak Flats High School (2)</td>
</tr>
<tr>
<td>Kanahooka High School (2)</td>
<td>Warrawong H/School (2)</td>
</tr>
<tr>
<td>Total Classes = 5</td>
<td>Total Classes = 6</td>
</tr>
</tbody>
</table>

| d) Corrimal Primary (1)          | Fairy Meadow Primary (1)     |
| Koonawarra Primary (2)           | Cringila Primary (1)         |
| Berkeley Primary (1)             | Warilla North P/S (2)        |
| Total Classes = 4                | Total Classes = 4            |
Group 3: For the purpose of testing students whose reading difficulty was identified by the Department of School Education to lie within the aetiology of a moderate/severe intellectual disability (IO/IS).

Experimental
  e) Para Meadows SSP (24)
  Total Classes = 24

Control
  Peterborough SSP (7)
  Total Classes = 7

Group 4: For the purpose of testing students whose reading difficulty was identified by the Department of School Education to lie within the aetiology of an unspecified leaning disability (LD).

Experimental
  f) Keira High School (1)
  Berkeley High School (1)
  Oak Flats High School (1)
  Total Classes = 3

  g) Fairy Meadow Primary (1)
  Mt. Warrigal Primary (1)
  Total Classes = 3

Control
  Warilla High School (1)
  Kanahooka H/School (1)
  Warrawong H/School (1)
  Total Classes = 3

  Warilla Primary (0.6)
  Bellambi Primary (1)
  Warilla North P/S (0.6)
  Total Classes = 2.2

The selection of these schools and classes allowed comparison of the four major groups of students with different aetiology and to compare the sub-groups i-x (as noted in sections 1.4. and 3.0).

Group 1:
  subsection a) Secondary students whose reading difficulty has been identified by the Department of School Education to lie within the aetiology of their learning English as a second language (ESL),
  subsection b) Primary students whose reading difficulty has been identified by the Department of School Education to lie within the aetiology of their learning English as a second
language (ESL).

Group 1 as an entirety plus its two subsections projects the research questions (i)-(iii).

Group 2:
subsection c) Secondary students whose reading difficulty has been identified by the Department of School Education to lie within the aetiology of a mild intellectual disability (IM),
subsection d) Primary students whose reading difficulty has been identified by the Department of School Education to lie within the aetiology of a mild intellectual disability (IM).

Group 2 as an entirety plus its subsections projects the research questions (iv)-(vi).

Group 3:
subsection e) Students whose reading difficulty has been identified by the Department of School Education to lie within the aetiology of a moderate/severe intellectual disability (10/IS).

Group 3 and subsection (e) are the same, and this group/subsection project the research question (vii).

Group 4:
subsection f) Secondary students whose reading difficulty has been identified by the Department of School Education to lie within the aetiology of a unspecified leaning disability (LD),
subsection g) Primary students whose reading difficulty has been identified by the Department of School Education to lie within the aetiology of a unspecified leaning disability (LD).

Group 4 as an entirety plus its subsections projects the research questions (viii)-(x).

Table 3.2 lists the schools that accepted the invitation to participate and states their role in this study.
### TABLE 3.2 List of schools and classes

<table>
<thead>
<tr>
<th>Name of School</th>
<th>Classes</th>
<th>Access Sought</th>
<th>Ex</th>
<th>Con</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lake Illawarra High</td>
<td>2@ESL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lake Illawarra High</td>
<td>1@LD</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wollongong High</td>
<td>1.4@ESL</td>
<td></td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>Mt. Warrigal P/S</td>
<td>1@ESL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mt. Warrigal P/S</td>
<td>1@LD</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Port Kembla P/S</td>
<td>2@ESL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coniston P/S</td>
<td>2@ESL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Warilla P/S</td>
<td>1@ESL</td>
<td></td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>Keira High</td>
<td>2@IM</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oak Flats High</td>
<td>2@IM</td>
<td>*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Koonawarra P/S</td>
<td>2@IM</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Berkeley P/S</td>
<td>1@IM</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corrimal P/S</td>
<td>1@IM</td>
<td></td>
<td>*</td>
<td></td>
</tr>
<tr>
<td>Warilla North P/S</td>
<td>2@IM</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peterborough SSP</td>
<td>7@1O/1S</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3.9 Data analysis.

The research design required the use of a statistical tool that would enable testing for significance of the difference among two or more population means, possibly after adjusting for the effects of other factors. Furthermore, it required a statistical tool for the question of whether the variability between groups is large enough in comparison with the variability within groups to justify the inference that the means of the populations from which the different groups were sampled are not the same (see Table 3.4).

I initially considered the use of Analysis of Covariance (ANCOVA) because it "permits the removal of effects associated with concomitant variables that might otherwise contaminate the results and lead to faulty conclusions" (Henning, 1987, p.189). Some claim that the primary purpose of the analysis of covariance is to provide an adjustment that is necessary to allow for the non-random nature of the school (Henning, 1987; Isaac & Michael, 1977: Keppel, 1973).

However, Hinkle, Wiersma and Jurs (1988) warn that although many authors cite ANCOVA as useful when researching data from intact groups such as classes within schools, "it must
be used with caution" (p.493). Hinkle et al. (1988) warn that in many instances, the use of ANCOVA for classroom research "is inappropriate" (p.493).

Therefore, Analysis of Variance, (ANOVA) was considered most suited to the needs of this study (Hinkle, Wiersma and Jurs, 1988; Isaac & Michael, 1977; Levin, 1987). The particular statistical test that yields the significance of the data is the $F$-ratio:

$$ F = \frac{\text{Between Group Variance}}{\text{Within Group Variance}} $$

The data analyses were processed using the computer program. There is little doubt that the following statement made by Long (1988) holds great truth.

During the past 20 years, there has been rapid growth in the variety and complexity of methods available for quantitative social research. Statistical analyses that taxed the largest computers 20 years past are now routinely accomplished on microcomputers. (p.7)

SAS$^{17}$ was the statistical package chosen.

3.10 Research design.

The research was consistent with an experimental design requiring both experimental and control groups chosen at random. However, because the nature of schools may deem that an intact school class bias the sample, the research was quasi-experimental. Glass and Stanley (1970) note that quasi-experimentation "seems to offer a middle ground between the controlled experiment of the laboratory and the uncontrolled experiment of nature" (p.501). The acceptance of intact classes means that each student is not truly random (see Cohen and Manion, 1985, p.193), but to help alleviate this effect, the

---

$^{17}$ SAS is a registered trademark of SAS Institute Inc., Cary, North Carolina.
selection of students was taken from a variety of schools (thirteen in all) and from a variety of classes within those schools (twenty-five in all).

Another research reality lay in the simple fact of availability within each group sample (ESL, IM, IO/IS, LD) (see selection of subjects, section 3.8). Timetables and numbers of students at the schools participating allowed for a relatively large sample of ESL and IM classified students. However, gaining access to students classified as IO/IS proved difficult, both in terms of student numbers available and school timetables. This problem repeated itself in the case of LD classified students, who were very difficult to access because they were integrated into regular classes with support from a Support Teacher (STLD) sharing teaching time between schools. Therefore I decided to use these latter two groups as their own control before implementing CIP. To allow for the fact that I now had correlated observations, Repeated Measures Analysis of Variance was applied to this data.

Graphically, the design for each of the dependent variable tests remains constant, and is represented in Table 3.3.

Furthermore, as noted in section 1.8.2, it was accepted that it may be possible that the independent variable was itself intrinsically dependent on the teacher's interpretation of the implementation of CIP. In order to determine that this was not an invalidating factor in this experiment, the overall research design allowed for regular monitoring (see Implementation, section 3.13). This check is graphically represented in Table 3.3.1.
### TABLE 3.3 Research Design.

#### Table 3.3.0.1 Design for E.S.L. students.

<table>
<thead>
<tr>
<th>E.S.L</th>
<th>01</th>
<th>X</th>
<th>02</th>
</tr>
</thead>
<tbody>
<tr>
<td>i).General</td>
<td>03</td>
<td></td>
<td>04</td>
</tr>
<tr>
<td>ii)Secondary</td>
<td>05</td>
<td>X</td>
<td>06</td>
</tr>
<tr>
<td></td>
<td>07</td>
<td></td>
<td>08</td>
</tr>
<tr>
<td>iii)Primary</td>
<td>09</td>
<td>X</td>
<td>010</td>
</tr>
<tr>
<td></td>
<td>011</td>
<td></td>
<td>012</td>
</tr>
</tbody>
</table>

#### Table 3.3.0.2 Design for I.M. students.

<table>
<thead>
<tr>
<th>I.M.</th>
<th>013</th>
<th>X</th>
<th>014</th>
</tr>
</thead>
<tbody>
<tr>
<td>iv)General</td>
<td>015</td>
<td></td>
<td>016</td>
</tr>
<tr>
<td></td>
<td>017</td>
<td>X</td>
<td>018</td>
</tr>
<tr>
<td>v)Secondary</td>
<td>019</td>
<td></td>
<td>020</td>
</tr>
<tr>
<td></td>
<td>021</td>
<td>X</td>
<td>022</td>
</tr>
<tr>
<td>vi)Primary</td>
<td>023</td>
<td></td>
<td>024</td>
</tr>
</tbody>
</table>

#### Table 3.3.0.3 Design for IO/IS. students.

<table>
<thead>
<tr>
<th>I.O/IS.</th>
<th>025</th>
<th>026</th>
<th>X</th>
<th>027</th>
</tr>
</thead>
<tbody>
<tr>
<td>vii)General</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Table 3.3.0.4 Design for L.D. students.**

<table>
<thead>
<tr>
<th>L.D.</th>
<th>02 8</th>
<th>02 9</th>
<th>X</th>
<th>03 0</th>
</tr>
</thead>
<tbody>
<tr>
<td>viii) General</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ix) Secondary</td>
<td>03 1</td>
<td>03 2</td>
<td>X</td>
<td>03 3</td>
</tr>
<tr>
<td>x) Primary</td>
<td>03 4</td>
<td>03 5</td>
<td>X</td>
<td>03 6</td>
</tr>
</tbody>
</table>

X represents the exposure of the group to the independent variable,
O represents the pretest and posttest observations with left to right order indicating temporal sequence.
X's and O's in the same line apply to the same subjects.
X's and O's vertical to one another are simultaneous.

---

**Table 3.3.1 Research Design Check for the Independence of the independent variable**

<table>
<thead>
<tr>
<th>E.S.L</th>
<th>i) General</th>
<th>01</th>
<th>X₀A₀B₀C</th>
<th>O2</th>
</tr>
</thead>
<tbody>
<tr>
<td>L.M.</td>
<td>iv) General</td>
<td>01 3</td>
<td>X₀A₀B₀C</td>
<td>01 4</td>
</tr>
<tr>
<td>L.O/IS.</td>
<td>vii) General</td>
<td>02 5</td>
<td>02 6</td>
<td>X₀A₀B₀C</td>
</tr>
<tr>
<td>L.D.</td>
<td>viii) General</td>
<td>02 8</td>
<td>02 9</td>
<td>X₀A₀B₀C</td>
</tr>
</tbody>
</table>

X represents the exposure of the group to the independent variable,
O represents the pretest and posttest observations with left to right order indicating temporal sequence.
X's and O's in the same line apply to the same subjects.
X's and O's vertical to one another are simultaneous.
X₀A₀B₀C represent the regular observations on both individual teacher performance and individual students linked with those teachers.
3.11 Research Questions.

This research sought to determine whether the Cognitive-Interactive Program to Facilitate the Learning of Reading (CIP) would indeed facilitate reading for students with reading difficulties. As noted in the research overview (section 3.0), it compared four major groups of students exploring aetiology plus another six sub-sections exploring both aetiology and age-applicability (i.e. high school-aged students and primary-aged students).

The same questions were asked of each group and subgroup, generating a total of eighty research questions.

A summary of the Research Questions is to be found in Table 3.4.

Specifically, this study asks:

3.11.1 Research Question 1 (i)-(x).

In relation to change over time, is there a significant difference between the experimental and control groups in their reading rate for:

i) students with an ESL classification?
ii) high school ESL students?
iii) primary school ESL students?
iv) students with an IM classification?
v) high school IM students?
vi) primary school IM students?
vii) IO/IS students?
viii) students with an LD classification.
ix) high school LD students?
x) primary school LD students?
3.11.2 Research Question 2 (i)-(x).

In relation to change over time, is there a significant difference between the experimental and control groups in their reading accuracy for:

i) students with an ESL classification?
ii) high school ESL students?
iii) primary school ESL students?
iv) students with an IM classification?
v) high school IM students?
vi) primary school IM students?
vii) IO/IS students?
viii) students with an LD classification.
ix) high school LD students?
x) primary school LD students?

3.11.3 Research Question 3 (i)-(x).

In relation to change over time, is there a significant difference between the experimental and control groups in their reading comprehension for:

i) students with an ESL classification?
ii) high school ESL students?
iii) primary school ESL students?
iv) students with an IM classification?
v) high school IM students?
vi) primary school IM students?
vii) IO/IS students?
viii) students with an LD classification.
ix) high school LD students?
x) primary school LD students?
3.11.4 Research Question 4 (i)-(x).

In relation to change over time, is there a significant difference between the experimental and control groups in their phonological word processing skills for:

i) students with an ESL classification?
ii) high school ESL students?
iii) primary school ESL students?
iv) students with an IM classification?
v) high school IM students?
vi) primary school IM students?
vii) IO/IS students?
viii) students with an LD classification.
ix) high school LD students?
x) primary school LD students?

3.11.5 Research Question 5 (i)-(x).

In relation to change over time, is there a significant difference between the experimental and control groups in their visual discrimination for:

i) students with an ESL classification?
ii) high school ESL students?
iii) primary school ESL students?
iv) students with an IM classification?
v) high school IM students?
vi) primary school IM students?
vii) IO/IS students?
viii) students with an LD classification.
ix) high school LD students?
x) primary school LD students?
3.11.6 Research Question 6 (i)-(x).
In relation to change over time, is there a significant difference between the experimental and control groups in their spelling for:

i) students with an ESL classification?
ii) high school ESL students?
iii) primary school ESL students?
iv) students with an IM classification?
v) high school IM students?
vi) primary school IM students?
vii) IO/IS students?
viii) students with an LD classification.
ix) high school LD students?
x) primary school LD students?

3.11.7 Research Question 7 (i)-(x).
In relation to change over time, is there a significant difference between the experimental and control groups in their writing for:

i) students with an ESL classification?
ii) high school ESL students?
iii) primary school ESL students?
iv) students with an IM classification?
v) high school IM students?
vi) primary school IM students?
vii) IO/IS students?
viii) students with an LD classification.
ix) high school LD students?
x) primary school LD students?
3.11.8 Research Question 8 (i)-(x).

In relation to change over time, is there a significant difference between the experimental and control groups in their cloze for:

i) students with an ESL classification?
ii) high school ESL students?
iii) primary school ESL students?
iv) students with an IM classification?
v) high school IM students?
vi) primary school IM students?
vii) IO/IS students?
viii) students with an LD classification.
ix) high school LD students?
x) primary school LD students?

3.12 Statistical hypothesis and test criteria.

Statistically, the population mean of the control group should be the same as the population mean of the treatment (or experimental) group, if there were no other experimental effects, other than by chance. In this case the null hypothesis (that there is no significant difference between the group means) will be accepted. If however, the group means differ, then the alternate hypothesis (that there is a significant difference) will be accepted and the null hypothesis rejected.

It was decided to use directional research questions, therefore 2-tailed tests were applied. To reflect the quality of this experiment, significance will be set at \( p \leq .05 \). To avoid repetition, the statistical hypothesis and test criteria are represented with the research questions in Table 3.4
Table 3.4 Statistical hypotheses, research questions and test criteria.

Statistical hypothesis

The null hypothesis:
\[ H_0 : U_T = U_C \]

The alternate hypothesis:
\[ H_A : U_T \neq U_C \]

\( U_T \) Represents the population mean of the treatment or experimental groups
\( U_C \) Represents the population mean of the control groups.

Research questions.

In relation to change over time, is there a significant difference between the experimental and control groups in their:
1. reading rate for:
2. reading accuracy for:
3. reading comprehension for:
4. phonological word processing skills for:
5. visual discrimination for:
6. spelling for:
7. writing for:
8. cloze for:

Test criteria

i) students with an ESL classification?

\[ F(\text{obs}) \leq F(\text{req}) \]

No significant difference
\( (p \geq .05; \text{2-tailed test}) \).

\[ F(\text{obs}) > F(\text{req}) \]

Significant difference
\( (p < .05; \text{2-tailed test}) \).

\( p \) represents the significance of the F-score set for this experiment.

\( F(\text{obs}) \) represents the F score observed (or obtained) from the analysis.

\( F(\text{req}) \) represents the F score required (or tabulated).
ii) high school ESL students?
\[ F(\text{obs}) \leq F(\text{req}) \]  
No significant difference  
\( (p \geq .05; \text{2-tailed test}) \).  
\[ F(\text{obs}) > F(\text{req}) \]  
Significant difference  
\( (p < .05; \text{2-tailed test}) \).

iii) primary school ESL students?
\[ F(\text{obs}) \leq F(\text{req}) \]  
No significant difference  
\( (p \geq .05; \text{2-tailed test}) \).  
\[ F(\text{obs}) > F(\text{req}) \]  
Significant difference  
\( (p < .05; \text{2-tailed test}) \).

iv) students with an IM classification?
\[ F(\text{obs}) \leq F(\text{req}) \]  
No significant difference  
\( (p \geq .05; \text{2-tailed test}) \).  
\[ F(\text{obs}) > F(\text{req}) \]  
Significant difference  
\( (p < .05; \text{2-tailed test}) \).

v) high school IM students?
\[ F(\text{obs}) \leq F(\text{req}) \]  
No significant difference  
\( (p \geq .05; \text{2-tailed test}) \).  
\[ F(\text{obs}) > F(\text{req}) \]  
Significant difference  
\( (p < .05; \text{2-tailed test}) \).

vi) primary school IM students?
\[ F(\text{obs}) \leq F(\text{req}) \]  
No significant difference  
\( (p \geq .05; \text{2-tailed test}) \).  
\[ F(\text{obs}) > F(\text{req}) \]  
Significant difference  
\( (p < .05; \text{2-tailed test}) \).

vii) IO/IS students?
\[ F(\text{obs}) \leq F(\text{req}) \]  
No significant difference  
\( (p \geq .05; \text{2-tailed test}) \).  
\[ F(\text{obs}) > F(\text{req}) \]  
Significant difference  
\( (p < .05; \text{2-tailed test}) \).

viii) students with an LD classification?
\[ F(\text{obs}) \leq F(\text{req}) \]  
No significant difference  
\( (p \geq .05; \text{2-tailed test}) \).  
\[ F(\text{obs}) > F(\text{req}) \]  
Significant difference  
\( (p < .05; \text{2-tailed test}) \).

ix) high school LD students?
\[ F(\text{obs}) \leq F(\text{req}) \]  
No significant difference  
\( (p \geq .05; \text{2-tailed test}) \).  
\[ F(\text{obs}) > F(\text{req}) \]  
Significant difference  
\( (p < .05; \text{2-tailed test}) \).
\( x \text{) primary school LD students?} \\
\( F_{\text{obs}} \leq F_{\text{req}} \) \quad \text{No significant difference} \\
\( F_{\text{obs}} > F_{\text{req}} \) \quad \text{Significant difference} \\
(\text{p} \geq .05; \text{2-tailed test}). \\
(\text{p} < .05; \text{2-tailed test}). \\

\( p \) represents the significance of the F-score set for this experiment. \\
\( F_{\text{obs}} \) represents the F score observed (or obtained) from the analysis. \\
\( F_{\text{req}} \) represents the F score required (or tabulated). \\

3.13 Implementation.

It was anticipated that some schools would be unable to accept the invitation to take part. For this reason, an excess of schools was approached to ensure sufficient numbers of students in each group for experimental reliability (see section 3.8).

Students were given their pretests in the data components, although in some cases, not all students were able to be exposed to all data components. This was usually due to an unavoidable aspect of "normal"19 school life (e.g. timetable complications, swimming school interruption). Furthermore, for some students, testing in all data components was not considered applicable. This was especially so in Group 3 (students with moderate/severe intellectual disabilities) where the nature of the disability was thought to negate any purposeful outcome of inflicting a full data component pretest. In these cases, use of the recommendations of the regular class teacher was considered prudent.

The experimental groups were then exposed to the treatment (independent variable). Following this exposure all students were posttested (in the data components in which they had been pretested).

To alleviate a possible intrinsic dependence on the classroom teacher's interpretation of the implementation of CIP, a close liaison was established between myself and those

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19 "Normal" refers here to the regular timetabled lessons and their inevitable "normal" interruption of a busy school environment!
teachers working with the experimental groups. In all cases, I directly taught the prerequisite skills and the initial lessons involving the introduction of the facilitating skills, (i.e. the plan for spelling and the plan for reading). This allowed the teacher to carry through with relative ease the plan or strategy the following week.

Furthermore, in order that revision became an automatic classroom procedure (e.g. in the process writing session, in the formal spelling session, in the reading sessions of silent reading or reading comprehension), I demonstrated a variety of ways how this could be done. My regular interventions and observations convinced me that there was otherwise little disruption to the "normal" classroom procedure. Indeed, these observations revealed that the program was enjoyed by the students and their teacher.

3.13.1 Variations in implementation

During the implementation of CIP, it became obvious that, for some, a simplification of the facilitating skills was appropriate. This was the case for Group 3 (students with moderate/severe intellectual disabilities). These children required many lessons in the acquisition of prerequisite 1 (my plan for doing things) and the prerequisites involving vowels (prerequisite 2-6) were not treated. Furthermore, because of the slow learning rate of these children and the reality of a time frame, it was considered inappropriate to try to teach these students the Plan for Spelling. The Plan for Reading was revised accordingly:
Reading (Word attack!) Plan.

**Step 1.** If you know the word, just read it!

**Step 2.** If not, can you guess the word

- from the story?
- from the picture?
- from the word itself? (What is the first sound?).

**Step 3.** If you can't guess the word, and if you absolutely must have it, sound out the word

**Step 4.** Have you won the attack?

- yes? Good, keep reading.
- no? Then don't worry but keep reading.

---

### 3.14 Documentation: The independent variable and classroom procedure.

The Cognitive-Interactive Program for Facilitating the Learning of Reading was designed for ease of implementation on behalf of the classroom teacher. It was designed to complement, rather than to substitute, the existing classroom program. CIP was prepared as a self-contained booklet for teachers. A copy of this booklet has been placed in the appendix (see Appendix 2).

The introductory section is intended to acquaint (albeit briefly) the participating teachers with the background for the theory on which the program is based. This section also notes reports which suggest that in fact up to twenty percent of our children are failing to read at a satisfactory level. As failure in reading is arguably the saddest outcome of an unrewarding school career, then if this program proved helpful even to some of the children involved in this experiment, then it would be worth the effort of implementation.

Part Two of the program stipulates the prerequisite skills required by both the teacher and the students. This section includes possible example lessons to assist the teacher.

Part Three treats the facilitating skills of the Cognitive-
Interactive Program for Reading (i.e. the plans) and this section again includes possible example lessons to assist the teacher.

Part Four projects many facilitating lessons for the Cognitive-Interactive Program for Reading. The lesson outlines are by way of suggestions only. It is not the intention of CIP to be prescriptive and thereby restrictive of the professional teacher's judgements as to lesson content. As discussed in Research Design (section 3.10), however, it is necessary that each teacher follow the program in a manner that protects the independent variable from becoming intrinsically dependent on the teacher's interpretation of implementation. Where some prescriptive suggestions are offered, these serve simply as a starting point.

Part Five includes the Appendices (for the program) and a glossary of terms. This section tabulates the Scope and Sequence of the program and offers many ideas for charts and lesson aides for the participating teachers.

Part Six is the original reference list for CIP. It has been included in the appendix as it was thus presented to the teachers participating in this experiment.

To avoid confusion the print convention for CIP deliberately differs from that adopted for the rest of the thesis. It is acknowledged that most references for CIP re-appear in the reference section of the thesis document.

3.15 Documentation: Department of Education

This research requires the co-operation of the N.S.W. Department of Education in the following ways:

a) Permission to research within Departmental Schools, and
b) The granting of Study Leave to this researcher.
To reproduce this documentation in its entirety would not enhance the thesis. Indeed, much of the documentation (e.g. CIP as it was submitted to the Regional Director for approval to use in local schools) is already included in this presentation. Therefore, copies of any official documentation to the Department of Education have been limited to letter correspondence between myself and the relevant Departmental representative. Such copies are to be found in Appendix 3.
CHAPTER FOUR

RESULTS AND DISCUSSION

4.0 Introduction.

Data were gathered from over three hundred students from thirteen different schools (for report of raw data, see Appendix 4). Four different groups of students, representing four different aetiologies were examined. The results from thirty-six sets of pretests and posttests were examined through Analysis of Variance (Group 1 and Group 2), or through Repeated Measure Analysis of Variance (Group 3 and Group 4). The statistical package used was SAS.

Some questions could not be answered for all schools, because in some cases, pretests or posttests could not be given (see section 3.13). Nevertheless, the overall findings show that it is possible to facilitate significant reading improvement for students suffering reading disabilities and difficulties.

Furthermore, some interesting observations were noted and these are discussed at the end of this chapter.

4.1 Overview of chapter format.

Tables 4.1-4.8 present the findings for Groups 1, 2 and 4 (ESL, IM and LD). These tables report the p value, number of observations, and the consequent acceptance or rejection of the null hypothesis. Means and the standard deviations of the control and experimental samples have also been reported. (Note that full summary tables have been included in Appendix 5).

Following each section of the tables, discussion arising from the implications of each result has been included. The data being analysed are the changes for each student from pretest to posttest results (i.e. individual's posttest result minus his/her pretest result). A positive mean20 indicates a positive gain for that group, a negative mean indicates a negative gain for that group. Where a significant difference (p<.05) in means occurs in

20 The means have been calculated by SAS.
favour of the experimental group, on the two-tailed test of significance, it is concluded that the experimental group has improved more than the control group because of the implementation of the I.V.

Table 4.9 presents the findings for Group 3 (IO/IS) separately.

4.2 Findings: Reading Rate.

In relation to change over time, is there a significant difference between the experimental and control groups in reading rate?

<table>
<thead>
<tr>
<th>TABLE 4.1 Reading Rate$^{21}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>i) students with an ESL classification</td>
</tr>
<tr>
<td>Result of F</td>
</tr>
<tr>
<td>F(obs) ≤ F(req)</td>
</tr>
<tr>
<td>n=76</td>
</tr>
<tr>
<td>SD Control 1.062</td>
</tr>
<tr>
<td>ii) high school ESL students</td>
</tr>
<tr>
<td>Result of F</td>
</tr>
<tr>
<td>F(obs) ≤ F(req)</td>
</tr>
<tr>
<td>n=21</td>
</tr>
<tr>
<td>SD Control 0.862</td>
</tr>
</tbody>
</table>

$^{21}$ Analysis of data processed through Analysis of Variance, statistical package SAS.
These findings reveal that CIP did not have a significant influence on the reading rate of students whose reading difficulty is defined by the Department of School Education to lie within the aetiology of their learning English as a second language. The p value for the primary group (p=.0680) is interesting, and indicates the need for further investigation.

Table 4.1 Reading Rate (cont)\(^{22}\).

\(^{22}\) Analysis of data processed through Analysis of Variance, statistical package SAS.
iii) primary school IM students

<table>
<thead>
<tr>
<th>Result of F (obs) ≤ F(req)</th>
<th>p Value</th>
<th>Decision</th>
<th>Mean (3 dec places)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F(obs) ≤ F(req)</td>
<td>p = .9730</td>
<td>Accept H₀</td>
<td>Control -0.443 (n=13)</td>
</tr>
<tr>
<td></td>
<td>n=47</td>
<td></td>
<td>Experi -0.458 (n=34)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD Control 1.364</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD Experi 1.327</td>
</tr>
</tbody>
</table>

These findings reveal that CIP did not have a significant influence on the reading rate of students whose reading difficulty is defined by the Department of School Education to lie within the aetiology of a mild intellectual disability.

