Chapter 6

Study 2

6.1 Procedure

      6.1.1 Introduction

6.2 Design

6.3 Participants

6.4 Teachers

6.5 Stimuli

6.6 Teaching Procedure

      6.6.1 Lesson format

Chapter 6

Study 2

This chapter provides a description of the methods used in this study. Following the introduction will be: the research design in a tabulated format, a description of the participants, the teachers involved in the study, the stimuli, description of the teaching procedure and a description of the statistical analyses used to collect the data.

6.1 Procedure

6.1.1 Introduction

This second study was designed to evaluate two different teaching methods with a group of phonemically aware children from the previous study. The two teaching methods which were compared were decoding and whole word instruction. The decoding method is associated with the skills approach to reading and involves explicit instruction in the use of individual phonemes in relation to reading and writing. The whole word, or sight word, method relies on children learning to read in a 'top-down' system, from the whole word to its component parts.

The question posed in this study was: If the children involved had very high levels of phonemic awareness and alphabet knowledge, would it then be sufficient just to teach them to read a group of words in order to develop productive decoding skills? It is implied by connectionist accounts that after learners have achieved the right "grain" of phonemic awareness , they should be able to read novel print sequences

once a group of words composed of the relevant letters and phonemes has been successfully acquired (Seidenberg, 1992). In essence, this was the thinking behind the Bloomfield and Barnhart (1961) "linguistic method" of teaching, which taught families of related words with the assumption that generalisation to new words would follow. In contrast, the studies cited in Chapter 3 suggest that further, explicit training in decoding contributes to productive reading. It is questionable whether exposure to the printed whole-word is likely to draw attention to the detailed orthographic structure which forms the basis for proficient word recognition (Ehri, 1992; Adams, 1990.), but if children have pre-existing high levels of phonemic awareness and knowledge of letter-phoneme relations, learning word lists may allow them to move on to be competent decoders.

6.2 Design

The following table illustrates the origin of the two Experimental Groups and the Control Group in the second study.

Table 6.1 Time Line of Studies 1 & 2

Preschool	Study 1 Preschool	Study 2 Kindergarten	16 Month Follow-Up
Researchers Byrne & Fielding-Barnsley 1990 July - October	Researcher Fielding-Barnsley 1994 July - October	Researcher Fielding-Barnsley 1995 Feb - April	Researcher Fielding-Barnsley 1995 November
	E1 n38 sample n17 to both groups (D/E&WW) ➔	D/E.n17	E1 + E2 including D/E and WW Groups
	E2 n36 sample n17 to both groups (D/E&WW) ➔	WW.n17	
E n64 becomes C1 1994 ➔	C1 n64	C2 n14	

D/E = Decoders/Encoders. WW = Whole Word

Table 6.2 Design of the Experiment

Research design where O indicates measurement, X^1 the decoding and encoding treatment and X^2 the whole word treatment.

Group	n	Pretest	Treatment	Posttest	16 Month Follow-Up
D/E	17	O^1	X^1	O^2	O^3
WW	17	O^1	X^2	O^2	O^3
C2	14	-	-	O^2	

6.3 Participants

Participants consisted of two groups matched on measures of phonemic awareness (see Table 5.2). Each group consisted of 17 children from the four original preschools in Method 1 (see Table 4.2). Group 1 consisted of 11 girls and 6 boys with a mean age of 63.2 months (range 57 - 68 months). Group 2 consisted of 9 girls and 8 boys with a mean age of 62.4 months (range 56- 68 months).

The participants were spread between two schools with 12 at a small school in a rural town with a population of 1,000. The other 22 children were at a larger state school in a small city, population 22,000. These 22 children were in four different kindergarten classes. The 2 groups were equally represented in both schools and between classes. The two groups were also equally represented from the total of four preschools in the first study.

The groups were also matched by their Experiment 1 post-test scores administered at the end of preschool. See Table 6.3.

Table 6.3 Preschool Scores of Decoding/Encoding and Whole Word Groups on

Phonemic Awareness Measures.

Condition	Decoding/Encoding		Whole Word	
	M	SD	M	SD
Initial Identity	11.25	1.34	11.25	1.48
Final Identity	11.13	1.15	10.89	1.09
Alphabet	15.75	6.90	16.25	6.08
Concepts About Print	9.56	3.69	9.81	3.54
PPVT	111.75	11.44	110.4	12.28
Critical Letters	5.69	0.70	5.63	0.89
Word Choice	10.31	1.92	10.06	1.69

Note. PPVT = Peabody Picture Vocabulary Test- Revised, Form M.

Ethical Considerations

Permission for the second study was gained from both Department of School

Education and the Catholic Schools Office. See Appendix A. Permission was also

granted from the school principals.

Permission had been gained from the parents of each child before the

commencement of Study 1. In addition a follow up letter was sent to each child in

Study 2 to explain the second programme of teaching. At this point the parents were

given the opportunity to withdraw their child from the study if they so wished. See

Appendix A.

A copy of the results from the second study was sent to the principal of each

school.

<u>6.4 Teachers</u>

The female teacher at the small Catholic school had 2 years experience as a

kindergarten teacher and was trained at The University of New England. This teacher

used a phonic component in her teaching along with reading of Big Books. She

introduced one sound every week and incorporated this sound with her Big Book

reading. There was no direct instruction in encoding/decoding or writing apart from

learning to write their own names. Of the total of 17 children in the class 12 were

involved in this study.

