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Teaching Phoneme-Grapheme Correspondence Rules to Children With Learning Difficulties : An Implementation of the Fernald Method

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TEACHING PHONEME-GRAPHEME CORRESPONDENCE RULES TO CHILDREN WITH LEARNING DIFFICULTIES: AN IMPLEMENTATION OF THE FERNALD METHOD

BY

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Abstract

A single subject design was used to investigate the effectiveness of the Fernald method as an instructional technique for teaching phoneme-grapheme correspondence rules. Participants were four primary grade children with learning difficulties in reading. Intervention training focussed on teaching phoneme-grapheme correspondence rules through the implementation of an adapted version of the Fernald method. The two dependent variables were word recognition and fluency rates.

The design of the study allowed analysis of maintenance and generalisation of the relevant variables. Results demonstrated an increase in word recognition skills and fluency rates by all four children with learning difficulties. Maintenance of these gains occurred in two children, while the other two children experienced a slight decrease in their word recognition and fluency rates during the two week follow-up probes. The results of this study clearly support the numerous research papers summarised by Adams (1990).

Motivation was not measured in this study, but appeared to have a significant influence in the children's results. The classroom implications of these findings are further discussed in the following chapters of this study.

Declaration

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

Signature.....[redacted]...

Date.....12/11/98.....

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Table of Content

List of Tables

List of Figures

CHAPTER I

Introduction

Teaching children how to read is a challenging task for any classroom teacher or parent. Many decisions need to be made regarding the method of instruction, teaching strategies, materials as well as the individual needs and abilities of the children. The acquisition of reading is a complex developmental process which is evident when examining the diversity of reading abilities within any classroom. Some children are exceptionally advanced readers while other children may struggle to read simple sentences fluently. All children within the classroom will have individual needs and varying levels of difficulty when developing their reading skills. Some children will have difficulty with comprehension while others may experience problems in word identification.

The importance attached to competent reading skills has significantly increased in recent years (Adams, 1990). America has displayed a substantial rise in literacy rates between the 1850's, when approximately 50-55 percent of the adult population was estimated to be able to read, and the 1950's when almost 92 percent of adults were found to be literate (Hulme, 1981). This research has also revealed a sizable number of students who have great difficulty learning how to read in regular classrooms.

A skills-based method of instruction has been promoted since before the 1920s and has been presumed by some to be the best method of teaching reading (Leu & Kinzer, 1995). The framework for most reading programmes in the majority of schools was based on the teaching of specific reading skills (Leu & Kinzer, 1995). The acknowledgment that a significant proportion of

children were failing in learning how to read also caused a sudden change in educators beliefs about how children acquire and develop reading skills. Different theories circulated about how reading acquisition skills were attained. Three theoretical frameworks in particular specific skills instruction, whole language approaches and the integrated approach were influential in this context (Adams 1990).

The skills-based method of instruction is based on the view that children learn to read through mastering a hierarchy of skills. The teacher is directly engaged in frequent and explicit deductive instruction of the skills required to develop reading abilities. Leu and Kinzer (1995) state that " teachers with a specific skills explanation of how children learn to read often organise instruction around an explicit set of reading skills, sometimes sequenced according to level of difficulty" (p. 55).

The whole language method is based on the view that reading ability is an inductive process. Advocates of the holistic learning theory believe children acquire reading skills when immersed in reading tasks that involve authentic contexts which are both purposeful and functional.

The whole language methodology is based on the assumption that children learn to read through immersion in authentic literacy contexts. Proponents of this method encourage social interaction and learning experiences promoting literacy learning at an inductive level. Controversy surrounds the effectiveness of this method as the approach was subject to the schools and teachers interpretation of whole language. Some teachers interpret whole language from the holistic perspective, while others believe whole language represented an integrated perspective (Weaver, 1990).

The whole language method has only received partial support in the research community (Leu & Kinzer,1995). Skills based methods have received a great deal of support from research studies, particularly when exploring letter / sound combinations and the alphabetic principle. Research in the area of learning difficulties has collected evidence which links the etiology of reading difficulties to a deficit in phonological processing. Phonological processing has been defined by Hurford and Sanders (1995) as a cluster of abilities involving an individual's ability to recognise that words are comprised of phonemes, and that phonemes can be used as linguistic building blocks.

The integrated approach promotes elements of both methods. Many educators believe that techniques of a one-dimensional nature are very limited in their effectiveness. As a result, the integrated approach is adopted in many classrooms. This approach incorporates both specific skills teaching and the immersion of children in functional and purposeful reading experiences (Leu & Kinzer, 1995).

It is recognised that a significant number of students fail to acquire satisfactory reading skills (Adams, 1990). The present study is a report which examines the effectiveness of combining letter-sound combinations to promote reading success.

Definitions

The terminology used within this study is complex and needs to be defined in order to clarify the substance and context of the research. The aim of this study is to use phoneme-grapheme correspondence rules to assist children with learning difficulties. Learning difficulties refer to children with an average to above average intelligence who display an unexpectedly low level of achievement in one or more reading skills (Casey, 1994). Through examination of their reading skills these children are found to often lack the knowledge of phoneme-grapheme correspondence rules (Hurford & Sanders, 1995).

A phoneme refers to a linguistic unit within the spoken language. Phonemes can represent a group of sounds or one single unit of speech which constructs a single abstract unit opposed to a physical unit. The replacement of one of these minimal units can completely change the meaning of the word, for example /h/ and /p/ changes the word from hen to pen (International Reading Association [IRA], 1981).

A grapheme is the physical representation of a phoneme presented in written or printed format. A grapheme can be a single representation of a letter in the alphabet or a combination of letters which denote all of the ways in which a word may be spelt (IRA, 1981; Schubert & Torgerson, 1969).

Phoneme-grapheme correspondence rules are taught to assist children in developing a knowledge of the letter / sound representations of words. Phoneme-grapheme correspondence rules refer to the set of generalisable sound-to-letter relations. For example the sound /s/ is s in seat, c in city and ss in pass (IRA, 1981; Schubert & Torgerson, 1969). This is often referred to

as a knowledge of the the alphabetic principle and is defined as distinctive graphical representation of letters used to symbolise each phoneme or speech sound in oral language (IRA, 1981).

Decoding refers to the analysis and interpretation of spoken or written symbols of a familiar language. A child must first learn the conventional code in which their language is written; for example, the alphabetic script. In the beginning reading process, the term decoding refers to the identification of different words rather than focussing on meaning (IRA, 1981).

The term word recognition skills refer to the retention of word knowledge based on phoneme-grapheme correspondence rules. Hence it is the quick identification of any written word, both the pronunciation and meaning (IRA, 1981; Schubert & Torgerson, 1969).

Fluency is the ability to read or write words from a written text in a clear and easy fashion devoid of errors in pronunciation or word recognition (IRA, 1981). Fluency promotes freedom from word recognition problems which can often interfere with the construction of meaning. Once fluency is established children can move on from simple word recognition and begin to develop their higher-order skills of constructing meaning from the text.

The model described in Figure 1 outlines the reading acquisition process. It represents the literacy framework for this research project. It signifies the framework that will be used to describe the basic procedures related to reading acquisition. The researcher will use the Fernald method, which is an instructional technique to teaching reading, which has received recognition for being both multi-sensory and motivational and applies to the literacy

framework represented in Figure 1. This framework also acknowledges that a child's oracy, which refers to a individual's fluency in speaking, can also have considerable impact on the acquisition of reading (IRA, 1981).

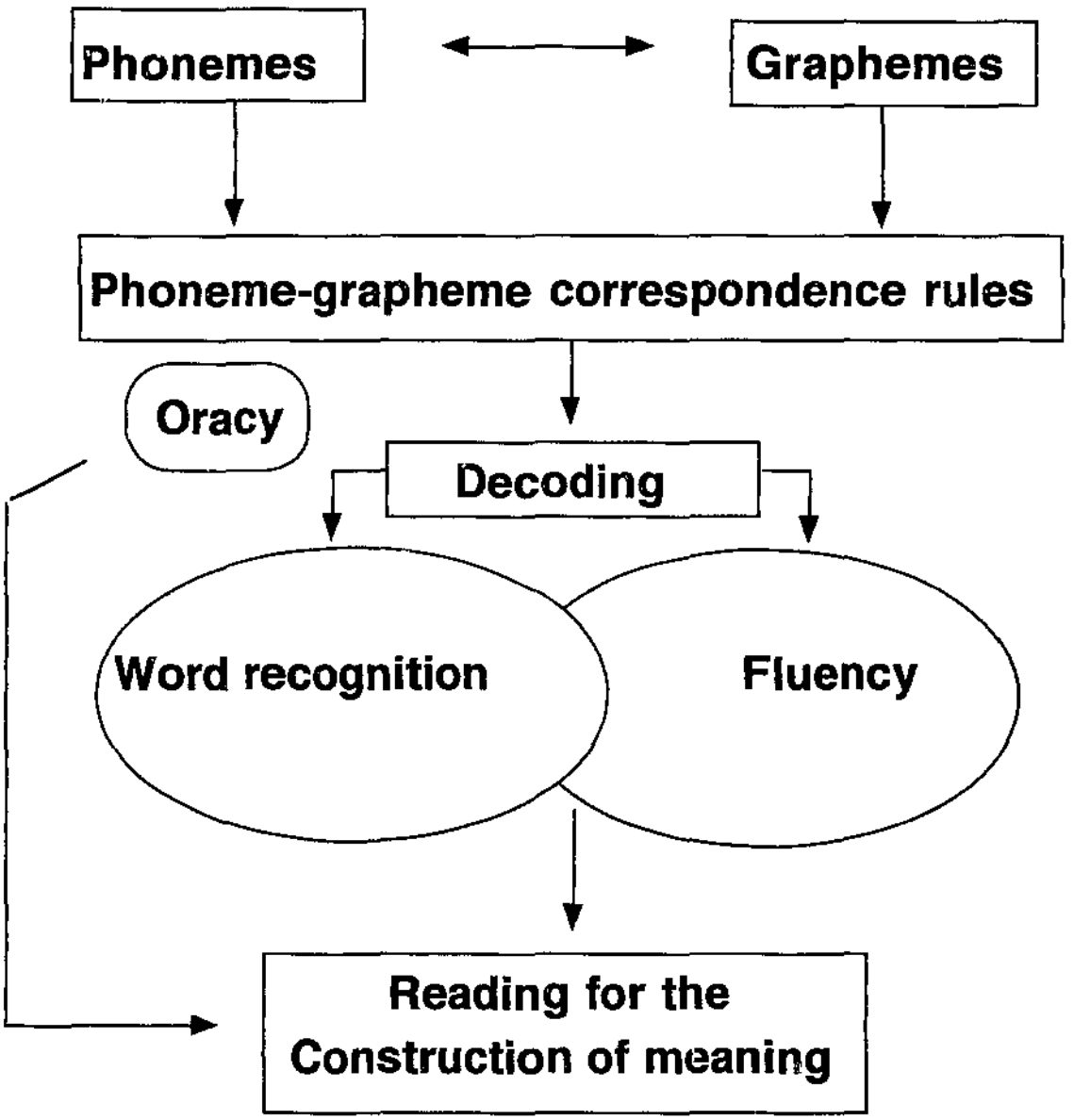

Figure 1. Literacy framework: Reading acquisition process of children with learning difficulties.

Purpose of Study

The purpose of this study was to improve the word recognition and fluency skills of children with learning difficulties. All children were enrolled in mainstream classrooms. Analysis of the children's word recognition skills is based on the theory that the learning of phoneme-grapheme correspondence rules is a strong determinant of a child's ability to decode and become a fluent reader. Four children were involved in independent training sessions to determine if training on the phoneme-grapheme correspondence rules enhanced word recognition and fluency skills.

The research analysis examined the impact teaching phoneme-grapheme correspondence rules had on word recognition skills. Performance was monitored and evaluated on an individual basis to identify the unique strengths and weaknesses of each participant. The participants results were compared to determine if the training sessions were beneficial to the students

The present study used an adapted version of the Fernald method to teach phoneme-grapheme correspondence rules. The study sought to determine whether children, performing at a level one to two years below their chronological age, would improve their word recognition abilities. The children were tested on their ability to develop word recognition skills and fluency based on instruction in phoneme-grapheme correspondence rules.

Statement of Research Questions

The present study investigated whether the Fernald method effectively increased fluency and the knowledge and application of phoneme-grapheme correspondence rules (word recognition) of children reading one to two levels below their chronological age. Additional questions which were addressed during this study included an examination of the number of times children needed to trace a word before they could spell and read it correctly. The children were not permitted to examine the model during the writing process. Comparison of results also endeavoured to reveal the common errors made in the reading and pronunciation of words.

The study was also designed to determine if all participants were capable of generalising their word knowledge to different words with similar phoneme-grapheme patterns.

CHAPTER II

Literature Review

Studies on reading processes have interested researchers from the fields of developmental psychology, education, linguistics, educational psychology and anthropology. The research, however, is vast and often quite technical and difficult to apply in a practical context. Adams' (1990) summary of the research in Beginning to Read: Thinking and Learning about Print provides a comprehensive analysis and review of the previous pertinent studies in the field . The text amalgamates the knowledge gained through research and presents a clear and concise summary which evaluates the instructional processes that assist in teaching reading.

The issue of which instructional method is most beneficial in teaching children how to read has always been a controversial one. Although reading has been recognised as a necessary requirement to successful functioning in modern society, there still remains a great deal of debate about how reading should be taught. Some advocate that teaching reading involves developing the skills required to read written words. Others promote reading for the sole purpose of constructing meaning, and believe that only comprehension should be taught when beginning reading.

Some researchers have endorsed the view that children should always be involved in constructing meaning, even from the earliest stages of learning to read. Children who were taught reading through letter-sounds correspondence were deprived and often developed negative attitudes to higher order reading activities.

Horace Mann (1920) was one of the first educators to promote the comprehension theory and to develop instruction based on teaching highly meaningful text. His beliefs were received with some contempt from other educators. However, Mann's influence grew and the all purpose reading books were replaced with a graded series of books which focused on the construction of meaning and matched the children's age and achievement levels (cited in Adams, 1990).

The dominance of the comprehension-based reading instruction methodology occurred between the 1930s and 1940s. The majority of beginning reading programmes implemented the holistic approach to teaching reading, focussing on the meanings of words. Phonics was viewed merely as a tool to be gradually and sparingly introduced. If children were failing to read words through straight recognition, then they were encouraged to use picture and context cues for assistance.