Table 4.1 Reading Rate<sup>23</sup> (cont).

i) students with an LD classification

<table>
<thead>
<tr>
<th>Result of F (obs) ≤ F(req)</th>
<th>p Value</th>
<th>Decision</th>
<th>Mean (3 dec places)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F(obs) ≤ F(req)</td>
<td>p = .3663</td>
<td>Accept H₀</td>
<td>Control -0.866</td>
</tr>
<tr>
<td></td>
<td>n=20</td>
<td></td>
<td>Experi -0.068</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD Control 0.652</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD Experi 1.223</td>
</tr>
</tbody>
</table>

ii) high school LD students

<table>
<thead>
<tr>
<th>Result of F (obs) ≤ F(req)</th>
<th>p Value</th>
<th>Decision</th>
<th>Mean (3 dec places)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F(obs) ≤ F(req)</td>
<td>p = .1409</td>
<td>Accept H₀</td>
<td>Control -0.866</td>
</tr>
<tr>
<td></td>
<td>n=5</td>
<td></td>
<td>Experi -0.068</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD Control 0.652</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD Experi 1.223</td>
</tr>
</tbody>
</table>

---

<sup>23</sup> Analysis of data processed through Repeated Measures Analysis of Variance. Statistical package SAS.
iii) primary school LD students

Result of F  p Value  Decision  Mean (3 dec places)
F(obs) ≤ F(req)  p = .5533  Accept H₀  Control -0.267
n=15
Experi 0.233
SD Control 1.791
SD Experi 1.730

These findings reveal that CIP did not have a significant influence on the reading rate of students whose reading difficulty is defined by the Department of School Education to lie within the aetiology of unspecified learning disability.

4.3 Findings: Reading Accuracy.
In relation to change over time, is there a significant difference between the experimental and control groups in reading accuracy?

<table>
<thead>
<tr>
<th>TABLE 4.2 Reading Accuracy</th>
</tr>
</thead>
</table>
i) students with an ESL classification?

Result of F  p Value  Decision  Mean (3 dec places)
F(obs) ≤ F(req)  p = .1318  Accept H₀  Control 0.447 (n=33)
n=76
Experi 0.711 (n=43)
SD Control 0.841
SD Experi 0.670
ii) high school ESL students?

<table>
<thead>
<tr>
<th>Result of F</th>
<th>p Value</th>
<th>Decision</th>
<th>Mean (3 dec places)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F(obs) ≤ F(req)</td>
<td>p = .6516</td>
<td>Accept H0</td>
<td>Control 0.493 (n=10)</td>
</tr>
<tr>
<td>n=21</td>
<td></td>
<td></td>
<td>Exper 0.644 (n=11)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD Control 0.810</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD Exper 0.695</td>
</tr>
</tbody>
</table>

iii) primary school ESL students?

<table>
<thead>
<tr>
<th>Result of F</th>
<th>p Value</th>
<th>Decision</th>
<th>Mean (3 dec places)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F(obs) ≤ F(req)</td>
<td>p = .1453</td>
<td>Accept H0</td>
<td>Control 0.427 (n=23)</td>
</tr>
<tr>
<td>n=55</td>
<td></td>
<td></td>
<td>Exper 0.734 (n=32)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD Control 0.871</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD Exper 0.671</td>
</tr>
</tbody>
</table>

These findings reveal that CIP did not have a significant influence on the reading accuracy of students whose reading difficulty is defined by the Department of School Education to lie within the aetiology of their learning English as a second language.

Although all students did improve their reading accuracy, there was not a significant difference between the improvement of the experimental group and the control group. It would appear that the ESL sample consistently improved their accuracy, which is most likely due to normal maturational development.

However, it must be noted that this result, requiring the acceptance of the null hypothesis, is not consistent with all other findings regarding reading accuracy. For the other reading accuracy scores, see below Table 4.2 (cont), both the IM and LD samples show a significant difference between the control and experimental groups results. These differences reveal that the experimental IM and LD groups improved by significantly more than the IM and LD control groups. Furthermore, the phonological word processing skills' scores for the ESL students were consistent with those of the IM and LD groups (see Table 4.4). These results revealed that all the experimental groups improved by significantly more than the control groups. Phonological word processing is another reflection of reading accuracy.
In view of the apparent inconsistency, this finding is worthy of further investigation.

---

**Table 4.2 Reading Accuracy (cont)**

i) students with an IM classification

<table>
<thead>
<tr>
<th>Result of F</th>
<th>p Value</th>
<th>Decision</th>
<th>Mean (3 dec places)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F(obs) &gt; F(req)</td>
<td>p = .0216</td>
<td>Accept H₀</td>
<td>Control 0.063 (n=24)</td>
</tr>
<tr>
<td>n=72</td>
<td></td>
<td></td>
<td>Experi 0.378 (n=48)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD Control 0.570</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD Experi 0.520</td>
</tr>
</tbody>
</table>

ii) high school IM students

<table>
<thead>
<tr>
<th>Result of F</th>
<th>p Value</th>
<th>Decision</th>
<th>Mean (3 dec places)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F(obs) ≤ F(req)</td>
<td>p = .2640</td>
<td>Accept H₀</td>
<td>Control 0.131 (n=11)</td>
</tr>
<tr>
<td>n=25</td>
<td></td>
<td></td>
<td>Experi 0.476 (n=14)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD Control 0.796</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD Experi 0.708</td>
</tr>
</tbody>
</table>

iii) primary school IM students

<table>
<thead>
<tr>
<th>Result of F</th>
<th>p Value</th>
<th>Decision</th>
<th>Mean (3 dec places)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F(obs) &gt; F(req)</td>
<td>p = .0132</td>
<td>Accept H₀</td>
<td>Control 0.005 (n=13)</td>
</tr>
<tr>
<td>n=47</td>
<td></td>
<td></td>
<td>Experi 0.338 (n=34)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD Control 0.296</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD Experi 0.426</td>
</tr>
</tbody>
</table>

These findings reveal that CIP had a significant influence in improving the reading accuracy of most students whose reading difficulty is defined by the Department of School Education to lie within the aetiology of a mild intellectual disability. Both the overall sample (p=.0216) and the primary samples (p=.0132) showed a significant improvement. However, this experiment did not show a significant influence on the reading accuracy for high
school IM students (p=.2640).

Any apparent inconsistent finding regarding the high school IM students, may be explained through the earlier findings of Maker (1981). In her findings that learning difficulties were related to apparent inability to generalise a previously learned problem solving strategy, Maker (1981) also concluded that it was more difficult to teach problem solving strategies to older, more mature students. Perhaps high school IM students are demonstrating the "inflexible personality" reported by Serfontein (1990, p.21).

No doubt further investigation is required to resolve this issue. However, the results for the mildly intellectually disabled sample remain interesting. The magnitude of reading difficulty for IM students is reflected in the raw data (see Appendix 4). Pretest raw scores reveal that for most of these high school students (chronologically aged thirteen years to seventeen years) the normed reading scores were those of infant-aged children (chronologically aged five to eight years). It is worth noting that the highest pretest score for reading accuracy from the high school sample effectively translates to a reading accuracy score of a student in the mid-fourth grade (see Appendix 4; student number 42, raw score reading accuracy = 9.58). The fact remains that, notwithstanding the apparent inconsistent result of the high school students, for the overall sample the experimental group have experienced a significantly greater improvement when compared to the control group in their reading accuracy following exposure to CIP.

This experiment shows that it is indeed possible to help IM students experiencing reading failure, and there is little doubt that such help is required urgently. Early intervention via CIP for this population can be readily justified and should not be caught up in the "tow-truck" described by Reynolds and Dallas (1989). It has already been accepted that current research supports the conclusion that early intervention has a significant effect on young children with intellectual and learning disabilities (Dale & Cole, 1988).
Table 4.2 Reading Accuracy (cont)

i) students with an LD classification

<table>
<thead>
<tr>
<th>Result of F</th>
<th>p Value</th>
<th>Decision</th>
<th>F(obs) &gt; F(req)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F(obs) &gt; F(req)</td>
<td>p = .0001</td>
<td>Accept H_A</td>
<td>n=20</td>
</tr>
</tbody>
</table>

ii) high school LD students

<table>
<thead>
<tr>
<th>Result of F</th>
<th>p Value</th>
<th>Decision</th>
<th>Mean (3 dec places)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F(obs) &gt; F(req)</td>
<td>p = .0066</td>
<td>Accept H_A</td>
<td>Control: -0.148</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Experi: 1.102</td>
</tr>
<tr>
<td></td>
<td>n=5</td>
<td></td>
<td>SD Control: 0.466</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD Experi: 0.200</td>
</tr>
</tbody>
</table>

iii) primary school LD students

<table>
<thead>
<tr>
<th>Result of F</th>
<th>p Value</th>
<th>Decision</th>
<th>Mean (3 dec places)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F(obs) &gt; F(req)</td>
<td>p = .0001</td>
<td>Accept H_A</td>
<td>Control: 0.173</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Experi: 0.733</td>
</tr>
<tr>
<td></td>
<td>n=15</td>
<td></td>
<td>SD Control: 0.440</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD Experi: 0.337</td>
</tr>
</tbody>
</table>

These findings reveal that CIP had a significant influence in improving the reading accuracy of students whose reading difficulty is defined by the Department of School Education to lie within the aetiology of unspecified learning disability.

This finding is consistent with similar findings in relation to Group 2, but it appears that high school LD students are more able to adopt, or learn, a new problem solving strategy than their high school IM peers.

These results suggest that CIP can be implemented profitably among the LD population. The findings of Dale and Cole (1988) show that this should be done early in their school careers, and indeed if possible, at the first indication of failure.
4.4 Findings: Reading Comprehension.

In relation to change over time, is there a significant difference between the experimental and control groups in reading comprehension?

TABLE 4.3 Reading Comprehension

i) students with an ESL classification?

<table>
<thead>
<tr>
<th>Result of F</th>
<th>p Value</th>
<th>Decision</th>
<th>Mean (3 dec places)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F(obs) ≤ F(req)</td>
<td>p = .3759</td>
<td>Accept H₀</td>
<td>Control 0.682 (n=33)</td>
</tr>
<tr>
<td>n=76</td>
<td></td>
<td></td>
<td>Experi 2.566 (n=43)</td>
</tr>
</tbody>
</table>

SD Control 0.852
SD Experi 12.105

ii) high school ESL students?

<table>
<thead>
<tr>
<th>Result of F</th>
<th>p Value</th>
<th>Decision</th>
<th>Mean (3 dec places)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F(obs) ≤ F(req)</td>
<td>p = .8635</td>
<td>Accept H₀</td>
<td>Control 0.416 (n=10)</td>
</tr>
<tr>
<td>n=21</td>
<td></td>
<td></td>
<td>Experi 0.491 (n=11)</td>
</tr>
</tbody>
</table>

SD Control 1.020
SD Experi 0.949
iii) primary school ESL students?

<table>
<thead>
<tr>
<th>Result of F</th>
<th>p Value</th>
<th>Decision</th>
<th>Mean (3 dec places)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F(obs) ≤ F(req)</td>
<td>p = .4011</td>
<td>Accept H₀</td>
<td>Control 0.798 (n=23)</td>
</tr>
<tr>
<td>n=55</td>
<td></td>
<td></td>
<td>Experi 3.279 (n=32)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD Control 0.763</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD Experi 14.007</td>
</tr>
</tbody>
</table>

These findings reveal that CIP did not have a significant influence on the reading comprehension of students whose reading difficulty is defined by the Department of School Education to lie within the aetiology of their learning English as a second language.

Table 4.3 Reading Comprehension (cont)

i) students with an IM classification

<table>
<thead>
<tr>
<th>Result of F</th>
<th>p Value</th>
<th>Decision</th>
<th>Mean (3 dec places)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F(obs) ≤ F(req)</td>
<td>p = .1672</td>
<td>Accept H₀</td>
<td>Control 0.228 (n=24)</td>
</tr>
<tr>
<td>n=72</td>
<td></td>
<td></td>
<td>Experi 0.497 (n=48)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD Control 0.712</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD Experi 0.797</td>
</tr>
</tbody>
</table>

ii) high school IM students

<table>
<thead>
<tr>
<th>Result of F</th>
<th>p Value</th>
<th>Decision</th>
<th>Mean (3 dec places)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F(obs) ≤ F(req)</td>
<td>p = .5600</td>
<td>Accept H₀</td>
<td>Control 0.339 (n=11)</td>
</tr>
<tr>
<td>n=25</td>
<td></td>
<td></td>
<td>Experi 0.565 (n=14)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD Control 1.001</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD Experi 0.905</td>
</tr>
</tbody>
</table>
iii) **primary school** IM students

<table>
<thead>
<tr>
<th>Result of F</th>
<th>p Value Decision</th>
<th>Mean (3 dec places)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F(obs) ≤ F(req)</td>
<td>p = .1353 Accept H₀</td>
<td>Control 0.134 (n=13)</td>
</tr>
<tr>
<td>n=47</td>
<td>Experi 0.469 (n=34)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SD Control 0.340</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SD Experi 0.761</td>
<td></td>
</tr>
</tbody>
</table>

These findings reveal that CIP did not have a significant influence on the reading comprehension of students whose reading difficulty is defined by the Department of School Education to lie within the aetiology of a mild intellectual disability.

---

### Table 4.3 Reading Comprehension (cont)

i) **students with an LD classification**

<table>
<thead>
<tr>
<th>Result of F</th>
<th>p Value Decision</th>
<th>Mean (3 dec places)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F(obs) &gt; F(req)</td>
<td>p = .0001 Accept Hₐ</td>
<td></td>
</tr>
<tr>
<td>n=20</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ii) **high school** LD students

<table>
<thead>
<tr>
<th>Result of F</th>
<th>p Value Decision</th>
<th>Mean (3 dec places)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F(obs) ≤ F(req)</td>
<td>p = .0943 Accept H₀</td>
<td>Control 0.048</td>
</tr>
<tr>
<td>n=5</td>
<td>Experi 1.034</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SD Control 0.741</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SD Experi 0.490</td>
<td></td>
</tr>
</tbody>
</table>

iii) **primary school** LD students

<table>
<thead>
<tr>
<th>Result of F</th>
<th>p Value Decision</th>
<th>Mean (3 dec places)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F(obs) &gt; F(req)</td>
<td>p = .0002 Accept Hₐ</td>
<td>Control 0.009</td>
</tr>
<tr>
<td>n=15</td>
<td>Experi 0.930</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SD Control 0.478</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SD Experi 0.364</td>
<td></td>
</tr>
</tbody>
</table>
These findings reveal that CIP had a significant influence in improving the reading comprehension of most students whose reading difficulty is defined by the Department of School Education to lie within the aetiology of unspecified learning disability.

Again, the high school sample is interesting for its apparent inconsistency with the general findings. For high school LD students, the null hypothesis was accepted (p=.0943) yet, the fact remains that for the overall sample, the experimental group have experienced a significantly greater improvement when compared to the control group in their reading comprehension. No doubt the small sample number for the high school LD group (n=5) makes analysis difficult. However, I suspect that, as for their high school IM peers, these high school LD students are confirming the findings of Maker (1981) and Serfontein (1990). This high school LD group is demonstrating the "inflexible personality" (Serfontein, 1990, p.21) that makes the teaching of problem solving strategies to these older, more mature students, more difficult (Maker, 1981).

This result of significant improvements for most of the LD students is interesting, for CIP does not teach specific comprehension strategies. Therefore significant improvements of the LD experimental groups when compared to the LD control groups must be originating from another source. These findings raise exciting possibilities if one considers the significant cloze result of the LD primary sample\textsuperscript{24}. The significant results for the reading accuracy, reinforced by the significant result for the primary LD cloze, suggest that the significant improvements that this LD group achieved in their reading accuracy (p=.001, .0066, .0001)\textsuperscript{25} and in (two of the three results for) their phonological word processing skills (p=.0003, .1051, .0019)\textsuperscript{26} are transferring to the reading comprehension.

\textsuperscript{24} see Table 4.8
\textsuperscript{25} see Table 4.2
\textsuperscript{26} see Table 4.4
4.5 Findings: Phonological Word Processing Skills.

In relation to change over time, is there a significant difference between the experimental and control groups in phonological word processing skills?

---

**TABLE 4.4 Phonological Word Processing Skills**

i) students with an ESL classification?

<table>
<thead>
<tr>
<th>Result of F</th>
<th>p Value</th>
<th>Decision</th>
<th>Mean (3 dec places)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F(obs) &gt; F(req)</td>
<td>p = .0003</td>
<td>Accept $H_A$</td>
<td>Control: 3.984 (n=33)</td>
</tr>
</tbody>
</table>

\[ n=76 \]

| | | | Experimental: 16.184 (n=43) |
| | | | SD: Control: 7.565 |
| | | | Experimental: 17.354 |

ii) high school ESL students?

<table>
<thead>
<tr>
<th>Result of F</th>
<th>p Value</th>
<th>Decision</th>
<th>Mean (3 dec places)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F(obs) &gt; F(req)</td>
<td>p = .0379</td>
<td>Accept $H_A$</td>
<td>Control: -0.605 (n=10)</td>
</tr>
</tbody>
</table>

\[ n=21 \]

| | | | Experimental: +8.091 (n=11) |
| | | | SD: Control: 0.877 |
| | | | Experimental: 12.263 |

iii) primary school ESL students?

<table>
<thead>
<tr>
<th>Result of F</th>
<th>p Value</th>
<th>Decision</th>
<th>Mean (3 dec places)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F(obs) &gt; F(req)</td>
<td>p = .0023</td>
<td>Accept $H_A$</td>
<td>Control: 5.979 (n=23)</td>
</tr>
</tbody>
</table>

\[ n=55 \]

| | | | Experimental: 18.967 (n=32) |
| | | | SD: Control: 8.318 |
| | | | Experimental: 18.119 |

These findings reveal that CIP had a significant influence in improving the phonological word processing skills of students.
whose reading difficulty is defined by the Department of School Education to lie within the aetiology of their learning English as a second language. These results are supported by the significant results of the IM and LD groups which indicate that CIP is able to facilitate the phonological word processing skills of a wide variety of students with reading difficulties.

An interesting trend is revealed through an examination of the standard deviations. In each case, the within-group difference for the experimental groups is much greater than the within-group difference for the control groups. Perhaps this is an indicator of the level of facilitation that CIP was able to generate. In section 2.7.2. I discussed how a child's mind is like a highly sophisticated library system, or even like a workshop offering "materials" (knowledge) and "tools" (strategies). The within-group difference reflected in the experimental groups' standard deviations (17.354, 12.263, 18.119) suggest that for some students the knowledge and strategies were already available, but were not being accessed with any degree of consistency or expertise. These students' scores, in having a much wider spread, most probably reflect that those with "more tools" were able to become consistent and expert in their application once an appropriate strategy was utilised.

This research has shown that it is possible to improve the phonological word processing skills of ESL students by the implementation of CIP. I suspect that this result is due to the facilitation that CIP was able to generate through the cognitive strategies which effectively "tidy" the consistency and accessing of pre-existing knowledge and strategies.
Table 4.4 Phonological Word Processing Skills (cont)

<table>
<thead>
<tr>
<th>i) students with an IM classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Result of F</td>
</tr>
<tr>
<td>F(obs) &gt; F(req)</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ii) high school IM students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Result of F</td>
</tr>
<tr>
<td>F(obs) ≤ F(req)</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>iii) primary school IM students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Result of F</td>
</tr>
<tr>
<td>F(obs) &gt; F(req)</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

These findings reveal that CIP had a significant influence in improving the phonological word processing skills of most students whose reading difficulty is defined by the Department of School Education to lie within the aetiology of a mild intellectual disability. It is apparent that the pattern for phonological word processing skills has repeated that of reading accuracy for this sample. The overall experimental group IM sample experienced a significant improvement ($p=.0002$) compared to their control group peers following exposure to CIP. Similarly the primary school experimental IM sample experienced a significant improvement ($p=.0002$) compared to their control group peers. However, consistent with the reading accuracy scores, the high
school experimental IM sample did not show a significant difference.

As discussed above in section 4.3, in the light of the literature (see Serfontein, 1990; Maker, 1981) this result is taken to suggest early exposure to remedial packages such as CIP, rather than that exposure be avoided. The magnitude of the high school IM reading disability is reflected in the raw data (see Appendix 4; student numbers 31-46; 188-206). These raw scores reveal that one third of the pretest scores were less than twenty-five percent of what should be a relatively simple word list for students of this chronological age.

Table 4.4 Phonological Word Processing Skills (cont)

i) students with an LD classification

<table>
<thead>
<tr>
<th>Result of F</th>
<th>p Value</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>F(obs) &gt; F(req)</td>
<td>p = .0003</td>
<td>Accept HA</td>
</tr>
<tr>
<td>n=20</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ii) high school LD students

<table>
<thead>
<tr>
<th>Result of F</th>
<th>p Value</th>
<th>Decision</th>
<th>Mean (3 dec places)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F(obs) ≤ F(req)</td>
<td>p = .1051</td>
<td>Accept H0</td>
<td>Control 8.022</td>
</tr>
<tr>
<td>n=5</td>
<td>Experi 14.946</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SD Control 6.724</td>
<td>SD Experi 8.551</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### iii) primary school LD students

<table>
<thead>
<tr>
<th>Result of F</th>
<th>p Value</th>
<th>Decision</th>
<th>Mean (3 dec places)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F(\text{obs}) &gt; F(\text{req})</td>
<td>p = .0019</td>
<td>Accept HA</td>
<td>Control 4.395</td>
</tr>
<tr>
<td>n=15</td>
<td></td>
<td></td>
<td>Experi 10.986</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD Control 5.928</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD Experi 4.878</td>
</tr>
</tbody>
</table>

These findings reveal that CIP had a significant influence in improving the phonological word processing skills of most students whose reading difficulty is defined by the Department of School Education to lie within the aetiology of unspecified learning disability.

The high school sample is again the exception to the general findings. It must be accepted that the small high school LD sample number (n=5) makes analysis difficult. However, I contend that, as for their high school IM peers, these high school LD students are confirming the findings of Maker (1981) and Serfontein (1990). CIP assisted most of the LD population sample in improving their reading accuracy, reading comprehension, phonological word processing and also in improving some (the primary sample) cloze. Further investigation is needed to resolve the matter of apparently inconsistent findings in relation to the high school groups in general.

The overall findings however, remain exciting and they indicate that CIP could be implemented in many more circumstances for the LD students in our schools.
4.6 Findings: Visual Discrimination.

In relation to change over time, is there a significant difference between the experimental and control groups in visual discrimination?

---

**TABLE 4.5 Visual Discrimination**

**i) students with an ESL classification?**

<table>
<thead>
<tr>
<th>Result of F</th>
<th>p Value</th>
<th>Decision</th>
<th>Mean (3 dec places)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F(obs) ≤ F(req)</td>
<td>p = .2758</td>
<td>Accept H₀</td>
<td>Control 3.600 (n=25)</td>
</tr>
<tr>
<td>n=66</td>
<td></td>
<td></td>
<td>Experi 0.488 (n=41)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD Control 18.000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD Experi 2.181</td>
</tr>
</tbody>
</table>

**ii) high school ESL students?**

<table>
<thead>
<tr>
<th>Result of F</th>
<th>p Value</th>
<th>Decision</th>
<th>Mean (3 dec places)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F(obs) ≤ F(req)</td>
<td>p = .4632</td>
<td>Accept H₀</td>
<td>Control 6.429 (n=14)</td>
</tr>
<tr>
<td>n=22</td>
<td></td>
<td></td>
<td>Experi 0.000 (n=8)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD Control 24.054</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD Experi 0.000</td>
</tr>
</tbody>
</table>

**iii) primary school ESL students?**

<table>
<thead>
<tr>
<th>Result of F</th>
<th>p Value</th>
<th>Decision</th>
<th>Mean (3 dec places)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F(obs) ≤ F(req)</td>
<td>p = .4151</td>
<td>Accept H₀</td>
<td>Control 0.0000 (n=11)</td>
</tr>
<tr>
<td>n=44</td>
<td></td>
<td></td>
<td>Experi 0.6061 (n=33)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD Control 0.000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD Experi 2.423</td>
</tr>
</tbody>
</table>

These findings reveal that CIP did not have a significant influence on the visual discrimination of students whose reading difficulty is defined by the Department of School Education to lie within the aetiology of their learning English as a second language.
This finding is consistent throughout the research for all the population samples. The implications of these findings for all the population samples are discussed in section 4.13.

Table 4.5 Visual Discrimination (cont)

i) students with an IM classification

<table>
<thead>
<tr>
<th>Result of F</th>
<th>p Value Decision</th>
<th>Mean (3 dec places)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F(obs) ≤ F(req)</td>
<td>p = .4646</td>
<td>Accept $H_0$</td>
</tr>
<tr>
<td>n=36</td>
<td>Control 0.000 (n=5)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Experi 6.774 (n=31)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SD Control 0.000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SD Experi 20.230</td>
<td></td>
</tr>
</tbody>
</table>

ii) high school IM students

<table>
<thead>
<tr>
<th>Result of F</th>
<th>p Value Decision</th>
<th>Mean (3 dec places)</th>
</tr>
</thead>
<tbody>
<tr>
<td>p = * (insufficient data)</td>
<td>n=11</td>
<td>Control 0.000 (n=5)</td>
</tr>
<tr>
<td></td>
<td>Experi 0.000 (n=6)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SD Control 0.000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SD Experi 0.000</td>
<td></td>
</tr>
</tbody>
</table>

iii) primary school IM students

<table>
<thead>
<tr>
<th>Result of F</th>
<th>p Value Decision</th>
<th>Mean (3 dec places)</th>
</tr>
</thead>
<tbody>
<tr>
<td>p = * (insufficient data)</td>
<td>n=25</td>
<td>Control (N/A) (n=0)</td>
</tr>
<tr>
<td></td>
<td>Experi 8.400 (n=25)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SD Control *</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SD Experi 22.301</td>
<td></td>
</tr>
</tbody>
</table>

These findings reveal that CIP did not have a significant influence on the visual discrimination of students whose reading difficulty is defined by the Department of School Education to lie within the aetiology of a mild intellectual disability.
Table 4.5 Visual Discrimination (cont)

i) students with an LD classification

<table>
<thead>
<tr>
<th>Result of F</th>
<th>p Value</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>F(obs) ≤ F(req)</td>
<td>p = .1876</td>
<td>Accept H₀</td>
</tr>
<tr>
<td>n=17</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ii) high school LD students

<table>
<thead>
<tr>
<th>Result of F</th>
<th>p Value</th>
<th>Decision</th>
<th>Mean (3 dec places)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F(obs) ≤ F(req)</td>
<td>p = .3632</td>
<td>Accept H₀</td>
<td>Control 1.667</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Experi 0.000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD Control 4.082</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD Experi 0.000</td>
</tr>
<tr>
<td>n=6</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

iii) primary school LD students

<table>
<thead>
<tr>
<th>Result of F</th>
<th>p Value</th>
<th>Decision</th>
<th>Mean (3 dec places)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F(obs) ≤ F(req)</td>
<td>p = .3409</td>
<td>Accept H₀</td>
<td>Control 3.333</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Experi 0.909</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD Control 4.924</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD Experi 3.015</td>
</tr>
<tr>
<td>n=11</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

These findings reveal that CIP did not have a significant influence on the visual discrimination of students whose reading difficulty is defined by the Department of School Education to lie within the aetiology of unspecified learning disability.
4.7 Findings: Spelling.

In relation to change over time, is there a significant difference between the experimental and control groups in spelling?

**TABLE 4.6 Spelling**

i) students with an ESL classification?

<table>
<thead>
<tr>
<th>Result of F</th>
<th>p Value</th>
<th>Decision</th>
<th>Mean (3 dec places)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$F(\text{obs}) \leq F(\text{req})$</td>
<td>$p = .4777$</td>
<td>Accept $H_0$</td>
<td>Control 0.000 (n=1)</td>
</tr>
<tr>
<td>n=26</td>
<td></td>
<td></td>
<td>Experi 3.019 (n=25)</td>
</tr>
<tr>
<td>SD Control *</td>
<td></td>
<td></td>
<td>SD Experi 4.104</td>
</tr>
</tbody>
</table>

ii) high school ESL students?

<table>
<thead>
<tr>
<th>Result of F</th>
<th>p Value</th>
<th>Decision</th>
<th>Mean (3 dec places)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$p = *$ (insufficient data)</td>
<td></td>
<td></td>
<td>Control (N/A) (n=0)</td>
</tr>
<tr>
<td>n=6</td>
<td></td>
<td></td>
<td>Experi 5.000 (n=6)</td>
</tr>
<tr>
<td>SD Control *</td>
<td></td>
<td></td>
<td>SD Experi 3.137</td>
</tr>
</tbody>
</table>

iii) primary school ESL students?

<table>
<thead>
<tr>
<th>Result of F</th>
<th>p Value</th>
<th>Decision</th>
<th>Mean (3 dec places)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$F(\text{obs}) \leq F(\text{req})$</td>
<td>$p = .5892$</td>
<td>Accept $H_0$</td>
<td>Control 0.000 (n=1)</td>
</tr>
<tr>
<td>n=20</td>
<td></td>
<td></td>
<td>Experi 2.394 (n=19)</td>
</tr>
<tr>
<td>SD Control *</td>
<td></td>
<td></td>
<td>SD Experi 4.243</td>
</tr>
</tbody>
</table>
These findings could be taken to indicate that CIP did not have a significant influence on the spelling of students whose reading difficulty is defined by the Department of School Education to lie within the aetiology of their learning English as a second language. However, this finding is not conclusive. The lack of response from the control samples (n=1, n=0) leaves insufficient data to make a decision either way.