Table 6.4 City school teachers. Teaching experience and distribution of children

within classes

Teacher 1	Teacher 2	Teacher 3	Teacher 4
32 years experience	18 years experience	10 years experience	5 years experience
10 children	3 children	3 children	6 children
D/E 6 WW 4	D/E 1	D/E 1 WW 2	D/E 2 WW 4

All four teachers were following The New South Wales Department of School

Education Curriculum Guideline, English K-6 - Coming to School. The curriculum

advocates; " Reading and interpreting text, Working with text and Creating text, p10."

Some phonic activities suggested by the syllabus included, "Identification and supply

of rhyme, p15, and identification and supply of beginning sounds of words, p8." The

use of shared book reading was also recommended, p12

Although the teachers in the two schools were working from different

guidelines they were, nevertheless, using the same approach. The important criterion

was that neither school had introduced decoding or blending skills which would have confounded the study.

6.5 Stimuli

The stimuli used for both the decoding/encoding group and the whole word group were: the Montessori sandpaper letters and Sound Foundation Snap cards, see stimuli section 4.6 Method 1. These stimuli were used for revision purposes in the first week of the study. The taught words and the test words were displayed on folded cards, 10cm by 7cm. The words were in N.S.W. Foundation style script 1.5 cms high. The cards were folded to enable each word to be displayed in an upright position in front of the child. In addition to these stimuli the decoding/encoding group was provided with rubber stamps bearing the taught letters in N.S.W. Foundation script, 1cm high. This group also used Leggo type letters and a board to which the letters were attached. The Leggo type blocks were 3cm by 1.5 cms with inscribed letters also in N.S.W Foundation script, 1cm in height. Each word card was accompanied by a matching illustration on the same size card (excepting the word *am* and pseudo-word *tam*). The test words were presented on cards in the same format as the cards used for teaching. The whole word group was provided with: colour change felt tip pens, food colour in dropper bottles , computer generated drawings to illustrate sentences written by the researcher. and printed lists of the taught words to cut out and glue onto appropriate pictures. Examples of the stimuli can be seen in Appendix B. A tape recorder was used to record the test sessions.

6.6 Teaching Procedure

Thirty four participants from Study 1 were selected for follow up Study 2. The participants were selected from two schools, as time constraints limited the number of participants and schools visited. Two schools were selected to give the highest numbers from the 4 feeder preschools. One small school in a rural setting and one larger school in a more urban setting.

As time of the school year was critical for this design, the experiment took place from week 2 to week 10 of the first term. The participants in this experiment, therefore, had only had one week of formal schooling before being part of this study. It was now possible to control for any prior learning which may have taken place at school. The participants were familiar with the writer. Consequently they were comfortable with being withdrawn from the classroom for a short period of time.

Experimental group 1 was classified as the decoders/encoders and experimental group 2 as the whole word group. The groups will be referred to as either D/E or WW. All participants were seen on an individual basis once a week. Each session was timed with an electronic timer and conducted in a quiet room away from the classroom. The library was used in one school and an unused office in the other.

In week one, both groups revised their alphabet knowledge and phonemic awareness, over two sessions. The first session involved revision of the 6 taught sounds using Montessori sandpaper letters and the same picture mnemonics that were used in Study 1,(see page 143) In session 2 the participants revised phonemic awareness using the Sound Foundations card games introduced in Experiment 1. The

card game involved matching picture cards with the same beginning sound as the grapheme. This game was played against a timer which beeped after a 2 minute interval.

6.6.1 Lesson format

In week 2 of the study the groups began their respective training. Group D/E was taught to read two words, *am* and *pam*. Leggo letters and board, plus flash cards of the words were used to aid decoding and blending. The participants were encouraged to stick the individual letters on the board, saying the sounds of the letters as they did so. They wrote the word *pam* first and then took away the *p* and attempted to work out what the little word that was left, might say. The writer told each participant that the little word said *am*. The participants were then asked if they could think of any words that rhymed with pam, the writer generated one rhyme as an example and continued with more if the participant was unable to generate any on their own. The session finished with a "test". The flash cards of the two words were shuffled and one presented to the child. "What does this one say?" Corrective feedback was given if the choice was incorrect. The test was completed after 5 consecutive correct responses. If the participant failed to reach criterion the lesson would be repeated later in the week until criterion was reached. This was only necessary on three occasions.

Group WW participants were also taught the same words, *am* and *pam*. The flash cards of the two words were displayed and also a picture of a girl, " pam". The participants were told what the words said and were then asked to repeat the words to the experimenter. The writer then wrote the sentence "I am pam" on a piece of paper

and the participant was asked to draw a picture of pam. The writer then read the sentence and asked the participant to point to the word *am*, and then to point to the word *pam*. The "test" was then administered as for Group D/E.

Week 3. Each session began with a review of the words learned in the previous week. Children were reminded if they had forgotten the words. The words *sat* and *mat*, on flash cards with accompanying illustrations, were introduced to both groups. Group D/E copied the words from the flash cards onto the Leggo board with the Leggo letters, sounding the letters as they put them on the board. The participants then wrote the new words onto a piece of paper with rubber stamps. These rubber stamps were made specifically for the project to assist children with the writing process. The letters were in The New South Wales Foundation Style print 1 cm in height. The participants then proceeded to the "test" as in week 1.