Controversy surrounding the comprehension-based method emerged in the 1950s. Educators began to show concern about the de-emphasis placed on the learning of phoneme-grapheme correspondence rules. The concern was raised largely due to the publication of Rudolph Flesch's (1955) Book Why Johnny Can't Read. His book argued that instruction in phonics was the most natural system of teaching children how to read. He advocated teaching the identities of letters and their accompanying sounds.

Flesch's book prompted investigations to look into the benefits of both the comprehension-based methods and the skills-based methods through the teaching of phoneme-grapheme correspondence rules. Results indicated that children involved in early systematic phonics instruction generally

achieved higher reading levels than children who were not engaged in systematic phonics instruction.

Many reading programmes promote both phoneme-grapheme correspondence rules and the holistic approach to the reading of text. This combination of methods has shown a rise in the performance of young readers. However, there is still a great deal of conflict over the benefits of both techniques. Adams' (1990) best describes the conflicting beliefs about both methods:

> To some the very term "whole language" is translated to mean an uninformed and irresponsible effort to replace necessary instruction with "Touchy-feely" classroom gratification and worse. Similarly the term "code-emphasis" is translated by others into an unenlightened commitment to unending drill and practice at the expense of the motivation and higher order dimensions of text that make reading worthwhile - and worse (p. 7).

Adams (1990) has sought to amalgamate the numerous research agendas in order to determine the most efficient and effective ways to improve current teaching methodologies of word recognition, reading and comprehension skills. Her summaries of studies on phonics instruction have found that the evidence strongly suggests that phonics has a valid and lasting value in the development of reading skills. In particular, she concluded that children must develop an understanding of the correspondence between letters and sounds, promoting an appreciation for the alphabetic principle.

What young children need to know to assist in the acquisition of reading.

Examination of previous research has enabled Adams (1990) to develop a profile of pre-reading characteristics which indicate a child's future success or failure in learning to read.

Research has shown that children are not alike in the development of perceptual skills. Some are more visually orientated while other children prefer auditory modalities. This indicated that the phonetic approach would be beneficial for children whom were auditory attuned, but it could be of little benefit and extremely frustrating to children visually orientated. This discovery lead to the question of instruction: should reading programmes and materials be tailored to the child's most dominant modality? The research conducted by Grogan (1995) indicated that visual and auditory memory did have a minimal impact on a students future reading capabilities. However, the study failed to present adequate evidence to support catering to a child's predisposition indicating that other areas need to be examined when exploring ways to improve reading instruction.

The mental age concept has long been a contentious issue in reading education. Researchers and theorists have explored the impact that mental age has had on learning. There are those who advocate that children should not be taught reading skills until they have reached a particular mental age in which they are deemed developmentally ready to commence learning. Studies conducted in 1937 (cited in Adams) indicated that children should not be introduced to phonics until they reach a mental age of seven. This was determined through the administration of an IQ test on a number of grade one and two students. Comparison of their mental age to their ability to match printed words to spoken test words was then examined. The results

found that children with a mental age of seven performed significantly better than children below this mental age.

Adams' (1990) reports that " in waiting on mental age, therefore, we are left with the uncomfortable position of waiting until children are ready to teach them precisely those skills that will most make them ready" (p. 38). Additionally, mental age is usually interpreted through a child's performance on an IQ test, however, reading readiness is only passably recognised through the implementation of an IQ test.

Research has found that cognitive abilities only indirectly relate to reading achievement. Delaying instruction until the children are cognitively ready has very little benefit on a child's acquisition of reading. More recently, educators have formed a variety of language games and activities for beginning readers and children with reading difficulties.

Additional research has, however, identified other cognitive abilities as being a predictor to reading readiness and success (Grogan, 1995). Studies conducted on children's basic logic and analytical abilities found that there was a casual but strong relationship between the above mentioned skills and a child's linguistic awareness and concepts of print, which, is related to reading achievement.

The investigation into the vast areas of research has enabled Adams (1990) to conclude that mental age and IQ are only minimally and nonspecifically related to early reading success and development. There has also been no compelling evidence to indicate that children's perceptual motor skills will influence their reading readiness or that teaching using instructional

methods which cater to the child's most dominant learning style will influence reading success. A knowledge of letters and their accompanying sounds and an exposure to print has, however, been found to have a powerful and clear relationship to the success and ease of reading development.

Phonics-based methods have been recognised as having a strong connection to reading success in pre-readers and children with learning difficulties. Chall (1983) conducted studies in 1967 which suggested that systematic phonics played a significant role in beginning reading programmes. Her results, however, were accumulated from old research papers which were before the time of modern statistical analysis. The United States Office of Education (USOE) commenced new research projects to compare the value of the different types of programmes based on statistical evidence. These studies covered a wide area of data which incorporated not only the examination of the different techniques but also the characteristics of students learning to read, the teachers and the schools involved.

Approaches that incorporated systematic phonics instruction were found to be superior in word recognition achievement scores when compared to straight basal reading programmes. When compared to the basal reading programmes, the combination of phonics instruction and the emphasis on meaning produced higher outcome measures in all aspects except in the areas of speed and accuracy.

Information collected on the students, teachers and schools were inconclusive in respect to the extent to which each of these areas impacted on reading success. Certain student characteristics were, however, identified as being strong determinants of reading success. For example, a

child's ability to recognise both upper and lower case letters and their accompanying sounds, prior to reading instruction, has been recognised as a strong determinant to reading success.

Studies completed in the 1930s found that children were taught phonics mainly through intrinsic methods. Today, it is recognised through research conducted by Lovett, Warren-Chaplin, Ransby & Borden (1990) that phonics taught in a systematic and explicit fashion is more beneficial than intrinsic methods. This is true not only of preschoolers, but, also of children with learning difficulties

Riley's (1996) studies supported the above findings and indicated that children who were capable of naming the letters of the alphabet and printing their own name were more likely to be successful readers than peers who possessed no knowledge of the alphabet prior to entering the school system. Children's knowledge of letter names is a good predictor of reading success in schools, but, this alone will not assist in teaching reading. Fluency has been recognised by Adam's as having an effect on children's reading success. Speed and accuracy provides not only an indication as to how well the letter identities have been learnt, but also assists children in beginning to recognise the various sounds and word spelling.

To acquire reading skills children need to be exposed to the alphabetic script and the accompanying phonemes. Children are first introduced to phonemes through the spoken language and automatically attend to the words and their meanings, as opposed to the individual sounds within each word, this is essential for effective listening and comprehension. For effective reading, however, conscious attention to phonemes and their accompanying

letters must occur.

Research by van de Bosch, van Bon and Schreuder (1995) has indicated that children who have difficulty in consciously attending to individual sounds are the ones who experience problems in reading. This deficit in a child's phoneme-grapheme knowledge is primarily responsible for the child's reading disability. Children lacking the knowledge of phoneme-grapheme correspondence rules suffer from an inability to develop the acquisition of sound word recognition skills.

The learning disabilities field has collected evidence to link the etiology of reading disabilities to deficiencies in phonological processing (Hurford & Sanders, 1995). Their findings were also supported by van de Bosch et al. (1995) and Cardoso-Martins (1995) in which they report that the primary problem associated with reading difficulties is the lack of phonological processing. Poor readers lack knowledge of phonemes and graphemes, the sounds we hear and speak and the visual/ symbolic representation of these sounds in both individual letters and words.

Research also suggests that print assists children in understanding that speech is a series of individual speakable, printable and meaningful words (Adam, 1990). Children often have problems in understanding that the spoken language is a series of individual words. Print is one technique that can assist children in developing their knowledge of language.

Preparing children to read

Research conducted by Cardoso-Martins (1995) has enabled educators to gain significant knowledge regarding the skills children require to become fluent readers. The following segment will examine the processes involved in developing these skills. This includes the examination of the spoken and written language.

To promote reading acquisition children need to focus on words and their accompanying sounds. In speaking and listening, our active attention focuses on the comprehension of what is being said and heard. For the purpose of reading educators need to teach children the difficult task of focussing their attention below the level of comprehension and to attend to the letter formations, sounds and segments of words.

Evidence summarised by Adams (1990) indicates that children have difficulty in recognising that the spoken language is a sequence of individual words with individual meanings. Instead they tend to automatically focus on the overall meaning of what is being said. For reading instruction children need to be introduced to the concept of a "word" and understand what a word signifies (Clay, 1972).

Educators need to move beyond spoken language which does not produce words one-by-one or incorporate pauses between each word. Children need to be exposed to print to form an awareness of the spaces between words and to develop the ability to isolate words in both print and oral language. Once children have developed an awareness of words they can begin to consciously focus their attention on syllables, the smallest units of speech which can be produced in isolation within the spoken language.

Children are instructed to direct their attention to syllables which is usually achieved with relative ease. This is recognised as a stepping stone to introducing children to the more difficult concept of phonemes (Cardoso-Martins, 1995.; Nation & Hulme, 1997).

Children must develop a conscious awareness of the phonemes within words to assist in the acquisition of reading. This is particularly difficult as phonemes are not physically dissectible within the spoken language. In addition to learning the sounds it is essential that children can identify the accompanying letters for reading success.

The continued use of written text assists in developing an awareness of phonemes and their relationship to text (Mauer & Kamhi, 1996). Children often develop an awareness about their environment spontaneously; they quickly become aware of appropriate social gestures and begin to identify familiar objects and logos. Children who are exposed to print in the early stages of development often apply their knowledge to make generalisations and distinction about print. They are often aware that print is different from other visual stimuli such as pictures, that it can appear in a variety of formats and materials and that the environment is full of many different examples of print.

Children must develop an understanding that print symbolises meaning and contains valuable information (Adams, 1990). This is achieved by providing a variety of different contexts in which print is used such as shopping lists, story books, recipes and other forms of written materials. To promote the acquisition of print knowledge children need to be exposed to an environment rich in print examples where they gain functional, intellectual

and social pleasure from the different contexts available.

The research conducted by Cardoso-Martins (1995) indicates that children previously given extensive exposure to print are more likely to have the motivation and background knowledge required for beginning reading and writing. Children who have limited exposure to print are often the ones who have little knowledge about letters, words and the general concepts of print for example text moves from left to right, top to bottom. These children also lack the knowledge that print is a form of communication and carries meaning.

Once it has been recognised that speech and print represents a series of words children can begin to focus their attention on individual letter formations in text. This process takes a great deal of time and practice; it requires the child to carefully attend to each letter or letter pattern. Children are usually introduced to the alphabet through rhymes and songs which focus on the names of the letters (Nation & Hulme, 1997). Adams (1990) recommends that children should be exposed to names prior to the visual representation of the letters. Once the children know the names of the letters they have a foundation for recognising the accompanying symbol. Additionally, children who have an automatic knowledge of the letter names, appear to suffer from less confusion when learning the sounds of letters. Once children have developed familiarity with all of the individual letters in the alphabet, environmental print can be used to promote word recognition skills. Logos can be used to draw children's attention to the print, individual letters and whole words. For example, many children are familiar with the McDonald's logo from an early age; directing them to the print within the logo can assist in developing their letter knowledge and word recognition skills.

There is a direct link between teaching children the sounds and symbolic representation of letters and reading success. Lovett et al. (1990) asserts that the teaching of phonemes or graphemes in isolation is counterproductive and is of little benefit to the reader. Teachers need to ensure that all children receive adequate practice in letter-sound pairs. Additionally, there is no prescribed amount of time which is considered sufficient . Each child's previous exposure to letters and their accompanying sounds varies, indicating that there will be a variation in the amount of training and practice each child will require.

Additionally, the nominated letter-sound correspondences are not all equally useful. Children do not need to learn every sound within the first grade of school as they are not all used with the same frequency. Children should be introduced to those correspondences which are deemed most useful, beneficial and age appropriate.

Conflict occurs over which instructional method should be employed to teach letter-sound correspondences. Research summarised by Adams (1990) has found that regardless of the instructional processes implemented, children exposed to letter-sound correspondence during the beginning reading process have greater reading success. Teaching letter-sound correspondence is not enough to promote the acquisition of reading; it is a means of assisting children to decode visually unfamiliar words. The ultimate goal of teaching reading is to assist children in gaining meaning and comprehending text.

Hurford and Sanders (1995) assert that if children with learning difficulties are exposed to frequently occurring words, their ability to decode occurs more rapidly and automatically. Consequently, children no longer need to rely on the individual letters and sounds to decipher the word; rather they have an instant recognition. Word recognition skills assists the reader in developing fluent reading skills; subsequently, they can concentrate on the meaning of the text as opposed to decoding individual words.

Mauer and Kamhi (1996) have summarised these learning processes into four stages. The first stage involves recognising words through visual clues such as logos (Pepsi can) or the words shape. The second phase comprises of applying their knowledge of phoneme-grapheme correspondence rules, initially this involves identifying the first and last letters of the word and moves to a controlled word recognition strategy. The children identify all letters and sounds to decode the word. The third stages involves decoding and developing word recognition skills to the point of automaticity. Finally, the fourth stage highlights the importance of efficient, fluent word recognition skills as the children begin to apply the majority of mental processing to the comprehension of the text.

The previous pages have discussed how children learn to read. Adams' (1990) review of literature are supported through the integration and evaluation of numerous recent research projects within the fields of linguistics, computer science, developmental, educational and cognitive psychology. The reviews of research incorporate both converging and confirming results which have contributed to the numerous theories and controversies surrounding how children learn to read. However, there are a number of key elements which have been recognised as contributing to the

developmental reading process.

Summary

Spoken language is an act of communication and as such is inherent on meanings. Close attention is not given to the individual sounds, words or syllables. The function of speaking and listening does not require individuals to attend to the careful processing of phonemes, syllables and words.

When developing the early skills for reading and writing individuals are required to attend to these linguistic units. This can be quite a complex and difficult task as children do not conceive the spoken language as a series of individual words which have individual meanings.

In order to teach children how to read they need to focus their selective attention on individual words, syllables and phonemes. Using oral language and print can help children develop word and syllable awareness which can lead into the more difficult task of nurturing phoneme awareness and the acquisition of the letter-sound correspondence rules.

Research findings suggest that teaching children to recognise letters is ineffective in developing reading, particularly when it is not taught in conjunction with the letter sounds. Additionally, teaching sounds was ineffective if not accompanied by appropriate writing activities.