Table 4.6 Spelling (cont)

i) students with an IM classification

<table>
<thead>
<tr>
<th>Result of F</th>
<th>p Value</th>
<th>Decision</th>
<th>Mean (3 dec places)</th>
</tr>
</thead>
<tbody>
<tr>
<td>p = * (insufficient n=23 data)</td>
<td>Control (N/A) (n=0)</td>
<td>Experi 11.815 (n=23)</td>
<td></td>
</tr>
<tr>
<td>SD Control *</td>
<td>SD Experi 11.128</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ii) high school IM students

<table>
<thead>
<tr>
<th>Result of F</th>
<th>p Value</th>
<th>Decision</th>
<th>Mean (3 dec places)</th>
</tr>
</thead>
<tbody>
<tr>
<td>p = * (insufficient n=0 data)</td>
<td>Control (N/A) (n=0)</td>
<td>Experi 1 N/A (n=0)</td>
<td></td>
</tr>
<tr>
<td>SD Control *</td>
<td>SD Experi *</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
iii) primary school IM students

<table>
<thead>
<tr>
<th>Result of F</th>
<th>p Value Decision</th>
<th>Mean (3 dec places)</th>
</tr>
</thead>
<tbody>
<tr>
<td>p = * (insufficient data)</td>
<td></td>
<td>Control (N/A) (n=0)</td>
</tr>
<tr>
<td>n=23</td>
<td></td>
<td>Experi 11.815 (n=23)</td>
</tr>
<tr>
<td>SD Control *</td>
<td></td>
<td>SD Experi 11.128</td>
</tr>
</tbody>
</table>

No conclusions can be drawn from this data other than to suggest that spelling is not a popular past-time in IM classrooms!

Table 4.6 Spelling (cont)

i) students with an LD classification

<table>
<thead>
<tr>
<th>Result of F</th>
<th>p Value Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>F(obs) ≤ F(req)</td>
<td>p = 0.3933 Accept $H_0$</td>
</tr>
<tr>
<td>n=12</td>
<td></td>
</tr>
</tbody>
</table>

ii) high school LD students

<table>
<thead>
<tr>
<th>Result of F</th>
<th>p Value Decision</th>
<th>Mean (3 dec places)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F(obs) &gt; F(req)</td>
<td>p = 0.0161 Accept $H_A$</td>
<td>Control 2.725</td>
</tr>
<tr>
<td>n=3$^{27}$</td>
<td></td>
<td>Experi -8.323</td>
</tr>
<tr>
<td>SD Control 5.653</td>
<td></td>
<td>SD Experi 4.351</td>
</tr>
</tbody>
</table>

iii) primary school LD students

<table>
<thead>
<tr>
<th>Result of F</th>
<th>p Value Decision</th>
<th>Mean (3 dec places)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F(obs) ≤ F(req)</td>
<td>p = 0.1483 Accept $H_0$</td>
<td>Control -2.222</td>
</tr>
<tr>
<td>n=9</td>
<td></td>
<td>Experi 7.070</td>
</tr>
<tr>
<td>SD Control 11.271</td>
<td></td>
<td>SD Experi 8.050</td>
</tr>
</tbody>
</table>

$^{27}$ renders this finding most questionable.
These findings reveal that CIP did not have a significant influence on the spelling of most students whose reading difficulty is defined by the Department of School Education to lie within the aetiology of unspecified learning disability.

Once again the high school sample appeared to go against the general findings. This time however, this sample showed a significant difference (p=.0161), with the experimental group doing less well than the control group! The data from the group sample in general, and from the primary group sample revealed no significant difference (p=.3933, p=.1483). In view of the high school sample size (n=3) which renders this finding most questionable, I have decided to ignore this finding, regardless of the statistical significance. This result requires further investigation.

4.8 Findings: Writing.
In relation to change over time, is there a significant difference between the experimental and control groups in writing?

<table>
<thead>
<tr>
<th>TABLE 4.7 Writing</th>
</tr>
</thead>
<tbody>
<tr>
<td>i) students with an ESL classification?</td>
</tr>
<tr>
<td>Result of F</td>
</tr>
<tr>
<td>F(obs) ≤ F(req)</td>
</tr>
<tr>
<td>n=49</td>
</tr>
<tr>
<td>n=49</td>
</tr>
<tr>
<td>SD Control</td>
</tr>
<tr>
<td>SD Experi</td>
</tr>
</tbody>
</table>
ii) high school ESL students?

<table>
<thead>
<tr>
<th>Result of F</th>
<th>p Value</th>
<th>Decision</th>
<th>Mean (3 dec places)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F(obs) ≤ F(req)</td>
<td>p = .4169</td>
<td>Accept H₀</td>
<td>Control 1.786 (n=14)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Experi 5.000 (n=7)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD Control 8.229</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD Experi 8.660</td>
</tr>
</tbody>
</table>

n=21

iii) primary school ESL students?

<table>
<thead>
<tr>
<th>Result of F</th>
<th>p Value</th>
<th>Decision</th>
<th>Mean (3 dec places)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F(obs) ≤ F(req)</td>
<td>p = .9932</td>
<td>Accept H₀</td>
<td>Control 6.000 (n=5)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Experi 5.942 (n=23)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD Control 16.733</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD Experi 13.083</td>
</tr>
</tbody>
</table>

n=28

These findings reveal that CIP did not have a significant influence on the writing of students whose reading difficulty is defined by the Department of School Education to lie within the aetiology of their learning English as a second language.

Table 4.7 Writing (cont)

i) students with an IM classification

<table>
<thead>
<tr>
<th>Result of F</th>
<th>p Value</th>
<th>Decision</th>
<th>Mean (3 dec places)</th>
</tr>
</thead>
<tbody>
<tr>
<td>p = * (insufficient data)</td>
<td>n=36</td>
<td></td>
<td>Control (N/A) (n=0)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Experi 7.639 (n=36)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD Control *</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD Experi 13.282</td>
</tr>
</tbody>
</table>
ii) high school IM students

<table>
<thead>
<tr>
<th>Result of F</th>
<th>p Value</th>
<th>Decision</th>
<th>Mean (3 dec places)</th>
</tr>
</thead>
<tbody>
<tr>
<td>p = *</td>
<td>(insufficient data)</td>
<td>n=8</td>
<td>Control (N/A) (n=0)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Experi 5.000 (n=8)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD Control *</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD Experi 11.952</td>
</tr>
</tbody>
</table>

iii) primary school IM students

<table>
<thead>
<tr>
<th>Result of F</th>
<th>p Value</th>
<th>Decision</th>
<th>Mean (3 dec places)</th>
</tr>
</thead>
<tbody>
<tr>
<td>p = *</td>
<td>(insufficient data)</td>
<td>n=28</td>
<td>Control (N/A) (n=0)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Experi 8.393 (n=28)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD Control *</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD Experi 13.747</td>
</tr>
</tbody>
</table>

Again, this is a disappointing outcome of classroom procedure which was not under the control of the researcher. No conclusions can be drawn from these data other than to suggest that writing is not a popular past-time in IM classrooms. If this be the case, this is an alarming observation indeed, and one that requires urgent attention.

Table 4.7 Writing (cont)

i) students with an LD classification

<table>
<thead>
<tr>
<th>Result of F</th>
<th>p Value</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>F(obs) ≤ F(req)</td>
<td>p = .3353</td>
<td>Accept H₀</td>
</tr>
<tr>
<td>n=10</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
ii) high school LD students

<table>
<thead>
<tr>
<th>Result of F</th>
<th>p Value</th>
<th>Decision</th>
<th>Mean (3 dec places)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F(obs) ≤ F(req)</td>
<td>p = .4778</td>
<td>Accept H₀</td>
<td>Control 0</td>
</tr>
<tr>
<td>n=3</td>
<td></td>
<td></td>
<td>Experi 6.667</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD Control 9.487</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD Experi 11.547</td>
</tr>
</tbody>
</table>

iii) primary school LD students

<table>
<thead>
<tr>
<th>Result of F</th>
<th>p Value</th>
<th>Decision</th>
<th>Mean (3 dec places)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F(obs) ≤ F(req)</td>
<td>p = .6729</td>
<td>Accept H₀</td>
<td>Control 0.714</td>
</tr>
<tr>
<td>n=7</td>
<td></td>
<td></td>
<td>Experi 2.143</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD Control 6.075</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD Experi 7.560</td>
</tr>
</tbody>
</table>

These findings reveal that CIP did not have a significant influence on the writing of students whose reading difficulty is defined by the Department of School Education to lie within the aetiology of unspecified learning disability.

It must be noted that this sample (n=10) was depleted in comparison to that for reading rate, accuracy, comprehension, and phonological word processing skills (n=20). Therefore, while it is correct to accept the null hypothesis for writing, in view of the exciting findings for all other aspects of reading, further investigations are recommended with this LD group.
4.9 Findings: Cloze.

In relation to change over time, is there a significant difference between the experimental and control groups in cloze?

---

**TABLE 4.8 Cloze**

i) students with an ESL classification?

<table>
<thead>
<tr>
<th>Result of F</th>
<th>p Value</th>
<th>Decision</th>
<th>Mean (3 dec places)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F(obs) ≤ F(req)</td>
<td>p = .7619</td>
<td>Accept $H_0$</td>
<td>Control: 3.367 (n=18)</td>
</tr>
<tr>
<td></td>
<td>n=43</td>
<td></td>
<td>Experi: 4365 (n=25)</td>
</tr>
</tbody>
</table>

SD Control: 10.127
SD Experi: 10.896

ii) high school ESL students?

<table>
<thead>
<tr>
<th>Result of F</th>
<th>p Value</th>
<th>Decision</th>
<th>Mean (3 dec places)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F(obs) ≤ F(req)</td>
<td>p = .1339</td>
<td>Accept $H_0$</td>
<td>Control: 2.565 (n=13)</td>
</tr>
<tr>
<td></td>
<td>n=17</td>
<td></td>
<td>Experi: 10.608 (n=4)</td>
</tr>
</tbody>
</table>

SD Control: 9.245
SD Experi: 7.215

iii) primary school ESL students?

<table>
<thead>
<tr>
<th>Result of F</th>
<th>p Value</th>
<th>Decision</th>
<th>Mean (3 dec places)</th>
</tr>
</thead>
<tbody>
<tr>
<td>F(obs) ≤ F(req)</td>
<td>p = .6951</td>
<td>Accept $H_0$</td>
<td>Control: 5.454 (n=5)</td>
</tr>
<tr>
<td></td>
<td>n=26</td>
<td></td>
<td>Experi: 3.176 (n=21)</td>
</tr>
</tbody>
</table>

SD Control: 13.110
SD Experi: 11.197

These findings reveal that CIP did not have a significant influence on the cloze of students whose reading difficulty is defined by the Department of School Education to lie within the aetiology of their learning English as a second language.
### Table 4.8 Cloze (cont)

#### i) students with an IM classification

<table>
<thead>
<tr>
<th>Result of F</th>
<th>p Value</th>
<th>Decision</th>
<th>Mean (3 dec places)</th>
</tr>
</thead>
<tbody>
<tr>
<td>p = * (insufficient)</td>
<td></td>
<td></td>
<td>Control (N/A) (n=0)</td>
</tr>
<tr>
<td>n=30 data</td>
<td></td>
<td></td>
<td>Experi 4.545 (n=30)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD Control *</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD Experi 8.671</td>
</tr>
</tbody>
</table>

#### ii) high school IM students

<table>
<thead>
<tr>
<th>Result of F</th>
<th>p Value</th>
<th>Decision</th>
<th>Mean (3 dec places)</th>
</tr>
</thead>
<tbody>
<tr>
<td>p = * (insufficient)</td>
<td></td>
<td></td>
<td>Control (N/A) (n=0)</td>
</tr>
<tr>
<td>n=3 data</td>
<td></td>
<td></td>
<td>Experi 20.200 (n=3)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD Control *</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD Experi 4.628</td>
</tr>
</tbody>
</table>

#### iii) primary school IM students

<table>
<thead>
<tr>
<th>Result of F</th>
<th>p Value</th>
<th>Decision</th>
<th>Mean (3 dec places)</th>
</tr>
</thead>
<tbody>
<tr>
<td>p = * (insufficient)</td>
<td></td>
<td></td>
<td>Control (N/A) (n=0)</td>
</tr>
<tr>
<td>n=27 data</td>
<td></td>
<td></td>
<td>Experi 2.806 (n=27)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD Control *</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>SD Experi 7.127</td>
</tr>
</tbody>
</table>

No conclusions were possible from these data.
### Table 4.8 Cloze (cont)

<table>
<thead>
<tr>
<th>i) students with an LD classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Result of F</td>
</tr>
<tr>
<td>F(obs) ≤ F(req)</td>
</tr>
<tr>
<td>n=14</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ii) high school LD students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Result of F</td>
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<tr>
<td>F(obs) ≤ F(req)</td>
</tr>
<tr>
<td></td>
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<td></td>
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<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>iii) primary school LD students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Result of F</td>
</tr>
<tr>
<td>F(obs) ≤ F(req)</td>
</tr>
<tr>
<td></td>
</tr>
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<td></td>
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</table>

These findings reveal that CIP did not have a significant influence on most students whose reading difficulty is defined by the Department of School Education to lie within the aetiology of unspecified learning disability. However, the primary school LD students did show a significant influence in improving their cloze (p=.0190).

This is an exciting result as it indicates that the significant improvement that this LD primary group achieved in their reading comprehension (p=.0002) has been confirmed in their cloze.
4.10 The findings for Group 3.

The following findings reveal that CIP did not have a significant influence on the reading rate, reading accuracy, reading comprehension or phonological word processing skills of students whose reading difficulty is defined by the Department of School Education to lie within the aetiology of a moderate/severe intellectual disability.

No conclusions can be drawn on Visual Discrimination, Spelling, Writing and Cloze.

Further discussion regarding these findings are to be found in section 4.11

<table>
<thead>
<tr>
<th></th>
<th>Result of F</th>
<th>p Value</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading Rate</td>
<td>F(obs) ≤ F(req)</td>
<td>p = .7968</td>
<td>Accept H₀</td>
</tr>
<tr>
<td></td>
<td>n=12</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Result of F</th>
<th>p Value</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading Accuracy</td>
<td>F(obs) ≤ F(req)</td>
<td>p = .2748</td>
<td>Accept H₀</td>
</tr>
<tr>
<td></td>
<td>n=12</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Result of F</th>
<th>p Value</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading Comprehension</td>
<td>F(obs) ≤ F(req)</td>
<td>p = .5557</td>
<td>Accept H₀</td>
</tr>
<tr>
<td></td>
<td>n=12</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

28 Analysis of data processed through Repeated Measures Analysis of Variance. Statistical package SAS.
Phonological Word Processing Skills

Result of $F$    $p$ Value    Decision
$F_{(obs)} \leq F_{(req)}$   $p = .8721$   Accept $H_0$

$n=11$

Visual Discrimination

Due to insufficient data, no analyses were done.

Spelling

Due to insufficient data, no analyses were done.

Writing

Due to insufficient data, no analyses were done.

Cloze

Due to insufficient data, no analyses were done.

4.11 Some interesting observations regarding students with moderate/severe intellectual disability.

Regardless of the statistical results for this group, teachers were enthusiastic about the response from students to CIP. The simple fact must be faced that the tests chosen were too difficult for this group. Furthermore, the time allocated (approximately six weeks for experimental period) was too short for a measurable improvement in this group. Notwithstanding the apparent non-significant result, this proved to be an interesting group with whom further work would most likely be very profitable.

It appeared that CIP heightened these students' awareness of the need to plan. As noted in section 3.13, I was quickly dubbed "the planning lady"! However, the teachers felt that the gains to these students were best revealed through their verbal expression and it goes without saying that no such test was
included in this experiment. Further investigation of the matter is recommended, for it would seem less than kind not to investigate thoroughly any program that might offer enhancement to this group.

4.12 Some interesting observations for reading rate.

The mean for the experimental ESL group (-0.959) indicates that this group slowed their normed rate of reading and the standard deviation (1.198) indicates that this was a fairly consistent within-group trend. The mean for the control ESL group also indicates an overall slowing of rate (-0.358), and again this was a fairly consistent within-group trend (SD=1.156).

On further examination of all the means for rate, it appears that in every case, the ESL sample has in fact slowed their reading rates. An explanation was found in an examination of the Neale Analysis Forms which indicated that students were progressing to more difficult material. No doubt this was because of the time lapse between the pretest and the posttests (approximately six months). Students were entering into the next level of difficulty. Teachers might expect, and should accept, a temporary reduction of rate if such a reduction is off-set by gains in levels of reading accessibility.

Further examination of the raw data for this particular ESL sample indicate another pattern that is very noticeable. On even a cursory examination of the raw data, it is apparent that this ESL population tended to gain much higher reading scores for rate and for accuracy than they did for comprehension (refer for examples to Appendix 4; student numbers 1-30). Perhaps this indicates that ESL children are reading "too fast", and while their reading rate and accuracy may not indicate a problem, their comparatively low comprehension scores should alert a teacher that there is indeed a problem.

The IM sample also slowed their reading rate. However, unlike the ESL sample, this was not because of the students experiencing a natural development that allowed them to enter harder reading material which in turn temporarily slowed their rate. Six months is not a long time when assessing for measurable improvement in students with mild intellectual
disabilities. Rather, on examination of the Neale Analysis Forms, it appeared that this IM sample slowed their rate as a "trade-off" for significantly higher accuracy scores at the same level of reading material.

The LD sample also slowed their reading rates. However, examination of the Neale Analysis Forms did not reveal any obvious patterns.

While this pattern within the ESL, IM and LD samples is of interest, it was, however, outside the purpose of the research, and no further data collection or analyses were undertaken. This matter requires further investigation.

4.13 Some interesting observations for visual discrimination.

The findings of this research revealed that there was no significant difference for visual discrimination between any of the four sample groups. These findings are important because in almost every pretest and posttest, the students achieved 100%. Therefore, there could be no difference between the groups because there was no deficiency to remedy. This finding supports the conclusions of Vellutino (1987) in his claim that reading problems are far from mere visual problems.

Therefore, this research has supported Vellutino's (1987) conclusions that reading problems have their aetiologies in a "subtle language deficiency" (p.20) and that problems with visual perception, or other visual inadequacies, are not a primary concern when dealing with reading problems in the classroom.
CHAPTER FIVE.

SUMMARY AND CONCLUSIONS.

5.0 An overview of this research.

There is an urgent need for thorough research to investigate a reading model that could supplement and complement the psycholinguistic approach by teaching active decoding as a step in the application of cognitive strategies. By emphasising the application of cognitive strategies, the emphasis on decoding skills would become a facilitating skill potentially capable of enhancing reading for life. Such a program would not simply represent a return to phonic based reading schemes.

Up to twenty per cent of our children are failing to learn to read at a level considered adequate in the wider community. Kronick (1990) points out that notwithstanding the fact that labels are "arbitrary cultural constructs, every society has members who have learning or emotional problems" (p.5). She also explains that it is not entirely correct to dismiss learning problems as a school-imposed label for many children interpret out-of-school situations in the same "impervious and constricted a fashion" (p.5). Kronick (1990) suggests that before the label "learning difficulty", such children were "unlabelled, yet learning little in school" (p.5), and concludes:

It is not the label that creates the stigma
but, rather, the behavior. (p.6)

These same students subsequently then leave school to join the one million Australian adults who are for all practical purposes illiterate. There is little argument that illiteracy is deleterious to both the individual and to society as illiteracy
renders many people to the status of social isolates. The importance of the problem is compounded by the Great Debate which continues to rage globally between the adherents to the opposing reading models. The debaters seldom acknowledge the vast background of research into learning failure and strategy deficiencies.

This research suggested that many students are failing to learn because they are cognitively blind. The claim by Johnson and Louis (1986), that children learn "usually unconsciously, the regularities between the way things are written and the way they are spoken" (p.22) may apply in the case of students who are effective readers but, one must accept that this is not the case for those with reading difficulties.

The importance of this research cannot be overstated for it sets out to develop and implement a cognitive-interactive program for facilitating reading for students with reading difficulties. Many teachers implement programs which they feel are of benefit learners, and in particular slow learners. However, regardless of intention Dale and Cole (1988) note:

Progress in the education of handicapped children can come only from a reciprocal interaction between theoretical innovations and a careful evaluation of the effectiveness of models when they are actually implemented in programs. The experience of recent decades suggests, perhaps surprisingly, that innovations may be more easily implemented than evaluated. (p.439)

Therefore this research set out with the intention of evaluating a cognitively-based reading approach designed to remedy reading failure. It involved use of a statistical tool29 that

29 The results from thirty-six sets of pretests and posttests were examined through Analysis of Variance (Group 1 and Group 2), or through Repeated Measure Analysis of Variance (Group 3 and Group 4). Each pretest and each posttest set contained up to
would enable testing for the significance of the difference among two or more population means, and possibly after adjusting for the effects of other factors. This statistical tool handled the question of whether the variability between groups was large enough in comparison with the variability within groups to justify the inference that the means of the populations from which the different groups were sampled were not the same. The study evaluated the cognitive-interactive program specifically developed for this research by testing for statistically measurable difference in the following reading and reading related areas which in turn generated eighty research questions.

- normed reading age in reading rate,
- normed reading age in reading accuracy,
- normed reading age in reading comprehension,
- phonological word processing skills,
- spelling,
- process writing, and
- a cloze exercise.

Because this research sought to determine whether the Cognitive-Interactive Program for Facilitating the Learning of Reading (CIP), (i.e. the independent variable), facilitated reading for students with reading difficulties, two hundred and fifty-nine students from the following populations were examined. These students were gathered from thirteen schools from the South Coast Region of New South Wales. The schools were selected to include High Schools, Primary Schools and Schools for Special Purposes.

Group 1: students whose reading difficulty is defined by the Department of School Education to lie within the aetiology of their learning English as a second language (ESL),

Group 2: students whose reading difficulty is defined by the Department of School Education to lie within the aetiology of a mild intellectual disability (IM),

eight measurements of reading and reading related abilities.
Group 3: students whose reading difficulty is defined by the Department of School Education to lie within the aetiology of a moderate/severe intellectual disability (IO/IS),

Group 4: students whose reading difficulty is defined by the Department of School Education to lie within the aetiology of an unspecified leaning disability (LD).

Groups 1 and 2 were divided into separate experimental and control groups, and Groups 3 and 4 served as their own control before exposure to CIP. This generated over three-hundred individual student observations through the pretests and posttests.

5.1 A summary of findings.

The overall findings of the research were considered exciting as they show clearly that it is possible to facilitate significantly reading for those students suffering reading disabilities and difficulties.

Specifically, this research found that the Reading Accuracy was improved significantly:

*for the sample of students whose reading difficulty is defined by the Department of School Education to lie within the aetiology of a mild intellectual disability (IM), and in particular to primary IM students.

*for the sample of students whose reading difficulty is defined by the Department of School Education to lie within the aetiology of an unspecified leaning disability (LD), and in this instance to both high school LD students and primary LD students.
Specifically, this research found that the Reading Comprehension was improved significantly:

*for the sample of students whose reading difficulty is defined by the Department of School Education to lie within the aetiology of an unspecified leaning disability (LD), and in particular to primary LD students.

Specifically, this research found that the Phonological Word Processing Skills were improved significantly:

*for the sample of students whose reading difficulty is defined by the Department of School Education to lie within the aetiology of their learning English as a second language (ESL), and in this instance to both high school ESL students and primary ESL students.

*for the sample of students whose reading difficulty is defined by the Department of School Education to lie within the aetiology of a mild intellectual disability (IM), and in particular to primary IM students.

*for the sample of students whose reading difficulty is defined by the Department of School Education to lie within the aetiology of an unspecified leaning disability (LD), and in particular to primary LD students.

Specifically, this research found that the Cloze was improved significantly:

*for the primary sample of students whose reading difficulty is defined by the Department of School Education to lie within the aetiology of an unspecified leaning disability (LD).

This research was not able to show any significant improvements for the reading related areas of spelling or writing. Spelling in fact proved a very difficult activity to test in the classroom and of the nine results sought, four were not
obtainable due to insufficient data. Writing most likely was undermined by the time constraints of the implementation period of CIP. For the experimental groups, the time of exposure to CIP was most likely too restrictive. In short, more time may well prove all that is necessary for transference of increased accuracy, comprehension, phonological word processing skills, and cloze to the writing domain. The disappointing results in writing however, do not detract from the positive findings of the overall research which show clearly that it is possible to facilitate significantly reading and reading related areas for those students suffering reading disabilities and difficulties.

5.2 A summary of other interesting observations.

Furthermore, this research noted and documented many patterns of behaviour which, although outside the purpose of the study, are worthy of further investigation.

Group 3 IO/IS.

These patterns include the findings pertaining to the sample of students whose reading difficulty is defined by the Department of School Education to lie within the aetiology of a moderate/severe intellectual disability (IO/IS). Although the findings revealed that CIP had no significant influence on the reading rate, reading accuracy, reading comprehension or phonological word processing skills of students, nevertheless it appeared that CIP heightened these students' awareness for the need to plan. Teachers felt that the gains to these students were best revealed through their verbal expression for which there was no test included in the experiment. Further investigation of this matter is recommended.

Reading Rate.

Another pattern of behaviour documented in the results and discussion pertained to the findings in relation to the reading rate. All students both control and experimental, with the only exception being the primary LD experimental students, slowed their reading rate. For example, the means for the experimental and control ESL students indicated that this group slowed their rate and the standard deviations indicated that this was a fairly
consistent within-group trend. An explanation was found in an examination of the Neale Analysis Forms which indicated that students were progressing to more difficult material thereby entering into the next level of difficulty. Teachers might expect, and should accept, a temporary regression of rate if such a regression is off-set by gains in levels of reading accessibility.

However, a somewhat alarming pattern was also revealed with relation to the reading rate of ESL students. An examination of the raw data indicated that ESL children are reading too fast, and while their reading rate and accuracy may not indicate a problem, their comparatively low comprehension scores should alert a teacher to a real problem.

An encouraging pattern was revealed in relation to reading rate with findings and observations pertaining to the IM students. It appeared that the IM sample slowed their rate as a trade-off for significantly higher accuracy scores at the same level of reading material.

Visual Discrimination.

Another pattern of behaviour documented in the results and discussion pertained to the findings in relation to the visual discrimination. In almost every pretest and posttest the students gained a raw score of 100%. This research found that of the two hundred and fifty-nine children with reading disabilities participating in this experiment, very few indicated that they had a visual discrimination problem such as might be expected if there was an underlying physiological or perceptual problem. This observation supports the conclusions of Vellutino (1987) in his claim that reading problems are far from mere visual problems, and that visual perception or other visual inadequacies are not a primary concern when dealing with reading problems in the classroom.

5.3 The findings in relation to the literature.

The literature background for this research was divided into eight sections which discussed integration issues, physiological considerations, teaching philosophies, spelling issues, reading comprehension issues, writing issues, cognitive learning theory
issues and the implementation of an interactive learning model in the classroom. Each of these sections will now be related to the findings of this study.

5.3.1 The findings in relation to integration issues.

The literature revealed that there are many misconceptions regarding integration. This study adopted the definitions of the Australian Association of Special Education (1989c) which dictates that integration is a movement along a continuum which should place a child in the least restrictive environment in which the individual child is able to operate. This definition is applicable to the policy of the N.S.W. Department of Education (1987a) and Richard (1991) and to policies of governments throughout Australia, America and Europe (see reviews in Gow, Balla, Hall, Konza, & Snow, 1986; Gow, Snow, Balla & Hall, 1987). Education Policy is basically to provide maximum opportunity to all students. The N.S.W. Department of Education therefore offers a cascade of services for students with special needs.

Debate continues to rage world-wide over student identification and placement. Regardless of the continuing debates over who has special needs, who best services, and how best to service these students, there is little controversy over the general agreement that reading failure must be addressed at the earliest indication.

Obviously this research needed to test a program that would operate within the existing structure of schools. Therefore the students in the study were selected from a wide variety of placements (including placement in Schools for Special Purposes, placement in Special Classes, placement in regular classes with support, students from primary schools and students from high schools). Furthermore, each had been formally classified by existing frameworks as being a student with one of a variety of special needs (ESL, IM, IO/IS, LD).

The findings of the research showed significant improvements to reading and reading related subject areas to students from across the wide variety of placements.
Furthermore, they showed significant improvements to reading and reading related subject areas for students with one of a variety of special needs.

These findings suggest that the Cognitive-Interactive Program for Facilitating Reading for Students with Special Needs (CIP) should have robust utility within a large variety of classroom settings which service students with a large variety of special needs. Furthermore, CIP should have utility in the new concept of Special Education Support Centres (see section 2.1.1). Richard (1992) states:

Special Education Support Centres have developed a strong focus on the provision of interactive, research-based educational programs for students with learning difficulties. (p.14)

Within this "new concept for helping students with learning difficulties" (Richard, 1992, p.14) a research-based educational program such as CIP should provide a worthwhile contribution.