Group WW also revised their words from week 1 and then proceeded to learn *sat* and *mat*. The children were asked to repeat the words after the writer, and then to read them by themselves. The writer then wrote the sentence "*pam sat* on the *mat*" and the children illustrated the picture. The new words were written in magic colour change pens to distinguish them from the other words. The routine then followed as for week 1.

Week 4. Virtually the same routine now continued with each group. Group D/E participants were asked to look at the new word carefully and then to reproduce the word with Leggo letters without any reference to the word on the flash card. A novel approach to the new word was introduced for Group WW This week the new word, *splat*, was illustrated on the child's work with a drop of food colouring representing a splat on the page, with the words, *splat* on the *mat*. (see Appendix B)

The testing procedure now changed to 2 consecutive correct responses for each word as the battery of words became too large for 5 correct responses.

Week 5. Revision of 5 learned words, followed by learning of the new words, *pal* and *lap*. Group D/E were asked to choose any 2 of the 7 words to write with Leggo letters. They then checked their writing against the flash card. On this occasion all words were spelled correctly, as the writer asked the children to "think again" if they chose the incorrect letter.

The novel approach for Group WW was a computer generated outline of, pam sitting on a splatted mat with a pal on her lap. The words; *pam, sat, mat, splat, pal* and *lap* were written in N.S.W. Foundation script under the picture. The children were asked to connect the correct word with the corresponding picture, using a coloured pen. (see Appendix B). Both groups finished with the testing procedure.

Week 6. Revision of 7 learned words. New words, *slam* and *lamp*, introduced. Group D/E followed the same routine as the previous week. Group WW used the same computer drawing as the previous week but were provided with the words on small pieces of paper, which they glued onto the corresponding part of the picture (see Appendix B).

Week 7. Revision of 9 learned words and the introduction of a pseudo word, *tam*. The revision of the learned words followed the same format each week. The children first matched each word card to the corresponding picture card and then read the words from the cards without reference to the picture cards. The reason for learning one pseudo word was to prepare the children for the transfer task on pseudo words in week 10. I t was explained to the children that *tam* was a silly word and that

it didn't mean anything. As there was no illustration to accompany the word it helped the children to understand that the word had no meaning. Group WW selected one of the learned words to copy/write and illustrate and they also wrote their names.

Week 8. Revision of all ten words by matching the word card with the picture card. A recorded test session, using the same format as for revision in previous weeks. After reading the displayed words, with no feedback, the children were asked to pronounce the sounds of the Leggo letters. All children were then asked to write the learned words with the Leggo letters. Group WW had no previous experience of using the Leggo letters so the move from saying the sounds of the letter blocks to writing the words made the task more relevant for them. None of the WW children showed any difficulty in using the Leggo letter blocks to form the words.

Week 9. All children were tested for the ability to read 10 novel words (see Appendix C). The writer employed an assistant, a trained infants teacher, to test the children. The assistant was unaware of which group the children belonged to. It was explained to the children that these words were new words, words that they had not learned before. The novel words were made up of the taught sounds; *s, m, p, l, t,* and *a.* The assistant was instructed not to use the term, "<u>sound</u> out the words", but to say "Can you <u>read</u> this word to me." If the child was unable to read the word, the assistant encouraged them to read a little bit of the word. The children were then asked to write the novel words using the Leggo letter blocks.

Week 10. All children were tested for the ability to read and write 8 pseudo words (see Appendix C). The same routine as for week 9 was used.

The children were also shown an irregular word, salt. The child was told "This is a tricky word, it says *solt* not *salt.* I am going to show you some more tricky

words to see if you can work them out for me. You might have to change the sound

of the *a* a little bit, until you hear what sounds like a real word. The children were

then shown 5 irregular words, (see Appendix C).

Chapter 7

Study 2 Results and Discussion

6.1 Procedure

      6.1.1 Introduction

6.2 Design

6.3 Participants

6.4 Teachers

6.5 Stimuli

6.6 Teaching Procedure

      6.6.1 Lesson format

7.1 Discussion

Chapter 7

Study 2 Results and Discussion

This chapter presents the results for the second component of the study in kindergarten. During the course of the eight weeks of the study two children left the district, one from each group, leaving a total of 32 children from the original 34 children who began the study.

Three groups were used in Experiment 2 including: 16 children from Experiment 1 who were taught to read a group of words using decoding/encoding methods (D/E); 16 children from Experiment 1 who were taught to read the same group of words using a whole word method (WW); and a control group of 14 children who were not included in any of the training methods (C2).

There were significant differences favouring the decoding group in how well they learned to read and write the taught words, and read and write the novel and pseudowords. Table 7.1 and Table 7.2 record scores out of a possible 10 for learned and novel words and a possible 8 for pseudowords. The scores were calculated on 1 point for each correct word. Table 7.3 presents a different scoring system, 1 point for each correct phoneme in any position in the word and 1 extra point for a correct word response, (e.g., slam for slap = 3 points, pam for map = 3 points, pam correct = 4 points, tam for tap = 2 points). The rationale for using the point scoring system was that several children were very close to the reading and writing of the target word and deserved some credit for this approximation.

Table 7.1 Kindergarten Scores of Decoding/Encoding and Whole Word Groups on

Reading and Writing Measures.

Number of Words Correct.