The main conclusion derived from these findings is that to promote maximum reading success, children need to be exposed continuously to written letter formations and their accompanying phonemes. Developing a child's awareness of phoneme-grapheme correspondence rules is a powerful determinant of a child's success or failure in learning to read.

Furthermore, teaching phoneme-grapheme correspondence rules to the point of automaticity assists in promoting fluency in reading. When children can quickly identify the sounds within a word, they should be taught to identify familiar spelling patterns and endeavour to construct meaning from the text. The development of conscious awareness of phoneme-grapheme correspondence rules and spelling patterns and the ability to construct meaning is not easily acquired. The ability to decode is an important factor when children are first developing reading skills and when they are progressing to increasingly complex text types.

Regardless of which instructional process is adopted, children appear to experience success in the acquisition of beginning reading skills when phonemic and letter awareness skills are well learned. Specific methods of promoting the development of letter recognition and phonemic awareness skills should be encouraged.

Instructional process

Ideally, children should be aware of letter formations and their corresponding sounds before they enter school. Realistically, however, many children enter the school system with little to no knowledge about the orthographic audits relating to phonemic structure. These students do not understand the concepts of print, such as reading left to right and top to bottom. They do not

understand what words and letters are, or that print carries meaning. The child's pattern of reading skills development is determined mainly by the teacher. Many different approaches to teaching reading are currently being utilised in classrooms. Some examples include language experience, and a range of strategies derived from top down and bottom up approaches. These methods have value in the educational setting. However, it is important that teachers recognise the strengths and weaknesses of each method rather than selecting a strategy based on teacher preference and familiarity.

The Fernald method is currently being employed in many classrooms to assist children with learning difficulties in acquiring reading skills. This technique is often adapted to meet the needs of individual students. Over the years the Fernald method has received recognition as a multisensory approach (Idol, 1988; Thorpe, Lampe, Nash & Chang, 1981) and as a motivational technique (Adelman & Taylor, 1989) for teaching reading.

The Fernald method usually involves teaching reading through visual, auditory, kinesthetic and tactile modalities (VAKT). This approach has been based on the view that learning is enhanced when information is received through multiple channels of sensory input (cited in Sartain, 1976). Children were taught the alphabet through the modalities of seeing, hearing and tracing. Once the children were able to identify the letters and some basic words, they progressed to independent reading and self instruction (Leu & Kinzer, 1995). Fernald's belief about how to teach children with learning difficulties has been summarised by Irvine (1981) and is quoted by Idol (1988, p. xiii):

> The tactile and muscle sense could also "read" and aid the eye, the ear, the total child, toward mastery of the written and printed word: This she believed and taught! Hers have been perhaps the most widely used of all classroom techniques by those attempting to help the struggling reader. They interface and link the past and present of remedial education.

Multisensory instruction (VAKT) has been employed for teaching children with learning difficulties for over fifty years. The success of this method, however, has never been adequately validated through research (Thorpe et al.,1998). The original technique consisted of four distinct stages which have been clearly defined by Idol (1988) to provide a sequential technique to promote the acquisition of reading.

Stage 1 of the method involved learning through tracing using finger contact. Words that the participant read incorrectly were written using crayon on a card. The participant was then required to trace the word with his/her finger ensuring that the finger made contact with the page. As the participant traced each part of the word they were required to say it aloud. This was repeated until the participant was capable of writing the word, without looking at the model, once on a scrap piece of paper and then within a story. When the participant's story was complete the teacher would type a copy for them to read. The participant would then file the words studied in an alphabetical word file. The file was incorporated to introduce participants to the alphabet in a non-rote learning fashion.

Stage 2 is similar to stage 1 with the exception that the individual words no longer need to be traced. The participant was capable of pronouncing the word as they looked at it on a card. At this stage the participant was capable of writing the word without referring to the model and was able to incorporate the word into increasingly complex and extended stories.

Stage 3 is similar to stage 2, except the participant no longer required a printed model of the word. The participants were capable of learning a new word from the printed text simply by looking and saying it to themselves. The participants were still required to write the word on a card and in a story before filing it in an alphabetic file.

Stage 4 was when a participant indicated a capacity to recognise new words because of their similarities to words or segments of words already learned. At this stage the participants were encouraged to read increasingly complex text types related to topics of individual interest. Once a participant achieved this level of independent reading it was believed that the participant became intrinsically motivated to read (Fernald,1943) .

The literature referring to the Fernald method provides little more than a brief overview of the multisensory approach and Fernald's four stage procedure (Casey, 1994; Sartain, 1976). Research conducted presents both confirming and conflicting results. Thorpe et al. (1981) conducted studies that concluded that the VAKT method had a greater impact on the reading and spelling of sight words, than instructional techniques which did not employ kinesthetic and tactile modalities. The participants involved in learning through the VAKT method also displayed superior retention abilities when compared to participants who did not receive kinesthetic-tactile training

(Thorpe et al., 1981). Earlier studies conducted by Silberberg, Iversen and Goins (1973), however, found conflicting results. They studied four remedial reading techniques, one of these included the Fernald method. Results of their research concluded that there were no significant long term benefits on students reading abilities when these methods were employed (Myers, 1978).

The findings of Silberberg et al. (1973) are further supported by the studies conducted by Hulme (1981). His research also incorporated and examined aspects of the Fernald method. Hulme identified several conclusions about the values of tracing for developing reading skills in children.

Hulme (1981) concluded that insufficient research has been conducted on the effects of tracing in assisting children to discriminate visually between words of similar structure. The research evidence has displayed insignificant results. Consequently, Hulme (1981) performed a series of experiments which examined the benefits of tracing from a number of perspectives which included the following:

The first study was on the effects of tracing on memory for verbal and visual stimuli in retarded and normal readers. Results concluded that tracing improved the performance in the readers with intellectual disabilities but not the normal children. However, when non-verbal forms were used for tracing, both groups of children benefited from the experiment. This finding was attributed to the intellectually disabled readers' dependence on visual, rather than verbal, memory strategy. The second study was on the mechanisms underlying the enhancement of visual recognition following tracing. Conclusions

indicated that tracing combined with visual input improved the visual recognition of the forms.

The third was the effects of tracing on memory order. This experiment produced negative results. However, even though tracing did not appear to improve memory order it was evident that it assisted in the recognition of individual forms. The fourth study demonstrated that tracing improved visual-verbal paired association. These findings suggest that using tracing in remedial reading programmes may produce beneficial results. For example, tracing the letters of the alphabet helps with identifying their corresponding sounds.

The Hulme (1981) studies indicate that there is very little evidence to support the benefits of kinesthetic tracing. He concluded that there is a need to further examine the effects of tracing to assist retarded readers.

New perspectives began to circulate in regard to the Fernald method. Adelman and Taylor (1988) displayed interest in the VAKT method from a motivational aspect rather than a multi-sensory outlook. They employed the four-stage Fernald method described previously and examined it through a series of three motivational phases.

Phase 1 involves preparing the children for reading readiness. Children often develop negative attitudes towards work that is perceived as too difficult or boring. In order to counteract this educators need to create an atmosphere which is conducive to learning. Using the Fernald method, this involves emphasising possible areas of learning for the student and examining the students interests. The student must not feel forced to engage

in the task. Instead, they are given the opportunity to work independently until the student discovers intrinsic reasons for seeking assistance from the teacher. Once this has been established, Stage 1 of the Fernald method can be implemented because the student is motivated to participate to satisfy their individual needs.

Phase 2 involves the maintenance of motivation during the instructional process. The Fernald method enables children to select personally meaningful texts, apply their new knowledge to story writing and to examine their finished typed product. The method encourages children to take responsibility for their learning and provides reinforcement by the children examining their own products, both their stories and alphabetical word lists, and experiencing feelings of success and accomplishment.

Phase 3 involves continuing motivation after instruction. This is encouraged through the implementation of the Fernald method. The children develop confidence and begin to apply and expand their knowledge to other areas of interest.

The new motivational direction of the Fernald Technique has been employed at the Fernald School located at the University of California. The staff at the school advocate that the Fernald method applied from a motivational perspective is beneficial to students with learning difficulties. However, no statistical data confirms the schools theories (Adelman & Taylor, 1989).

Significance to study

An alternative explanation is that it is not tracing or motivation that promotes the acquisition of reading skills. Rather, it is the ability to develop knowledge about the use of phoneme-grapheme correspondence rules. The aim of the present study was to use tracing and phonemic sequencing to assist in developing phoneme-grapheme relationships. The process of tracing is merely a technique adopted to assist children in attending to the phoneme-grapheme correspondence rules.

The stages of the Fernald method have been adapted to meet the requirements of the research project and to reflect the theoretical stance of the experimenter.

Stage 1 of the method involved learning by tracing. Words that the subject reads incorrectly are written on a card. The subject is then required to trace the word with his/her finger ensuring that the finger makes contact with the page. As the child traces each part of the word they are required to say it aloud. This is repeated until the child is capable of writing the word without looking at the copy. This stage enables the student to visually recognise the letters as they verbalise the phonemes.

Stage 2 is similar to stage one, except the student no longer needs to trace the word. This occurs when the child no longer needs to trace but can simply recognise and learn the new word by verbally repeating and looking at the letter formations as they appear in the model. The child is capable of writing and saying each part of the word without looking at the copy. Stage 2 of the Fernald method supports Adam's assumptions, as this stage enables children to develop their decoding skills necessary for promoting reading

acquisition and the progression to increasingly complex text types.

Stage 3 of the Fernald method enables children to progress to increasingly complex text. The child has developed their letter recognition, phonological knowledge and decoding skills and has become capable of learning from the printed word, simply by looking at it and saying it to him/her self. The child is capable of learning directly from the printed word without having the teacher write it for him/her. Additionally, the child is able to write the word without referring back to the written text for assistance.

Stage 4 focuses on developing the ability to identify and read words of a similar nature in phoneme-grapheme correspondence to words previously learned. At this stage the child is capable of recognising similarities in words and applying his/her knowledge to decode other words. This stage of the Fernald method further supports Adams reviews of literature by assisting in teaching phoneme-grapheme correspondence rules to the point of automaticity which promotes fluency in reading. The children quickly identify the sounds within a word, begin to identify familiar spelling patterns and endeavour to construct meaning from the text.

The present study aimed to determine whether children with learning difficulties can improve their reading abilities so that they equal or exceed expected grade levels. The children will be tested on their ability to develop word recognition skills and fluency based on instruction using an adapted version of the Fernald method and the learning of phoneme-grapheme correspondence rules.

CHAPTER III

Method

The participants in this study were selected from a private catholic college in the Perth metropolitan region. The participants were initially chosen as possible candidates for this research project based on the recommendations by classroom teachers and the special education support teacher. Parental consent forms were issued to all parents or nominated children prior to the initial screening to determine suitability for the study. Once participants were identified their parents were notified and consent was reconfirmed. Participation in this study was completely voluntary and participants were given the option of withdrawing during any stage of the proceedings.

All four participants were screened using the San Diego Quick Assessment Test. This instrument was used to determine the reading level of each child. This test identifies three different reading levels which include the independent reading level, instructional reading level and the frustration reading level.

The independent reading level denotes the stage where a child can read independently without any assistance from the classroom teacher. The child's comprehension of the text should be 90% accurate and their word recognition should be 99% accurate (Ekwall & Shanker, 1993). The instructional reading level identifies the stage, at which the child is capable of reading curriculum-based materials with the assistance of the classroom teacher. The students decoding skills should be 95% accurate and their comprehension should be approximately 60% accurate. The frustration level

is the stage where a text is too difficult for the child to read. At this level the child is able to decode 90% or less of the text and comprehends up to 50% of the material read (Ekwall & Shanker, 1993).

The second screening assessment used was the Peabody Picture Vocabulary Test. This provides a quick assessment of a child's verbal abilities, primarily their receptive vocabulary. Vocabulary knowledge has been recognised as being a strong indicator of educational success and can assist in determining if a child has a complete language deficit or if they have a specific learning difficulty such as reading.

Both the San Diego Quick Assessment Test and the Peabody Picture Vocabulary Test provided valuable information of each participant's individual performance prior to the commencement of the study.

Participants

John was seven years and two months old at the time of the study and had attended the same school since year one. He was in a year two classroom at the commencement of the study and was classified as an at risk student in the areas of reading and writing. John's performance was significantly lower than expected for his chronological age. John's performance on the San Diego Quick Assessment test indicated a performance at an independent reading level of a pre-primary student, an instructional level of a primer grade (before year one) and at a frustration level on the year one word lists. John's results on the Peabody Picture Vocabulary test indicated that his standard score equivalent was 117 which converted into a percentile ranking of 87 and a stanine of 7 on receptive language. Conversion of his raw score to an age equivalent score indicated that John's receptive vocabulary was at

the level of a child eight years and six months.

Brad was seven years and two months old and had attended the same school since year one. He was in a year two classroom and was recognised as experiencing difficulties in reading, writing and spelling. Brad's performance was considerably lower than expected for his chronological age. Brad's achievement on the San Diego Quick Assessment Test indicated that he was performing at an instructional reading level of a pre-primary student and a frustration level of a primer year student. Brad's results on the Peabody Picture Vocabulary test indicated that he obtained a standard score equivalent of 98 which converts into a percentile ranking of 45 and a stanine of 5. Conversion of his raw score to an age equivalent score indicated that Brad was performing at the level of a child six years and ten months.

Dale was seven years and eight months old and attended the same school since kindergarten. He was in a year three classroom and had been long recognised as having extremely poor language skills, particularly in reading, spelling and writing. Dale performed at a level considerably lower than his chronological age. His performance on the San Diego Quick Assessment Test indicated that he was performing at an independent reading level of a pre-primary grade, an instructional reading level of a primer student, and a frustration level of a year one. Dale's results on the Peabody Picture Vocabulary test indicated that his standard score equivalent was 88 which converted into a percentile ranking of 21 and a stanine of 3. Conversion of his raw score to an age equivalent score indicated that Dale was performing at the level of a child six years and seven months.

Neil was seven years and nine months old and had been attending the same school since kindergarten. He was in a year three classroom and was recognised as experiencing difficulties in reading and writing. Neil performed at a level lower than his chronological age. His achievement on the San Diego Quick Assessment test indicated that he was performing at an independent reading level of a primer student, an instructional reading level of year one, and a frustration level of a year two. Neil's results on the Peabody Picture Vocabulary test indicated that his standard score equivalent was 109 which converted into a percentile ranking of 73 and a stanine of 6. Conversion of his raw score to an age equivalent score indicated that Neil was performing at the level of a child eight years and seven months.