5.3.2 The findings in relation to physiological considerations.

The literature revealed that there are many theories as to the relationship between physiological considerations and learning disabilities. There remains little doubt that while mortality rates have dropped amongst children in need of medical care, morbidity rates remain high. Furthermore, the developments in neuroscience will continue to offer hope to many.

However, once again the literature revealed controversy. It is apparent that many "experts" are in disagreement as to the aetiology, (and indeed in the definition), of reading difficulties (commonly termed dyslexia). Fortunately, there is general agreement that although modern medical knowledge will assist teachers in programming for poor readers, there is no easy way out (see Hall, 1992; Hall, in
press). Teachers must offer appropriate programs for those with reading problems and uncertainty as to diagnosis need not impair the effectiveness of remedial treatment.

A study of the literature suggested a consensus (see Andrews, 1989; Andrews & Jardine 1989; Hall & King, in press; Lloyd & Goyen, 1986; Serfontein, 1990; Stanovich, 1986; Vellutino, 1987) that a successful remedial program should allow for the development of both phonemic and psycholinguistic skills. The Cognitive-Interactive Program for Facilitating Reading for Students with Reading Disabilities meets these requirements. CIP offers a programmed development for both these skills which are considered essential for the child's proper acquisition of reading and reading related fluency.

The findings of this research showed significant improvements to reading and reading related subject areas for students regardless of aetiology. Therefore, once again these findings suggest that the Cognitive-Interactive Program for Facilitating Reading (CIP) should have robust utility within a large variety of classroom settings with any variety of students with special needs.

5.3.3 The findings in relation to the Great Debate.

Yet again the literature revealed controversy. Successful reading students learn between six hundred and six thousand words per year and there is little doubt that these students cannot learn such an enormous vocabulary word by word. It remains a paradox that the best way to improve reading is the activity of reading. However, the causal interpretation for the elements of reading continue to fuel the current global debate centred around the code emphasis approach versus the meaning emphasis approach. Questions of causal direction remain far from resolved (Mercer & Mercer, 1981; Forell, 1985; Torneus, 1984) with many questions remaining largely unanswered. Nicholson (1986) might well have claimed that "the great debate seems settled" (p.206), but the search for a "best" method for teaching reading has been elusive and the question of classroom-based philosophy
which dictates the reading instructional program, remains far from resolved.

There is consensus that the psycholinguistic model has made important contributions to the teaching of reading and writing in our classrooms today, and indeed the N.S.W. Reading K-12 curriculum has been heavily influenced by psycholinguistic philosophy. There is also consensus that reading cannot occur without reading words (Andrews, 1989; Andrews & Jardine, 1989; Juel, 1988; Lloyd & Goyen, 1986; Perfetti, 1984; Serfontein, 1990; Stanovich, 1986; Vellutino, 1987). Lexical access is the central recurring reading process and its execution requires decoding skills. Therefore as noted in section 2.3.1,phonemic awareness "may be induced; it may be acquired through direct instruction; it may be acquired along with or after the build up of a visually based sight vocabulary - but it must be acquired if a child is to progress successfully in reading" (Stanovich, 1986, p.363).

This research tested for reading accuracy by requiring the students to read a story (see Neale, 1989). Thus, the students were allowed to apply their psycholinguistic skills. Reading accuracy was tested by requiring the student to apply phonological word processing skills and read a list of words designed to diagnose phonemic status (see Neal, 1988).

The results on both these reading accuracy indicators showed significant improvements, indicating that psycholinguistic skills and phonemic skills go together. This finding supports the suggestions from Torneus (1984) regarding the prerequisite status of metaphonological abilities. The causal interpretation for the elements of phonemics/reading/spelling is not appropriate; these abilities most probably are facilitating factors.

CIP teaches students to utilise both psycholinguistic and phonemic skills and the findings which showed significant improvements to (normed) reading accuracy and to phonological word processing skills for students experiencing reading failure suggest that the conclusions of Stanovich (1986) are correct: students must develop phonemic awareness. Furthermore, the findings of this
research suggest that support for Stanovich (e.g. from Andrews, 1989; Andrews & Jardine, 1989; Juel, 1988; Lloyd & Goyen, 1986; Perfetti, 1984; Serfontein, 1990; Stanovich, 1986; Vellutino, 1987) is justified.

Success in gaining significant improvements to reading accuracy in both psycholinguistic-based and phonemic-based tests adds support for Stanovich (1986); within our psycholinguistic-based classrooms, phonemic awareness must still be acquired if a child is to progress successfully in reading.

5.3.4 The findings in relation to spelling.

Once again the literature revealed much controversy. This controversy is exemplified through the comments of Goyen (1989) that the belief that we learn to spell through reading is itself contradicted by the likelihood that one does not attend to individual letters or letter sequences when reading. Torneus (1984) found that the largest causal influence on spelling is imposed by metaphonological abilities, and this was supported by the observations of Cattley (1988) who notes that while it is acknowledged that spelling is learned best through the writing process there are many who need to focus on the internal structure of words.

This research failed to demonstrate that any improvement occurred in spelling. While it is conceded that spelling is also dependent on other metalinguistic abilities "such as metasyntactic and metamorphological abilities" (Torneus, 1984, p.1348), and that final spelling mastery might well be "directly dependent on cognitive development" (Torneus, 1984, p.1348), the findings of no significant improvement are probably due largely to insufficient data. Furthermore, insufficient exposure to CIP may also have been a factor.

Further research in this area is needed.

5.3.5 The findings in relation to comprehension issues.

The literature search revealed that there is a double
standard operating in our classrooms. It appears that the fluent readers have no difficulty with the reading material because they can use all their context cues to identify words and still be capable of thinking about what they are reading (Forell, 1985). This is not so for the poor readers who are frequently frustrated. As section 2.5.0 noted, the irony lies in the fact that most teachers believe that children need to be challenged, yet in truth, the most successful readers, those who have cracked the code, are rarely challenged.

Comprehension is the process by which the meanings of words are integrated into sentences and text structure (Juel, 1988), but the literature revealed that only those readers who are successful decoders can be expected to have skilled comprehension processes (Perfetti, 1984). The research of Nicholson et. al (1988) supported findings that poor readers use context to help with reading, whereas good readers who are skilled at decoding, do not need to do so.

Much research has centred around improving reading comprehension through specific comprehension strategy training such as paragraph restating (Jenkins, Heliots, Stein & Haynes, 1987) or reciprocal teaching (Brown & Palincsar, 1982). However, this study suggests that such complicated programs may not be necessary because it showed that reading comprehension could be significantly improved by the mere implementation of a program (CIP) that teaches both psycholinguistic and phonemic skills combined in specific strategies for spelling and reading (word attack).

Significant improvements to reading comprehension were achieved by Group 4 (primary and high school students with unspecified learning disability), and again by primary aged LD students. These findings are exciting. LD students contribute to a high proportion of the students recognised as being in need of special education servicing. It is in response to this high number that the Department of School Education allocates funding for the Support Teacher/Learning Difficulties to regular schools for the Support Program.

There were no other significant results from any of the other student samples (ESL and IM). The non-significant
results for reading comprehension with respect to the ESL students may well be a reflection of what Juel (1988) termed the decontextualised nature of communication in schools and in books. The interesting finding pertaining to the ESL students and reading rate (which was summarised in section 5.2) suggests that there may be other factors involved for ESL students. Their less than rich English-based language background may compound this decontextualised nature of communication. Further research needs to be undertaken here as well.

It must also be noted that the non-significant result with respect to the IM students may well reflect merely their more global developmental delay in comparison to their LD peers (see section 5.3.8). A longer time of exposure to CIP may well be all that is needed to assist these students to transfer their proven gains in reading accuracy and phonological word processing skills to reading comprehension and therefore, to address this matter, further research needs to be undertaken.

The findings that reading comprehension can be significantly improved for LD students by the implementation of CIP, which teaches both psycholinguistic and phonemic skills combined in specific strategies for spelling and reading (word attack), strongly supports the earlier suggestion that CIP should find a robust utility within the classroom.

5.3.6 The findings in relation to writing.

There was general consensus in the literature that writing is a complex process, being nonlinear and consisting of several overlapping sub-processes. Furthermore, there is general consensus that a good strategy for teaching writing skills is to give students stimulating books, pieces of paper and pens, and encourage them to use them every day (Dwyer, 1986). Such a routine is seen daily in most Australian classrooms.

However, controversy arises over what could be termed as a quantitative aspect, rather than to a qualitative aspect,
to adherence to the widely acclaimed psycholinguistic-based process writing teaching program. For example, Goyen (1989) suggests that this insistence that everyone can learn if stimulated to do so, is merely an illusion of knowledge and that this *illusion of knowledge* is a very real danger to effective teaching and in particular to teaching students with learning difficulties.

Notwithstanding a specific program which teaches both psycholinguistic and phonemic skills, this research failed to improve writing. Perhaps the criticism of Englert and Raphael (1988), that most remedial writing programs have focused on mechanical or transcription skills because of the tendency of educators to focus on the written products rather than the cognitive activities that underlie the production of text, has merit. In defence to this anticipated criticism it must be noted that CIP is a program to facilitate reading and that any gains to writing from the implementation of CIP would be by way of transference of proven gains in reading accuracy and phonological word processing skills.

The results did not demonstrate improved writing skills for the sample of students with special needs. This finding may well be due to the complexity of the writing process and to the compounding factor of pre-existing deficits in the writing pre-requisites of good speech habits and good reading habits of "at-risk" students. As noted in section 5.1, this non-significant finding may well be due to the time constraints of the experiment, or, like the results for spelling, the findings of no significant improvement could be due largely to insufficient data (noting that insufficient data were recorded for the entire IM sample).

More research must be done in this area of literacy.

5.3.7 The findings in relation to cognitive learning theory.

The literature confirms a general consensus of the possibility of teaching "thinking skills" (Yates, 1987, p.15) and there is general excitement that strategy-deficient,
inactive learners may be taught the "something extra" advocated by Gaskins and Baron (1985, p.390). The something extra is enhanced learning through cognitive strategy training.

It would appear that many children do not access the necessary knowledge when it is needed. This in turn leads to an incorrect response or even to a seemingly random action. The literature revealed that the chances of a correct response were very much increased if the student undertook strategy training. Indeed, any number of studies, researching many different cognitive approaches, illustrated that strategy training improved overall performance (see section 2.7.0).

This research has supported the conclusions of Maker (1981) and Serfontein (1990); that it is more difficult to teach problem solving strategies to older, more mature students. If this be the case, more weight is added to the arguments of Reynolds and Dallas (1989) in that remedial servicing for children experiencing problems should not be delayed. Current research supports the conclusion that early intervention has a significant effect on young children with intellectual and learning disabilities.

The findings of this research support the analogies offered by Vellutino (1987) and Siegler and Jenkins (1989); that a child's mind can be likened to a library reference system or to a work shop claiming a large variety of tools. This support was found in the interesting trend revealed in the examination of the standard deviations for the ESL phonological word processing skills. As noted in section 4.5, the within-group difference reflected in the experimental groups' standard deviations (17.354, 12.263, 18.119) suggest that for some students the knowledge and strategies were already available, but were not being accessed with any degree of consistency or expertise. These students' scores, having a much wider spread than their peers in the control groups, most probably indicate that those with "more tools" were able to become consistent and expert in their application once an appropriate strategy was utilised.
The results of this research add to the growing conviction that a cognitive strategy program will enhance learning. The findings of significant improvements in reading accuracy, reading comprehension, phonological word processing skills and cloze confirm that a program based on strategy training does indeed supply the "something extra" needed to assist strategy deficient learners.

5.3.8 The findings in relation to a cognitive-interactive learning model.

The literature suggested that many of the arguments in the Great Debate could be defused by the acceptance of an interactive process in reading and reading related activities. A student taught to read interactively is thought to be able to choose the most appropriate strategy for any literacy confrontation (e.g. psycholinguistic guessing of the unknown word, or, phonemic attack of the unfamiliar word). This ability to read interactively is not confined to students in English-speaking classrooms. For example, (as noted in section 1.0) Schreuder and van Bon (1989) point out that although Dutch education system beginning readers learn to read by way of the "phonological route" (p.61), for many readers this is soon followed by the use of the "lexical route" (p.61).

There is however, a major problem in the acceptance and teaching of an interactive approach. As noted in section 2.8.0, it is assumed by the advocates of an interactive approach that students possess some central executive system "which co-ordinates both information sources to arrive at the best interpretation of the word or phrase being read" (Andrews, 1989, p.16). This assumption of central executive systems and their application is in conflict with research findings from those investigating learning disabilities. A great wealth of research has shown beyond doubt that many children do not access the necessary knowledge when it is needed; that is, many students are not using effective or efficient cognitive strategies with any degree of consistency (Bereiter & Engelmann, 1967; Engelmann & Bruner, 1969;
Chapter 5

Engelmann & Carnine, 1970; Feuerstein and Jensen, 1980; Gaskins and Baron, 1985; Gow, 1987; Gow, Burton & King, 1988; Gow & Ward, 1985; Hall and Gow, 1989; Havertape & Kass, 1978; Maker, 1981; Meichenbaum, 1977; Meichenbaum and Goodman, 1971; Wragg, 1987; Yates, 1987). As noted in section 2.9.0, interactive approaches have failed to address the cognitive aspect of utilising executive systems to assimilate simultaneously the interactive cues and clues from text.

This researcher set out to develop and to implement an interactive program that incorporated "the cognitive aspect", hence, CIP combined the elements of both psycholinguistic and phonemic teaching philosophy within prescriptive cognitive "plans" for spelling and reading (see Appendix 2). The results which showed that this program (CIP) significantly improved a wide variety of specific performances (reading accuracy, reading comprehension, phonological word processing skills and cloze) for a variety of experimental groups30 when compared to their control groups indicates that the Great Debate may well be resolvable. An interactive approach, which actively teaches the application of the "something extra" advocated by Gaskins and Baron (1985, p.390) has now proven its potential.

It was of interest that the results showed some students with reading disabilities also were able to improve significantly their reading comprehension and cloze. As noted in sections 4.4 and 5.3.5, these results are exciting. CIP does not teach specific comprehension strategies. Therefore, significant improvements of the LD experimental groups when compared to the LD control groups must be originating from another source. The significant results for their reading accuracy, reinforced by the significant results for their phonological word processing skills may well be transferring to the reading comprehension and cloze. In section 2.8.2 it was noted that reading interactively is often illustrated through the analogy of a driver of a car (see Andrews, 1989;
Lloyd & Goyen, 1986). The novice driver may need to concentrate closely on steering, braking and accelerating, but the experienced driver carries out these functions more automatically, and is thus able to devote time to higher level tasks (such as navigation). However, if the driving conditions change (e.g. heavy fog or peak hour traffic) the experienced driver then needs to concentrate more on the lower order elements. This research suggests that once a poor reader becomes more efficient at word attack, then s/he can devote more time to higher level tasks, and one such task is comprehension.

The question must be asked as to why only some of the experimental students were able to transfer their gains in reading accuracy and phonological word processing to comprehension and cloze. It might be fair to hypothesise that the LD population (who by definition have no intellectual impairment) have accumulated more "tools" and "materials" than their IM peers, who, by the nature of their disability, are more globally developmentally delayed. Siegler and Jenkins (1989) hypothesise that a broad "range of products" (p.1) raises the potential for an individual's "meeting future demands" (p.1). The LD sample may well have been illustrating that they already did have a wide variety of knowledge and processes, but that they were not accessing this wealth until they were taught a cognitive strategy for reading.

The ESL children demonstrated in their results for phonological word processing that they too may well possess a "broader range of products" (see section 5.3.7) however, these same students did not transfer their gains in word attack to reading comprehension. As discussed in section 5.3.5, the matter of their poorer English language background may compound their difficulties with the decontextualised nature of communication. Certainly this hypothesis is supported by the interesting observations arising from the ESL raw scores in reading rate. It was noted (see summary section 5.2) that ESL students may well be reading "too fast", preferring to achieve quick lexical access at the expense of
comprehension.\textsuperscript{31}

Harris, Graham & Freeman (1988) found that one of the most basic of metacognitive skills in terms of knowledge about cognition is the ability to know that one has a problem, yet, perhaps not surprisingly, children with learning disabilities appear less capable in predicting their own performance than do their normally achieving peers. I suggest that ESL students be made aware of the problem of reading "too fast" and that more emphasis be placed upon comprehension. Quite simply, this apparent inconsistent ESL behaviour to transfer their "broader range of products" may be explained by the analogy of Siegler and Jenkins (1989) in that:

> Realizing this potential, however, requires not only that diverse tools and materials be on hand but that they be efficiently organized. Otherwise, they will simply represent clutter. (p.1)

I suggest that being made aware of the problem of reading "too fast" may facilitate in the reduction of "clutter".

This research has shown that a Cognitive-interactive program will facilitate significantly the acquisition of reading for students experiencing reading difficulties pertaining to a wide variety of aetiologies. Specifically, the implementation of CIP to ESL, IM and LD students resulted in significantly greater improvements of the experimental groups (p<.05) when compared to the control groups. These findings should encourage many more researchers to examine other applications of cognitive-interactive programs.

5.4 Conclusions of this research.

There is a great concern among our community support groups, government and teachers. The Australian Association of

\textsuperscript{31} This was suggested after examination of the raw data that revealed a pattern of low comprehension scores in comparison to accuracy and rate scores.
Special Education (AASE), the Association for Children with Learning Difficulties (ACLD), the Association for Specific Learning Difficulties (SPELD), Teachers Reacting Against Failure (TRAF) and the New South Wales Council for the Intellectually Disabled (NSWCID), persistently re-state the concern that between ten and twenty percent of our children are experience reading difficulties (AASE, 1989a). Recent reports in newspapers (see "Mrs Chadwick's", 1992; "Chadwick looks", 1992) confirm that this concern is current, and that it is creating division between governments and teachers.

The consequential bottom-line is that school pupils who are failing to read then join the larger part of one million Australian adults who are for all practical purposes, illiterate (Lloyd & Goyen, 1986), that is, they cannot read. In stressing the need for early remedial action, the following newspaper article (see "Mrs Chadwick's", 1992) comments:

There is something basically wrong with an education system which begins producing drop-outs among pre-high-school students.

This statement is supported by another newspaper's article ("Chadwick looks", 1992) which comments that children sent to high school without basic skills "were doomed to failure". This article reported that the NSW Schools Education Minister Virginia Chadwick was creating "a storm in education circles" in her efforts to open public debate on a proposal "to stop primary students graduating to high school" if they failed in demonstrating basic skills.

The debates originating from philosophical stands with regard to reading acquisition, or from philosophical stands with regard to the identification and classification of students with learning problems do little for those students affected. Indeed, much of the work now being done by the medical fraternity investigating aetiologies such as dyslexia has done little for teachers who need to generate programs for students in the immediate future. Kronick (1990) realises that:
There are biological differences and constraints that even the most optimum environment will be unable to overcome. In the bravest of new worlds we can eliminate labels and education streams, and place everyone in the mainstream and teach to their strengths, none of which will eradicate individual differences or ensure that the skills our culture values will be acquired. (p.5)

There is little doubt that the future directions for education must consider these biological differences and constraints. The community view is somewhat emphatically stated: "it is the function of a public education system to serve all the people, geniuses and slow-learners alike" (see "Mrs Chadwick's", 1992). Indeed, this consideration has already been demonstrated in the founding of the Special Education Support Centres following strong lobbying by parent groups. These SESC's are considered a critical part of future directions for planning student services and are in a position to be "at the forefront of innovation in the area of education of students with learning difficulties" (Richard, 1992, p.14).

This research set out to develop and implement a cognitive-interactive program in the classrooms of students who have been formally identified as suffering reading disabilities. It has shown that for many students experiencing reading failure, a cognitive-interactive program which teaches students to apply strategies with consistency, may assist in the remediation process.
Siegler and Jenkins (1989) consider that:

Construction of new strategies is one facet of the larger topic of learning. However, it is a facet that has historically received relatively little attention. (p.3)

The findings of significant improvements (p<.05) in reading accuracy, reading comprehension, phonological word processing skills and cloze confirm that a program based on the construction of new strategies does have the potential to facilitate reading for students with reading disabilities. It is hoped that this research will help to alleviate the historical neglect noted by Siegler and Jenkins (1989). Furthermore, it is hoped that the findings of this research will generate more interest in cognitive-interactive programming per se. The planners of future directions for Education, and in particular for Special Education Services, might even be among those who show greatest interest.
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The development and implementation of cognitive strategies to facilitate the learning of reading for students with reading difficulties.

Volume 2.
Appendix 1.

Test data components.
1. The Neale Analysis of Reading Ability.
   Refer to manual for details of implementation. Test is individually administered. Included in this appendix are copies of an Individual Record Sheet Form 1 and Form 2.
### RAW SCORE SUMMARY

<table>
<thead>
<tr>
<th>Passage Level</th>
<th>Name</th>
<th>Cumulative Number of Words</th>
<th>Time (in secs) to read</th>
<th>Maximum Possible Score</th>
<th>Errors</th>
<th>Passage Score</th>
<th>Questions Correctly Answered</th>
<th>Target Words</th>
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<td></td>
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<td></td>
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<td></td>
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<tr>
<td>4</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>The Fox</td>
<td>[364]</td>
<td></td>
<td></td>
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</tr>
<tr>
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<td>Migration</td>
<td>[505]</td>
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<tr>
<td>TOTAL TIME</td>
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* Words per min. = \( \frac{\text{WORDS}}{\text{TIME}} \times \frac{60}{1} \times \frac{60}{1} = \)

### STANDARD SCORE SUMMARY

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### ERROR COUNT

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<th>Mispronunciations</th>
<th>Substitutions</th>
<th>Refusals</th>
<th>Additions</th>
<th>Omissions</th>
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</tbody>
</table>

### Summary and Recommendations:
Practice “X” 5–7 year-olds

I have a lot of toys. I have them in a box. I like to play with all of them. But, at bed-time I like my teddy bear best.

QUESTIONS

1. What was that story about?
2. Where did the little boy/girl keep his/her toys?
3. At night-time what was the little boy’s/girl’s favourite toy?
4. Why do you think teddy was the best toy at bed-time?

Practice “Y” above 7 year-olds

My friend and I made a tree-house. We like to hide in it. We climb up the rope and pull it up after us. Then no-one knows where we are. We play space-ships. At tea-time we slide down fast and we are always first for tea.

QUESTIONS

1. What would you say was the best name for that story?
2. Who built the house in the tree?
3. How did the boys/girls get up into the tree-house?
4. How could the children’s friends guess that they were playing up in the tree-house?
5. What game did the boys/girls play in the tree-house?
6. How did the little boys/girls manage to be always first for tea?

FORMAL TESTING STARTS

Bird (Level 1)

A bird hopped up to my window. I gave her some bread. She made a nest in my garden. Now I look after her little ones. [26 words]

QUESTIONS

1. Where did the bird hop to?
2. What did the little boy/girl give the bird?
3. What did the bird do in the garden?
4. What does the little boy/girl do now for the bird?

TOTAL

<table>
<thead>
<tr>
<th>Mispronunciations</th>
<th>Substitutions</th>
<th>Refusals</th>
<th>Additions</th>
<th>Omissions</th>
<th>Reversals</th>
<th>Total Errors</th>
<th>Comprehension</th>
</tr>
</thead>
</table>
Road Safety (Level 2)

Ken stopped on his way to school. In the middle of the traffic lay two children. Their bicycles had crashed into each other. Ken ran quickly to help. He saw that no-one was hurt. The children pointed to a television camera. "We are taking part in a road safety lesson," they said. [52 words]

QUESTIONS
1. Where was Ken going?
2. Why did Ken stop?
3. What had happened to the bikes?
4. How do you think Ken felt?
5. What did Ken do?
6. Were the children hurt?
7. What were the children really doing?
8. How did Ken find out what was happening?

Ali (Level 3)

As Ali sheltered in an old temple, his shoulder knocked a secret spring. Instantly, he was thrown into an underground room. In the darkness the walls seemed to be covered with jewels. Ali rested awhile. He knew that desert travellers often imagined strange things. Later, he explored the place for a way to escape. To his amazement, the jewels were still there. He had found a palace that had been buried long ago. [73 words]

QUESTIONS
1. Why did Ali go into the temple?
2. How did he find the secret spring?
3. What happened when he touched the spring?
4. What did he see there?
5. Why did Ali not rush to look at the jewels?
6. After he had rested, what did Ali try to find?
7. Why was he so surprised?
8. How had the jewels come to be there?

Kells (Level 4)

Skipper Kells buckled on his diving belt of metal weights and dropped from the launch. Jan supervised his air-hose to prevent tangling. Leo, following the bubbles, guided the dinghy above the diver as he searched the mysterious underwater world. Kells surfaced frequently clutching crayfish. The required number of specimens was almost obtained when the grey nurse shark advanced directly towards him. Kells retreated cautiously without signalling for assistance. The creature brushed by, ignoring him, as baby sharks emerged from some rocky grooves. Their welfare was more important to the shark than the diver's now motionless figure. [96 words]

QUESTIONS
1. What equipment assisted Skipper Kells in his exploration under water?
2. What did Jan do to help the Skipper?
3. How did Leo know where the diver was?
4. What do you think the Skipper was diving for?
5. Why did it seem that the shark might attack him?
6. How did the skipper avoid trouble with the shark?
7. What kind of a home protected the baby sharks from enemies?
8. Why was the shark not interested in the Skipper?
The Fox (Level 5)

Among animals the fox has no rival for cunning. Suspicious of man, who is its only natural enemy, it will, when pursued, perform extraordinary feats, even alighting on the backs of sheep to divert its scent. Parent foxes share the responsibilities of cub-rearing. Through their hunting expeditions they acquire an uncanny knowledge of their surroundings which they use in an emergency. This is well illustrated by the story of a hunted fox which led its pursuers to a neglected mine-shaft enclosed by a circular hedge. It appeared to surmount the barrier. The hounds followed headlong, only to fall into the accumulated water below. The fox, however, apparently on familiar territory, had skirted the hedge and subsequently escaped. [117 words]

QUESTIONS

1 Who is the chief enemy of the fox?
2 Why does the hunted fox sometimes jump onto the back of a sheep?
3 Who provides food for the cubs?
4 How do foxes know the best hiding places in their surroundings?

5 To where did the fox in this story lead the hounds?
6 Was the mine working?
7 How did the fox avoid falling into the water?
8 Why were the hounds unable to see the danger?

Migration (Level 6)

Each Spring, at the reappearance of the swallows in their familiar haunts, bird-watchers must marvel at the accurate flights with which birds span the considerable distances between their seasonal abodes. What motivates these regular journeys? The theory that rigorous winters compel birds to migrate is insufficient, as some migrate in summer. Neither can it be argued that the fledglings imitate the older generation, for the offspring generally migrate alone. One reasonable explanation may be that migration is an inborn behaviour, probably originating in the distant past when the flights were essential for survival. Most species favour particular routes. On one occasion when some storks from East Germany were captured and released among storks in West Germany, they did not accompany their relatives along the western migration route. Instead, with unerring instinct, they rediscovered the traditional south-easterly path of their eastern ancestors. [141 words]

QUESTIONS

1 When can bird-watchers hope to see the swallows reappear?
2 Why do bird-watchers think that birds are such remarkable creatures?
3 Why is it wrong to say that the cold of winter makes all the birds migrate?
4 Do the young birds learn the migration routes from their parents?

5 What do people think causes the birds to migrate in this way?
6 Where was an experiment done with storks?
7 What route did the eastern storks usually take when migrating?
8 In which direction did the eastern storks fly when they were taken to the west?
Note: Differentiate between errors of sounding and naming in Test 2 by using different coloured pencils or different markings, e.g. circle, cross.