Condition	Learned (max.10)		Novel (max. 10)		Pseudo (max. 8)	
	Read	Write	Read	Write	Read	Write
Decode/Encode						
M	9.25	8.56	6.50	6.75	4.00	5.06
SD	0.78	1.21	2.81	2.11	2.94	2.38
Whole Word						
M	7.31	3.00	2.31	3.81	2.18	2.94
SD	1.89	3.06	2.52	2.93	2.37	2.46
t (30) =	3.80**	6.77**	4.44**	3.26**	1.92	2.48*

$* p < .05. ** p < .01.$

Table 7.2 Kindergarten Scores of Decoding/Encoding and Whole Word Groups on

Reading and Writing Measures.

Number of Words Correct

Condition	Novel Clusters (max. 3)	Learned word Substitutions
	Read	Read
Decode/Encode		
M	1.25	2.25
SD	1.18	2.54
Whole Word		
M	0.50	4.25
SD	0.89	4.07
t (30)=	2.02†	1.67

† $p = .05$.

Table 7.3 Kindergarten Scores of Decoding/Encoding and Whole Word Groups on

Reading and Writing Measures.

Number of Letters Correct

Condition	Learned		Novel		Pseudo	
	Read	Write	Read	Write	Read	Write
Decoding/Encoding						
M	41.18	40.56	34.88	37.13	26.75	29.25
SD	1.83	2.19	8.59	5.29	6.86	5.62
Whole Word						
M	37.94	26.44	22.38	28.56	19.94	23.44
SD	3.64	8.62	11.93	10.27	10.27	7.72
t (30) =	3.19**	6.35**	3.40**	2.97**	2.15*	2.44*

* $p < .05$. ** $p < .01$.

Group WW tended to make more guesses and approximations which resulted in better scores for this group in the second scoring method. For example, more children in the whole word group responded with learned words for the novel words than in the decoding group, (see Table 7.3) e.g., 'splat' (learned) for 'stamp' (novel) would score 4 points *vs* 6 points for the correct response 'stamp'. This inflated their scores under this scoring method. The phenomenon of substituting learned words for novel words has also been reported by Seymour & Elder (1986).

To see whether the superiority of the DE group in reading novel words was solely due to their superiority in learning the original list, a regression analysis was performed. Performance on the original list was entered as Step 1 and Group as Step 2. The regression analysis, reported in Table 7.4, shows that there was a group effect on reading and writing the novel words, using both scoring methods, over and above the effect of how well they learned the taught words.

Table 7.4 Regression Analysis Predicting Novel Word Reading from Score on

Instructed Words and Experimental Group.

Step	Novel Word Reading: Number of Words Correct	
	R^2 Change	F Change
Words learned	.43	25.75**
Group	.12	7.76**

Step	Novel Word Reading: Number of Letters Correct	
	R^2 Change	F Change
Words learned	.46	25.31**
Group	.09	5.64*

$* p < .05. ** p < .01.$

The results for the control group of n= 14, (7 girls and 7 boys)age 63.7

months, were; 8.9 points (range 0-17) for reading the novel words and a knowledge of

4.7 (range 1-6) of the critical letters. The 'correct word' scoring system was not used

for the control group as only one child read one word correctly. It is important to note

that most of the children in the control group knew the sounds of the critical letters

required to read the test words. From Table 5.4, both experimental groups knew an

average of 5.7 letters from the 6 letters taught.

The irregular words which were presented to both groups in the last test

session were not included in the results section because the children were unable to

read them. The only correct response given by one child was maul for mall, this is the

Australian pronunciation for a shopping mall. Only those children who were above

the mean in reading the novel word were presented with the irregular words.

7.1 Discussion

The question which was posed at the outset of this study was: Will children

high in phonemic awareness and alphabet knowledge be able to decode novel words

after learning a group of words comprised of the learned letters? The results of this

study help to confirm the hypothesis that explicit instruction in decoding and

encoding, on top of phonemic awareness and alphabet knowledge, assists children in

the decoding of novel words. The superior results of the DE group, compared to the

WW group in reading and writing both novel and pseudo words justifies the need for

the explicit teaching of decoding and encoding for most children.

However, it must be noted that the WW group was successful, if not to the

same extent as the DE group, at decoding and writing novel and pseudowords. The

WW group was in fact able to decode and write several of the test words. There were

two children in the WW group who performed as well as the best children in the DE

group. Care must be exercised in interpreting these findings as the study was

conducted over a very short period of time and with minimal exposure to a group of

only ten words.

The generally lower scores for reading pseudowords for both groups, and the

discrepancy between reading and writing pseudowords, may be explained partially by

the fact that some children were embarrassed by reading "silly words". Real words

rather than pseudowords have been used by some researchers for these reasons

(Ferreiro & Teberosky, 1982; Vandervelden & Siegel, 1995). Some children refused

to make any attempt at reading the words. However, writing did not pose the same problems. All children attempted to write all of the pseudowords. They might also have thought that all words that you read must make sense, that the words must be in their lexicon, even though it had been explained to them that they were not real words. Torgesen, Wagner, Balthazar, Davis, Morgan, Simmons, Stage and Zirps (1989) also found that real words were easier for children to read than nonwords.

It may be argued that the decoders outperformed the whole word group solely because they had learned the taught words more proficiently. The regression analysis (see Table 7.4) shows this not to be the case.

Another factor that might explain the apparent 'catching up' of the whole word group to the decoding group in the pseudoword reading and writing is practice. As the testing procedure took three weeks, and involved a practice effect, it could be reasoned that the whole word group was actually learning to decode/encode when writing the words with the Leggo letters. In other words, there appeared to be a practice effect. Cunningham & Stanovich (1990) suggested that the act of writing itself may facilitate a grasp of phonemic awareness in graphic form which could help explain this phenomenon.