Research design

An ABA single subject design was used in this study. This method describes groups or individuals and has three distinct characteristics. The first characteristic is that the dependent variable or behaviours being measured were assessed under standard conditions repeatedly over a period of time. Secondly, this design compares each subject's performance in one phase to their performance in another phase. Trend lines, which represent a summary of the level of performance and trend of the data collected, assists in comparing the changes between phases. The slope of the trend line is interpreted to determine the degree of change over the period of observations. Rapidly increasing lines indicate a quick increase in a behaviour over a specified time period, a gradual increasing line indicates less of an increase in the behaviour over the same period of time. A decreasing slope indicates the reduction of a behaviour, and this can be rapid or gradual. The examination of the slope provides valuable information on changes in participants behaviour, often referred to as the

level of performance, across the phases. The third characteristic of this design is that the evidence collected can be proved reliable through the replication of the phases (Wolery, Bailey & Sugai, 1988).

Each participant was assessed at baseline until a consistent level of word recognition and fluency was determined. Once stability was established the treatment was introduced. During the intervention phase each participant received one-on-one training based on the Fernald method. At the completion of each training session the participants were reassessed on their word recognition skills and fluency. A reversal phase followed in which baseline conditions were re-established. The participants were tested to determine their ability to generalise their sight recognition to words of similar phonemic structure. Two follow-up probes were conducted two weeks after the completion of the study to determine the participant's ability to retain the skills and knowledge acquired.

The independent variables consisted of the three phases (A,B,A). There were two dependent variables (a) the number of words correctly identified without assistance and (b) the time taken to complete the test.

Setting and Materials

Training and assessment schedules were conducted in a private section of the school library away from the regular classroom. This assisted in reducing the possibility of incidental variables influencing the children's results.

The materials utilised included two test boxes, each consisting of fifty word cards incorporating common phonograms. Test box I (TBI) consisted of the initial set of fifty words which were used during baseline, intervention and the reversal phase. Test box II (TBII), was utilised during baseline and the reversal phase and consisted of fifty words of a similar structure. The words in TBI and TBII were collected from the books Phonics in Perspective by Heilman (1985) and Ray and Wingo's (1968) text Reading with Phonics. A storybook was written to be utilised in Phase B, the text incorporated all the words from TBI and also consisted of a series of joining words to promote fluency.

Additional materials included a word-record booklet and two pens, one for the participant and one for the experimenter. A stop watch was also used to assist in recording the participant's fluency rates.

Procedure

Baseline All participants were tested to determine their basic recognition of words incorporated in both TBI and TBII test lists. During baseline, the participants were required to complete two tests during each session. In the first session, the children were first assessed using ten randomly selected words from TBI. Once completed, the second test was administered using ten randomly selected cards from TBII. This process of conducting two tests (one from TBI and one from TBII) on the same occasion continued for all of the ten baseline sessions.

To assist in determining the effects of the training session on fluency rates, each participant was monitored on the time taken to complete each of the two tests from TBI and TBII. The timing was started at the commencement of the first word in TBI and stopped on completion of the first set of ten words. A record of the participants speed was then recorded before the commencement of testing, timing and recording of TBII.

Intervention Each participant was engaged in a familiarisation process prior to the beginning of the intervention training sessions. Participants were first introduced to the examiner and a brief discussion was held about the examiners reasons for working with them in their school. It was clearly explained to the children that the examiner was in the school to teach them a new method which could help develop their reading skills. The experimenter encouraged participants to relax as their performance was not being tested for their classroom report.

The participants were then given the opportunity to inform the examiner about themselves. They were encouraged to talk about their hobbies, interests and opinions about reading. The aim of this brief discussion was to assist in relaxing the participants and to develop a rapport between the examiner and the participants.

The participants were informed of the key elements of the Fernald method. Each participant started at a randomly selected page in the allocated text which was written to incorporate all fifty words from TBI for the specific purpose of this study. They were instructed to read the text until they made an error. Once an error was made the process of tracing and sounding out the word was explained, demonstrated by the examiner, and practised by the

participant. This process was continued until the participant appeared to understand the processes involved in the intervention phase. Each participant partook in a series of ten intervention training sessions as part of Phase B. The participants were issued with a copy of the story book which they were required to read. At the commencement of each ten-minute training session, the student randomly selected a page from the book. The experimenter then pointed to a section in the text and asked the participant to start reading the story from the place indicated.

When a participant made an error or failed to read a word the experimenter stopped the participant from continuing by signalling that an error had been made. The experimenter stated " Stop, let's look more closely at this word" and would then say "the word is" and read the word while writing it in the record booklet.

The experimenter used the recorded word to model how to trace and sound out the word simultaneously. This involved pronouncing the sounds as the fingers traced the accompanying letters. For example, if the word city was read incorrectly the experimenter would say "Stop let's look more closely at this word, the word is city" , and the experimenter would write the word in the record booklet. The experimenter would repeat "the word is city", and trace the letters as the word was repeated. This process was conducted to assist the children in identifying the unusual conventions of the words; for example, the beginning letter of city does not sound like /c/ but sounds like an /s/.

The participants were required to use the word written by the experimenter and to trace each letter with an index finger and repeat the sounds as the finger traced over the letters. The participants were required to pronounce

the word as it "usually sounds" and not simply verbalise or stress each individual phoneme. For example, the word load would be repeated as /load/ not as /l/ /o/ /a/ /d/. If the participant repeated the sounds of the word before tracing the letter, they were asked to repeat the task.

The above process was repeated three times before the participants attempted to write the word in the record book without referring to the model. If the word was spelled and read correctly, then the participants received positive feedback and continued with the story. If the word was written incorrectly, tracing and pronouncing was repeated until the word was written by the participants without error. At the completion of the ten minute training session the participants were reassessed on their word recognition and fluency skills using ten randomly selected cards from TBI only.

The process that the participants were engaged in is quickly summarised into a series of steps. Figure 2 on the following page provides a diagrammatical representation of the steps involved.

On the completion of the intervention phase, the participants were congratulated on their performance and effort. A quick discussion was held to explain that the following visits would not involve any training session but would consist simply of a series of word lists to be read by the participant.

Reversal phase At the completion of the training sessions the participants were returned to baseline conditions and tested using a series of ten randomly selected cards from TBI. On the same occasion, the experimenter reintroduced TBII to determine each participant's ability to generalise their phoneme-grapheme knowledge with words of a similar structure. During

each session each participant's time was monitored on both tests. This assisted in identifying any changes in the participant's fluency rates. Each individual involved in the study partook in a series of ten consecutive baseline measures.

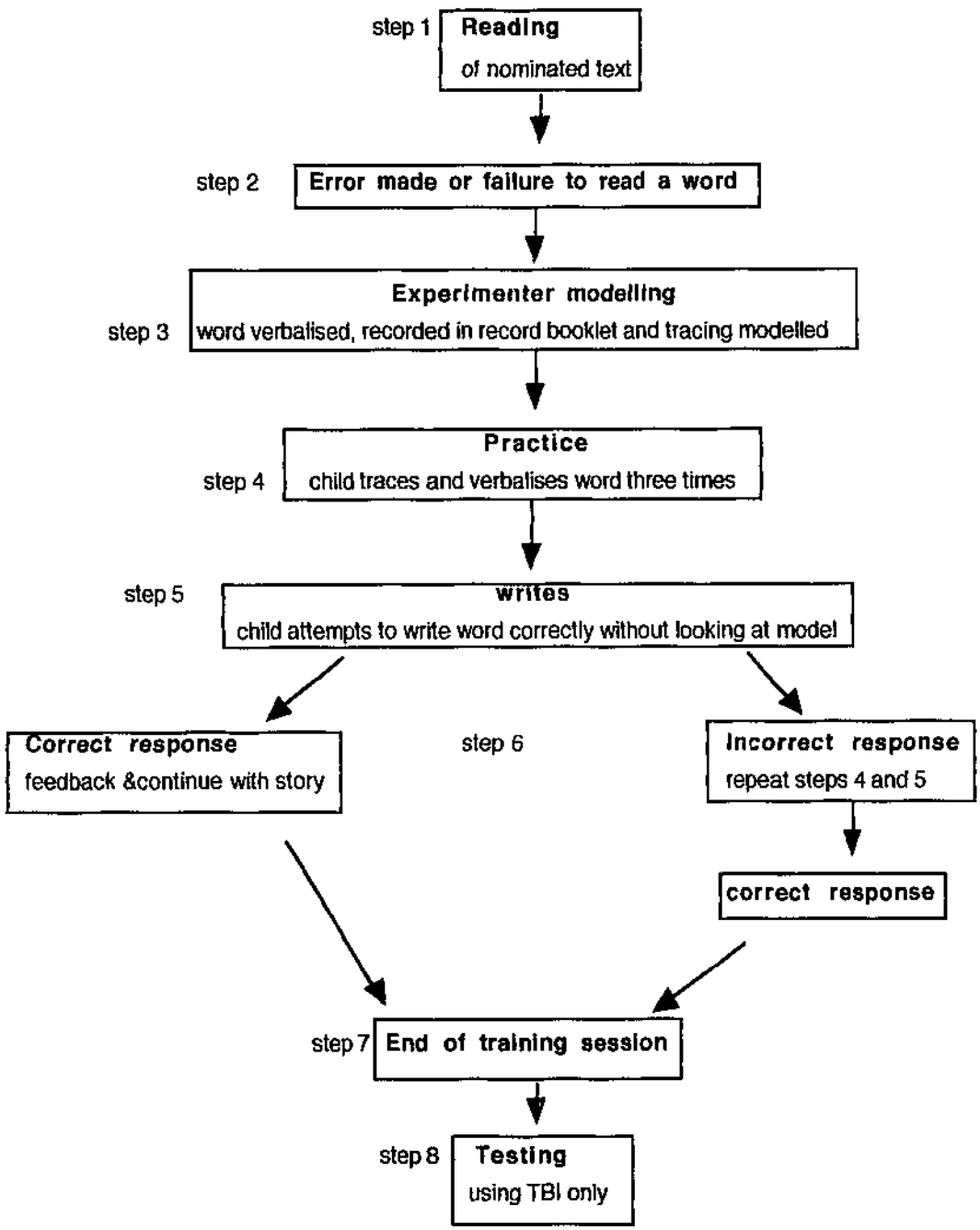

Figure 2. Step-by-step process followed during intervention phase.

Hypotheses

Based on Adams' (1990) findings, this study endeavoured to to determine if the Fernald method (1943) is a successful strategy for teaching phoneme-grapheme correspondence rules. The following hypotheses were formulated:

H1: Word recognition skills and fluency rates will improve during the intervention phase of the study. The performance levels of the participants will increase throughout the intervention sessions. The trend line of the single subject graphs will clearly indicate a positive improvement in levels of word recognition of each subject.

H2: Participants will maintain a higher level of word recognition skills and fluency rates following the intervention phase. The level and slope of the graphical representations will clearly indicate the maintenance of skills.

H3: Participants will be able to generalise their knowledge of phoneme-grapheme correspondence rules to recognise words of a similar structure. Results will be examined through the comparison of each participant's initial performance on words from Test Box II and their performance on Test Box II following the intervention phase.

CHAPTER IV

Results

The results of the participants' performance on word recognition tests and fluency rates are discussed and shown in Figure 3 to 10. In general, the data indicated that the Fernald method was highly effective in developing a knowledge of phoneme-grapheme correspondence rules and promoting fluency in reading.

Participant 1

Word recognition

During baseline, John's performance on the word recognition tests from TBI and TBII were relatively constant. He attained approximately 2-3 correct responses in each test conducted from both test boxes. John attained a mean score of 2.3 correct responses in TBI and a mean of 2.4 in TBII. During intervention, John displayed a rapid increase in his word recognition skills in TBI. John's number of correct responses ranged from 4 in the first intervention session to 10 in the eighth session, indicating that his word recognition improved from the onset of the intervention and continued to improve throughout the sessions. John attained a mean score of 7.2 correct responses in TBI during the intervention phases. TBII was not used or assessed in the intervention phase

During the return to baseline phase, John showed that he was capable of maintaining his word recognition skills above the mean of 7.7 attained during intervention. John's performance after intervention continued to increase with his scores ranging between 7-9 (M = 8.4) in TBI. Follow-up probes conducted two weeks after the final intervention session using TBI indicated

that John was capable of maintaining and increasing his word recognition skills by attaining a mean of 8.5.

Generalisation

Probes taken using TBII in both the initial and reversal to baseline phases indicated that John was capable of generalising his knowledge of phoneme-grapheme correspondence rules to words of a similar structure. His mean performance in TBII during the initial baseline was 2.4. During the reversal to baseline John displayed a rapid increase in his word recognition skills by attaining a mean score of 7.7. Follow-up probes indicated that John maintained and continued to increase his word recognition and generalisation skills two weeks after the final baseline by attaining a mean score of 8 correct responses in TBII.