Supplementary Diagnostic Test 1  Discrimination of Initial and Final Sounds  a e i o u t j a/u

Supplementary Diagnostic Test 2  Names and Sounds of the Alphabet

Supplementary Diagnostic Test 3  Graded Spelling

Supplementary Diagnostic Test 4  Auditory Discrimination and Blending

Directions for using and interpreting the above Supplementary Diagnostic Tests can be found in the Manual.
**Qualitative Assessment**

### PERSONAL DETAILS

<p>| | |</p>
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<thead>
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<tr>
<td><strong>1</strong></td>
<td>General physical appearance</td>
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<td><strong>2</strong></td>
<td>Hearing</td>
</tr>
<tr>
<td><strong>3</strong></td>
<td>Vision</td>
</tr>
<tr>
<td><strong>4</strong></td>
<td>Any emotional difficulties</td>
</tr>
<tr>
<td><strong>5</strong></td>
<td>Attitude to school: Likes 'a little' [ ] 'a lot' [ ] 'not really' [ ]</td>
</tr>
<tr>
<td><strong>6</strong></td>
<td>Attitude to reading: Likes 'a little' [ ] 'a lot' [ ] 'not really' [ ]</td>
</tr>
<tr>
<td><strong>7</strong></td>
<td>Other</td>
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### READING BEHAVIOURS

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<table>
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<tr>
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<tbody>
<tr>
<td><strong>Needs encouragement to begin reading</strong></td>
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</tr>
<tr>
<td><strong>Refuses to try unknown words</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Repeats words or phrases habitually</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Reads in a quiet</strong></td>
<td></td>
</tr>
<tr>
<td><strong>mumbled</strong></td>
<td></td>
</tr>
<tr>
<td><strong>louder</strong></td>
<td></td>
</tr>
<tr>
<td><strong>hurried</strong></td>
<td></td>
</tr>
<tr>
<td><strong>voice</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Spontaneous language.</strong></td>
<td>Poor [ ] Average [ ] Good [ ]</td>
</tr>
</tbody>
</table>

### INFORMAL ERROR ANALYSIS

#### Grapho-phonetic errors

- Unable to pronounce words
- Reverses words
- Spells out words
- Sounds out letter combinations but cannot synthesize
- Does not know letters
- Does not know sounds
- Errors cause meaning to be lost

#### Syntactic/semantic errors

- Reads word by word (poor phraseology)
- Ignores punctuation

#### Additions:
- Meaning retained
- Meaning lost

#### Substitutions:
- Meaning retained
- Meaning lost

#### Omissions:
- Meaning retained
- Meaning lost

#### Guesses at unknown words

#### Generally ignores context

- At sentence level
- At passage level
- Both

### CONCLUSIONS

From the above qualitative assessment, conclusions can be made in the space provided on the front page of this record form.
### Raw Score Summary

<table>
<thead>
<tr>
<th>Passage Level</th>
<th>Name</th>
<th>Cumulative Number of Words</th>
<th>Time (in secs) to read</th>
<th>Maximum Possible Score</th>
<th>Errors</th>
<th>Passage Score</th>
<th>Questions Correctly Answered</th>
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<tr>
<td>3</td>
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<td>[146]</td>
<td>16</td>
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<tr>
<td>4</td>
<td>Dragon</td>
<td>[237]</td>
<td>16</td>
<td></td>
<td>=</td>
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<td>[352]</td>
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<td>6</td>
<td>Everest</td>
<td>[491]</td>
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**Total Time**

**Total Raw Scores**

*Words per min. = \( \frac{\text{WORDS}}{\text{TIME}} \times \frac{60}{1} = \frac{60}{1} \).*

### Standard Score Summary

<table>
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### Error Count

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<th>Additions</th>
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</tbody>
</table>

**Summary and Recommendations:**

---

*Published by The Australian Council for Educational Research* 
*Copyright © M. D. Neale 1958, 1988* 
*ISBN 0 86431 022 6*
Practice “X” 5-7 year-olds

I have a lot of toys. I have them in a box. I like to play with all of them. But, at bed-time I like my teddy bear best.

QUESTIONS

1. What was that story about?
2. Where did the little boy/girl keep his/her toys?
3. At night-time what was the little boy’s/girl’s favourite toy?
4. Why do you think teddy was the best toy at bed-time?

Practice “Y” above 7 year-olds

My friend and I made a tree-house. We like to hide in it. We climb up the rope and pull it up after us. Then no-one knows where we are. We play space-ships. At tea-time we slide down fast and we are always first for tea.

QUESTIONS

1. What would you say was the best name for that story?
2. Who built the house in the tree?
3. How did the boys/girls get up into the tree house?
4. How could the children’s friends guess that they were playing up in the tree-house?
5. What game did the boys/girls play in the tree-house?
6. How did the little boys/girls manage to be always first for tea?

---

Kitten (Level 1)

A black cat came to my house. She put her kitten by the door. Then she went away. Now I have her baby for a pet. [26 words]

QUESTIONS

1. What came to the little boy/girl’s house?
2. Where did the black cat leave her kitten?
3. What did the black cat do then?
4. What did the little boy/girl do with the kitten?

---

TOTAL

<table>
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<th>Refusals</th>
<th>Additions</th>
<th>Omissions</th>
<th>Reversals</th>
<th>Total Errors</th>
<th>Comprehension</th>
</tr>
</thead>
</table>

Do not include practice passages in formal scoring
**Surprise Parcel** (Level 2)

A surprise parcel for Jane and Peter arrived on Saturday. Peter looked at the strange stamps. Jane undid the string. Then they shouted with delight. Uncle had sent some skates for Jane and an electric train for Peter. They were what the children had wanted for a long time. [49 words]

**QUESTIONS**

1. On what day did the parcel arrive?
2. How do you know that Jane and Peter were not expecting the parcel?
3. Who undid the string?
4. How do you know that the parcel came from another country?
5. Who had sent the parcel?
6. What was in the parcel for Jane?
7. What was in the parcel for Peter?
8. Why were the children so pleased to receive these presents?

---

**Circus** (Level 3)

The lions' final act was in progress. Jack stood waiting to clear the ring. The thunder outside the circus tent had made the lions restless. Suddenly Tina, the lion trainer, stumbled. Her whip fell. The youngest lion sprang towards her. Jack leaped swiftly inside the cage, cracking the whip with great skill. His prompt action enabled Tina to regain control quickly. After that brief adventure, Jack decided upon his future work. [71 words]

**QUESTIONS**

1. Where did this story take place?
2. Were the lions near the beginning, near the middle or near the end of their act?
3. What was Jack waiting for?
4. Why were the lions restless?
5. What happened to Tina?
6. What did Jack do?
7. Who finished the act?
8. What did Jack decide after this adventure?

---

**Dragon** (Level 4)

The fearful roaring of the dragon guided the Knight to the monster's territory. As the intruder crossed the dreaded marshes, the dragon charged furiously, whipping its enormous tail around the legs of the Knight's steed. Horse and rider collapsed. The Knight now realised that he must attack when the creature was off-guard. He crouched as though wounded. The monster, accustomed to speedy victory, prepared to seize its prey. Then the Knight struck powerfully beneath the beast's outstretched wing. A despairing groan told the villagers that they would be troubled no more. [91 words]

**QUESTIONS**

1. How did the Knight know exactly where to find the dragon?
2. What kind of land did the Knight have to cross?
3. How did the dragon knock the Knight down?
4. What did the Knight realise would be a good moment to attack the dragon?
5. What did the Knight pretend?
6. Why did the dragon think that its very first blow could kill the Knight?
7. What part of the dragon's body did the Knight strike?
8. Why were the people in the village pleased?
Submarine (Level 5)

The stricken submarine lay at a depth of approximately thirty metres. Although it was common knowledge that the treacherous currents of the area would make rescue operations difficult, the crew remained disciplined and confident. Meanwhile, outside their prison, a diver with technical equipment for their release was in peril. His lifeline had become entangled around a projection on a nearby wreckage. Experience warned him against his first impulse to dislodge the line by force. Patiently he turned and twisted. At last his calmness and persistence were rewarded. Triumphanty he detached the final loop from the obstruction. Then weary but undaunted by this unpleasant accident, he proceeded to provide an escape exit for the submarine’s captives. [115 words]

QUESTIONS
1 What did the diver have to do in this story?
2 To what depth did he have to go?
3 What was this part of the sea noted for?
4 How did the crew feel?
5 What happened to the diver?
6 What did the diver’s experience warn him not to do?
7 What qualities did the diver show in his danger?
8 What did the diver do as soon as he was free?

TOTAL

<table>
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<th>Mispronunciations</th>
<th>Substitutions</th>
<th>Refusals</th>
<th>Additions</th>
<th>Omissions</th>
<th>Reversals</th>
</tr>
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</tbody>
</table>

Everest (Level 6)

Realising the necessity to conserve the strength of the team, the leader decided to pitch an intermediate camp. The initial enthusiasm and anticipation of attaining the final camp had been subdued by the recent mishap in which one member had fallen into a crevasse. Although the rescue had been accomplished magnificently, it was obvious that the incident had hampered the original programme. The team accepted the leader’s decision with relief. The tedious crawl to the plateau against incessant winds of varying violence had challenged their endurance to the limit. Every step at this height required will-power. Immediately ahead lay an unforeseen rise from which, by great misfortune, all the tracks of the advance party had disappeared. Rest was essential if the team were to withstand the arduous conditions in the concluding stages of the assault upon this unconquered peak. [139 words]

QUESTIONS
1 What did the leader realise his team needed?
2 What did the leader decide to do?
3 How did the team feel about the leader’s decision to stop climbing?
4 What incident had hindered their progress?
5 What had made them slacken their pace of climbing to a crawl?
6 What lay just ahead of them?
7 What piece of bad luck had the team noticed?
8 Why would it be exciting to reach the peak?

TOTAL

<table>
<thead>
<tr>
<th>Mispronunciations</th>
<th>Substitutions</th>
<th>Refusals</th>
<th>Additions</th>
<th>Omissions</th>
<th>Reversals</th>
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</tbody>
</table>
Supplementary Diagnostic Tests

Note: Differentiate between errors of sounding and naming in Test 2 by using different coloured pencils or different markings, e.g. circle, cross.

Supplementary Diagnostic Test 1  Discrimination of Initial and Final Sounds  a e i o u l g t j a/u

Supplementary Diagnostic Test 2  Names and Sounds of the Alphabet

a c o e  A H K F E L I T X
f t k h  C G O Q P R D B J
p d b g q y  M N U V Y W S Z
m w n r u v
s z x i j l

Supplementary Diagnostic Test 3  Graded Spelling

1  tap  man  rat  11  gift  gives  gears
2  beg  red  pet  12  taught  called  halt
3  tin  lip  ink  13  choice  joints  noise
4  fold  bolt  cold  14  school  skill  shield
5  but  mug  hutch  15  several  average  beverage
6  show  star  sport  16  memory  primary  temporary
7  every  bridge  chicken  17  combination  congregation  publication
8  girl  grid  grumble  18  discussion  compassion  destruction
9  light  late  life  19  abdominal  abominable  indomitable
10 rice  race  right  20  depreciation  anticipation  negotiation

Supplementary Diagnostic Test 4  Auditory Discrimination and Blending

three  tree  hat  hat  lend  lend
from  from  not  nut  run  rung
sport  sport  pint  paint  task  task
shop  chop  soap  soap  gives  gifts
brick  click  like  look  self  self
still  still  pin  pen  card  cart
scrap  strap  then  than  thump  thumb
dress  dress  gem  gem  sing  sing

directions for using and interpreting the above supplementary diagnostic tests can be found in the manual.
# Qualitative Assessment

## PERSONAL DETAILS

1. General physical appearance
2. Hearing
3. Vision
4. Any emotional difficulties
5. Attitude to school: Likes 'a little' [ ] 'a lot' [ ] 'not really' [ ]
6. Attitude to reading: Likes 'a little' [ ] 'a lot' [ ] 'not really' [ ]
7. Other

## READING BEHAVIOURS

- Needs encouragement to begin reading
- Articulation. Poor [ ] Average [ ] Good [ ]
- Refuses to try unknown words
- Articulation. Poor [ ] Average [ ] Good [ ]
- Repeats words or phrases habitually
- Hold reading close to face
- Articulation. Poor [ ] Average [ ] Good [ ]
- Reads in a quiet [ ] loud [ ] mumbled [ ] hurried [ ] voice
- Articulation. Poor [ ] Average [ ] Good [ ]
- Spontaneous language. Poor [ ] Average [ ] Good [ ]

## INFORMAL ERROR ANALYSIS

**Grapho-phonetic errors**
- Unable to pronounce words
- Reverses words
- Spells out words
- Sounds out letter combinations but cannot synthesize
- Does not know letters
- Errors cause meaning to be lost

**Syntactic/semantic errors**
- Reads word by word (poor phraseology)
- Ignores punctuation
- Adds:
  - Meaning retained
  - Meaning lost
- Substitutes:
  - Meaning retained
  - Meaning lost
- Omissions:
  - Meaning retained
  - Meaning lost
- Guesses at unknown words
  - Meaning retained
  - Meaning lost
- Generally ignores context
  - At sentence level
  - At passage level
  - Both

**Head movements.**
- Marked [ ] Slight [ ]

## CONCLUSIONS

CONCLUSIONS from the above qualitative assessment can be made in the space provided on the front page of this record form.
2. The Neal Phonemic Skills Screening Test.

Refer to manual for details of implementation. Test is group administered. Included in this appendix is a photocopy of the test.
<table>
<thead>
<tr>
<th>LETTERS</th>
<th>SOUNDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>a, m, s, e, r, d, f, i, t, n, c, o</td>
<td>if up at on pug wit fez lag zip bud yen rod wax jut</td>
</tr>
<tr>
<td>h, u, g, l</td>
<td>chop thick shun whet chuck chess quiz which thud lash quit shock</td>
</tr>
<tr>
<td>w, v, p, b</td>
<td>swim spat trot grim drum flog glen skip bled crab twig scab fret plop</td>
</tr>
<tr>
<td>y, x, j, z</td>
<td>wept gulp zest list colt bust limp fold tiff next ramp sink rift yell kelp jazz</td>
</tr>
<tr>
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<td>hitch scrub strap fetch thrip botch splat bunch shrug clutch prompt strict</td>
</tr>
<tr>
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<td>cube hive cute nape mile poke lame wage vice globe rote slate gripe crime graze froze</td>
</tr>
<tr>
<td>w, h, c, k</td>
<td>seen pert raid burn oats meal loin horn coax jaw cart ray firm head curt gout laud pew loom fowl nigh mall tow guy hoe soy thief</td>
</tr>
<tr>
<td>oo, oa, or, ai, al, ea, ou</td>
<td>picnic visit cricket umbrella expect reject hopeless undertake pressing wicked message accepted</td>
</tr>
<tr>
<td>lamb, measure, blind, canyon, dispute, ration salmon, knit, various, gnaw, initial, vague wrong, phrase, cough, echo, concise, physics</td>
<td>gac kez vum hon jis chen thack shol whid quox</td>
</tr>
</tbody>
</table>

Permission to reproduce granted
3. The two part spelling assessment test.

Part B: Word List.
Part A.

Visual discrimination. Group administered. Students given copy as below. Instructions as to how to match the top line given and done together. Students then instructed to complete the remainder of paper. (Actual test consisted of size larger print)

Spelling Test: Part A Pretest.

<table>
<thead>
<tr>
<th>sad</th>
<th>mad</th>
<th>sad</th>
<th>sud</th>
<th>sat</th>
<th>lip</th>
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<tbody>
<tr>
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<td>jam</td>
<td>mam</td>
<td>jar</td>
<td>hen</td>
<td>jim</td>
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<td>geld</td>
<td>hell</td>
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<td>loft</td>
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<td>spob</td>
<td>twin</td>
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<td>throb</td>
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<td>give</td>
<td>make</td>
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<td>shut</td>
<td>shot</td>
<td>shum</td>
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<td>moat</td>
<td>coet</td>
<td>coat</td>
<td>mail</td>
<td>coal</td>
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</table>

Spelling Test: Part A Posttest (not used).

<table>
<thead>
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<th>fed</th>
<th>lop</th>
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<tr>
<td>week</td>
<td>seek</td>
<td>week</td>
<td>week</td>
<td>weed</td>
<td>leaf</td>
</tr>
</tbody>
</table>
Part B

An adaptation of the Mann-Suiter Developmental Spelling Inventory. This test is group administered. The teacher must read to the students the following words.

Level 1: cat, no, red, see, and, you, the, we, it, yes, dog, big, like, have, was.

Level II: nod, jug, get, sip, table, sled, clap, ship, drop, think, sing, little, home, ask, father, doll, morning, pretty, boat, said.

Level III: sheep, each, third, catch, drank, lake, stick, duck, child, bath, wash, puppy, train, laughing, short, swing, walk, uncle, right, because.
4. The writing assessment.

a) This is for a story about a given stimulus depicting a fictional character. The test is group administered. The students are given the following page/s. Note that the page is lined to lower the stress of handwriting.

-----------------------

fictional character

placed here

-----------------------
b) This is for a story beginning with *Yesterday I....* The test is group administered. The students are given the following page/s. Note that the page is lined to lower the stress of handwriting.

Yesterday I

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
5. The cloze exercise.

This cloze exercise is taken from the original Neale Analysis (1970). The test is to be group-administered; synonyms can be accepted as correct answers. The teacher should explain to students that each story is unrelated.

A raw score out of a possible 33 is adjusted as a percentage for purposes of analysis.

A robin hopped up to my ___. I gave her some bread. She __ a nest in my garden. Now ____ look after her little birds.

A _____ parcel for Jane and Peter arrived ____ Saturday. Peter looked at the strange _____ Jane undid the string. Then they _____ with delight. Uncle had sent some _____ for Jane and an electric train ____ Peter. They were what the children ____ wanted for a long time.
As Ali _____ in a ruined temple, his shoulder _____ against a secret spring. Instantly he ____ thrown into an underground room. In ____ darkness the walls appeared to be ______ with precious jewels. Ali rested awhile. ______ remembered that desert travellers often imagined ______ things. Later he explored the place ______ means of escape. To his amazement ______ treasure did not vanish. He had ______ a buried palace of former times.
Susan ______ to the starting position for the ______ race. Last year her team had ______ disqualified for not transferring the baton ______. Now they were determined to avenge ______ defeat. But what was this? Susan ______ one shoe. The sole had broken ______ in the obstacle race. Her heart ______. The track was unsuitable for running ______.

Her plight, however, had been observed. "______ mine," insisted Phillip, a reserve runner, ______ his shoes. Luckily they fitted, and ______, Phillip shared the honours when his ______ was awarded the athletic shield.
Appendix 2

THE COGNITIVE-INTERACTIVE PROGRAM FOR FACILITATING THE LEARNING OF READING FOR STUDENTS WITH READING DIFFICULTIES.
Preface.

Dear teachers,

The following pages offer a program designed to assist those students failing in their learning to read. This program draws upon six years of classroom experience with children exhibiting difficulties in learning and it appears successful with children ranging grades 1-7 with mild intellectual disability who have experienced severe reading failure. Furthermore, this program offers the flexibility required to program for meeting the individual needs of a class comprising of individual students, ranging in age and ability.

The introductory section will briefly acquaint you with the background for the theory on which this program is based. It may be that such an approach is alien to your usual preference. However, it must be stressed that this program is only to be used with the student who is labouring under the massive disadvantage of failing to read.

Reports suggest that in fact up to twenty percent of our children are failing to read at a satisfactory level. If this program helps even some of these children, then it will be worth the effort of implementation. Failure in reading is arguably the saddest outcome of an unrewarding school career.

Judith V. Hall. M.Ed.(Hons), B.Ed.,
Grad.Dip.Ed.Stud.(Special Education),
Dip.Teach.

Judith V. Hall.
Part One

Introduction and rationale.

The United Nations Declaration of the Rights of the Child (proclaimed on 20th November, 1959) notes in Principal 5:

The child who is physically, mentally or socially handicapped shall be given the special treatment, education and care required by his particular condition.

However, claims by community groups such as the Australian Association of Special Education (AASE), the Association for Children with Learning Difficulties (ACLD), the Association for Specific Learning Difficulties (SPELD), Teachers Reacting Against Failure (TRAF) and the New South Wales Council for the Intellectually Disabled (NSWCID), focus upon the concern that between ten and twenty percent of our children are labouring under massive disadvantages. These are children experiencing reading difficulties. Furthermore, these community groups claim that such children are not receiving any special treatment, education or care such as should be mandatory for their particular conditions.

The result of an unrewarding early reading experience is the perpetuation of lack of practice, deficit word attack and decoding skills, lack of comprehension and minimal comprehension cues and clues. This continues to retard the development of automaticity and speed at the word/text recognition level.

Concern for children labouring under these massive disadvantages is not confined to Australia. In 1986 Keith Stanovich from Oakland University, USA, labelled this problem the Matthew Effect. The "Matthew effect", is the outcome whereby the rich readers become richer and the poor readers become poorer. The Matthew effect occurs in reading for poor readers when the student suffers exposure to material which
is too difficult. Difficult material makes the chances of learning minimal, for the struggling students avoid reading and thereby experience insufficient practice to develop the speed and accuracy in word recognition that would otherwise enable them to develop comprehension skills.

Recent research indicates that servicing for children who fail at reading (i.e. through remediation/special education facilities) is occurring too long after failure occurs (AASE Chapter Committee 1989; Andrews & Jardine, 1989; Juel, 1988; Reynolds & Dallas, 1989). For example, children often have to demonstrate two years delay in reading skills before gaining access to any servicing, despite research now documenting the cost efficacy of prompt servicing, "when the first indicators of future failure occur" (AASE Chapter Committee, 1989:7). Reynolds and Dallas (1989) note that the existing system is a "tow-truck" model; that is, the more breakdowns a child has, the more chance that child has of gaining special education services. The resulting bottom-line is that school pupils who are failing tend to be passed from year to year within the system and join the larger part of one million Australian adults who are for most practical purposes, illiterate (Lloyd & Goyen, 1986).

Simply stated, illiterate adults can't read. Furthermore, there is little argument that reading is more than merely gaining meaning from print. Reading is a means of growth and well-being for the individual, not only in a narrow academic field restricted to the classroom lesson, but also growth in the cognitive, social and emotional areas, for reading behaviour "mirrors the processes of thinking in a coordinated expression of human behaviour" (Neale, 1987:4).

**Different approaches for the teaching of reading.**

The search for a "true and correct" method for teaching reading has been elusive, and the current world wide debate has been raging for decades. Many theorists and teachers have firmly settled themselves into one of the two main protagonist camps; the psycholinguistic camp and the phonemic camp. More recently, some theorists have been

Judith V. Hall.
proposing the Interactive Model, (see below) having concluded that in the attempt to develop a "correct" theory of reading instruction, both theoretical approaches (psycholinguistic and phonemic) need to be implemented. (Over a decade ago Tendys (1979) questioned the adherence by a teacher to one model of reading instruction and suggested that each individual reader will idiosyncratically predict and sample; some using the semantic and syntactic cues of psycholinguistic theory, while others on the basis of graphophonetic cues. Tendys (1979) also points out that differences in cognitive style are accepted in the psychological field, yet differences in reading style have received little attention.)

This attitude is more recently reflected by Lloyd and Goyen (1986) who state that teachers should not lock up their students into an exclusive phonemic or psycholinguistic learning situation, "as neither theory is viable in itself" (p.44). Furthermore Lloyd and Goyen (1986) note that while psycholinguistic theory has added much to our understanding of how print is processed, the traditional top-down approach has under-estimated the importance of phonological skill in normal effective reading. These researchers propose that successful readers "are recoding letter and sub-word sounds so rapidly that the technique is repeatedly, though selectively, being used as part of a total spectrum of sentence attack skills" (p.42).

The resolution of the great dilemma.

The Interactive model claims that readers simultaneously process at several levels (semantic, syntactic, lexical, letter cluster, letter feature), "with hypotheses initiated at the more promising levels and tested against other levels, hence the term, interactive" (Lloyd & Goyen, 1986:43). Within this method, the problem of teaching phonics per se is resolved as both psycholinguistic and phonemic processes are assumed to be carried out simultaneously and indeed to complement each other. As Andrews states:

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Reading involves the simultaneous operation of a number of processes. We must at some level analyse the visual features of the text, we must access the meanings of words or phrases, and we must integrate these to form a coherent understanding of what we have read. If it was possible to reduce the demands of any of these component operations, that would leave more resources available for the others, and presumably, as a consequence the efficiency of these other operations would be increased (1989:17).

The acceptance of the simultaneous operation factors in reading helps to alleviate the great paradox in teaching phonics. That is; it is a paradox that to teach beginning readers skills in phonemics is useful, yet, as skilled readers, these same children will have little need of this skill. Andrews and Jardine (1989) suggest that phonemic awareness offers a "self-teach mechanism" (p.10) in that children use their knowledge of sound-symbol correspondence to sound out unfamiliar words, which will upon repetition and exposure, eventually become sight words. Andrews and Jardine state:

Children who have acquired this self-teach mechanism can engage in the massive amounts of practice necessary to be a good reader throughout the years. Good readers do exactly this, and consequently become better readers, with large vocabularies, greater word knowledge and more sophisticated language skills (1989:11).

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Facilitating factors.

Tornes (1984) notes that instead of being a prerequisite skill, metaphonological abilities might well be facilitating factors in reading and spelling acquisition. Perhaps this acceptance of phonemic awareness as a facilitating factor rather than a prerequisite skill helps to resolve the paradox.

This facilitating or self-teach mechanism, and the ability to use it, can be illustrated in a comparison of a child with a reading disability to that of a child who is visually impaired or totally blind. A child who is visually impaired or blind may sit in the classroom, surrounded by immersion charts, given the most exciting of books to read, shown story maps and sociographs (even be asked to draw one), asked to read along with a big book; and yet there is little doubt that the child would gain little from these experiences. Unless teaching strategies are employed that include the recommendations of the Itinerant Teacher: Visual, (such as extra large print, raised print, or even Braille), the visually impaired child would gain little from the lesson.

Yet the same is true of the child who is reading disabled. Logic dictates that while not being physically blind, a child with reading disabilities is still essentially blind to the teaching strategies employed in most classrooms.

The cognitively blind reader.

Students with reading disabilities are unable to assimilate this knowledge (even at a slower pace to normal children) because they are cognitively blind. Children with reading disabilities are cognitively blind because they lack the essential cognitive strategies to note "usually unconsciously, the regularities between the way things are written and the way they are spoken" (Johnson & Louis, 1986:22).

The suggestion that students with a reading disability are in fact, cognitively blind, follows from the observations and conclusions of cognitive researchers. Over two decades ago, Jerome Bruner (Bruner, 1964, 1966) advocated widely the proposal that learning involves the active processing of information, organised and constructed in a unique way by each

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individual. Bruner adhered to the belief that individuals attend selectively to the environment, process and organise the information, then integrate this information into their unique models of the environment. Bruner has had a profound influence on schools' curriculum, particularly with regard to his insistence that learning is active and that much learning occurs through discovery.

However, there is ample evidence to suggest that people with intellectual disabilities do not use active strategies for learning or solving problems (see reviews in Gow and Ward, 1985). Over a decade ago, Havertape and Kass (1978) concluded that students with intellectual disabilities lack attack strategies in problem solving. Their observation was supported by Maker (1981) who argued that this could be related to apparent inability to generalise a previously learned problem solving strategy.

Early attempts at improving the use of cognitive strategies were made by Bereiter and Engelmann at the University of Illinois in the mid-1960s (see Bereiter, 1967; Bereiter & Engelmann, 1967; Engelmann & Carnine, 1970). Engelmann and Bruner (1969) developed DISTAR (Direct Instruction System for Teaching Arithmetic and Reading). This system gained considerable acceptance in Head Start which targeted the prevention of environmentally determined mental retardation through a curriculum emphasising language development, motor development, sensory training and perception (Kirk & Gallagher, 1979).

Recent developments in cognitive approaches include that of Meichenbaum, known as Verbal Self-Instruction Training (VSIT) (see Meichenbaum, 1977; Meichenbaum & Goodman, 1971); the Feuerstein approach known as Instrumental Enrichment (see Feuerstein & Jensen, 1980), which is allied to the work of Bereiter and Engelmann; the approach of Gow known as Self-Instruction Problem Solving (SIPS) (see Gow, 1987); the cognitive-behaviour modification program developed by Wragg (1987) called "Talk sense to yourself Program", and another cognitive-behaviour modification approach proposed by this author which requires

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the learner to Observe and Copy (OBCOP) (see Hall & Gow, 1989).

The Cognitive-Interactive program for the teaching of reading is yet another recent development in the field of cognitive strategy training.

Cognitive Strategies.

The above approaches all teach cognitive strategies. Cognitive strategies are general plans of action by means of which learners can manage their own behaviour, much of which will be overt and observable. There are clear implications for educational programming in this notion; both in terms of criteria relating to efficiency and effectiveness and in terms of education viewed as learning for living. Recent research by this author (see Hall, 1988) found that traditional subject performance of students with mild intellectual disabilities was enhanced through the teaching of a specific cognitive strategy which was then generalised to the traditional subject domains.

It follows that somehow students must become independent word learners; but so far attempts to design direct vocabulary instruction that generalises, leading students to learn non-instructed words independently have failed (Nagy, Herman & Anderson, 1985). It continues to remain a paradox that the best way to improve reading, that is, to produce large scale vocabulary growth, is the activity of reading.

This cognitive-interactive program aims at remediating reading failure by utilising cognitive theory; utilising existing knowledge available from the cognitive schools and utilising existing knowledge in the teaching of active strategies.

Strategies and rules.

Strategies, by definition, are not rules. This is because a strategy is a general plan of action, rather than an inflexible rule; thereby its use can be expected to generalise to many situations. As teachers (and no doubt when we ourselves were students) we all have encountered the vast number of spelling
rules and exceptions to those rules. Many of us may still remember the jingles that accompanied these rules and exceptions e.g. "'i' before 'e' except after 'c'"; "cross off the 'e' to add 'ing'"; "the 'ant' ate the currant"; "Elmer swam the channel". Advanced students still struggle to remember the relationship between "proceed" and "procedure"; "enrol", "enrolling", and "enrolment". These rules are inflexible and indeed, in many cases situation specific.