An interesting difference between the two groups was the 'guessing' component displayed by the whole word group. They appeared to use different strategies to learn the words, e.g., 'I know that's *splat* because it's the longest.' There seem to be several factors that could explain the guessing phenomenon when reading the novel words; similar word length, overall similarity to a learned word, and cuing from an initial sound. Only the control group responded with words which had the same letter in any position and no other similarity with the test word, e,g.,

Macdonald's for *map, mas* and *sam.* The children using the cuing method from initial

sound could be described by Ehri and Wilce's (1987) terminology as 'phonetic-cue

readers', where reading involves reading words by forming and storing associations

between some of the letters in words' spellings and some of the sounds in their

pronunciations. Ehri and Saltmarsh (1995) have also reported that disabled readers

process only partial letter information about words, which results in an impairment of

lexical representations of sight words in memory

Even though some children seemed to use the 'phonetic-cue' method there

was an absence of the use of 'analogy.' Children make inferences or analogies about

new words on the basis of spelling patterns in words that they already

know.(Goswami & Bryant, 1990,p.147). This was also the thinking behind the well

known work of Bloomfield and Barnhart (1961, p10) who advocated the learning of

'lists' of words which would in turn transfer to reading new 'lists' of words using the

'word' method. The opportunity to use analogy was significant in this study. There

were several instances when the children learned word families which could have

alerted them to the fact that these words shared common sounds. Nevertheless they

failed to note the significance. Towards the end of the teaching segment the children

were asked to compile the words with the Leggo letters. During one session the

words they were asked to compile were, *sat* and *mat.* By leaving the *at* on the board

the child would only have to substitute one letter, but on every occasion they took all

the letters off the board and rewrote the whole word. The same pattern occurred with

the writing of *pam* and *pal.* In fact the opportunities for analogy were considerable as

the total of ten words was made up of only six letters. These finding s are in

accordance with those of Bruck and Treiman (1992), Ehri and Robbins (1992), and

further explained by Duncan, Seymour and Hill (1997) who state that "...letter-sound correspondences rather than onset or rime units formed the basis of their first attempts to utilise phonology in reading." The decisive words in this context may be 'first attempts', it could be argued that children need explicit instruction in the use of analogy before they can utilise this knowledge. However the children in the Goswami (1988) study were not given explicit instruction in the use of analogy but they were older and attending an infant class of a primary school. A two-year follow-up study, of the children in the Duncan et al. study has shown that these children, especially the more advanced readers, are now utilising rime units in their reading although the focus on small units is still maintained (P. Seymour, personal communication, March 20, 1997). The children in the present study were certainly classified as those who were making their 'first attempts' at reading. Coltheart and Leahy (1996) also noted that both children and adults used grapheme-phoneme units more frequently than rime units. The case has been made that there is a link between preschool rhyming skills and later reading development (Bradley & Bryant,1983) and that this may help to explain the use of orthographic analogies (Goswami,1988). If this were the case the children in the present study were well equipped to use analogy as their knowledge of rhyme was secure. Even though rhyme was not measured in the present study, it may be deduced from the results of a study by Byrne & Fielding-Barnsley (1991). Byrne and Fielding-Barnsley tested the rhyming ability of children at 55 months and found that they had a mean score of 7.2 out of a possible 10 on a rhyming task. These children may be compared with the children in the present study as they were the same age and attended the same preschools.

The present study demonstrates that after minimal training, 18 weeks in total (12 weeks at preschool and 6 weeks in kindergarten), it is possible for children in their first term at school to be able to read quite complex novel words, e.g., *stamp, splat* and *slap* (see Table 7.2). Initial clusters tend to behave as single units and are, consequently, very difficult to read and spell correctly (McClure, Ferreira, & Bisanz, 1996; Treiman, 1992). Ehri and Wilce (1987) also found that that their experimental group, trained in segmental awareness, was superior in reading clusters to a control group.

At this point it is important to note that not all children in the decoding group were successful and that one child in particular had no success in decoding either novel or pseudowords. It was noteworthy that this child failed to grasp the concept of phoneme identity, a measure of phonemic awareness, in the preschool study. Other studies have noted that there are children who are harder to teach than others. In a study by Torgesen, Morgan & Davis (1992), for example, it was found that 30% of their at-risk sample showed no measurable growth in phonological awareness following an 8-week training program that produced significant growth in awareness in the majority of children. Obviously these children require additional help if they are to become successful readers. Children who were the lowest scorers in kindergarten in a training study by Blachman (1994) received additional phonemic awareness and letter-name and letter-sound instruction for up to 12 weeks of first grade. As the length and complexity of treatment increased they also had fewer 'treatment resistors.' (Blachman, 1994a, p. 289).

This study also supports the idea promoted by Williams (1979, 1980), Adams (1990), Blachman (1987,1989, 1994a), Juel (1988), Liberman et al., (1980) and

Torgesen et al. (1994), that phonemic awareness skills should be included in beginning reading instruction, before the possibility of reading failure. Blachman (1987) suggests that the kindergarten prereading curriculum should incorporate phonemic awareness training, emphasis on letter names and sounds and encoding.

While it is important to acknowledge the value of phonemic awareness in early reading instruction, it should not preclude the value of strategies used in whole language programs, e.g., learning to recognise a battery of sight words by exposure to frequent shared reading of <u>Big Books.</u> Castle, Riach, and Nicholson (1994) have shown the benefits of teaching phonemic awareness concurrently within a whole language program, maintaining perhaps the better elements of both methodologies.