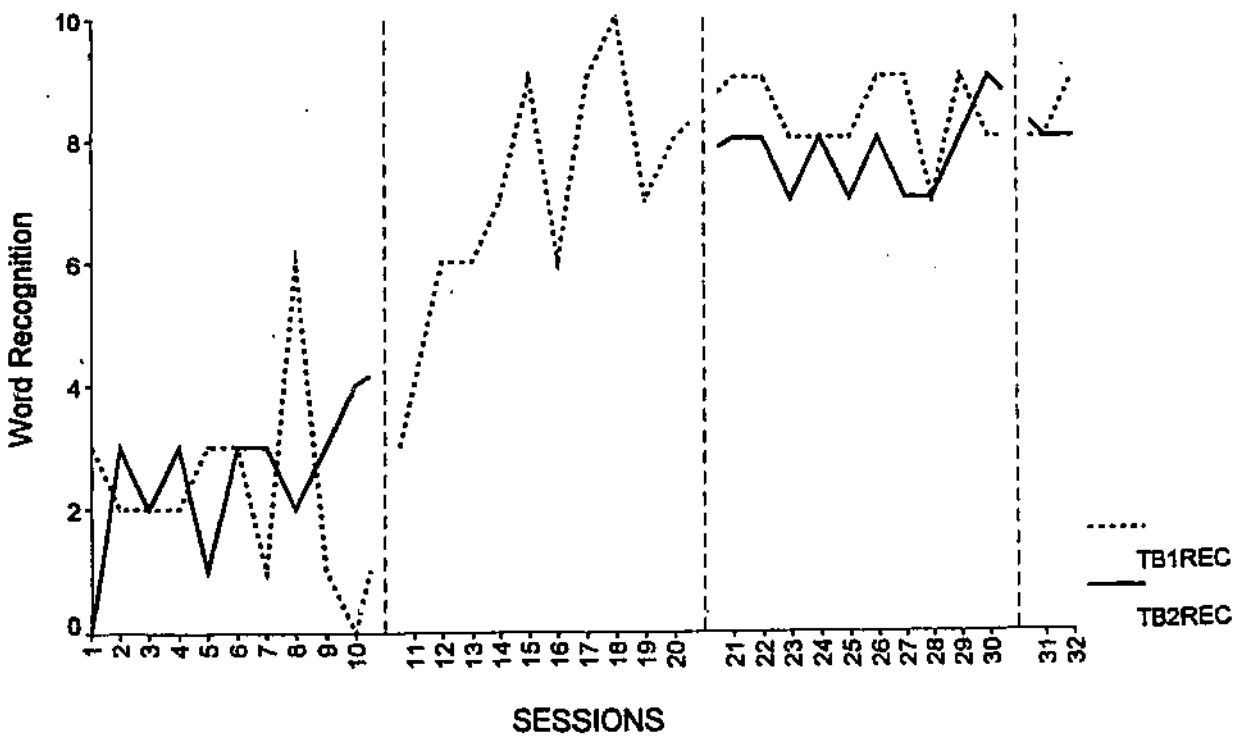

Figure 3. John's number of correct word recognition responses across baseline, intervention, baseline and follow-up probes.

Common errors

Analysis of the errors made by John indicated that specific words and vowel blends caused him significant problems. Table 1 indicates the most frequent errors made during baseline, intervention, reversal to baseline and an overall examination of the words that were repeatedly mistaken across the phases.

Table 1.

Most common errors made and frequency during each phase.

	Baseline		Intervention		Baseline		Overall	
	word (w)	no of errors (e)	w	e	w	e	w	e
TBI								
	Pain	4	lied	4	ties	4	lied	9
	lied	4	lies	3	hour	3	boil	7
	loud	3	toil	3			hour	6
	Paul	3	boil	3			ties	6
	Maud	3					loud	5
	toad	3						
TBII	haul	4			coil	3	coil	6
	bead	3			pout	2	haul	6
	coil	3			sour	2	pout	5
	sour	3			join	2	sour	5
	join	3			beam	2	join	5

Analysis of the most common errors indicated that John had particular problems with words containing the vowel blends /oi/, /ou/ and /ie/. John was capable of identifying the first and last consonants with relative ease, difficulty occurred when John attempted to sound out the vowel phonemes in isolation as opposed to recognising that the individual vowel sounds blend. On average, John traced the word three times before he was able to write the word without referring to the model.

Fluency

During baseline, John's fluency rates during testing were somewhat variable. John scores ranged from 47-78 seconds to complete a test from TBI, to 54-107 seconds to complete a test from TBII. John attained a mean score of 77.4 seconds in TBI and a mean of 80.6 in TBII. During intervention, John displayed a rapid increase in his fluency rates when using TBI. John's fluency rates ranged from 73 seconds in the first intervention session to 35 seconds in the fifth session, indicating that his fluency rates increased from the onset of the intervention and continued to improve on baseline results in the final six sessions. John attained a mean score of 47.3 seconds in TBI during the intervention phases. Fluency rates using TBII were not assessed in the intervention phase

During the return to baseline phase, John indicated that he was capable of maintaining and increasing his fluency rates attained during intervention. John's performance after intervention continued to increase with his mean score in TBI changing from 47.3 during intervention to a mean of 45.6 seconds in the second baseline phase. Follow-up probes conducted two weeks after the final session using TBI indicated that John was able to maintain and increase his fluency rates by attaining a mean of 44 seconds.

Generalisation

Probes taken using TBII in both the initial and reversal to baseline phases indicated that John was capable of increasing his fluency rates by generalising his knowledge of phoneme-grapheme correspondence rules to words of a similar structure. His mean performance in TBII during the initial baseline was 80.6 seconds. During the reversal to baseline John displayed a rapid increase in his fluency rates by attaining a mean score of 38.9

seconds. During the follow-up probes John averaged 57 seconds, indicating that he was capable of maintaining his fluency rates in comparison to the initial baseline scores. He was, however, unable to maintain the high standards reached during the second baseline. A graphical representation of the amount of time taken by John to complete tests from both TBI and TBII is presented in Figure 4. The decline in the time taken clearly indicates that John's fluency in word recognition is increasing.

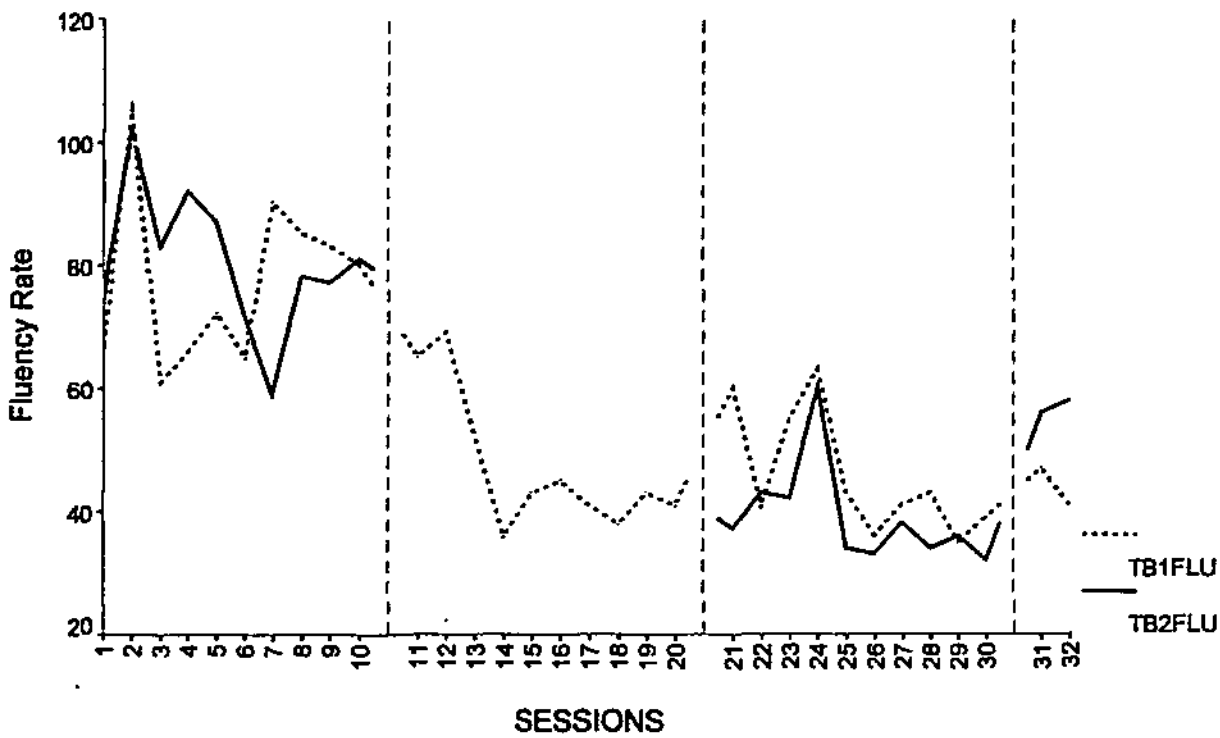

Figure 4. Time taken to complete each test across baseline, intervention, reversal to baseline and follow-up probes.

Participant 2

Word recognition

During baseline, Neil's performance on the word recognition tests from TBI and TBII were relatively stable. He scored approximately 3-4 correct responses in each test conducted from both test boxes. Neil achieved a mean score of 3.9 correct responses in TBI and a mean of 3.6 in TBII. During intervention Neil displayed a rapid increase in his word recognition skills in TBI. Neil's number of correct responses ranged from 6-10 in the intervention session, indicating that his word recognition improved from the onset of the intervention and continued to improve throughout the sessions. Neil achieved a mean score of 7.6 correct responses in TBI during the intervention phases. TBII was not used or assessed in the intervention phase

During the return to baseline phase, Neil indicated that he was capable of maintaining word recognition skills above the mean of 7.6 attained during intervention. Neil's performance after intervention continued to increase with his scores ranging between 8-10 (M = 9.0) in TBI. Follow-up probes conducted two weeks after the final intervention session using TBI indicated that Neil was capable of maintaining his word recognition skills by attaining a mean of 9.

Generalisation

Probes taken using TBII in both the initial and reversal to baseline phases indicated that Neil was capable of generalising his knowledge of phoneme-grapheme correspondence rules to words of a similar structure. His mean performance in TBII during the initial baseline was 3.6. During the reversal to baseline Neil displayed a rapid increase in his word recognition skills by

attaining a mean score of 8.1. Follow-up probes indicated that Neil maintained and continue to increase his word recognition and generalisation skills two weeks after the final baseline by attaining a mean score of 9 correct responses in TBII.

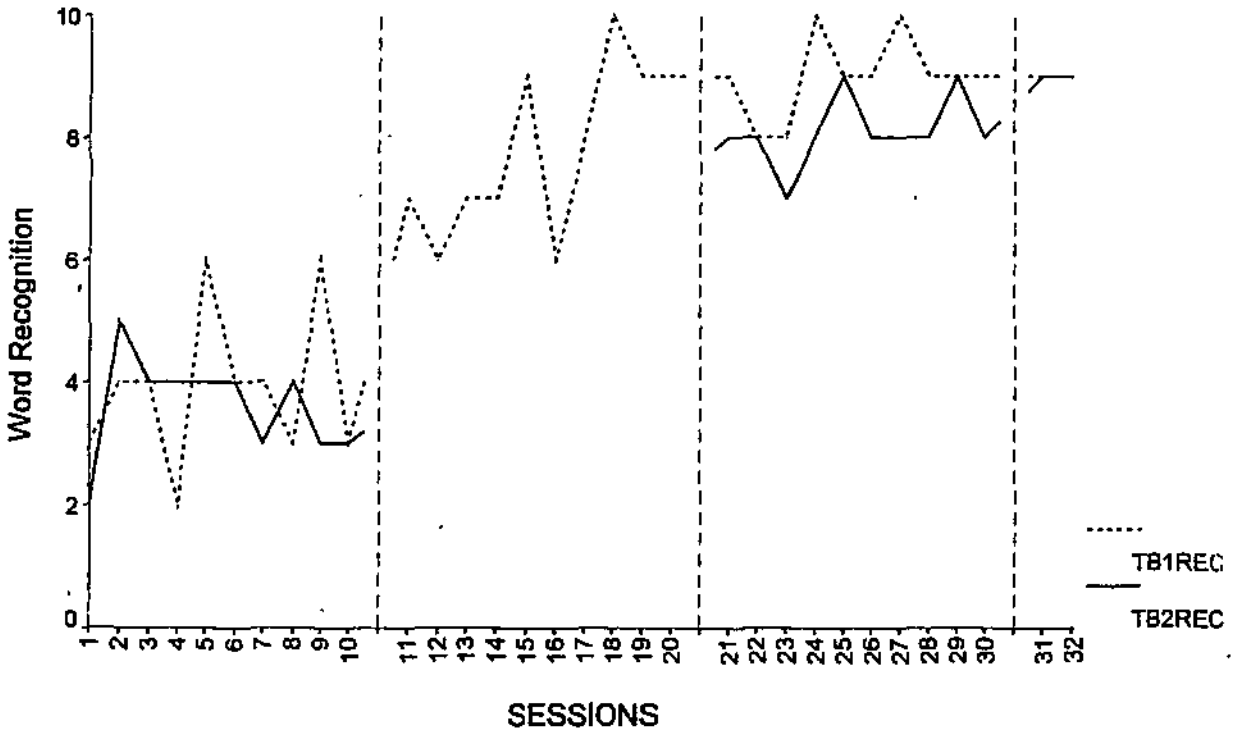

Figure 5. Neil's number of correct word recognition responses across baseline, intervention, baseline and follow-up probes.

Common errors.

Specific words and vowel blends caused Neil significant problems. Table 2 indicates the most frequent errors made during baseline, intervention, reversal to baseline and an overall examination of the words that were repeatedly mistaken across the phases.

Table 2.

Most common errors made and frequency during each phase.

	Baseline		Intervention		Baseline		Overall	
	word (w)	no of errors (e)	w	e	w	e	w	e
TBI								
	soak	5	lied	3	paid	2	soak	7
	soil	5	soak	2	bail	2	soil	6
	toil	4	feel	2	lean	2	toil	5
	Paul	3	neat	2				
	ties	3						
	heel	3						
TBII	tail	4			pout	3	coil	6
	bead	4			coil	3	pout	5
	haul	3			sour	2	haul	4
	hail	3					bead	4
	Jail	3					tail	4
	coil	3						

Analysis of the most common errors indicated that Neil had particular problems with words containing the vowel blends /oi/ and /ai/. Neil was capable of identifying the first and last consonants with relative ease. Difficulty occurred when Neil attempted to guess the entire word based on the consonants. On average Neil traced the word three times before he was able to write the word without referring to the model.

Fluency

During baseline, Neil's fluency rates during testing were relatively constant. Neil's scores ranged from 30-69 seconds to complete a test from TBI, to 30-60 seconds to complete a test from TBII. Neil attained a mean score of 49.5 seconds in TBI and a mean of 44.7 in TBII. During intervention, Neil displayed a minimal increase in his fluency rates when using TBI. Neil's fluency rates ranged from 60 seconds in the first intervention session to 30 seconds in the fourth session. Neil attained a mean score of 47.3 seconds in TBI during the intervention phases. Fluency rates using TBII were not assessed in the intervention phase

During the return to baseline phase, Neil indicated that he was capable of increasing his fluency rates during intervention. Neil's performance after intervention significantly increased with his mean score in TBI changing from 47.3 during intervention to a mean of 32.2 seconds in the second baseline phase. Follow-up probes conducted two weeks after the final session using TBI indicated that Neil was able to maintain and increase his fluency rates by achieving a mean of 20 seconds.