Yet in spite of the difficulties encountered we learnt to read and spell. Most readers quickly link the relationship of "regularities between the way things are written and the way they are spoken" (Johnson & Louis, 1986:22). How one individual reader links these relationship depends on what cognitive strategies an individual reader develops. Cognitive strategies elevate situation-specific rules into generic utilities orientated for real-life confrontations.

The cognitively blind student however, is unable to develop such strategies. This program is based on the assumption that it is possible to teach a student to develop cognitive strategies.

Which rules? Which strategies?

This author has found it wasteful to spend hours each week rehearsing over phonic letter-sound relationships. As Johnson and Louis emphatically state:

If they [the student] spend considerable time marking whether vowels are glided or unglided, deciding whether 'b' or 'd' goes at the beginning or end of a tattered remnant of a mutilated word rendered meaningless by its isolation, or huffing and puffing at letters, can children be blamed for being puzzled as to what all this is for? Such Kafka-esque activities are not likely to motivate the learner, nor will they provide an inkling of the vast repertoire...
of pleasure and the increase in social power that literacy provides (1986:12).

However, an interactive approach to teaching reading accepts the factor of simultaneous operations; that is, the simultaneous processing at several levels (semantic, syntactic, lexical, letter cluster, letter feature) as both psycholinguistic and phonemic processing simultaneously complement each other. Therefore, this program is committed to teach some phonemic rule(s). The selection of exactly which phonemic rule(s) is my own decision and reflects the experience in, and professional judgements formed from teaching students with special needs.

Throughout my years of experience teaching students with reading and associated spelling difficulties, I have found that children have most trouble with the vowels. The vowels are inconsistent in their messages to learners. A consonant can be relied upon to say its regular sound in most confrontations (e.g. b usually says b as in bat) or to say its regular digraph sound or regular blend (e.g. th as in thrill, or sc as in scrub, sh as in bash). A consonant never says its letter name. Through normal reading sessions, a child can usually perceive these regularities and begin to predict consonant sounds with confidence. However, a vowel may say its simple or short vowel sound (a as in apple, e as in elf), it may say its letter name or long vowel sound (O as in bOat and pOtato), or a vowel may say nothing at all (e in name, i in paint)! A child experiencing reading problems has little chance of perceiving any regularities in their confrontations with the vowels, because the regularities appear not to exist.

Yet there is regularity between the vowel grapheme and phoneme, and it is to the teaching of this understanding to which this program is largely applied.

It was consciously decided that which ever rules were to be taught, they had to be themselves generic. Thus being characteristic of a class, generic rules are intrinsically apt to generalisation. Thus, the mere application of these rules should set the cognitively blind student along the path of

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strategy formulation. Furthermore, it was consciously decided that which ever rules were to be taught, they had to be of high utility. Thus, being useful and practical, a high utility rule should be expected to apply consistently to any (in this case) literacy confrontation.

The specific rationale for the selection of each rule reflecting this criteria can be found in Part Two. The development of the rules along the path of strategy formulation can be found in Part Three and Four. A summary of this program can be found in the Scope and Sequence of the Cognitive-Interactive Program in Part Five (pp.4-7).
Part Two

The Cognitive-Interactive Program for Facilitating the Learning of Reading for Students with Reading Difficulties.

Prerequisite skills.

a) Prerequisite skills for the teacher:

Classroom management is a highly individualistic and specialised manner of each teacher. However, for the purpose of this program, it is necessary to develop a style that actively encourages students to solve problems for themselves on an individual basis. Research has clearly demonstrated that learning disabled students fail to activate strategies that assist generalisation of learning from one situation to another. The student must be encouraged to solve EVERY problem that s/he encounters. For example, a child who is not on task because his/her pencil is on the floor (how often has this occurred!) usually is TOLD to PICK UP THE PENCIL and to GET ON WITH THE TASK. This is an example of an application of a situation specific rule. However, to meet the criteria for rule selection of this program, it is instead necessary for the teacher to involve the student in the application of a generic and high utility rule by asking: "What are you (supposed to be) doing? How are you going to do it? Thus the first prerequisite for this program is:

Prerequisite 1. Know the four-step "My plan for doing things" (a cognitive strategy) and apply it to EVERY situation.

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Prerequisite 1 is an activity to be taught by rote and actively rehearsed in a wide variety of situations, and in fact, in every situation until it is part of the students overt behaviour. Initially the students practise this Plan by overtly speaking the steps, (firstly to the teacher, and then to themselves), however, usually students quickly learn to talk to themselves quietly, and then to talk to themselves covertly. This Plan is presented in the student’s Word Mapping Book provided with the program. Alternatively, a chart, suitably attractive to the class, which formalises this strategy, may be displayed. An example of this chart is in Part Five (p.1).

Perhaps this prerequisite seems a little strange. Be assured however, that this is an important step in learning to learn. Remember the research of Havertape and Kass (1978) and Maker (1981) in which it was concluded that students with intellectual disabilities lack attack strategies in problem solving and that this was most likely related to apparent inability to generalise a previously learned problem solving strategy. Furthermore, research by the present author (see Hall, 1988) has shown that the teaching of this plan does enhance learning across the subject domains, as it facilitates generalisation of problem solving skills from one situation to another.

You, as the involved teacher, can think up many appropriate activities to include as part of "My plan for doing things". Here are some suggestions to get you started. (Note how these examples cover different situations that increase in complexity).
Situation A. Student to prepare for day's work.

In this example the student must apply the basic Plan for doing things as per Prerequisite 1

(Student to ask him/herself)
What am I doing?

(Student to tell him/herself)
I am getting ready for today's work.

How can I do it?
I must make a plan
I must get my pencil case, ruler, homework book out of my bag. I must put my lunch order into the basket. I must put my bag in the locker room. I must then sit at my desk.

Am I using my plan? Is it working? (student does the above).

Yes! Good I'm finished.
I'm all ready for class.

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Situation B. Student to prepare for craft.

In this example the student must apply the basic Plan in a manner that enables student to be ready for a specific lesson (craft).

(Student to ask him/herself)

What am I doing?

(Student to answer him/herself)

I am getting ready for craft.

How can I do it? I must make a plan
I must get my scissors, cardboard from the store room, and wait for Jenny to bring the paint.

Am I using my plan? Is it working? (student does the above).

Yes! Good I'm finished
I'm all ready for craft and here comes Jenny with the paint.

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Situation C. Student to prepare for mathematics (in a class that uses Multibased Arithmetic Blocks for concrete material).

In this example the student must apply the basic Plan in a manner that enables student to be ready for a specific lesson (mathematics).

(Student to ask him/herself)
What am I doing?
(Student to answer him/herself)
I am getting ready for maths.

How can I do it? I must make a plan
I must get my book from the maths tray, and some M. A. B. blocks from the table, and I'd better make sure my pencil is sharp.

Am I using my plan? Is it working? (student does the above).

Yes! I'm all ready for maths, so here goes.

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Furthermore, in this example the student must apply the basic Plan in a manner that enables student to progress through an actual algorithm (subtraction with regrouping)

**What am I doing?** I have to do this subtraction (fourty-two subtract twenty-four).

**How can I do it?** I need to get four tens (rods) and two units (rods) and I need to take away twenty-four; that will mean I have to re-group.

**Am I using the plan?**-Yes and I'll keep going. So I'll take this ten and regroup it into units, so now I'll have three tens and twelve units.

**Am I using the plan?**-Yes and I'll keep going. Now I can take away the twenty-four. I need to take away the four units from the twelve units, that leaves eight.

**Am I using the plan?**-Yes and I'll keep going. Then I take away the two tens from the three that are there.

**Am I using the plan?**

Yes. Good I'm finished and I have my answer, *eighteen.*
b) Prerequisite skills for the students.

Most children who are enjoying a normal path to literacy, and who therefore are meeting grade expectations, will have mastered these prerequisites without conscious effort. Time needs to be set aside to teach actively those students who have not mastered the prerequisites before the implementation of the program. However, reason dictates that one does not hold up the entire class for one or two children who are not able to master these prerequisites. If, in the teacher's professional judgement, it is considered that a certain student is unable to master some of these prerequisites, then continue the program with the realisation that such students will continue to need extra cues from you. As the program continues, these children will receive adequate practice and also they will enjoy the added boost from the development of the facilitating skills.

The actual application of each rule is not the prerequisite, rather the prerequisite is merely the rote (parrot-fashion verbal response) learning of these facts. The ability of the student to apply these prerequisites develops as the program progresses. Each prerequisite complies with the criteria for the selection of rules to be learnt for this program; that is, each prerequisite is generic and of high utility.

These prerequisites, with the possible exception of the last one, are most likely to be familiar to the teacher.
Prerequisite 2. Student must know (or at least be aware of) the simple phonic sounds of the alphabetic single letters.

Prerequisite 3. Student must know that five of these letters are more important than other letters, and we call these *Vowels*. (Sometimes "y" pretends to be a vowel).
The vowels are more important because every word has at least one vowel (or "y") and usually it/they will say one of the ten vowel sounds.

Prerequisite 4. Student must know (or at least be aware of) the ten vowels sounds.
These sounds are the short (simple) and walking\(^1\) (letter name) sounds. (U\(^2\) should be explained as being a "bit lazy" and instead of saying its letter name as in "you", rather it says "u" as in glue, ruler, Sue).

Prerequisite 5. Student must know the rhyme:
When two vowels go walking, the front one does the talking.
Walking vowels usually (but not always) say their letter name.

\(^1\)This program will not refer to the term "long vowel sound" but rather as the walking vowel sound or letter name.

\(^2\)The indication of the small capital letter indicates the long vowel sound.

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Prerequisite 6. Vowels "walk" when they are together (e.g. "oa" in boat/"eo" in people) or when there is only one other letter between them (e.g."i" in kite/kiting).

Note that if there is more than one other letter between them, then the vowels will not walk (e.g. kitten). The vowel is stopped from walking.

Prerequisites 2-4 are considered best taught by the teacher in the regular class in a group lesson. A quick screening test will allow the teacher to target those children at risk. As there are many phonemic kits and teacher aids, this program does not offer another. Also, it was considered that in teaching these basic prerequisites, material used should reflect the local environment by using pictures and objects familiar to the children.

Prerequisite 5 is a rule that is to be taught by rote and is displayed in the Student's Word Mapping Book as the key. Alternatively, this rule may be presented (in a suitably attractive manner) on a wall chart.

Prerequisite 6 is the expansion of the preceding rule and is similarly to be taught by rote. This expansion is, at first, best illustrated by the teacher in the giving of specific examples such as "boat", "kite", "kitten". It must be remembered that as a prerequisite skill, it is only the fact that is to be addressed, while development of true application for this rule will be addressed within the facilitating skills and facilitating lessons of the program.

An example of a teacher modelling this rule (with a student whom I have deliberately exemplified as a student with very basic reading/writing skills) is to be found below (see section Facilitating skill 2: Spelling Word Mapping Plan).
Part Three

Facilitating skills of the Cognitive-Interactive Program.

The following list of facilitating skills involve skills that will actually grow with the individual student. At any one time, there will be as many adaptations of these skills as there are students in the room. For this reason, they are not prerequisite skills but, rather, facilitating skills which will allow a child to organise his/her superordinate cognitive strategies: or put another way, these facilitating skills will help a child learn to learn.

The following list of skills must be introduced in the given order. The time interval between the introduction of each skill is flexible, however a guide is offered to assist initial planning for the teacher. The use of the skills is then continual, with reference to the skills being made during any lesson, every time the opportunity arises. Furthermore, the facilitating skills are to be used at whatever ability/functioning level the student is operating; that is, for one student the skills are applied for a very simple phonetically consistent consonant/vowel/consonant word (e.g. run) while another more advanced student will be reminded of the facilitating skills in the process of adding "ing" to a word (e.g. running). In the long path to adult literacy levels, another student may be applying the facilitating skills to words such as "proceed" and "procedure". For an outline of the scope and sequence of this model, please refer to Part Five (pp.4-7).

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There are four facilitating skills, being:

1. Exposure to Basic Sight Vocabulary,
2. Spelling (Word Mapping) Plan,
3. Reading (Word Attack!) Plan,
4. Exposure to the Trick List.

These four facilitating skills fall into three distinct categories, being:

A. the basic sight vocabulary which is used as a reference throughout the initial implementation of the program,
B. the Spelling (Word Mapping) Plan and the Reading (Word Attack!) Plan which are definite formulations of cognitive strategies,
C. the Trick List exposure which encapsulates those few (as far as actual numbers in the dictionary) but frequent (as far as appearing in common text) words which have continually plagued students to learn exceptions and special rules.

Each of these facilitating skills will now be discussed in more detail to allow greater insight into the Cognitive-Interactive Program.

Facilitating skill 1: Basic sight vocabulary.

(Week 1).

The basic sight vocabulary facilitates the teaching of the Spelling (Word Mapping) Plan and the Reading (Word Attack) Plan through exemplifying strategy usage with the most commonly used words in basic readers. Again this list is not a prerequisite, but rather a facilitating list for use (as opposed to testing) in the classroom. This list appears in the Student's Word Mapping Book.

There are many paradoxes in the learning of reading, and one of these is that before one can learn to read, one needs to be able to read a basic sight list. This list is needed for constant reference throughout the reading process. It is arbitrary, and may be modified by the teacher once s/he is

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familiar with the Program. (e.g. you might like to add *here*). The list can simply be referred to as "the special list" and you can explain to the class that it is *special* because these are words that "we use a lot". Basically the following list is frequently used words taken from readers used in the introductory stages of print recognition:

```
the
to
and
a
said
kitten
is
you
in
he
it
(student's name)
```

Note that these are frequently used words and that many are not phonetically consistent. Again note that this list is not a prerequisite skill, but a facilitating skill. This sight list will slowly develop throughout the early stages of the program, and an individual's lack of this sight vocabulary should not hold up the program. This sight list (with the exception of names, which will be probably on individual desks) should be displayed along with the many other examples of print that immerse the student in the regular classroom (e.g. poems, science words, dairy words, stories, song charts etc) and treated in daily print walks.

**Facilitating skill 2: Spelling (Word Mapping) Plan.**

(Week 2).

Spelling is a powerful way of teaching reading as it reinforces the more tangible and therefore more concrete alphabetic mapping principle of the graphemes (including multiple representations) and the relationship to the less tangible and transient phonetic utterances. Spelling is a form
of mapping as it requires the student to organise knowledge about a word and to transpose this knowledge into print. Spelling is also a process of writing (story writing, poem writing, letter writing etc), with writing the product. It follows therefore, that spelling is not an isolated skill to be confined to a set lesson (or to be excluded from the timetable and treated incidentally during writing). Be it in a spelling lesson, a reading lesson, a writing lesson or an oral/aural lesson, spelling gives the opportunity for the teacher to model (or demonstrate) how to organise one’s existing knowledge about the sound of a word and map this knowledge into the printed code. This is consistent with the research by Hohn and Ehri (1983) and supported by further research by Perfetti (1984) which found that teaching segmentation with alphabet letters (rather than mere oral sounds) appeared to provide learners with a mental symbol system for representing and thinking about specific phonemes.

The Spelling (Word Mapping) Plan is therefore an important facilitator for teaching reading. This plan should be written with the class in a lesson that will roughly follow this outline:

Teacher explains the objective of the lesson.

**Teacher:** "Today we are going to think about **How we go about spelling a word**. We want to make a plan to help us spell that we can follow.

"For starters, how do we go about spelling a word that we already know?

**Students:** (hopefully after an appropriate discussion) "Just write it down!"

The appropriate discussion may involve some eliciting on behalf of the teacher, as many students do not realise that much spelling is in fact automatic. The teacher needs to stress
that the best way to spell is automatically and that this is an essential part of the Plan for spelling.

**Teacher:** Good. If you know the word, just write it down. Now what about a word you don't know?

**Students:** (hopefully after an appropriate discussion) "Say the word and write down the sounds."

Again, the appropriate discussion may involve some eliciting on behalf of the teacher to achieve the answer, as many students need to be reminded about the association between spoken and written language. The teacher needs to stress that this too is an essential part of the Plan for spelling.

**Teacher:** "Good. Now how do you know if your word is correct?

**Students:** "I just look at it, it looks right" or "I check it in a dictionary" or "I just leave it anyway" etc.

Students usually understand this process, and their answers will reflect their individual development and, in many cases, their maturity.

**Teacher:** "Good. Now think. Where are most of the problems in trying to spell a word?"

**Students:** (hopefully after an appropriate discussion) "It's the words that don't look like they sound."

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Most of the problems in spelling a more difficult word lie with the vowels. It is the vowel sounds that continue to plague an otherwise orderly acquisition of spelling regulations. By noting the Basic Sight Vocabulary, it can be clearly seen that the troublesome words are those that do not give their simple vowel sound. This discussion prepares the student for the extra step in the Plan that they are devising (i.e. "Check the vowels").

**Teacher:** "Yes, and which *letters* in a word are most likely to cause this problem of not looking like they sound? *Let's look at our special list.*

"Which ones *do* look like they sound?"

At this stage the Basic List is divided into phonetically consistent and inconsistent words.

**Students and teacher together:**
"and, is, in, it, kitten,
(and in some cases, some student's names, e.g. Jean, Kim, Kane"- note that in some names the vowels are *walking* as per the prerequisite skill).

**Teacher:** "Which ones *don't* look like they sound?"

**Students and teacher together:**
"the, to, a, said, you, he
(and in some cases, some student's names, e.g. Michael, Terrisa)."

The teacher must now focus interest now on the individual letters of the word, rather than the whole word.

**Teacher:** "So now look. Which are the letters that are tricking you?"

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Students: (hopefully after an appropriate discussion) "The vowels!"

Teacher: "Good. We need to check the vowels.

Thus the extra step in the Plan that they are devising is now revealed. The teacher now explains the intention of this exercise.

Teacher: "Today we are going to make a Plan for spelling, just like we made a plan for doing things. Because spelling is a form of mapping the word, we will call it our Spelling (Word Mapping) Plan."

With younger students, you may need to say "spelling is a form of drawing the word" and then explain that when we draw something, it might be called "a map".

Teacher: "Our first step is: If you know the word, just spell it!"
(Revision of Step 1.)

"If we don't know the word: Listen to the sound of the word and write down all the sounds". (Revision of Step 2.)

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"Then we need a third step. We need to **check the vowels** to determine: **Is this vowel meant to be walking?** *(e.g. note, boat)*."

"or: **Do we need to STOP this vowel from walking** *(e.g. kitten, running)*."

(Revision of Step 3.)

"and finally we can: **check that it looks right, or check a class chart or a word mapping dictionary**."

(Revision of Step 4)

There will be times when the student is still unable to determine the correct spelling. However, to ensure a rule that is generic and of high utility, the student must have one final option, that being to offer the option for the student to "just leave it anyway", rather than not to complete work. Note that this option will not be formalised, but rather left as an informal option. This might be achieved thus:

**Teacher:** "What if you still can't work out the word?"

**Students:** (after some encouragement to admit this step!). "Just leave it anyway and get on with the work".

**Teacher:** "Yes, sometimes we still can't work out the word, but as you get better at applying the plan, this will get less. We won't actually put this option as a step in our plan, we will just remember this as an emergency!"
At this point, the teacher and class may make up a chart for display, or simply refer to the Word Mapping Book. The plan should be continually referred to through teacher modelling or demonstration. Occasions should present themselves through the incidental modelling at the beginning of a formal "spelling" lesson, or during an appropriate moment in a writing lesson. An example of this chart may be found in Part Five (p.2).

An example of a naturalistic opportunity to model this plan may be found in the following illustration. (This example is deliberately that of a student with very basic reading/writing skills, and indeed of a student who has not yet begun the facilitating lessons (Part Four) of the Cognitive-Interactive program. The amount of assistance from the teacher may be therefore necessarily quite considerate).

The student needs a word to proceed in the work. This student is unable to proceed as s/he does not know this word and therefore cannot "just spell it" as per Step 1 of the Spelling Plan.

**Student:** "Will you show me how to write kite?"

**Teacher:** "First, lets say the word and write down all the sounds."

Student spells word in phonetic form onto paper. If the student puts c-l-t. the teacher, at this stage, should direct that "kite" begins with a "k".
**Student:** "kite,...that's k- I-t."

**Teacher:** "Yes, but you forgot that you need two vowels, because the "I" is saying its letter name, and therefore our rule says that there must be two vowels, because we need two vowels to go walking!

What other vowel do you think kite needs?"

**Student:** "I don't know."

(In this case the student, not surprisingly, is unable to supply the correct answer).

**Teacher:** "That's O.K. You have done well, the other vowel is the letter e, and it goes on the end of the word, to make k- I-t-e.

See now that you have two vowels walking, (the front one doing the talking), to make the "I" say its letter name

Note that the teacher must clearly point out the role of the e in keeping with the prerequisites 5 & 6. To help achieve this the teacher should write a similarly structured word (e.g. note) onto a piece of paper.

**Teacher:** "Here's another word: note.". With what is the "O" walking to make it say its letter name?"

**Student:** "The e on the end." (The teacher should prompt if necessary to achieve this generalisation of the rule).
Facilitating skill 3: Reading (Word attack!) Plan.

Before the introduction of the Reading (Word Attack!) Plan, the students should be very familiar with the Spelling (Word Mapping) Plan. For this reason, the time lapse is recommended. Remember, the time lapse recommendation is flexible, with you the teacher making your professional judgement as to when the actual introduction is best made.

The Spelling (Word Mapping) Plan and the Reading (Word Attack!) Plan are definite cognitive strategies to be discussed in the classroom and continually modelled by the teacher for the students. These strategies give the student a general plan of action (for either spelling or reading) that can be applied to any word and thereby trigger a specific plan of action for that word. These plans are both generic and of high utility. These plans represent facilitating skills which are able to generalise to most (if not all) spelling and reading problems. The facilitating skills are not intended to be learnt off in rote fashion and chanted daily along with the mathematics tables! Rather, these facilitating skills are to be discussed and modelled by the teacher in a variety of natural occurrences during classroom spelling/reading situations (as illustrated in the above "kite" example) or brought to the attention of a child experiencing difficulties in word automaticity as a means of solving the problem.

These two plans are further discussed and implemented throughout the progression of the Program, and in particular, throughout Part Four: Facilitating Lessons for the Cognitive-Interactive Program.

The cognitive strategies have been presented in the Student's Word Mapping Book and may be displayed alternatively on a class wall chart.

The actual introduction of this Plan follows a similar lesson outline to that of the introduction to the Spelling (Word Mapping) Plan, thus:
Teacher links the strategies of making these two Plans.

Teacher: "Today we are going to think about how we actually read a word, sentence or page of print. Then, after we have thought about it, we will make up a Plan, like we did for spelling. Let's think. How do we read a word?"

Students: (hopefully after an appropriate discussion) "I just read it.... I leave it out if I don't know it..... I try to guess the word.... I look at the picture to see if it helps.... I look at the first sound and try to work it out...." (etc).

(These answers will reflect the student's individual development and, in many cases, their maturity).

Teacher: "O.K. Now let's see if we can get all that down in some sort of order.

What is the first thing we actually do?"

Students: (hopefully after an appropriate discussion) "If we know the word, just read it."

This is Step 1 of the Plan. The appropriate discussion may involve some eliciting on behalf of the teacher, as many students do not realise that much reading is in fact automatic. It must be stressed that the best way to read is automatically and that this is an essential part of the Plan for Reading.

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The teacher should then continue to elicit the following:

**Students:** "If we don't know the word, see if we can guess it by working it out from the story, ... by looking at the picture ... or by looking at the word itself."

This is Step 2 of the plan. These are all appropriate psycholinguistic strategies, and these strategies are to be encouraged at all times. However, there will still be many occasions when they will not be enough. Therefore the teacher will need to continue the discussion:

**Teacher:** "However, if you still can't read the word, (and you need that word), or, if there are so many words that you can't work out what the story is about, you simply must start to work out some of them, what do you do then?"

This situation will be familiar to many of the students for whom this program is targetted.

**Students:** (hopefully after an appropriate discussion) "Try to sound it out".

(This is Step 3 of the plan. Also note the link to the Spelling Plan at this point).

**Teacher:** "Good. When you sound out a word and it doesn't make sense, what are the most likely letters that are tricking you?"

**Students:** "The vowels!"

(This now leads to the formulation of Step 4 and Step 5).
Teacher: "Good, when it does not sound out and make sense, go back and check the vowel. Are they walking? (Step 4) or, does it need another vowel sound? (Step 5)"

At this point the teacher may need to proceed with a quick revision of the ten vowel sounds from the Prerequisite 4, and remind the students that the vowels are more important than other letters (Prerequisite 3) because every word has a vowel sound.

Teacher: "Let's look at the words that don't sound out from our Special List and see what we mean. Which ones don't sound out and make sense?
(... the, to, said, you, he).

Note that the following illustrations deal with each word. Some words, such as the will always be sight words and this should be admitted to by the teacher. These illustrations are not scripts, however, they are intended to exemplify a typical classroom session that achieves the objective of formulating Steps 4-6 of the Reading Plan.

Teacher: "Let's take each word one at a time...
"the: it doesn't stick to any rule, so let's hope you all remember this word! It's such a common word that you should know it. Let's put it up on the wall here for now.
"to: ... t-o .... it certainly doesn't sound out. But if we go back to the vowel sound, what do you notice?"
Students: (hopefully after an appropriate discussion).

"The o is saying the walking "U" sound. We give it another vowel sound.

(Also note Prerequisites 3 and 4. A quick reminder of these prerequisites may be appropriate).

Teacher: "Good. Now let's look at said: the vowel should be walking and saying the walking "A" sound because the front one should be doing the talking,

but what really is it saying?"

Students: "The short vowel sound for e. We give it another vowel sound.

Teacher: (cont): "you: what do you notice?"

Students: "It's the walking vowel sound for "U", but, in this case, it's the second one doing the talking! We give it another vowel sound, this time, the second vowel."

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At some stage (or indeed, many stages) during this lesson it is necessary to reaffirm the importance of Step 1. However, to ensure that this plan is generic and of high utility, we must include the final alternative, Step 6.

**Teacher:** "Now students, I'm letting you in on a secret. The easiest way is always just to know the word, and the more you read, the more words you will learn.

"What if, after trying all of the above steps, that is, you tried just to read it, you tried to guess it, you checked the vowels to see if they were walking, and you gave them other vowel sounds, but, you still could not get the word. What do you do then?"

**Student:** (hopefully gaining insight from their Spelling Plan) "We forget it and keep reading!"

At this point, the teacher and class may refer to the Reading (Word Attack) Plan in their Word Mapping Book or they may make up a chart for display. The students should continually refer to this plan (initially through teacher modelling or demonstrating its use, and then incidentally at the beginning of a formal "reading" lesson, or during an appropriate moment in a writing lesson). An example of the chart may be found in Part Five (p.3).

2. Note also that the inclusion of "the secret" is similarly part of the Cognitive-Interactive Model in its entirety.
Facilitating skill 4: The Trick List.

The trick lists have several uses. These lists extend the prerequisites by noting that "gh" may pretend to be a vowel and "walk" another vowel (e.g. light), and by noting that vowels may be irregular but that they will still give either:

- a "true" vowel sound (e.g. was=wOs, some=sUm)
- or else a variation of a vowel sound (e.g. look, foil).

By encapsulating these words as "tricks", the Cognitive-Interactive Program reveals these words as words that still have a place in the hierarchy of a predictable system to which strategies or Plans may be applied. These lists have been presented in the Student's Word Mapping Book and may alternatively be displayed on a class wall chart.

Many of the words treated on the trick list (see Part Five p.8) will already be displayed in one manner or other in your classroom. However, for the purposes of this program, it is necessary to display them grouped together on the same chart. Many of the students will already know these words, and others will be in the process of gaining automaticity in them. However, the purpose of presenting this list in the Word Mapping Book is to reinforce the above facilitating skills through provision of a readily available list for teacher/peer modelling or demonstration and for a readily available list on which the students are able to check as per Spelling (Word Mapping) Plan and Reading (Word Attack) Plan and treat occasionally in a standard print walk.

These lists are not in any way prerequisites and should never be tested or treated as such. Compared to the enormous number of words that a student will learn in any year (between 600 and 6,000) the lists do not justify any great time spent on it. The lists are however, a necessary part of the Cognitive-Interactive Program in its entirety, as it is necessary for the students to have a readily available check point. Also these lists most adequately give some form of reason to those many
words which have been complicating simple phonemic approaches since the beginning of reading instruction!

You may prefer to split the lessons differently or to leave out some of the lists for the time being if you have a very young class which may render some lists less age-appropriate.