Here, in Australia, the New South Wales Department of School Education is introducing some very basic aspects of phonological awareness and phonemic awareness into their kindergarten curriculum. They suggest having students gain an understanding of rhyme, phonological awareness, and to recognise the sound they can hear at the beginning of their name, phonemic awareness. The Document (1994,p15) states, 'Students need phonological skills, such as rhyming, to be able to utilise the alphabetic principle effectively in reading and spelling.' It seems that the results of research into reading acquisition are being implemented into our classrooms, albeit rather slowly.
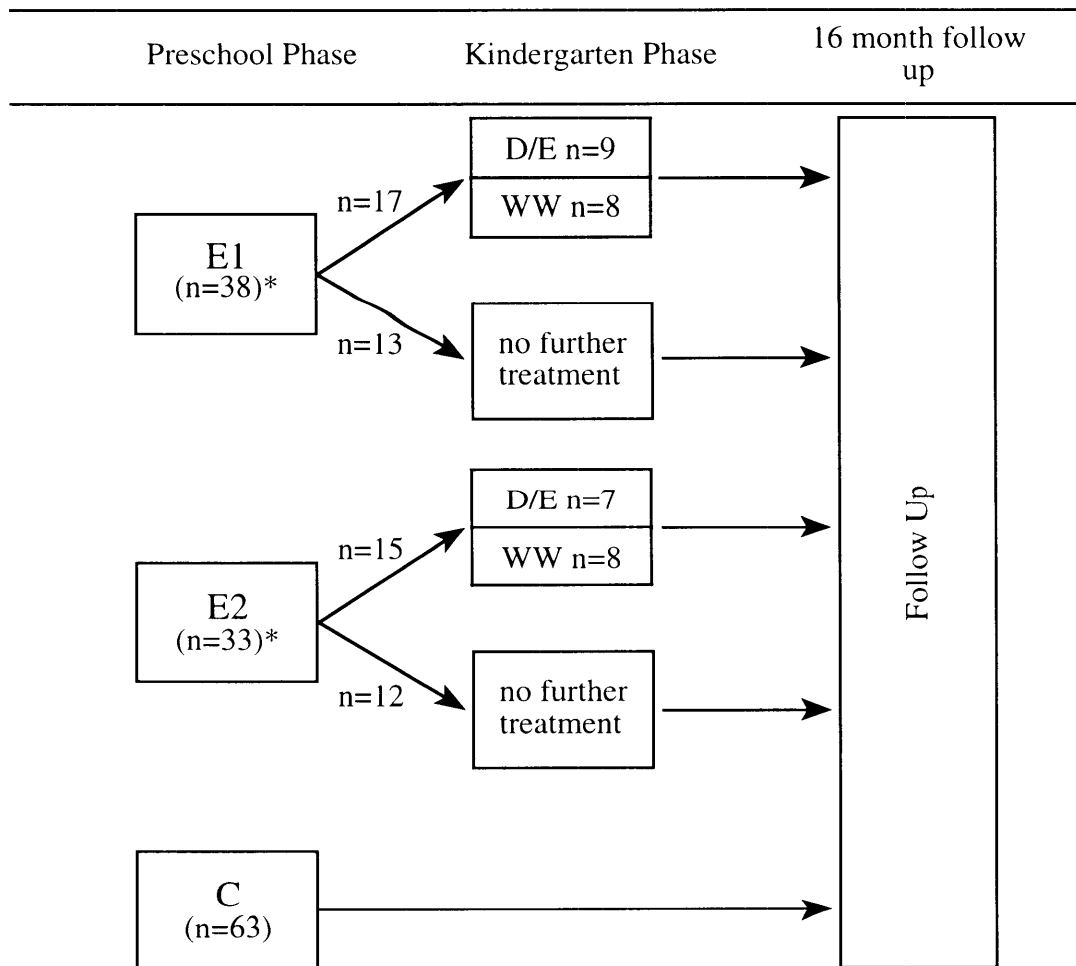
Chapter 8

Sixteen Month Follow-Up

8.1 Design

8.2 Results and Discussion

8.3 Discussion

Chapter 8

Sixteen Month Follow-Up

8.1 Design

Preschool Phase	Kindergarten Phase	16 month follow up

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                          ┌──────────────┐
                    n=17  │  D/E n=9     │ ──────►
       ┌──────────┐   ╱   ├──────────────┤
       │   E1     │──      │  WW n=8      │ ──────►
       │ (n=38)*  │──      └──────────────┘
       └──────────┘   ╲   ┌──────────────┐
                    n=13   │  no further  │ ──────►
                          │  treatment   │
                          └──────────────┘

                          ┌──────────────┐
                    n=15  │  D/E n=7     │ ──────►
       ┌──────────┐   ╱   ├──────────────┤
       │   E2     │──      │  WW n=8      │ ──────►
       │ (n=33)*  │──      └──────────────┘
       └──────────┘   ╲   ┌──────────────┐
                    n=12   │  no further  │ ──────►
                          │  treatment   │
                          └──────────────┘