Generalisation

Probes taken using TBII in both the initial and reversal to baseline phases indicated that Neil was capable of increasing his fluency rates by generalising his knowledge of phoneme-grapheme correspondence rules to words of a similar structure (refer to Figure 6). His mean performance in TBII during the initial baseline was 44.7 seconds. During the reversal to baseline Neil displayed a rapid increase in his fluency rates by attaining a mean score of 29.6 seconds. During the follow-up probes Neil averaged 24 seconds, indicating that he was capable of maintaining and increasing his fluency

rates.

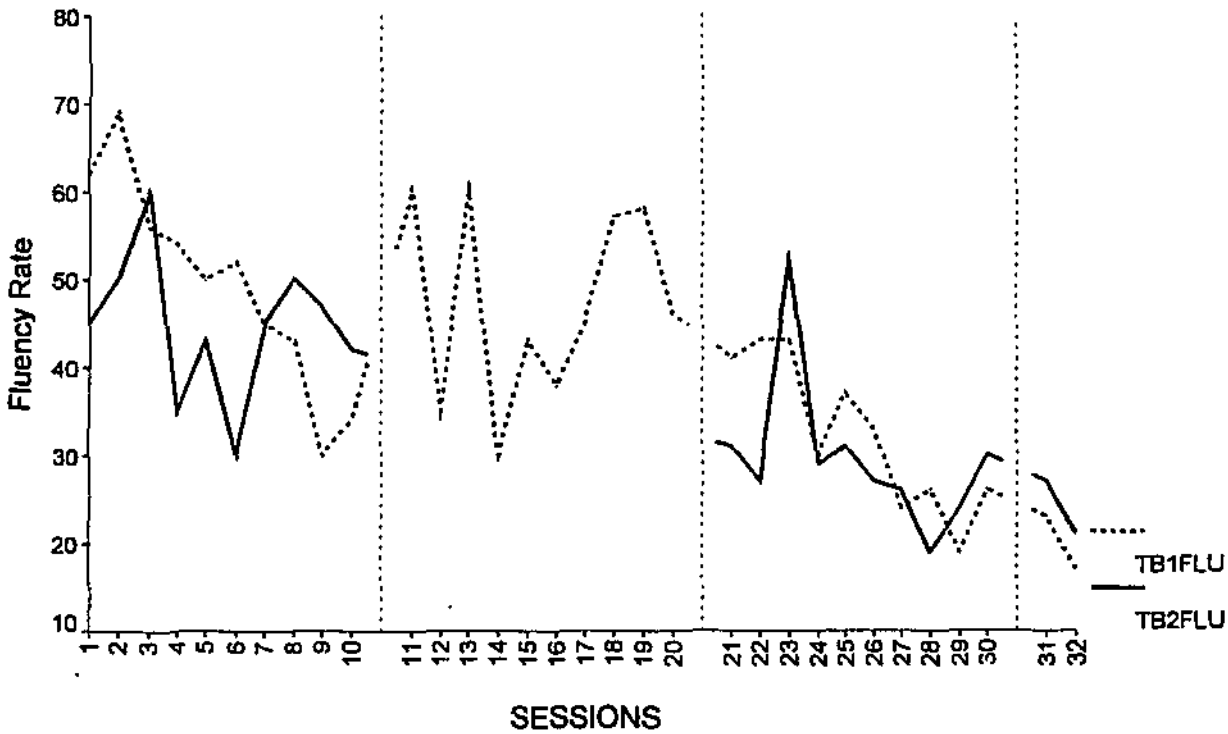

Figure 6. Time taken by Neil to complete tests from both TBI and TBII across each phase.

Participant 3

Word recognition

Dale's performance on the word recognition tests from TBI and TBII were relatively constant during baseline. He attained approximately 2-3 correct responses in each test conducted from both test boxes. Dale attained a mean score of 2.6 correct responses in TBI and a mean of 2.4 in TBII. During intervention, Dale displayed a moderate increase in his word recognition skills in TBI. Dale's number of correct responses ranged from 3-7 in the intervention phase, indicating that his word recognition improved from the onset of the intervention and continued to improve throughout the sessions. Dale attained a mean score of 5.3 correct responses in TBI during the intervention phases. TBII was not used or assessed in the intervention phase

During the return to baseline phase, Dale indicated that he was capable of maintaining his word recognition skills above the mean of 5.3 attained during intervention. Dale's performance after intervention continued to increase with his scores ranging between 4-8 (M = 6.3) in TBI. Follow-up probes conducted two weeks after the final intervention session using TBI indicated that Dale was capable of maintaining his word recognition above initial baseline scores by attaining a mean of 6.0. However, he was incapable of maintaining the high scores attained during intervention.

Generalisation

Probes taken using TBII in both the initial and reversal to baseline phases indicated that Dale was capable of generalising his knowledge of phoneme-grapheme correspondence rules to words of a similar structure. His mean performance in TBII during the initial baseline was 2.4. During the reversal to baseline Dale displayed a moderate increase in his word recognition skills

by attaining a mean score of 5.7. Follow-up probes indicated that Dale maintained and continue to increase his word recognition and generalisation skills two weeks after the final baseline by attaining a mean score of 6.5 correct responses in TBII.

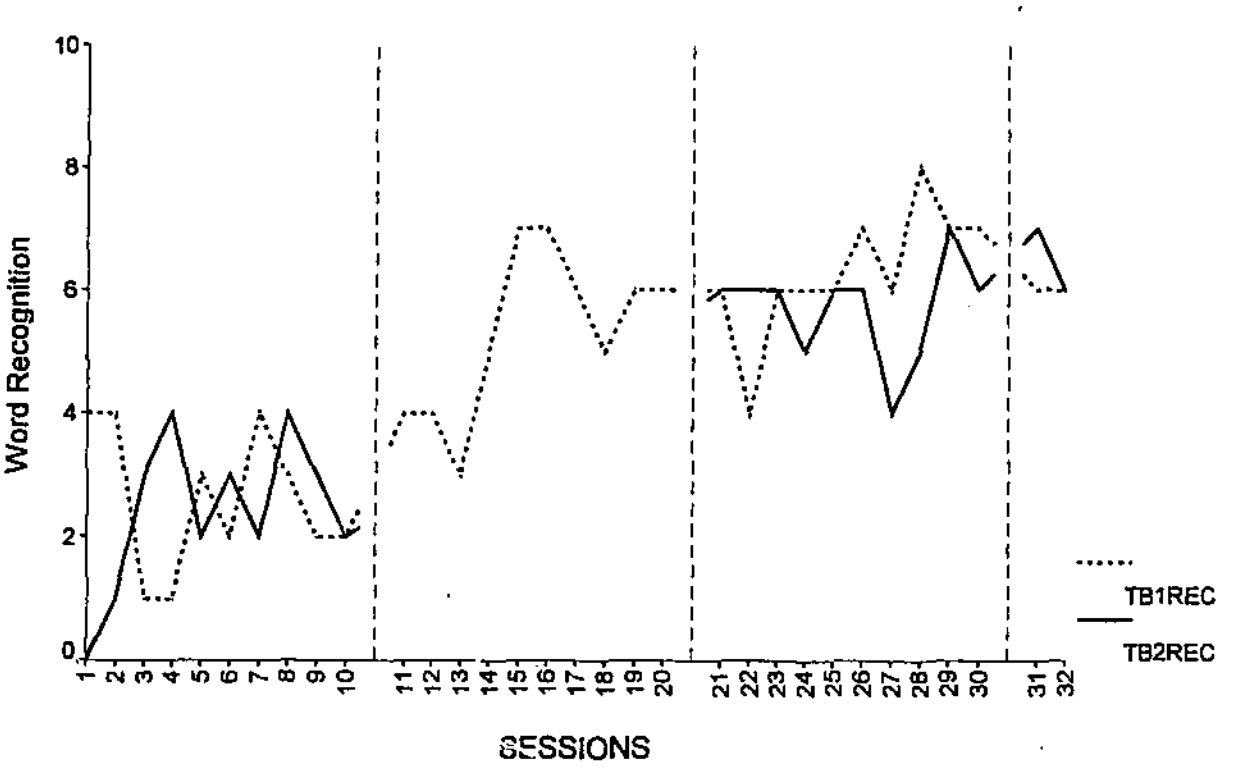

Figure 7. Dale's number of correct word recognition responses across baseline, intervention, baseline and follow-up probes.

Common errors

Analysis of the errors made by Dale indicated that specific words and vowel blends caused Dale significant problems. Table 3 on the following page indicates the most frequent errors made during baseline, intervention, reversal to baseline and an overall examination of the words that were repeatedly mistaken across the phases.

Analysis of the most common errors indicated that Dale had particular problems with words containing the vowel blends /oi/ and /ea/. Dale was capable of identifying the first consonant with relative ease, however, he would quickly guess the rest of the word rather than attempting to decode the remaining letters. On average Dale traced the word three times before he was able to write the word without referring to the model. In some instances Dale would need to trace the word an additional three times before spelling and writing it correctly.

Table 3.

Most common errors made and frequency during each phase.

	Baseline		Intervention		Baseline		Overall	
	word (w)	no of errors (e)	w	e	w	e	w	e
TBI							boil	10
	toil	5	boil	3	load	6	load	10
	boil	4			heap	4	heap	8
	ties	4			lean	3	lean	8
	mean	4					toil	8
							leak	6
							neat	6
TBII	foam	4			coil	5		
	haul	4			moan	4		
					join	4		
					pout	4		

Fluency

During baseline, Dale's fluency rates were relatively variable. Dale's scores ranged from 47-78 seconds to complete a test from TBI, to 54-107 seconds to complete a test from TBII. Dale attained a mean score of 68 seconds in TBI and a mean of 80.7 in TBII. During intervention Dale displayed a moderate increase in his fluency rates when using TBI. Dale's fluency rates ranged from 46 -95 seconds in the intervention phase which converts into a mean score of 62.2 seconds in TBI. Fluency rates using TBII were not assessed in the intervention phase

During the return to baseline phase, Dale indicated that he was incapable of maintaining his fluency rates attained during intervention. Dale's performance after intervention marginally decreased with his mean score in TBI changing from 62.2 during intervention to a mean of 65.7 seconds in the second baseline phase. Follow-up probes conducted two weeks after the final session using TBI indicated that Dale was able to increase his fluency rates by attaining a mean of 44 seconds.

Generalisation

Probes taken using TBII in both the initial and reversal to baseline phases indicated that Dale was capable of increasing his fluency rates by generalising his knowledge of phoneme-grapheme correspondence rules to words of a similar structure. His mean performance in TBII during the initial baseline was 80.7 seconds. During the reversal to baseline Dale displayed a rapid increase in his fluency rates by attaining a mean score of 58.6 seconds. During the follow-up probes Dale averaged 58 seconds, indicating that he was capable of maintaining and slightly increasing his fluency rates .

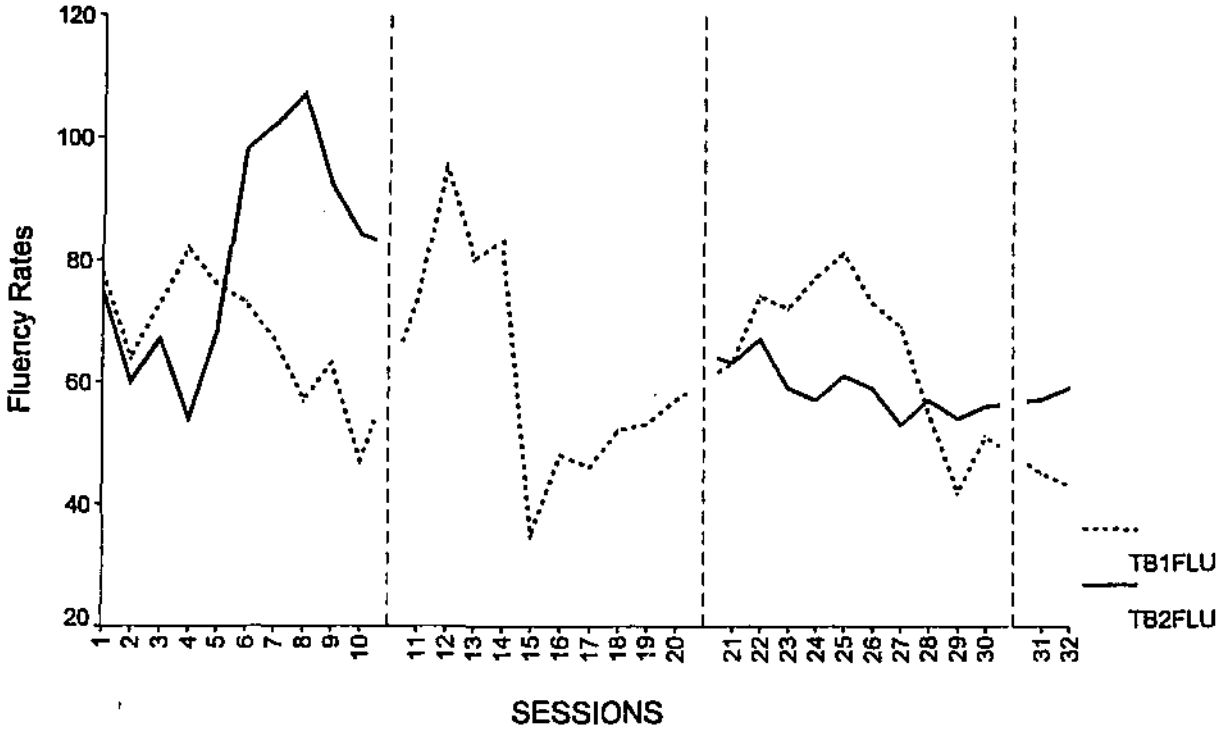

Figure 8. The amount of time taken by Dale to complete tests from both TBI and TBII across each phase.