**Lesson 1.** In this lesson the implications of vowels exhibiting other vowel sounds is discussed.

Note 1: A quick revision of Prerequisite 3 and 4 might be an appropriate introduction to this lesson.

Note 2: The teacher should try to limit class discussion regarding these words, as the objective is to encapsulate these trick words as quickly as possible.

**Teacher:** "Today we are going to list some of those common words in which the vowels trick us and in which we then must go back to the vowel and give it another vowel sound.

Let's start with was. What has happened to the vowel in was?"

**Students:** "Instead of saying "a" the vowel is saying "o"."

**Teacher:** "Good, ...let's make a list of words in which the "a" tricks us by sounding "o"."

(Write out words on chart- use as few or as many as your professional judgement dictates).

**Teacher:** "Now what about words like soon: Here the two walking vowels (the letters "O" and "O") say the walking "u" sound. Let's make a list of words like soon."

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Appendix 2. The I.V.

(Write out words on chart- use as few or as many as your professional judgement dictates).

**Teacher:** "Now what about those other double-"O" words that don't even say a vowel sound. Think about words such as "book". We just have to know these ones, but let's list them anyway.

(Write out words on chart- use as few or as many as your professional judgement dictates).

**Teacher:** "Now one more list for today. Again it's the vowel "O" that's up to tricks. When it walks with an "I" (oi) it really tricks us. Think of some words for the list. (write out words on chart- use as few or as many as your professional judgement dictates).

**Lesson 2.** In this lesson the influence of the "gh" upon the vowel is discussed.

**Teacher:** "Yesterday we made up some trick lists. Today I'd like us to do one more. Think of the word -HIGH. With what is the "I" walking?"

**Students:** "The gh."

**Teacher:** "Good, in a few trick words, the "gh" pretends to be the vowel!"

(Write out words on chart- use as few or as many as your professional judgement dictates).

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Part Four

Facilitating lessons for the Cognitive-Interactive Program.

The following lessons are by way of illustration and suggestion only. It is not the intention of the Cognitive-Interactive Program to be prescriptive and thereby restrictive of the professional teacher's judgements as to lesson contents. However, whenever one is trying something new many provide some prescriptive suggestions, a starting point.

Here, then, are some suggestions that may work for you, or at least, suggest other activities that you might like to try and that will achieve the same objective. These activities are not to replace your existing reading scheme, but rather to complement it.

Facilitating Lesson 1.

Word building from basic CaC\(^3\) words.

Ask the class (or group) to provide some little words that have a short vowel "a" sound. Elicit *cat*, *hat*, *bat*, *rat*, *man*, *fan*, *dad*, *mad*, *lag*, *nag*,. Write these words in a list down the left-hand side of the chalk board or cardboard (see Part Five, p.9) under the heading "word".

Now invite the class (or group) to add "ed" to these words. Depending on the age and ability of the class (or group) they will tell you or you tell them, that some of these words cannot have "ed" added to them. Write the words along the same line as the root word under the heading " add "ed" ", *batted*, *manned*, *fanned*, *lagged*, *nagged*

\[^3\text{Word structure consonant/a/consonant}\]

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Discuss: Why did I have to double the t,n, and g when adding "ed"?

Elicit from the class (or group) that it was necessary to stop the vowels walking. This is consistent with our Spelling (Word Mapping) Plan Check the Vowels.

Now invite the class (or group) to add "ing" to these words. Depending on the age and ability of the class (or group) they will tell you or you tell them, that some of these words cannot have "ing" added to them. Write the words along the same line as the root word under the heading "add ing" batting, ratting, manning, fanning, lagging, nagging.

Discuss: Why did I have to double the t,n, and g when adding "ing"?

Elicit from the class (or group) that it was necessary to stop the vowels walking. This is consistent with our Spelling (Word Mapping) Plan Check the Vowels.

Finally, invite the class to change the short vowel sound to the walking vowel sound. Note at this point, some younger and lower ability students will not be able to offer a word. However, these same students still need to watch this step, as it facilitates the cognitive strategies represented in the Spelling (Word Mapping) Plan and the Reading (Word Attack!) Plan. Write the words along the same line as their root word under the heading "walking vowel", hate, bait, rate, main, made

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Discuss: Why did we have to add "e" to the end of the word, or "i" to the middle of the word?

Elicit that we needed to do this so that the vowels could walk and say their walking (or letter name) vowel sound.

Conclude by saying to the children, that when we do change the vowel sound, we change the whole meaning of the word.

(All lists suggested in the program are presented in the student's Word Mapping Book).

Facilitating Lesson 2-5.

Word building from basic Cec⁴, CiC⁵, CoC⁶, CuC⁷ words.

The above lesson for CaC words may be repeated with each of the vowels (see Part Five, pp.9-10). ll, lists are presented in the student's Word Mapping Book.

Having now completed the word mapping of short vowel words, it is necessary to study the word mapping of the walking vowel words. This leads to the following Facilitating lessons 6-10.

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⁴Word structure consonant/e/consonant
⁵Word structure consonant/i/consonant
⁶Word structure consonant/o/consonant
⁷Word structure consonant/u/consonant

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Facilitating Lesson 6-10.

Word building for recognition of the various alphabetic mapping indicators specific to the long (walking) vowel sounds.

In these lessons, word families are created in which all words offered by the students and teacher, are grouped into their "Vowel-House" (or "Vowel-Cloud"). Note that any words offered that do not give true vowel sounds are to be identified as trick words and if necessary, added to a trick list, but not to these Vowel-Houses (see Part Five, pp.11-15). These "Vowel-Houses" are intended to facilitate the automaticity gained from the mastery of the recognition of the various alphabetic mapping indicators specific to the long (walking) vowel sounds.

The Facilitating Lessons 6-10 may follow a similar pattern to the following outline for the walking vowel A.:

Teacher. "Today we are going to make a house for all the words we use that has the walking vowel "A" sound.

How many vowels do we need to make the walking vowel "A" sound?"

Students. "Two, because two vowels go walking and make the front one do the talking."

(revision Prerequisite 5).

Teacher. "Good, so let's start with walking vowel "A" words that rhyme with "ate."

I'll write them into their two different lists, the "ate" list and the "ait" list."

(revision Prerequisite 6).

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Students. (not necessarily in this order!) "date, fate, gate, hate, Kate, late, mate, rate, bait, gait, wait".

Teacher. "Good, now let's write walking vowel "A" words that rhyme with "ave." There will be only one list here as all "a-v-e " words have the pattern of an "e " on the end.

Students. "cave, gave, pave, rave, save, wave.".

This lesson pattern should then be followed until all words offered and elicited were recorded on the list. At an appropriate time interval (probably successive weeks) the lesson should be repeated to create the Vowel-House (or Vowel-Cloud) for each of the long (walking) vowel sounds (see Part Five, pp.11-15).

Facilitating Lesson 11.

Trick list: When "y" pretends to be a vowel.

This lesson incorporates the objectives of both the Facilitating Skill 4 (Trick Lists) and Facilitating Lessons 6-10 (the various alphabetic mapping indicators specific to the walking vowel sounds). The treatment of the words in which "y" gives a vowel sound should assist in giving reason to words which have been complicating simple phonemic approaches since the beginning of reading instruction.

Teacher. "Think of the word "my". Teacher writes "my" onto the chalk board. "Look at the word. What is saying the vowel sound?"
Students. "The "y" is saying I."

Teacher. "Good, there are many words in which "y" pretends to be a vowel,

Revision of Prerequisite 3, "sometimes "y" pretends to be a vowel".

Teacher. "let's list some other words in which the "y' sounds I."

(Write out words on chart-see Part Five, p.16 - use as few or as many as your professional judgement dictates).

Teacher. Think of the word "funny".
    What is saying the walking vowel sound E?

Students. The "y".

Teacher. "Good, there are more words in which "y" pretends to be a vowel,
    let's list some other words in which the "y' sounds E."

(Write out words on chart-see Part Five, p.16 - use as few or as many as your professional judgement dictates).

Teacher. "Think of the word day.
With what is the vowel "a" walking to make it say A?"

Students. "The "y"!

8 In this section the display for the letter "y" should be read as in the word "why".
Teacher "Good, as you know already, in many words the letter "y" pretends to be a vowel. In words like "day" it makes the front vowel walk. Let's list a few common ones.

(Write out words on chart- use as few or as many as your professional judgement dictates).

Facilitating Lesson 12.
Word building from basic CaCe and CaiC words.
Begin this facilitating lesson with a revision of the Facilitating Lessons 6-10: Word building for recognition of the various alphabetic mapping indicators specific to the walking vowel sounds. Examine the chart displaying the vowel house (or cloud) for the walking vowel "A". Tell the class that you are going to add "ed" and "ing" to some of these words. Depending on the age and ability of the class (or group) they will tell you or you tell them, that some of these words cannot have "ed" added (e.g. maked).

On the chalk board or a new piece of cardboard, ask the class (or group) to provide some words that have a walking vowel "A" sound. Keep the list representative, rather than absolute. Elicit (not necessarily these words or necessarily in this order):

cave, name, race, nail, wait, chain, play,

Write these words in a list down the left-hand side of the chalk/cardboard (see Part Five, p.17) under the heading "word".

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Now invite the class (or group) to add "ed" to these words. Write the words along the same line as the root word:

\[ \text{caved, named, raced, nailed, waited, chained, played..} \]

\textbf{Discuss: What did we have to do to the words when we added "ed"?}

Elicit from the class (or group) that there were different kinds of patterns for the "walking vowels" and therefore we had to do different actions when adding "ed".

At this point, divide the list into three sections:

\[ \text{caved, named, raced,} \]
\[ \text{nailed, waited, chained} \]
\[ \text{played..} \]

\textbf{Discuss: Why did we kick away the old "e" to add the "ed"?}

It is important to establish that we have in fact removed the "old e" before adding the "ed". This is necessary to remain consistent when adding "ing".

Elicit that we had to remove the "e" to add "ed" because\textit{caveed, nameed, raceed}:

*do not look right (this is consistent with our Spelling (Word Mapping) Plan check.),
*the two e's (ee) would probably begin to walk as they are now together. This explanation often allows the student access to a generic factor and therefore allows some insight into building successful strategies. Remember, the objective is to try and give a reason that is generalised from our Plans and accomplished skills of the Cognitive-Interactive

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Program, and therefore they should make sense to the student.

**Discuss:** Why didn't I have to double the *l, t, n* or the *y* when adding "ed" to "nailed", "waited", "chained" or "played"?

Elicit from the class (or group) that it wasn't necessary to stop the vowels walking, as they were already walking. This is consistent with our Spelling (Word Mapping) Plan check.

Some students may ask why we don't kick out the "i" in the "ai" combination, or the "y" in the "ay" combination in the same manner as we did the "e" at the end of the previous words. If this matter is brought up, explain simply that if we started ripping out letters from the middle of words, they probably wouldn't look right (as per our spelling plan). However, if the class is very mature (such as a senior ESL class), you could explain that in a few words this is the case (proceed, procedure), but that this is not the usual pattern. However, it is the experience of the developer of this model that such a question rarely arises. The explanation of "no need to stop the vowels walking" usually suffices. Always keep each step as simple as possible, as it is not the intention of the model to claim a rule that covers all situations, but rather, to offer a strategy for learning to achieve literacy.

Now invite the class (or group) to add "ing" to these words.

*caving, naming, racing, nailing, waiting, chaining, playing*..

**Discuss:** What did we have to do to the words when we added "ing"?
Elicit, that there were different kinds of patterns for the "walking vowels" and therefore we had to do different actions when adding "ing".

At this point, divide the list into three sections:

- caving, naming, racing,
- nailing, waiting, chaining,
- playing.

Discuss: Why did I kick away the "e" to add "ing" to caving, naming and racing?

It is important to establish that we have removed the "old e" before adding the "ing". This then remains consistent with the popular rule that we have to remove the "e" to add "ing" and the logical reason offered by the Cognitive-Interactive approach is because caveing, nameing, raceing:

*do not look right (This is consistent with our Spelling (Word Mapping) Plan check.),
*the two vowels (ei) would probably begin to walk as they are now together.

Once again remember that the objective is to try and give a reason generalised from our Plans and accomplished skills of the Cognitive-Interactive approach.

Discuss: Why didn't I have to double the l, t, n or the y when adding "ing" to "nailing", "waiting", "chaining" or "playing"?

Elicit from the class (or group) that it wasn't necessary to stop the vowels walking, as they were already walking. This is consistent with our Spelling (Word Mapping) Plan check.

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Facilitating Lesson 13-16. Word building from:
CeeC9, CeaC10 words; CiCe11,Cie12 words;
CoCe13, CoaC14, Coe15 words; and
CuCe16, CCue17 words.

The above lesson for walking vowel "A" words may be repeated with each of the walking vowels. All lists appear in the student's Word Mapping Book (see Part Five, pp.17-18).

Facilitating Lesson 17:
Word building from basic CVCC words.
(e.g. walked, walking)

The above lesson for walking vowel "A" words may be repeated, noting that when applying the Spelling (Word Mapping) Plan to CVCC words, that is,
-Check. Do we have to stop the vowels walking?
the answer on this occasion is no. The vowels are stopped from walking because the words end with two consonants (walk, bill) (see Part Five, p.19).

9Word structure consonant/ee/consonant
10Word structure consonant/ea/consonant
11Word structure consonant/i/consonant/e
12Word structure consonant/i/e
13Word structure consonant/o/consonant/e
14Word structure consonant/oa/consonant
15Word structure consonant/o//e
16Word structure consonant/u/consonant/e
17Word structure consonant/consonant/u/e

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Facilitating lesson 18.

**Word Building from words in which the vowel influences the consonants C and G.**

The above lesson for walking vowel "A" words may be repeated, noting that in these words (e.g. nice, giraffe), the vowel is having an influence on the consonants and in fact, changing their sound.

It is also necessary to note that although it is necessary to be aware of this possible consonant change, it is not consistent. In some words, the vowels will change the "g" (George) and the "c" (nice) but this is not the case for such words as Gary and camera.

Facilitating lesson 19.

**Word building for words ending with O.**

The above lesson for walking vowel "A" words may be repeated, noting that when a word ends with o, it says its letter name, as in *go*.

However, when we need to add *s*, we must add *es*.

We need the "e" to **keep the vowels walking**. Children have little problem with this concept, and can easily refer to *go*, goes, (not *gos*) and have little difficulty in applying it to *do*, does; *potato*, potatoes; *tomato*, tomatoes. 18 (see Part Five, p.14)

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18 Some children may inquire re the spelling of "photos". It is worth noting that the reason for this particular spelling irregularity lies in the fact that "photo" is a contraction of "photograph" and therefore an informal noun. The same is also true of "hippos" for "hippopotami".

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Facilitating lesson 20:
Attacking long words.

Most words have a variety of vowels and vowel sounds. However, the basic rule of walking vowels can assist a child to attack even the longest of words.

I have found that younger children love to attack supercalafagralistic expealledocious. By first checking the vowels for those which are walking (being the sUpercAlafragAlistic expEallEdOciou), they quickly gain enough phonic cues to apply their psycholinguistic knowledge (of Mary Poppins) to guess the rest of the word. In fact, the ious is seldom a problem because the child has guessed the word long before this particular phonic phenomenon is met.

The procedure of checking vowels (to see if they are walking, or to give them another vowel sound) helps children to attack words such as:

- future, potato, photosynthesis,
- geography, hydrogen, calcium, isotope.

(Note that the "y" in photosynthesis says a short "i" sound because it is not walking).

It is important at this stage to reassure the children that they are more than capable of guessing the words once they are getting sufficient cues from the word to do so. As word confrontations increase, so also the sight vocabulary and the child's psycholinguistic knowledge.

Further Facilitating lessons.

At this stage, it should be obvious that the strategies of the Cognitive-Interactive Program are broadening into an approach that is both generic and of high utility that should enhance reading for a wide variety of students with reading difficulties. However, the teacher must continue to demonstrate the strategies to the class and to individual students at their own individual levels.

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Therefore, future facilitating lessons have been summarised thus:

**Continual demonstration by teacher and student of Plans whenever need arises.**

Students begin to use the experience of the Trick List to predict irregularities within new words:

caught, taught
thought
shoulder

**Extension Program.**

Students approach age-appropriate reading material by applying the Cognitive-Interactive rules and strategies to words such as:

**Proceed, proceeding, procedure**
(o is walking with the e which in turn is also walking with the second e: there is no need to worry when adding ing because the vowels are already walking; however, in procedure the e walks with the u to make its walking vowel sound).

**sclerosis**
(o is walking with the i. Note that if the child decides to make the first e walk with the o, it makes very little difference to the pronunciation of the word, and may be considered correct).

**Triassic, tyrannosaurus**
(All vowels walk as per Prerequisite 6, noting that y is pretending to be a vowel. Whether the y takes the I or the E walking vowel sound makes little difference to the sounding of the word, and therefore applying the strategy should enable the

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fiend, field  
(It's the second vowel doing the walking).

ointment  
(Need to refer to trick list.

science, lion  
(Vowels walking plus second vowel still saying its short vowel sound).

psychology, psycholinguistic  
(y giving walking vowel sound in disregard of the two consonants ch; first o in psychology has decided not to walk but gives its short sound. This is not so in psycholinguistic, however the u is remaining soundless and the i is saying its short vowel sound. Again note that if the student pronounced the word psycholinguistic as psycholing-u-stics, it would be of little consequence.

enrol, enrolling, enrolment  
(Must double the l in enrolling to stop the vowels walking. This is not the case when adding -ment).
A final thought.

Remember that this program has been devised for students experiencing reading difficulties. The scope and sequence of the program reflects the point that such students themselves are not homogeneous. Rather they are representative of a wide variety of chronological ages, maturity and cognitive ability. It is for this reason that the Program offers a wide scope and sequence. Some students will need to begin at Facilitating Lesson 1; others may be able to slot into other lessons along the sequence. Furthermore, some students will be able to progress to the end of the program, while others may only be able to manage the very early lessons of the scope and sequence suggested in this program.

This program should benefit both teacher and student in proving a worthwhile supplement to the regular class literacy programs. To reiterate what I wrote in the Preface:

Reports suggest that in fact up to twenty percent of our children are failing to read at a satisfactory level. If this program helps even some of these children, then it will be worth the effort of implementation. Failure in reading is arguably the saddest outcome of an unrewarding school career.

Thank you for trying this program,

Yours in teaching,

Judith V. Hall.
Part Five

Appendices to CIP
My plan for doing things.

What am I doing?

How can I do it? I must make a plan.

Am I using my plan? Is it working?

Yes ..... Good I'm finished.
No .... oops, Go back to 1.
Spelling (Word Mapping) Plan

Step 1. If you know the word, just spell it!

Step 2. If not, listen to the sound of the word and write down ALL the sounds.

Step 3. Check the Vowels
*is this vowel meant to be walking?
or
*do I have to stop this vowel walking?

Step 4. Does the word look right?
yes? Good.
no? Then check on a class chart or in a word mapping dictionary
Reading (Word Attack) Plan.

Step 1. If you know the word, just read it!

Step 2. If not, can you guess the word
   *from the story?
   *from the picture?
   *from the word itself? (What is
   the first sound? What is the shape
   of the word?).

Step 3. If you can't guess the word, and if you
  absolutely must have it, sound out
  the word, remembering to

Step 4. Check the vowels:
   *are they walking?
   or

Step 5. Check the vowels:
   *Go back to the vowel and give it
   another vowel sound

Step 6. Have you won the attack?
   yes? Good, keep reading.
   no? Then don't worry
   but keep reading.
Scope and Sequence of the Cognitive-Interactive Program.

Step 1. Prerequisite acquisition stage.

**Prerequisite 1.** Know the four-step plan (a cognitive strategy) and apply it to EVERY situation.

**Prerequisite 2.** Student must know the simple phonic sounds of the alphabetic single letters.

**Prerequisite 3.** Student must know that five of these letters are more important than other letters, and we call these Vowels. Sometime "y" pretends to be a vowel.

**Prerequisite 4.** Student must know the ten vowels sounds. These sounds are the short (simple) and walking sounds. The walking vowel sound is just the letter name, but U should be explained as being a "bit lazy" and instead of saying its letter name as in "you", rather it says "OO" as in glue, ruler.

**Prerequisite 5.** Student must know the rhyme: When two vowels go walking, the front one does the talking. Walking vowels usually (but not always) say their letter name.

**Prerequisite 6.** Vowels "walk" when they are together (e.g. "oa" in boat"eo" in people) or when there is only one other letter between them (e.g."i" in kite/kiting). Note that if there is more than one other letter between them, then the vowels will not walk (e.g. kitten). They are stopped from walking.
Step 2. Facilitating Skills acquisition Stage

1 Basic sight vocabulary.

the to and a said
kitten is you in he it
(student's name)

2. Spelling (Word Mapping) Plan

Step 1. If you know the word, just spell it!
Step 2. If not, listen to the sound of the word and write down ALL the sounds.
Step 3. Check the Vowels
*is this vowel walking?
or
*do I have to stop this vowel from walking?
Step 4. Does the word look right?
yes? Good.
no? Then check on a class chart or in a word mapping dictionary

3: Reading (Word attack!) Plan.

Step 1. If you know the word, just read it!
Step 2. If not, can you guess the word
*from the story?
*from the picture?
*from the word itself? (What is the first sound?).
Step 3. If you can't guess the word, and if you absolutely must have it, sound out the word, remembering to===>
Step 4. Check the Vowels
*are they walking?
Step 5. Check the Vowels
*Go Back to the vowel and give it another vowel sound
Step 6. Have you won the attack?
yes? Good, keep reading.
no? Then don't worry but keep reading.

4. The Trick Lists

Judith V. Hall.
Step 3. Facilitating Lessons Stage.

Facilitating Lessons 1-5
Stop vowel walking by doubling last letter when adding ed/ing:
1. CaC; can, canned, canning
2. CeC; beg, begged, begging
3. CiC; fit, fitted, fitting
4. CoC; mop, mopped, mopping
5. CuC; gut, gutted, gutting

Continual application of Spelling (Word Mapping) Plan.

Facilitating Lesson 6-10
Word building for recognition of the various alphabetic mapping indicators specific to the walking vowel sounds.
6. gate, gait, mail, cave, jade
7. week, meat, people
8. hive, lie
9. mope, boat, toe
10. glue, flute

Continual application of Reading (Word Attack) Plan.

Facilitating Lesson 11
Trick list "y" as walking vowel I & E.
My, funny, day

Facilitating Lesson 12-16
Word building from basic CVVC and CVCe words.
12. mailing, caving, jaded
13. meeting, beating
14. jived, lied, kiting
15. boating, roped
16. glued, gluing

Continual application of Reading (Word Attack) Plan.

Facilitating Lesson 17
Word building CVCC words.
banking, welded, silted, romping, sulking.

Facilitating Lesson 18
Word Building from words in which the vowel influences the consonants C and G.

N.B. Continual application of Spelling and Reading Plans.
Facilitating lesson 19:
Word building for words ending with O.
go, goes, potato, potatoes

Facilitating lesson 20:
Attacking long words.
future, supercalifragalistic, photosynthesis

(N.B. Continual application of Spelling and Reading Plans.)

Continual demonstration by teacher and student of Plans whenever need arises.

Students begin to use the experience of the Trick List to predict irregularities within new words.
cought, taught thought shoulder

Step 5. Extension Applications for the Cognitive-Interactive Program.
Students approach age-appropriate reading material by above Step 4. Application of Cognitive-Interactive rules and strategies to words such as fiend, field ointment proceed, procedure, proceeding sclerosis Triassic, tyrannosaurus tyrant science psychology, psycholinguistic enrol, enrolling, enrolment

Judith V. Hall.
## Trick-List

<table>
<thead>
<tr>
<th>Trick &quot;a&quot; sounds &quot;o&quot;</th>
<th>Trick &quot;oo&quot; sounds &quot;U&quot;</th>
<th>Trick &quot;oo&quot; sounds</th>
<th>Trick &quot;oi&quot; sounds &quot;oi&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>want</td>
<td>moon</td>
<td>book</td>
<td>oil</td>
</tr>
<tr>
<td>waddle</td>
<td>noon</td>
<td>cook</td>
<td>boil</td>
</tr>
<tr>
<td>waffle</td>
<td>soon</td>
<td>hook</td>
<td>coil</td>
</tr>
<tr>
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<td>pool</td>
<td>look</td>
<td>foil</td>
</tr>
<tr>
<td>wallaby</td>
<td>cool</td>
<td>nook</td>
<td>soil</td>
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<td>drool</td>
<td>rook</td>
<td>point</td>
</tr>
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<td>walloping</td>
<td>fool</td>
<td>took</td>
<td></td>
</tr>
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<td>tool</td>
<td>hood</td>
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</tr>
<tr>
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<td>boot</td>
<td>stood</td>
<td></td>
</tr>
<tr>
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<td>hoot</td>
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<tr>
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<td>loot</td>
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<td>moot</td>
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<td>root</td>
<td>Trick &quot;ew&quot; sounds &quot;U&quot;</td>
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<td>proof</td>
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<td></td>
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<td>what</td>
<td>roof</td>
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<td></td>
<td>mood</td>
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### Trick "igh" sounds "I"
- high

### Trick "ew" Sounds "U"
- fight
- light
- might
- right
- sight

### Trick "o" sounds "u"
- some
- honey
- money

---

**The really nasty tricks**

the said to do because
go
# Word Maps for short vowel words: adding "ed" and "ing".

<table>
<thead>
<tr>
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<th>Add &quot;ed&quot;</th>
<th>Add &quot;ing&quot;</th>
<th>Walking Vowel</th>
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<td></td>
</tr>
<tr>
<td>fan</td>
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</tr>
<tr>
<td>dad</td>
<td></td>
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<td>made</td>
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<tr>
<td>mad</td>
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<tbody>
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<td>men</td>
<td></td>
<td></td>
<td>mean</td>
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<td>met</td>
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<td>hem</td>
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<td></td>
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<td>billed</td>
<td>billing</td>
<td>bile</td>
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</table>

19 Sell, selling, bill, billed, billing will similarly lead to some discussion, but it must be noted that these words follow our rule as stipulated in Pre-requisite 4.
<table>
<thead>
<tr>
<th>Word</th>
<th>Add &quot;ed&quot;</th>
<th>Add &quot;ing&quot;</th>
<th>Walking</th>
<th>Vowel</th>
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Appendix 2. The I.V.

Vowel House Walking "A"
(Sample Only)

<table>
<thead>
<tr>
<th>ate</th>
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<tr>
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</table>

Judith V. Hall.
Vowel House Walking "E"
(Sample only)

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Judith V. Hall.
### Vowel House Walking "i" (Sample only)

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<td>vine</td>
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<td></td>
<td>lie</td>
</tr>
<tr>
<td>wine</td>
<td></td>
<td></td>
<td>pie</td>
</tr>
</tbody>
</table>

---

Judith V. Hall.
Vowel House Walking "O"
(Sample only)

oak  ote  ope  oke  oe
croak note hope coke toe
soak vote dope moke woe
dote dopey smoke
voter lope

oat oak ome one ose
ccoat soak home cone hose
oats dome bone nose
float gnome telephone
boat  gnome telephone

-0 -0ES

-go potato goes
-no tomato tomatoes
-quo (photo) potatoes
-so (radio)

And don't forget
hotel ocean over folk
Vowel House Walking "U"
(Sample only)

uge  uit  ute  ue  (uu)
huge  fruit  cute  glue  (vacuum)
abuse  suit  brute  Sue  (continuum)
accuse

ube  tube  cube
ruler

duke  huge
Trick List: When "y" Pretends to be a Vowel

<table>
<thead>
<tr>
<th>Trick &quot;y&quot; sounds &quot;I&quot;</th>
<th>Trick &quot;y&quot; walks &quot;ay&quot;</th>
<th>Trick &quot;y&quot; sounds &quot;E&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>by</td>
<td>bay</td>
<td>bunny</td>
</tr>
<tr>
<td>my</td>
<td>day</td>
<td>funny</td>
</tr>
<tr>
<td>cry</td>
<td>hay</td>
<td>runny</td>
</tr>
<tr>
<td>dry</td>
<td>lay</td>
<td>sunny</td>
</tr>
<tr>
<td>fry</td>
<td>may</td>
<td></td>
</tr>
<tr>
<td>sty</td>
<td>nay</td>
<td>walks &quot;ey&quot;</td>
</tr>
<tr>
<td>try</td>
<td>pay</td>
<td>honey</td>
</tr>
<tr>
<td>why</td>
<td>ray</td>
<td>money</td>
</tr>
<tr>
<td></td>
<td>stay</td>
<td></td>
</tr>
<tr>
<td></td>
<td>way</td>
<td></td>
</tr>
</tbody>
</table>

Judith V. Hall.
Word Maps for walking vowel words: adding "ed" and "ing".