       ┌──────────┐
       │    C     │ ──────────────────────────────►
       │ (n=63)   │
       └──────────┘
```

Follow Up

* Subject attrition between phases accounts for lack of correspondence between groups.

Figure 8.1 Design of follow-up study

Tests

In November of the same year, 1995, follow-up tests were conducted to assess the permanence of the instruction. This was 7 months after the last posttest and 16 months after the initial intervention at preschool. As in the posttest the writer employed an assistant, a trained infants teacher, to test the children. The assistant was unaware of which group the children belonged to.

The justification for using the following tests was to be able to compare the performance of the control group and Experimental Groups, E1 and E2. The tests which were selected were those used by Byrne and Fielding-Barnsley in their 1993 study, to which the control group for the present study belonged. The experimental groups from Study 1 (E1 & E2) could therefore be compared directly with the control group.

The tests administered were; the Word Identification subtest from the Woodcock Reading Mastery Tests- revised , Form G (Woodcock, 1987), pseudoword identification (Byrne & Fielding-Barnsley, 1993), and a spelling test (Byrne & Fielding-Barnsley, 1993).

The Woodcock Word Identification test requires children to pronounce single words until they make errors on six consecutive items.

The pseudoword identification task was a forced-choice recognition test with 15 items. For each item, the child heard a pseudoword pronounced and was asked to circle the correct spelling from among three alternatives. The items were constructed so that the correct response could not be detected on the basis of a single letter. For instance, the foils for *ap* were *ep* and *aj*. See Appendix C for full list.

The spelling test consisted of 10 real words and 4 pseudowords. The children were asked to spell the 10 real words which were said once, repeated in a sentence, and spoken a third time. The words were presented in the following order: *dog, man, one, said, blue, come, plug, went, limp, tree.* The 4 pseudowords, *ig, sut, frot, yilt,* were pronounced three times. The test was an amended version of one used by Liberman , Rubin, Duques, and Carlisle (1985). The scoring system was also adapted from Liberman et al. (1985). A correct spelling such as "come" earns the maximum of 6 points. Letter reversals, such as *b* for *d,* are also ignored. Letter reversals have been found to be common at this age (Liberman, Shankweiler, Orlando, Harris, & Berti, 1971). The rest of the scoring system is based on the number of correct phonemes the child attempts to represent. A spelling that represents all the phonemes with conventionally acceptable letters, such as "cum" or "kum," earns 5 points, and one that represents all phonemes but includes more distantly related letters, such as "cam" is given 4 points. If the attempt includes more than one but not all phonemes, such as "cm" or "ku" for *come* or "pug" for *plug,* it is awarded 3 points. One phoneme with a conventional letter, such as *k,* is given 2 points, and one phoneme with a related letter, such as *g* or *n* for *come* earns 1 point.

Table 8.1 Examples of Developmental Spelling Scores

6 points	5 points	4 points	3 points	2 points	1 point
dog	*	dig	dot	d	*
bog					
one	wun	oen	wn	o	w
said	sed	snd	sd	s	e
blue	bloo	bleo	bew	b	*
plug	plag	pulg	pug	p	b
tree	tre	ter	tee	t	i

* no examples

8.2 Results and Discussion

Of the original 71 children in the preschool study (Study 1), 57 remained for the follow-up study. All 16 subjects who were not available for follow-up testing were members of the untrained kindergarten group. All 32 subjects from the trained kindergarten group were available for follow-up testing.

The Woodcock Word Identification test and pseudoword test were both scored by the writer. The spelling test was scored both by the writer and by her supervisor. Consultation took place if scores differed. Scores only differed by one or two points in most cases. The most frequent difference was the score for "ig"; "eg" was awarded 6 points by the writer but only 5 points by the supervisor. It was agreed that "eg" was indeed a correct rendition of the word pronounced "ig" because the letter name e is the closest sound for /I/ among the letter names (Read, 1986).

Table 8.2 Follow-Up Scores of Trained, Untrained and Control Groups on Reading

and Spelling Measures (subgroups of Trained [DE, WW] also included).

Condition	Woodcock		Pseudo (max.15)		Spelling (max.84)	
	M	SD	M	SD	M	SD
D/E	139.31	39.19	14.13	1.20	71.13	8.56
WW	134.31	26.84	13.50	2.10	65.25	9.63
Total Trained	**136.81**	**33.14**	**13.81**	**1.71**	**68.19**	**9.45**
Total Untrained	**136.04**	**34.76**	**12.80**	**1.96**	**61.64**	**13.87**
Control	**110.87**	**18.82**	**12.37**	**2.54**	**57.62**	**17.12**

An ANOVA analysis was carried out to investigate the long term effects of

alphabet instruction in addition to instruction in phonemic awareness. The original

control group from the Byrne and Fielding-Barnsley (1991) study and the children

from the two experimental groups, E1 and E2, who were not given further training in

kindergarten were compared.

There was a significant difference favouring the Untrained kindergarten group

over the Control group on the Woodcock Word Identification test, $t(86) = 4.37$, p<

.01. There were no differences on the Pseudoword test, $t(86) =$. 0.77, or the Spelling

test, $t(86) = 1.05$.

Within the trained groups, there was a significant difference favouring the

Decoding/Encoding group over the Whole Word group on the Spelling test, $t(30) =$

1.82, p< .05 (1-tailed). There were no differences on the Woodcock test, $t(30) = 0.42$,

or the Pseudoword test, $t(30) = 1.03$.

There were significant differences favouring both Trained kindergarten

groups, when combined, over the Untrained kindergarten group on Pseudowords,

t(55) = 2.08, p< .05, and on Spelling, t(55) = 2.12, p< .05. There was no difference on the Woodcock Test, t(55) = .08.

8.3 Discussion

It may be argued that the superiority of the trained group was due to the individual attention that they received. Therefore a comparison was made between the control group which received no individual instruction and the untrained kindergarten sample, see Table 8.2. The superiority of the untrained group over the control group **may** be attributed to the additional instruction in alphabet knowledge which they received in preschool. Instruction in phonemic awareness combined with letter/sound instruction has been shown to improve early reading and spelling skills (Bradley & Bryant,1983., Ball & Blachman, 1991., McGuiness et.al., 1995).