Participant 4

Word recognition

Brad's performance during baseline on the word recognition tests from TBI and TBII were relatively constant. He attained approximately 2-3 correct responses in TBI and 3-4 correct responses in TBII. Brad attained a mean score of 2.7 correct responses in TBI and a mean of 3.3 in TBII. During intervention Brad displayed a rapid increase in his word recognition skills in TBI. Brad's number of correct responses ranged from 6 in the first intervention session to 9 in the tenth session, indicating that his word

recognition improved from the onset of the intervention and continued to improve throughout the sessions. Brad attained a mean score of 7.8 correct responses in TBI during the intervention phases. TBII was not used or assessed in the intervention phase

During the return to baseline phase, Brad indicated that he was capable of maintaining his word recognition skills above the mean of 7.8 attained during intervention. Brad's performance after intervention continued to increase with his scores ranging between 8-9 (M = 8.3) in TBI. Follow-up probes conducted two weeks after the final intervention session using TBI indicated that Brad was incapable of maintaining and increasing his word recognition skills attained during the intervention phase. His mean number of correct responses declined to 7.5. However, his results were significantly better when compared to initial baseline conditions.

Generalisation

Probes taken using TBII in both the initial and reversal to baseline phases indicated that Brad was effectively capable of generalising his knowledge of phoneme-grapheme correspondence rules to words of a similar structure. His mean performance in TBII during the initial baseline was 3.3. During the reversal to baseline Brad displayed a rapid increase in his word recognition skills by attaining a mean score of 7.8. Follow-up probes indicated that Brad experienced a slight drop in his word recognition and generalisation skills two weeks after the final baseline. He attained a mean score of 7.5 correct responses in TBII.

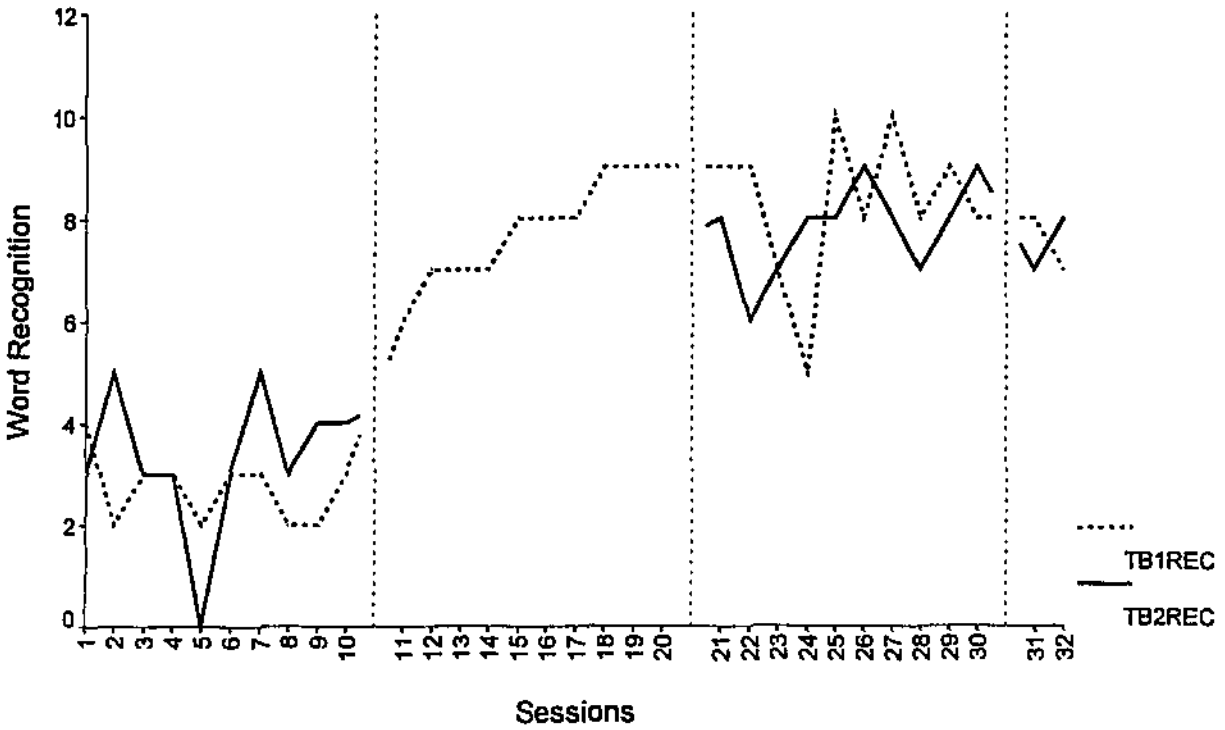

Figure 9. Brad's number of correct word recognition responses across baseline, intervention, baseline and follow-up probes.

Common errors. Analysis of the errors made by Brad indicated that specific words and vowel blends caused Brad significant problems. Table 4 on the following page indicates the most frequent errors made during baseline, intervention, reversal to baseline and an overall examination of the words that were repeatedly mistaken across the phases.

Table 4.

Most common errors made and frequency during each phase.

	Baseline		Intervention		Baseline		Overall	
	word (w)	no of errors (e)	w	e	w	e	w	e
TBI	lies	5	ties	4	hour	3	ties	10
	lean	4	load	2	boil	3	hour	8
			loud	2	ties	3	boil	7
			toil	2	lied	3	lies	7
			boil	2				
			soil	2				
TBII	tail	4			join	3	pout	6
	coil	4			sour	2	coil	6
	hoof	4			pout	2	pies	5
	foam	4			haul	2	tail	5
					pies	2		
					ties	2		

Analysis of the most common errors indicated that Brad had particular problems with words containing the vowel blends /oi/, /ou/ and /ie/. Brad was capable of identifying the first and last consonants with relative ease. Difficulty occurred when Brad attempted to sound out the vowel phonemes in isolation as opposed to recognising that the individual vowel sounds blend. On average Brad traced the word three times before he was able to write the word without referring to the model.

Fluency

During baseline, Brad's fluency rates during testing were relatively variable. Brad scores ranged from 92-126 seconds to complete a test from TBI, to 98-132 seconds to complete a test from TBII. Brad attained a mean score of 102.7 seconds in TBI and a mean of 115.2 in TBII.

During intervention Brad displayed a rapid increase in his fluency rates when using TBI. Brad's fluency rates ranged from 63 seconds in the first intervention session to 25 seconds, indicating that his fluency rates increased from the onset of the intervention and continued to remain higher than baseline results. Brad attained a mean score of 44.2 seconds in TBI during the intervention phases. Fluency rates using TBII was not assessed in the intervention phase

During the return to baseline phase, Brad indicated that he was capable of maintaining and increasing his fluency rates attained during intervention. Brad's performance after intervention continued to increase with his mean score in TBI changing from 42.2 during intervention to a mean of 40.2 seconds in the second baseline phase. Follow-up probes conducted two weeks after the final session using TBI indicated that Brad was able to maintaining and increasing his fluency rates by attaining a mean of 37 seconds.

Generalisation

Probes taken using TBII in both the initial and reversal to baseline phases indicated that Brad was capable of increasing his fluency rates by generalising his knowledge of phoneme-grapheme correspondence rules to words of a similar structure. His mean performance in TBII during the initial baseline was 115.2 seconds. During the reversal to baseline Brad displayed a rapid increase in his fluency rates by attaining a mean score of 41.2 seconds. During the follow-up probes Brad averaged 44.5 seconds, indicating that he was capable of maintaining his fluency rates in comparison to the initial baseline scores. He was, however, unable to maintain the high standards reached during the second baseline.

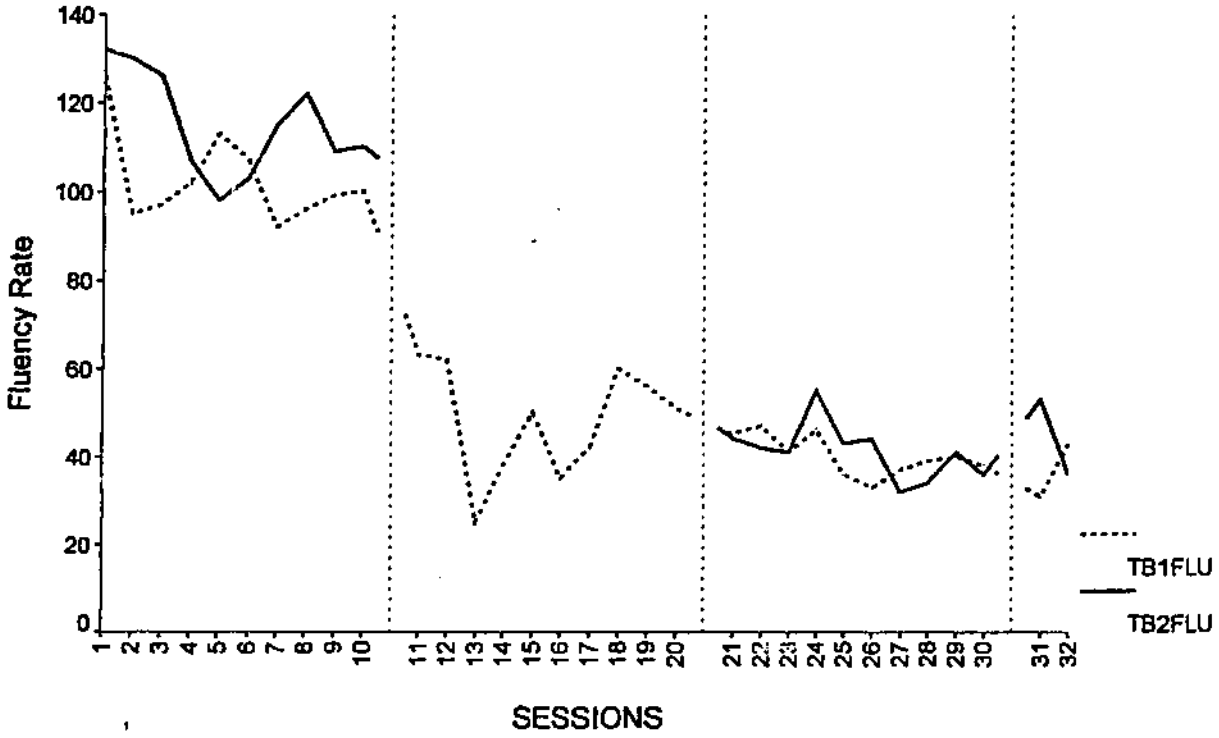

Figure 10. The amount of time taken by Brad to complete tests from both TBI and TBII across each phase.

CHAPTER V

Discussion

This study evaluated the effectiveness of the Fernald method which aimed at teaching phoneme-grapheme correspondence rules to children with learning difficulties. This research project used phoneme-grapheme correspondence rules to promote word recognition and fluency for the purpose of advancing the acquisition of reading skills.

The present study required four children to engage in independent training sessions using the Fernald method. Testing was conducted immediately after the training sessions to determine if training of the phoneme-grapheme correspondence rules was an effective method of promoting reading acquisition. Two dependent variables were prescribed as measures of the outcomes of phoneme-grapheme correspondence rules. These variables were word recognition and the time taken to complete each test (fluency).

The major aim of the study was to monitor and evaluate the effectiveness of phoneme-grapheme training on four individual participants. Participants involved in this study were selected from mainstream classrooms. Word recognition and fluency skills were assessed on an individual basis to identify the unique strengths and weaknesses of each participant. Results of the study were compared to determine if the students benefited from the training sessions.

The results confirm the findings of previous investigations that phonemic awareness plays a significant role in the acquiring reading skills (Grogan, 1995; Hurford & Sanders, 1995). All four participants improved dramatically on word recognition skills and fluency rates after teaching phoneme-grapheme correspondence rules.

The primary objective was to compare each participant's word recognition and fluency rates across three phases. An ABA single subject design was implemented. It was argued that this form of analysis would demonstrate the degree of success of teaching phoneme-grapheme correspondence rules to promote word recognition and fluency skills.

The most significant result of this study was that training in phoneme-grapheme correspondence rules significantly increased the word recognition skills and fluency rates of each participant. This is supported by some of the previous research findings on reading acquisition (Nation & Hulme, 1997; Vernon, 1993) This result suggests that the learning of phonemes and their accompanying letter formations are a strong determinant of a child's ability to decode and become a fluent reader.

Major results of the present study provide strong support for the teaching of phoneme-grapheme correspondence rules to children with reading difficulties. The presence of a significant difference in the word recognition skills and fluency rates of each participant suggests that phoneme-grapheme training enhances the acquisition of reading skills. The rise in each participant's word recognition test results and the decline in the time taken to complete the test for TBII, indicate that the participants developed the ability to generalise their knowledge of phoneme-grapheme correspondence rules

to words of a similar structure. This finding suggests that the participants are learning the phoneme-grapheme correspondence rules as opposed to merely memorising the words incorporated in TBI. If no significant difference occurred in the generalisation testing phase then it would be reasonable to assume that the children had not learned the phoneme-grapheme correspondence rules, but had simply learned the words in TBI through rote learning.

Several predictions made by the experimenter about the participants word recognition skills and fluency rates were not substantiated by the results. Firstly, it was predicted that all participants' word recognition skills would improve and continue to improve following the completion of the intervention sessions and follow-up probes, but this was not the case. All participants experienced an increase in their word recognition skills during the reversal to baseline phase. However, most were not able to maintain the level of word recognition previously attained in the follow-up probes. This is contrary to some of the previous research findings (Hurford & Sanders, 1995). Adams' review produced evidence strongly suggesting that phonics instruction had a valid and lasting value in the development of reading skills. In the present study, only one participant continued to increase word recognition skills across all three phases and the follow-up probes. One participant maintained his score in TBI and increased his word recognition in TBII. Two participants experienced a decrease in their word recognition test scores during the follow-up probes.

The slight decrease in the participants word recognition skills can be attributed to a number of factors. Adams (1990) asserts that all children enter the education system with varying degrees of knowledge. Some have very

little knowledge of the alphabet, whereas others can recite the alphabet and the accompanying sounds. The inference could be made that the children within this study had varying degrees of background knowledge which would transfer to skills learned during the acquisition period.

The issue of instructional time is another factor to consider. It is widely recognised that children learn at different rates. However, the time constraints of this study did not allow for any variations in the instructional time. The assumption can be made that the participants were not ready to move to independent learning and required extended teacher-guided instructional time.

Researchers need to address the reinforcement of new learning in such contexts. If the children's skills are not reinforced regularly then it is likely that these skills will diminish (Barry & King, 1993). During this study, the participants were removed from the classroom for instruction and no measures were taken to ensure that classroom teachers reinforced the participants' new knowledge during and on completion of the study.