Walking Vowel "A"

<table>
<thead>
<tr>
<th>Word</th>
<th>Add &quot;ed&quot;</th>
<th>Add &quot;ing&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>date</td>
<td>dated</td>
<td>dating</td>
</tr>
<tr>
<td>mail</td>
<td>mailed</td>
<td>mailing</td>
</tr>
<tr>
<td>race</td>
<td>raced</td>
<td>racing</td>
</tr>
<tr>
<td>take</td>
<td>(took)</td>
<td>taking</td>
</tr>
<tr>
<td>sail</td>
<td>sailed</td>
<td>sailing</td>
</tr>
</tbody>
</table>

Walking Vowel "E"

<table>
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<tr>
<th>Word</th>
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<th>Add &quot;ing&quot;</th>
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</thead>
<tbody>
<tr>
<td>see</td>
<td>(saw)</td>
<td>seeing</td>
</tr>
<tr>
<td>wheel</td>
<td>wheeled</td>
<td>wheeling</td>
</tr>
<tr>
<td>greet</td>
<td>greeted</td>
<td>greeting</td>
</tr>
<tr>
<td>heat</td>
<td>heated</td>
<td>heating</td>
</tr>
<tr>
<td>read</td>
<td>read</td>
<td>reading</td>
</tr>
</tbody>
</table>

Judith V. Hall.
Walking Vowel "I"

<table>
<thead>
<tr>
<th>Word</th>
<th>Add &quot;ed&quot;</th>
<th>Add &quot;ing&quot;</th>
</tr>
</thead>
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<tr>
<td>dice</td>
<td>diced</td>
<td>dicing</td>
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<tr>
<td>time</td>
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<td>dine</td>
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<td>dining</td>
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<tr>
<td>wipe</td>
<td>wiped</td>
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</tr>
<tr>
<td>die</td>
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<td>dying</td>
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</table>

Walking Vowel "O"

<table>
<thead>
<tr>
<th>Word</th>
<th>Add &quot;ed&quot;</th>
<th>Add &quot;ing&quot;</th>
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</thead>
<tbody>
<tr>
<td>boat</td>
<td>boated</td>
<td>boating</td>
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<tr>
<td>roam</td>
<td>roamed</td>
<td>roaming</td>
</tr>
<tr>
<td>dote</td>
<td>doted</td>
<td>doting</td>
</tr>
<tr>
<td>smoke</td>
<td>smoked</td>
<td>smoking</td>
</tr>
<tr>
<td>go</td>
<td>(gone)</td>
<td>going</td>
</tr>
</tbody>
</table>

Walking Vowel "U"

<table>
<thead>
<tr>
<th>Word</th>
<th>Add &quot;ed&quot;</th>
<th>Add &quot;ing&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>abuse</td>
<td>abused</td>
<td>abusing</td>
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<tr>
<td>rule</td>
<td>ruled</td>
<td>ruling</td>
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<tr>
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<td>tuned</td>
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<tr>
<td>flute</td>
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<td>fluting</td>
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<tr>
<td>vacuum</td>
<td>vacuumed</td>
<td>vacuuming</td>
</tr>
</tbody>
</table>
### Word Maps: adding "ed" and "ing".

<table>
<thead>
<tr>
<th>Word</th>
<th>Add &quot;ed&quot;</th>
<th>Add &quot;ing&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>walk</td>
<td>walked</td>
<td>walking</td>
</tr>
<tr>
<td>belt</td>
<td>belted</td>
<td>belting</td>
</tr>
<tr>
<td>wink</td>
<td>winked</td>
<td>winking</td>
</tr>
<tr>
<td>bolt</td>
<td>bolted</td>
<td>bolting</td>
</tr>
<tr>
<td>dust</td>
<td>dusted</td>
<td>dusting</td>
</tr>
</tbody>
</table>

### Word Maps: Maths Words.

<table>
<thead>
<tr>
<th>Word</th>
<th>Add &quot;ed&quot;</th>
<th>Add &quot;ing&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>big</td>
<td>bigger</td>
<td>biggest</td>
</tr>
<tr>
<td>small</td>
<td>smaller</td>
<td>smallest</td>
</tr>
<tr>
<td>little</td>
<td>littler</td>
<td>littlest</td>
</tr>
<tr>
<td>long</td>
<td>longer</td>
<td>longest</td>
</tr>
<tr>
<td>short</td>
<td>shorter</td>
<td>shortest</td>
</tr>
<tr>
<td>close</td>
<td>closer</td>
<td>closest</td>
</tr>
<tr>
<td>far</td>
<td>farther</td>
<td>farthest</td>
</tr>
<tr>
<td>strong</td>
<td>stronger</td>
<td>strongest</td>
</tr>
<tr>
<td>weak</td>
<td>weaker</td>
<td>weakest</td>
</tr>
<tr>
<td>fast</td>
<td>faster</td>
<td>fastest</td>
</tr>
<tr>
<td>slow</td>
<td>slower</td>
<td>slowest</td>
</tr>
<tr>
<td>quick</td>
<td>quicker</td>
<td>quickest</td>
</tr>
</tbody>
</table>

Judith V. Hall.
Glossary of Terms

**Cognitive strategies:** Cognitive strategies are general plans of action by means of which learners can manage their own behaviour, much of which will be overt and observable.

**Demonstration:** A demonstration is a session when a teacher shows a student or a group of students how an action is completed. The student then assimilates this demonstration and adapts it to individual requirements.

**Lesson:** In today's terminology, "lesson" may also read "demonstration". Because this program has been written for a wide variation of clientele (both in consideration of teacher and student idiosyncrasies), the term "lesson" may equate to the time indicative of an entire timetable session, or, for the more advanced student, "lesson" may be a reasonably quick session and therefore in truth, a "demonstration" section of a whole timetable pedagogic experience.

**Modelling:** Modelling is more than a mere demonstration. This requires the teacher to verbalise (i.e. to think aloud) while performing the exact movements required by the student. The student is then required to imitate this modelling process.

Judith V. Hall.
PART SIX

References to CIP.


Armidale Inspectorate (The), (1980). "Armidale word frequency list with sight vocabulary." N.S.W.Department of Education.


BRISBANE COURIER MAIL "School reading system wrong, says academic.", 28.4.1990.


Judith V. Hall.


Appendix 2. The L.V.


Judith V. Hall.


MACQUARIE (EXPRESSIVE) WORD ATTACK SKILLS TEST (undated). Macquarie University Special Education Centre.


MANN-SUITER DEVELOPMENTAL SPELLING INVENTORY (undated). NCAE Special Education Centre.

Judith V. Hall.


Judith V. Hall.
Appendix 2. The I.V.


Appendix 3.

Communications to schools.

Appendix 3 contains samples only of all the communications entered into with schools because much of the communication is repetitive with the same or similar information being sent to the thirteen schools involved in this research.

This researcher made a special effort to keep informed those co-operating with the study.

The sample includes:
* original requests
* thank you letters
* final letters summarising the research and its findings.
Dear Dr. Burke,

Please find enclosed my research proposal. I seek your approval to research my Doctor of Philosophy in Department of School Education schools in this region. Specifically, I require your permission to approach a total of twenty-four schools (thirteen experimental and eleven control) to seek their co-operation in this research. Please note that only the special education teachers in each school will be asked to participate. The list of schools and teachers that I wish to approach are on pp.35-36 of the proposal.

The title of this research is: The development and implementation of cognitive strategies to facilitate reading in students with reading disabilities. The Independent Variable is to be found on pp.37-72. I have designed this program to fit easily into the existing programs of classroom teachers, and it therefore should create a minimum of disruption to the existing classroom routine. Furthermore, I believe that this program will be welcomed by many teachers, as it offers assistance in programming and in catering for those students who are, by the nature of their disability, finding it most difficult to learn.
The proposal has been divided into four sections, being:
Part One; Introduction and Rationale....p.2
Part Two; The selection of the tests....p.12
Part Three; Selection of schools...........p.33
Part Four; The Independent Variable......p.37

During this year, I have been granted two days per week study leave to undertake this research. The initial preparations and literature searches are almost completed, and I would like to begin pretesting students in Term 4, 1990. The tests I have chosen are The Neale Analysis of Reading Ability (Revised), The Neal Phonemic Skills Screening Test, a two part spelling assessment test, a two part writing assessment test, and a cloze exercise. Following the pretesting, I hope to implement the Independent Variable at the beginning of Term 1, 1991.

Please find enclosed the proposal for your approval, plus a copy of my Study Leave 1990, a copy of a letter stating my Principal's support for my research, a copy of my Curriculum Vitae, and, a copy of my school executive's report on my school documentation and professional contribution to my school.

I am also seeking Study Leave for 1991, and have submitted application for same to Mr. F. Cook.

Thanking you in anticipation of your consideration,

Yours faithfully

Ms. Judith V. Hall M.Ed.(Hons).
THE PRINCIPAL,  
SMITH HILL HIGH SCHOOL

Dear Principal,

I am a Special Education teacher with the N.S.W. Department of School Education currently researching Reading Difficulties with the University of Wollongong.

I am seeking access to your school with the specific intention of involving the following teachers and classes:

<table>
<thead>
<tr>
<th>Name of School</th>
<th>Classes</th>
<th>Access Sought</th>
<th>Exp Con'1</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMITH HILL HIGH</td>
<td>2.8@ESL</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

All students participating in this research will be requested to undertake the following tests.

1. The Neale Analysis of Reading Ability Revised
2. The Neal Phonemic Skills Screening Test
3. A two part spelling assessment test, being;
   Part A. Visual discrimination of whole words through a simple matching test
   Part B. Spelling test adapted from the Mann-Suiter Developmental Spelling Inventory Levels I-III.
4. A two part writing assessment
   Part a. Story writing using picture as stimulus,
   Part b. Diary report
5. A Cloze Exercise.

As an Experimental participant, the teachers will then be requested to follow a specific program designed for students with specific reading difficulties. This program is consistent with Departmental requirements and should prove adaptable for all school needs. This program will not disrupt any regular school programs and activities.
It is my intention that the above tests be pre-tested during Weeks 4-10 of this current school Term 4, with the implementation of the Program to include Terms 1-3 of 1991. I hope to regularly visit the teachers involved to support them in this implementation.

As it remains your final prerogative to allow me to research within your school, I will ring you towards the end of next week for an appointment convenient to you that will allow me to meet both you and your Special Education staff. At this meeting, we can then discuss appropriate communications with parents.

Please note that this research, the tests involved, and the specific program have been approved by Dr. T. R. Burke (please refer to inclosed letter).

Thanking you,
Yours faithfully,

Ms. Judith Hall M.Ed(Hons), B.Ed.,
Teach.
THE PRINCIPAL,
LAKE ILLAWARRA HIGH SCHOOL

Dear Mr Bray,

I am a Special Education teacher with the N.S.W. Department of School Education currently researching Reading Difficulties with the University of Wollongong.

I am seeking access to your school with the specific intention of involving the following teachers and classes:

<table>
<thead>
<tr>
<th>Name of School</th>
<th>Classes</th>
<th>Access Sought</th>
<th>Exp Con’t</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAKE ILLAWARRA HIGH</td>
<td>2@ESL</td>
<td>*</td>
<td></td>
</tr>
</tbody>
</table>

All students participating in this research will be requested to undertake the following tests.

1. The Neale Analysis of Reading Ability Revised
2. The Neal Phonemic Skills Screening Test
3. A two part spelling assessment test, being;
   - **Part A.** Visual discrimination of whole words through a simple matching test
   - **Part B.** Spelling test adapted from the Mann-Suiter Developmental Spelling Inventory Levels I-III.
4. A two part writing assessment
   - **Part a.** Story writing using picture as stimulus,
   - **Part b.** Diary report
5. A Cloze Exercise.

As an Experimental participant, the teachers will then be requested to follow a specific program designed for students with specific reading difficulties. This program is consistent with Departmental requirements and should prove adaptable for all school needs. This program will not disrupt any regular school programs and activities.
It is my intention that the above tests be pre-tested during Weeks 4-10 of this current school Term 4, with the implementation of the Program to include Terms 1-3 of 1991. I hope to regularly visit the teachers involved to support them in this implementation.

As it remains your final prerogative to allow me to research within your school, I will ring you towards the end of next week for an appointment convenient to you that will allow me to meet both you and your Special Education staff. At this meeting, we can then discuss appropriate communications with parents.

Please note that this research, the tests involved, and the specific program have been approved by Dr. T. R. Burke (please refer to inclosed letter).

Thanking you,

Yours faithfully,

Ms. Judith Hall M.Ed(Hons), B.Ed.,
Teach.
THE PRINCIPAL,  
PORT KEMBLA HIGH SCHOOL

Dear Principal,

I am a Special Education teacher with the N.S.W. Department of School Education currently researching Reading Difficulties with the University of Wollongong.

I am seeking access to your school with the specific intention of involving the following teachers and classes:

<table>
<thead>
<tr>
<th>Name of School</th>
<th>Classes Access Sought</th>
<th>Exp Con't</th>
</tr>
</thead>
<tbody>
<tr>
<td>Port Kembla High</td>
<td>2@ESL</td>
<td>*</td>
</tr>
</tbody>
</table>

All students participating in this research will be requested to undertake the following tests.

1. **The Neale Analysis of Reading Ability Revised**
2. **The Neal Phonemic Skills Screening Test**
3. **A two part spelling assessment test**, being;
   - **Part A.** Visual discrimination of whole words through a simple matching test
   - **Part B.** Spelling test adapted from the Mann-Suiter Developmental Spelling Inventory Levels I-III.
4. **A two part writing assessment**
   - **Part a.** Story writing using picture as stimulus,
   - **Part b.** Diary report
5. **A Cloze Exercise.**

As an **Experimental** participant, the teachers will then be requested to follow a specific program designed for students with specific reading difficulties. This program is consistent with Departmental requirements and should prove adaptable for all school needs. This program will not disrupt any regular school programs and activities.
It is my intention that the above tests be pre-tested during Weeks 4-10 of this current school Term 4, with the implementation of the Program to include Terms 1-3 of 1991. I hope to regularly visit the teachers involved to support them in this implementation.

As it remains your final prerogative to allow me to research within your school, I will ring you towards the end of next week for an appointment convenient to you that will allow me to meet both you and your Special Education staff. At this meeting, we can then discuss appropriate communications with parents.

Please note that this research, the tests involved, and the specific program have been approved by Dr. T. R. Burke (please refer to inclosed letter).

Thanking you,

Yours faithfully,

Ms. Judith Hall M.Ed(Hons), B.Ed.,
THE PRINCIPAL,
LAKE ILLAWARRA HIGH SCHOOL

Dear Tony, Silvia, Lois and Helen,

Thank you for allowing me to research in your school, and in particular, for allowing me to work with your ESL and LD pupils. I trust that the intervention and results were of practical value to you. I can assure you that without your co-operation I would not have been able to undertake this task of Ph.D. study.

As you are aware, all students participating should now have undertaken the following tests.

1. The Neale Analysis of Reading Ability Revised
2. The Neal Phonemic Skills Screening Test
3. A two part spelling assessment test
4. A two part writing assessment
5. A Cloze Exercise.

I have enclosed a copy of your section of the results. Overall, this project gathered data from over three-hundred children from four high schools, eight primary schools and one SSP. The pupils were all classified as "special needs" by the Department; being either L.M., ESL (NESB), L.D. or I.O.

The raw data is now undergoing analysis and the results, inferences and conclusions will be available next year.

Once again, I thank you for your co-operation in this research.

Yours faithfully,

Judith V. Hall  M.Ed (Hons.), B.Ed.,
THE I.M. Staff
KEIRA HIGH SCHOOL

Dear Kim and Kylie,

Thank you for allowing me to research in your classes. I trust that the intervention and results were of practical value to you. I can assure you that without your co-operation I would not have been able to undertake this task of Ph.D. study.

As you are aware, all students participating should now have undertaken the following tests.

1. The Neale Analysis of Reading Ability Revised
2. The Neal Phonemic Skills Screening Test
3. A two part spelling assessment test
4. A two part writing assessment
5. A Cloze Exercise.

I have enclosed a copy of your section of the results. Overall, this project gathered data from over three-hundred children from four high schools, eight primary schools and one SSP. The pupils were all classified as "special needs" by the Department; being either I.M., ESL (NESB), L.D. or I.O.

The raw data is now undergoing analysis and the results, inferences and conclusions will be available next year.

Once again, I thank you for your co-operation in this research.

Yours faithfully,

Judith V. Hall  M.Ed (Hons.), B.Ed.,
Dear Fred,

Enclosed is a copy of the letters that I have now sent to all schools that participated in the research. This should be my final involvement and communication to them.

Thank you once again for all your support. I look forward to our next meeting when I should have a fully bound copy of the thesis for you— I think I will choose a red cover!

The final communication to the schools reads thus:

Thank you for allowing me to research in your school, and in particular, for allowing me to work with your (ESL, IM IO/IS and/or LD) pupils. I trust that the intervention and results were of practical value to you. I can assure you that without your cooperation I would not have been able to undertake this task of Ph.D. study.

The following pages are a summary to the research and findings. The thesis (two volumes! about 500 pages in all!) in its entirety should be bound and ready for external assessment in about eight weeks.
General background to the research.

This research realised that there was an urgent need for thorough research to investigate a reading model that would supplement and complement the psycholinguistic approach by teaching active decoding as a step in the application of cognitive strategies. By emphasising the application of cognitive strategies, the emphasis on decoding skills would become a facilitating skill potentially capable of enhancing reading for life. Such a program would not simply represent a return to phonic based reading schemes.

This study further recognised that up to twenty per cent of our children are failing to learn to read at a level considered adequate in the wider community. Kronick (1990) points out that notwithstanding the fact that labels are "arbitrary cultural constructs, every society has members who have learning or emotional problems" (p.5). She also explains that it is not entirely correct to dismiss learning problems as a school-imposed label for many children interpret out-of-school situations in the same "impervious and constricted a fashion" (p.5). Kronick (1990) suggests that before the label learning difficulty, such children were "unlabelled, yet learning little in school" (p.5), and concludes:

... it is not the label that creates the stigma but, rather, the behavior. (p.6)

These same students then subsequently leave school to join the one million Australian adults who are for all practical purposes illiterate. There is little argument that illiteracy is deleterious to both the individual and to society as illiteracy renders many people to the status of social isolates.

The importance of the problem is compounded by the Great Debate which continues to rage globally between the adherents to the opposing reading models. The debaters seldom acknowledge the vast background of research into learning failure and strategy deficiencies. This research suggested that many students are failing to learn because they are cognitively blind. The claim by Johnson and Louis (1986), that children learn "usually unconsciously, the regularities between the way things are
written and the way they are spoken" (p.22) may apply in the case of students who are effective readers but, one must accept that this is not the case for those with reading difficulties.

The importance of this research cannot be overstated for it set out to develop and implement a cognitive-interactive program for facilitating reading for students with reading difficulties. No doubt there are many teachers implementing programs which they feel is of benefit learners, and in particular slow learners. However, regardless of intention Dale and Cole (1988) note:

Progress in the education of handicapped children can come only from a reciprocal interaction between theoretical innovations and a careful evaluation of the effectiveness of models when they are actually implemented in programs. The experience of recent decades suggests, perhaps surprisingly, that innovations may be more easily implemented than evaluated. (p.439)

Therefore this research set out with the intention of evaluating a cognitively-based reading approach designed to remedy reading failure. This research used a statistical tool that would enable testing for the significance of the difference among two or more population means, and possibly after adjusting for the effects of other factors. Furthermore this statistical tool answered the question of whether the variability between groups was large enough in comparison with the variability within groups to justify the inference that the means of the populations from which the different groups were sampled were not the same and therefore there was a statistically significant difference present in the data. This study evaluated the cognitive-interactive program specifically developed for this research by testing for statistically measurable difference in the following reading and reading related areas which in turn generated eighty research questions.
normed reading age in reading rate,
normed reading age in reading accuracy,
normed reading age in reading comprehension,
phonological word processing skills,
spelling,
process writing, and
a cloze exercise.

Because this research sought to determine whether the Cognitive-Interactive Program for Facilitating the Learning of Reading (CIP) facilitated reading for students with reading difficulties, two hundred and fifty-nine students from the following populations were examined. These students were gathered from thirteen schools from the South Coast Region of New South Wales. The schools were selected to include High Schools, Primary Schools and Schools for Special Purposes.

Group 1: students whose reading difficulty is defined by the Department of School Education to lie within the aetiology of their learning English as a second language (ESL),

Group 2: students whose reading difficulty is defined by the Department of School Education to lie within the aetiology of a mild intellectual disability (IM),

Group 3: students whose reading difficulty is defined by the Department of School Education to lie within the aetiology of a moderate/severe intellectual disability (IO/IS),

Group 4: students whose reading difficulty is defined by the Department of School Education to lie within the aetiology of an unspecified leaning disability (LD).
Groups 1 and 2 were divided into separate experimental and control groups, and Groups 3 and 4 served as their own control before exposure to CIP. This generated over three-hundred individual student observations through the pretests and posttests.

**A summary of findings.**

The overall findings of the research were considered exciting as they show clearly that it is possible to significantly facilitate reading for those students suffering reading disabilities and difficulties.

Reading Accuracy was significantly improved:

*for the sample of students whose reading difficulty is defined by the Department of School Education to lie within the aetiology of a mild intellectual disability (IM), and in particular to primary IM students.*

*for the sample of students whose reading difficulty is defined by the Department of School Education to lie within the aetiology of an unspecified leaning disability (LD), and in this instance to both high school LD students and primary LD students.*

Reading Comprehension was significantly improved:

*for the sample of students whose reading difficulty is defined by the Department of School Education to lie within the aetiology of an unspecified leaning disability (LD), and in particular to primary LD students.*
Phonological Word Processing Skills were significantly improved:

*for the sample of students whose reading difficulty is defined by the Department of School Education to lie within the aetiology of their learning English as a second language (ESL), and in this instance to both high school ESL students and primary ESL students.

*for the sample of students whose reading difficulty is defined by the Department of School Education to lie within the aetiology of a mild intellectual disability (IM), and in particular to primary IM students.

*for the sample of students whose reading difficulty is defined by the Department of School Education to lie within the aetiology of an unspecified leaning disability (LD), and in particular to primary LD students.

Cloze was significantly improved:

*for the primary sample of students whose reading difficulty is defined by the Department of School Education to lie within the aetiology of an unspecified leaning disability (LD).

Spelling proved a very difficult activity to test in the classroom and of the nine results sought, four were not obtainable due to insufficient data and therefore no conclusions can be made in this regard.

Writing most likely was undermined by the time constraints of the implementation period of CIP. For the experimental groups, the time of exposure to CIP was most likely too restrictive. In short, more time may well prove all that is necessary for transference of increased accuracy, comprehension, phonological word processing skills, and cloze to the writing domain. The
disappointing results in writing however, does not detract from the positive findings of the overall research which show clearly that it is possible to significantly facilitate reading and reading related areas for those students suffering reading disabilities and difficulties.

A summary of other interesting observations.

Furthermore, this research noted and documented many patterns of behaviour which, although outside the purpose of this study, are worthy of further investigation.

Group 3 IO/IS.

These patterns include the findings pertaining to the sample of students whose reading difficulty is defined by the Department of School Education to lie within the aetiology of a moderate/severe intellectual disability (IO/IS). Although the findings revealed that CIP had no significant influence on the reading rate, reading accuracy, reading comprehension or phonological word processing skills of students, nevertheless it appeared that CIP heightened these students' awareness for the need to plan. Teachers felt that the gains to these students were best revealed through their verbal expression for which there was no test included in this experiment. Further investigation of this matter is recommended, for as noted in section 4.11, it would seem less than kind not to thoroughly investigate any program that might offer enhancement to this group.

Reading Rate.

Another pattern of behaviour documented in the results and discussion pertained to the findings in relation to the reading rate. All students both control and experimental, with the only exception being the primary LD experimental students, slowed their reading rate. For example, the means for the experimental and control ESL students indicated that this group slowed their rate and the standard deviations indicated that this was a fairly consistent within-group trend. An explanation was found in an examination of the Neale Analysis Forms which indicated that students were progressing to more difficult material thereby.
entering into the next level of difficulty. Teachers might expect, and should accept, a temporary regression of rate if such a regression is off-set by gains in levels of reading accessibility.

However, a somewhat alarming pattern was also revealed with relation to the reading rate of ESL students. An examination of the raw data indicated that ESL children are reading "too fast", and while their reading rate and accuracy may not indicate a problem, their comparatively low comprehension scores should alert a teacher that there is indeed a problem.

An encouraging pattern was revealed in relation to reading rate with findings and observations pertaining to the IM students. It appeared that the IM sample slowed their rate as a "trade-off" for significantly higher accuracy scores at the same level of reading material.

**Visual Discrimination.**

Another pattern of behaviour documented in the results and discussion pertained to the findings in relation to the visual discrimination. In almost every pretest and posttest the students gained a raw score of 100%. This research found that of the two hundred and fifty-nine children with reading disabilities participating in this experiment, very, very few indicated that they had a visual discrimination problem such as might be expected if there was an underlying physiological or perceptual problem. This observation supports the conclusions of Vellutino (1987) in his claim that reading problems are far from mere visual problems, and that visual perception or other visual inadequacies are not a primary concern when dealing with reading problems in the classroom.

**Conclusions of this research.**

There is a great concern among our community support groups. The Australian Association of Special Education (AASE), the Association for Children with Learning Difficulties (ACLD), the Association for Specific Learning Difficulties (SPELD), Teachers Reacting Against Failure (TRAF) and the New South Wales Council for the Intellectually Disabled (NSWCID), persistently re-state the concern that between ten and twenty
percent of our children are experiencing reading difficulties (AASE, 1989a). The consequential bottom-line is that school pupils who are failing to read then join the larger part of one million Australian adults who are for all practical purposes, illiterate (Lloyd & Goyen, 1986), that is, they cannot read.

The debates originating from philosophical stands with regards to reading acquisition, or from philosophical stands with regards to the identification and classification of students with learning problems do little for those students affected. Indeed, much of the work now being done by the medical fraternity investigating aetiologies such as dyslexia have done little for teachers who need to generate programs that will facilitate students in the immediate future. Kronick (1990) realises that:

There are biological differences and constraints that even the most optimum environment will be unable to overcome. In the bravest of new worlds we can eliminate labels and education streams, and place everyone in the mainstream and teach to their strengths, none of which will eradicate individual differences or ensure that the skills our culture values will be acquired. (p.5)

There is little doubt that the future directions for education must consider these biological differences and constraints. Indeed, this consideration has already been demonstrated in the founding of the Special Education Support Centres following strong lobbying by parent groups. These SECSs are considered a critical part of future directions for planning student services and are in a position to be "at the forefront of innovation in the area of education of students with learning difficulties" (Richard, 1992, p.14). Somewhat sadly, Siegler and Jenkins (1989) consider that:

Construction of new strategies is one facet of the larger topic of learning. However, it is a facet that has historically received relatively little attention. (p.3)

This research set out to develop and implement a cognitiveinteractive program in the classrooms of students who have been formally identified as suffering reading disabilities. This
research has shown that for many students experiencing reading failure, a cognitive-interactive program which teaches students to apply strategies with consistency, may assist in the remediation process.

The findings of significant improvements (p<.05) in reading accuracy, reading comprehension, phonological word processing skills and cloze confirm that a program based on the construction of new strategies does have the potential to facilitate reading for students with reading disabilities. It is hoped that this research will help to alleviate the historical neglect noted by Siegler and Jenkins (1989). Furthermore, it is hoped that the exciting findings of this research will generate much interest in this area, and thereby stimulate more research and attention to this exciting field of cognitive-interactive programming. The planners of future directions for Education, and in particular for Special Education Services should find this research of great interest.

Once again, I thank you for your co-operation in this research.

Yours faithfully,

Judith V. Hall M.Ed (Hons.), B.Ed.,
Appendix 4

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³General Linear Models Procedure Repeated Measures ANOVA
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| Error(TREAT)      | 4  | 1.89754000   | 0.47438500   |         |      |

| Dependent Variable |    | RATEDIF1 RATEDIF2 Class 2 |              |         |      |
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| Error(TREAT)      | 14 | 71.12990000  | 5.08070714   |         |      |

| Dependent Variable |    | ACCYDIF1 ACCYDIF2 |              |         |      |
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| Error(TREAT)      | 19 | 3.90476000    | 0.20551368   |         |      |

| Dependent Variable |    | ACCYDIF1 ACCYDIF2 Class 1 |              |         |      |
| TREAT             | 1  | 3.90625000     | 3.90625000   | 26.93   | 0.0066 |
| Error(TREAT)      | 4  | 0.58030000    | 0.14507500   |         |      |

| Dependent Variable |    | COMPDIF1 ACCYDIF2 Class 2 |              |         |      |
| TREAT             | 1  | 6.15627000     | 6.15627000   | 27.78   | 0.0001 |
| Error(TREAT)      | 14 | 3.10258000    | 0.22161286   |         |      |

^4General Linear Models Procedure Repeated Measures ANOVA
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