The comparison of the two teaching methods, decoding/encoding and whole word, was in favour of the decoding/encoding method which was consistent with the findings of the post tests earlier in the year, see Table 7.1, Table 7.2 and Table 7.3. However the significance was restricted only to the scores in spelling. The spelling test may be the most sensitive of the three tests used in this follow-up study. However, Stuart (1990) found that even though phonologically advanced children became better spellers their IQ also seemed to have been a factor. The pseudo word recognition test reached close to ceiling level of 15, 14.13 and 13.50 respectively. It could also be argued that the Woodcock Word Identification subtest measures many sight/irregular words which do not require superior decoding skills, e.g., *is, you, come, blue* and *two* in the first 14 test items. This factor has also been noted by McGuiness et.al., (1995) "Greater gains appear in Word Attack performance and transfer more

slowly to performance on tests of word recognition" (p.849). They also state that nearly half of the words in the Woodcock Word Identification subtest are irregularly spelled words whereas 80% of English spellings are regular or predictable. Greater gains were also made on regular words compared to irregular words in a study by Foorman, Francis, Novy and Liberman (1991).

The data also show that individual instruction in reading words, both by the decoding/encoding and whole word method, was successful in raising decoding and spelling scores over a matched group that received no individual instruction, see Table 8.2. In addition both of these groups, trained and untrained, were superior to the control group.

Chapter 9

Case Studies

9.1 Rationale

9.2 Lauren

9.3 Jessica

9.4 Fergus

9.5 Conclusions

Chapter 9

Case Studies

9.1 Rationale

Several cases in Study 2 are worthy of further investigation. In each of the following cases the child in question did not progress at the same rate or used different learning strategies to the rest of the participants. The educational implications which arise, as a result of these different learning strategies are justification for their inclusion.

9.2 Lauren

Lauren, who was in the DE group, was one child who appeared to learn in an uncharacteristic way. Even though she was secure in her knowledge of all the preschool measures, e.g.; PPVT, CAP, Identity, Word Choice and Critical Letters, (see Table 5.3) and was given the opportunity to learn decoding skills she appeared to use logographic or whole word strategies.

During the first 5 weeks of learning how to read by decoding/encoding she showed no evidence of using the whole word method but in the sixth week she showed the first evidence of using some other method rather than decoding. During revision time she consistently responded with *mate* for *pal*. It was not until the test scores were analysed that this response became significant. Lauren was the only child in the decoding/encoding group who after a perfect score on the learned words responded with learned word substitutions for all 10 of the novel words, the mean for

the decoding/encoding group being 2.25, (see Table 7.2) However she did not consistently substitute learned words for novel words, she read three of the pseudowords correctly and for the other five words, even though she gave incorrect responses, they were not learned word substitutions. Unlike some other children Lauren seemed to be aware that pseudowords were nonsensical and could not be substituted with real words.

There were five children who scored less than two out of eighteen on the transfer task. Four of these five children were in whole word group which could explain their low scores, explicit training in decoding and blending may have benefited these children. However the one child, Jessica, who scored zero in the decoding/blending group needs some further examination.

9.3 Jessica

Jessica was one of the two children who failed to grasp phoneme identity at preschool. The other child was in the whole word group and also scored zero on the transfer task. Jessica also scored significantly lower on alphabet knowledge, she knew five letter names- mean 16. Her score of two in the Concepts About Print test revealed her lack of knowledge about book and print conventions, the mean being close to ten. However, in other respects e.g., scores on the P.P.V.T and Reading Attitude test, Jessica was not significantly below the mean for the kindergarten group. Jessica learned the six critical letters necessary to pass the Critical Word Choice test but failed to pass the actual test with a score of five out of a possible twelve. This case lends support to the idea that phoneme identity must be in place for a child to be able to decode novel words.

9.4 Fergus

Fergus, who was in the decoding group, performed well on all the learning and transfer tasks except for the transfer on pseudowords with a score of zero. It is difficult to isolate the reason for this as several children performed poorly on the pseudoword transfer but Fergus was above the mean on all other tests. Fergus suffers from 'myotonic dystrophy' the symptoms being muscle weakness and delayed relaxation of muscles after contraction. The disability rarely becomes severe until 15 to 20 years after the onset of the symptoms. About half of the patients with myotonic dystrophy are intellectually impaired , but severe mental retardation is unusual. The remainder are of average or occasionally above average intelligence (Isselbacher, Braunwald, Wilson, Martin, Fanci, & Kasper, 1950, pp. 3284-2385). Fergus tended to have his on and off days and was frequently uncooperative at preschool. It is important to note that Fergus had an above average score of 118 (x = 103) on a measure of verbal intelligence (PPVT) at preschool. He also had average scores on measures of phonemic awareness and Concepts About Print.

9.5 Conclusions

The educational implications of the children cited as case studies are important. There could be similar children in classrooms all over the world. Teachers must be aware of the children in their classrooms who may not be grasping the concepts that are being taught.