Intrinsic motivation can also play a significant role in the maintenance of new learning. It was observed that two of the participants were highly motivated to learn to read. Both had positive attitudes towards the phoneme-grapheme correspondence rules training regimes. These two participants displayed higher levels of improvement and maintenance of new skills. The other two participants indicated negative attitudes towards reading and displayed a lack of motivation when participating in the intervention. Their results displayed a decline in word recognition skills during the follow-up probes.

No measures were taken to monitor attitudes and motivational levels of the participants. The experimenter recommends that motivation should be considered as an independent variable in future studies. This recommendation is based on the observations of the experimenter and the perceived impact motivation had on not only word recognition, but also on fluency rates.

Adam's (1990) review of literature asserts teaching phoneme-grapheme correspondence rules to the point of automaticity assists in promoting fluency in reading. The results of this study support these findings, but also recognises the internal factors which can affect fluency rates. Intrinsic motivation appeared to have a particular impact on one participant. It was observed that his reading fluency was affected not only by the difficulty of the test but also by his desire to participate. If he was removed from class during work activities his motivation was high and he completed tasks quickly. If he was removed from class during fun activities then his motivation was low, as he preferred to be in the classroom.

This also accentuates the issue of attitudes towards learning. Children with a positive attitude towards learning tend to perform at a higher level than children with a negative attitude. Additionally, children with a desire to learn have been recognised as displaying higher levels of task attendance. (Barry & King, 1993).

The ultimate goal of the previous study was to determine if the Fernald method could be utilised to teach basic phoneme-grapheme correspondence rules. The results of this study support the use of the Fernald method as an instructional technique to promote the learning of phoneme-grapheme

correspondence rules. The study offers a method for teaching reading in the educational setting to children with learning difficulties.

Significance of results to education

The evaluations of research and the results of this study indicate that children exposed to the letter formations and their accompanying sounds prior to instruction have a greater success rate in acquiring reading skills (Riley, 1996). Many techniques can be employed to expose children to the written word. However, reading aloud has been recognised as an important activity for building a knowledge of the skills required to commence reading (Adams, 1990). Other techniques which expose children to print include language activities and big books.

Once children have been exposed to the printed word instructional techniques can be employed by educators to introduce children to the concepts of words, syllables and phonemes.

This study extends on the literature based on the instructional methods that teachers can use with children with learning difficulties. First, the method gives instruction in phonics and the sounds of words and also assists in directing their attention to the spelling patterns in words. They also acquire a basic knowledge of print concepts and an appreciation for the alphabetic principle. Children also develop an understanding that sounds paired with letters are part of the spoken language.

Children who enter school with knowledge of the alphabet and their accompanying sounds display higher results in reading achievement measures. Children lacking in this knowledge need to be introduced to the

alphabet and accompanying sounds through an effective instructional process. Programmes which focus on phoneme-grapheme correspondence rules assist children in the ability to recognise letter formations and their accompanying sounds.

Teaching phonics in isolation is beneficial to promoting reading success. However, because most phonemes cannot be pronounced without a vowel it is important to teach children about the concepts of blending to produce pronounceable words. Even so, programmes for both children with learning disabilities and regular readers should provide an appropriate balance between phoneme-grapheme correspondence rules and reading for the comprehension of the text.

A child's ability to recognise phoneme-grapheme correspondence rules is extremely important in the development of word recognition skills. For this reason reading texts should be coordinated with the teaching of phonics. Additionally, providing writing and spelling activities during reading instruction should assist children in developing and reinforcing their knowledge of both spelling and spelling-sound patterns (Vernon, 1993).

The Fernald method is only one instructional technique which can be adapted to teach children phoneme-grapheme correspondence rules. It is a beneficial technique as it can be adapted to meet the needs of individuals. An important component of the method is to insure that it remains intrinsically interesting to the participants engaged in the programme. Adelman and Taylor (1988) examined the original multi-sensory four-stage Fernald method through a series of three motivational phases which can be adapted and applied by classroom teachers in both the planning and implementation

of the method.

Phase 1 involves preparing the student for reading readiness. This involves creating an atmosphere which is conducive to learning, emphasising possible areas of learning and examining the students' interests. The students are given the opportunity to work independently until they discover intrinsic reasons for seeking assistance from the teacher.

Phase 2 involves the maintenance of motivation during the instructional process. The students are permitted to select personally meaningful texts and are encouraged to take responsibility for their own learning. The student receive reinforcement through examining their own products, both their stories and alphabetical word lists. Phase 3 involves continuing motivation after instruction. The students develop confidence and begin to apply and expand their knowledge to other areas of interest.

During the implementation and completion of instructional methods students should be encouraged to practise their reading. This involves providing a variety of different reading opportunities during classroom activities. A number of different texts can be used to assist students in identifying the purpose and meaning of the text. Students need to appreciate that to be an effective reader they need to learn to comprehend the meaning within the different text types (Adams, 1990).

Repeated reading, which is facilitated by the Fernald method, promotes word recognition and fluency, but can assist in developing comprehension skills, as such understanding depends on the ability to distinguish words quickly and effectively. To assist in developing comprehension, educators should

provide texts which the student is capable of reading with 90-95% accuracy. Any words that cause difficulty should be emphasised and re-read to ascertain the meaning of the sentence in which it appears (Adams, 1990).

The above processes required to teach students the skills necessary to become fluent readers are complex. As previously mentioned children enter the school system with varying degrees of prereading knowledge. It is every educator's responsibility to ensure that student's strengths and weaknesses are identified and that programmes are implemented which will cater to their needs and promote the acquisition of reading skills. Numerous techniques and instructional processes are available to educators. However, this study recommends the Fernald method as an appropriate technique for teaching phoneme-grapheme correspondence rules to children with learning difficulties. To promote maximum success it is recommended that educators consider the motivational aspect of this method. The Fernald method will need to be adapted to meet the needs and interest of the participants engaged in reading instruction.

CHAPTER VI

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CHAPTER VII

Appendices

Appendix I

21st May 1997

Dear Parent / Guardian,

Hello, my name is Paula Kinsman and I am currently participating in a project aimed at helping children learn how to read effectively. I am a qualified teacher and will be assisting at Ursula Frayne over the next few weeks.

I believe your child would be one of the students who would greatly benefit from one-on-one reading instruction. For this reason, I seek your permission to work with your child for a period of approximately four weeks.

Some of the materials and information collected will be used as part of a research project I am conducting for Edith Cowan University. Your child's name will not be used in any documentation or correspondence.

If you have any questions regarding my teaching methods please feel free to contact me on 95284861 or 0419 858457. I would be happy to answer any questions or concerns you may have.

Thank you for your time and consideration.

Paula Kinsman

I _____ hereby grant permission for my child _____ to participate in one-on-one reading instruction with Paula Kinsman over the next few weeks. I understand that some information may be used in a study being conducted at Edith Cowan University and that my child will not be identified in any documentation.

Signature:_____ Date:_____

Parent / guardian

Appendix II

words in TB1

rain	seed	wood
raid	seen	took
pain	seem	Paul
gain	feet	Maud
maid	feed	loud
paid	feel	hour
laid	heel	
mail	weed	
bail	lies	
bait	lied	
seam	ties	
mean	load	
lean	loaf	
neat	road	
leak	toad	
leap	soak	
heap	goat	
seal	toil	
meat	soil	
neat	boil	
deed	cook	
deep	book	

Appendix III

words in TBII

tail	need	haul
fail	keen	pout
jail	keep	sour
rail	tied	bout
pail	pies	
sail	coat	
nail	boat	
hail	soap	
beat	coal	
seat	moan	
heat	loan	
beak	foam	
bead	foil	
bean	coil	
beam	join	
real	coin	
deal	soot	
meal	foot	
week	hoof	
weep	hook	
beef	good	
beet	hood	
meet	look	

Appendix IV

Story: incorporating 50 words from TBI

Going to the lake

Paul and Maud wanted to go to the lake to catch some fish. They took a basket and filled it with meat, a loaf of bread, a book and some wood

Paul and Maud walked down the road but it started to rain They stopped at the post office and watched the people send their mail. One man paid for his stamp and forgot to look where he was going. The man stood on a toad and landed with a loud thump in a heap on the floor If the man had seen the toad he would not have landed in the deep puddle made by a leak in the roof.

They began to walk on the road again They passed a goat, a big load of bird seed, the neighbours maid and the mean lady with funny feet. Maud was in pain because the basket was a heavy load to carry. Paul lied and said he couldn't carry the basket because the fish bait was heavier, Paul always told lies.

It took them an hour to get to the lake. When they got there the ground was wet. The rain had given the soil a good soak. Maud laid a blanket on the ground. It was nice and neat. But Paul complained he could feel a big weed digging into his heel. So he went to do a good deed and catch some fish. He took his fishing rod and went down to the lake

While he was away Maud made a fire and put a deep pot of water onto boil. She then put the potato in the pot and chanted bubble, bubble, toil and trouble as she waited for it to cook. Paul came back with no fish and started to tell a lie about seeing a seal. Maud turned away to raid the basket, she pulled out some lean meat to eat. Paul began to leap up and down and make loud noises because Maud was not listening. It didn't seem very funny to Maud and she told him to sit down and have a feed.

After they ate they had a race Paul was winning but just as Maud began to gain speed she fell down and ripped the seam and one of the ties on her dress She was very upset and they both packed up and went home.

Appendix V

Fluency Rates (mean scores)

TBI Phase	John	Neil	Brad	Dale
1	77.4	49.5	102.7	68.0
2	47.3	47.3	42.2	62.2
3	45.6	32.2	40.2	65.7
4	44.0	20.0	37.0	44.0

TBII Phase	John	Neil	Brad	Dale
1	80.6	44.7	115.2	80.7
3	38.9	29.6	41.2	58.6
4	57.0	24.0	44.5	58.0

Appendix VI

Word Recognition (mean scores)

TBI	John	Neil	Brad	Dale
Phase				
1	2.3	3.9	2.7	2.6
2	7.2	7.6	7.8	5.3
3	8.4	9.0	8.3	6.3
4	8.5	9.0	7.5	6.0

TBII	John	Neil	Brad	Dale
Phase				
1	2.4	3.6	3.3	2.4
3	7.7	8.1	7.8	5.7
4	8.0	9.0	7.5	6.5

Appendix VII

Word recognition

	A	B
1	TB1	TB11
2	4	0
3	4	1
4	1	3
5	1	4
6	3	2
7	2	3
8	4	2
9	3	4
10	2	3
11	2	2
12		
13	4	
14	4	
15	3	
16	5	
17	7	
18	7	
19	6	
20	5	
21	6	
22	6	
23		
24	6	6
25	4	6
26	6	6
27	6	5
28	6	6
29	7	6
30	6	4
31	8	5
32	7	7
33	7	6
34		
35	6	7
36	6	6

Dale's and fluency

	A	B
1	TB1	TB11
2	78	75
3	64	60
4	73	67
5	82	54
6	76	68
7	73	98
8	67	102
9	57	107
10	63	92
11	47	84
12		
13	73	
14	95	
15	80	
16	83	
17	35	
18	48	
19	46	
20	52	
21	53	
22	57	
23		
24	63	63
25	74	67
26	72	59
27	77	57
28	81	61
29	73	59
30	69	53
31	55	57
32	42	54
33	51	56
34		
35	45	57
36	43	59

Appendix VIII

John's

Word recognition and fluency

	A	B
1	TB1	TB11
2	3	0
3	2	3
4	2	2
5	2	3
6	3	1
7	3	3
8	1	3
9	6	2
10	1	3
11	0	4
12		
13	4	
14	6	
15	6	
16	7	
17	9	
18	6	
19	9	
20	10	
21	7	
22	8	
23		
24	9	8
25	9	8
26	9	7
27	8	8
28	8	7
29	9	8
30	9	7
31	7	7
32	9	8
33	8	9
34		
35	8	8
36	9	8

	A	B
1	TB1	TB11
2	67	75
3	105	102
4	61	83
5	66	92
6	72	87
7	65	72
8	90	59
9	85	78
10	83	77
11	80	81
12		
13	65	
14	69	
15	52	
16	36	
17	43	
18	45	
19	41	
20	38	
21	43	
22	41	
23		
24	60	37
25	41	43
26	55	42
27	63	60
28	43	34
29	36	33
30	41	38
31	43	34
32	35	36
33	39	32
34		
35	47	56
36	41	58

Appendix IX

Brad's word recognition and fluency scores

	A	B
1	TB1	TB11
2	4	3
3	2	5
4	3	3
5	3	3
6	2	0
7	3	3
8	3	5
9	2	3
10	2	4
11	3	4
12		
13	6	
14	7	
15	7	
16	7	
17	8	
18	8	
19	8	
20	9	
21	9	
22	9	
23		
24	9	8
25	9	6
26	7	7
27	5	8
28	10	8
29	8	9
30	10	8
31	8	7
32	9	8
33	8	9
34		
35	8	7
36	7	8

	A	B
1	TB1	TB11
2	126	132
3	95	130
4	97	126
5	102	107
6	113	98
7	107	103
8	92	115
9	96	122
10	99	109
11	100	110
12		
13	63	
14	62	
15	25	
16	38	
17	50	
18	35	
19	42	
20	60	
21	56	
22	51	
23		
24	45	44
25	47	42
26	41	41
27	46	55
28	36	43
29	33	44
30	37	32
31	39	34
32	40	41
33	38	36
34		
35	31	53
36	43	36

Appendix X

Neil's

Word recognition and fluency

	A	B
1	TB1	TB11
2	3	2
3	4	5
4	4	4
5	2	4
6	6	4
7	4	4
8	4	3
9	3	4
10	6	3
11	3	3
12		
13	7	
14	6	
15	7	
16	7	
17	9	
18	6	
19	8	
20	10	
21	9	
22	9	
23		
24	9	8
25	8	8
26	8	7
27	10	8
28	9	9
29	9	8
30	10	8
31	9	8
32	9	9
33	9	8
34		
35	9	9
36	9	9

	A	B
1	TB1	TB11
2	62	45
3	69	50
4	56	60
5	54	35
6	50	43
7	52	30
8	45	45
9	43	50
10	30	47
11	34	42
12		
13	60	
14	35	
15	60	
16	30	
17	43	
18	38	
19	45	
20	57	
21	58	
22	46	
23		
24	41	31
25	43	27
26	43	52
27	30	29
28	37	31
29	33	27
30	24	26
31	26	19
32	19	24
33	26	30
34		
35	23	27
36	17	21