Refereed Papers

LOOK-SAY-COVER-WRITE-SAY-CHECK AND *OLD WAY/NEW WAY – MEDIATIONAL LEARNING*: A COMPARISON OF THE EFFECTIVENESS OF TWO TUTORING PROGRAMS FOR CHILDREN WITH PERSISTENT SPELLING DIFFICULTIES

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ABSTRACT

The goal of this research was to compare the effectiveness of the Look-Say-Cover-Write-Say-Check *and* Old Way/New Way – Mediational Learning *approaches to spelling remediation. Prior to commencing the research program, selected third and fourth year Bachelor of Education (Primary) pre-service teachers were trained by the first author in tutoring methods in both spelling remediation approaches. Participants consisted of 25 students, ages 7–12, from local community schools, who were randomly allocated to one of the two treatment conditions. The program involved one-on-one tutoring by the trained pre-service teachers, under the mentorship of the first author. Statistical analysis of the pre- and post-test results indicated significant improvement for both groups, but one method did not emerge as superior to the other.*

Current research supports the commonly held belief that progress in school may be affected by poorly developed spelling skills (e.g., Graham, Harris, & Fink-Chorzempa, 2003; Sipe, Walsh, Reed-Nordwall, Putnam, & Rosewarne, 2002). Not only does poor spelling impede academic progress by impacting on the ability to transmit meaning in written form (Graham et al., 2003), but it is also linked with problems with reading at the word level (Ehri, 2000; Graham et al., 2003). In turn, poor decoding skills

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frequently place comprehension processes at risk (Stanovich, 1992). Furthermore, the shame and embarrassment encountered by students who struggle with spelling and decoding often leads them to resist or avoid situations that involve reading and writing, thus further compromising academic progress (Sipe et al., 2002). However, a positive research finding is that instruction in the underlying structure of the alphabetic system for students who are struggling with spelling leads to significant gains not only in spelling ability, but also in word-level reading ability, even when no direct instruction in reading is provided (e.g., Bhattacharya & Ehri, 2004; Graham et al., 2003).

Implications for learning to spell

Given the critical role of spelling in the overall development of literacy, it is important to determine the most effective instructional methods for children who are challenged spellers. A growing body of research has highlighted a number of important principles underlying best practices in spelling instruction and remediation, including the following: (i) using a combination of traditional and language-based approaches (Bear & Templeton, 1998; Hammond, 2004; Schlagal, 2002; Westwood, 1994); (ii) student self-correction of errors (Baxter, 2000; Goddard, & Heron, 1998; Wirtz, Gardner, Weber, & Bullara, 1996); (iii) targeting the instructional level of the child (Morris, Blanton, Blanton, Nowacek, & Perney, 1995; Schlagal, 2002), and (iv) strategy training (Bruce & Chan, 1989; Westwood, 1999). Each of these principles will be discussed below.

A combined approach. The *combined* approach to spelling instruction seeks to incorporate the best out of both the "instruction-centred" *traditional* and the "child-centred" *whole language* approaches (Hammond, 2004). For example, while the *combined* approach uses formal weekly spelling lists, as in the traditional approach, it has reconceptualised spelling as "more than simply learning the correct sequence of letters in a word" (Bear & Templeton, 1998, p. 239). Rather, spelling lists organised to highlight some linguistic feature of English spelling become the basis for explicit, intense and systematic word study of common spelling patterns, rules and generalisations, through activities such as word analysis, word sorts, and syllabification of words (Bear & Templeton, 1998; Hammond, 2004; Knight & Smith, 2000; Westwood, 1999). The combined approach also includes incidental and opportunistic spelling instruction, as in the *whole language* approach, as children are encouraged to apply and practise the principles learned in formal spelling lessons, by engagement in meaningful reading and writing activities (Hammond, 2004; Knight & Smith, 2000). Such a balance in instruction enables children who are poor

spellers to make the link more easily between the underlying language base of the English spelling system, and the development of clear visual mental representations of the spellings of words (Treiman & Bourassa, 2000). In this context, the traditional *Look-Cover-Write-Check* method of learning spelling has been reconceptualised as *Look-Say-Cover-Write-Check* (Hammond, 2004; Westwood, 1994), or variations thereof (Keller, 2002; Knight & Smith, 2000), thus supporting in visual memory the link between the phonological and orthographic aspects of the word.

Interestingly, Hammond (2004) describes a school in Western Australia where all the teachers are committed to just such combined methods of spelling instruction, and where young graduate teachers are inducted by the older, more experienced teachers into the school's philosophy of teaching spelling. This school draws its students from a variety of low to medium socio-economic backgrounds, and yet consistently, in the annual government standardised literacy assessment for Years 3, 5 and 7, upwards of 87 per cent of students exceed the state benchmark for spelling. These results would seem to speak for themselves.

Self-correction of errors. A number of research studies have highlighted the powerful effects of immediate self-correction of errors in improving the spelling performance of students with learning disabilities (e.g., Baxter, 2000; Goddard & Heron, 1998; Sipe et al., 2002; Wirtz et al., 1996). Wirtz et al., for example, found a self-correction method to be superior to traditional spelling instruction for a group of third grade students with learning disabilities, not only in learning new words, but also in maintaining their ability to spell previously learned words. Goddard and Herron (1998) have summarised a number of benefits for self-correction strategies, including (i) empirical validation and replication; (ii) active involvement of students in their own learning through a problem-solving approach; (iii) individualisation of instruction; (iv) immediate feedback of correct spellings so that students are less likely to practise the wrong spelling, as so often happens with other methods of correction; (v) the focus on checking correct sequences of letters in words which supports the development of visual memory of orthographic patterns; and (vi) students liking the process and feeling that it helps them to learn better.

Targeting the instructional level of the child. One valuable insight arising from the *whole language* approach is the recognition of the fact that in any one grade children at a number of developmental levels may be represented, necessitating close monitoring of each child's level of proficiency and his or her immediate need for instruction (Westwood, 1994). Accordingly, the value of individualising spelling instruction based on analysis and close monitoring

of the individual's current knowledge, skills and use of strategies, rather than the lock-step method of teaching all children from the same grade-level materials, has received considerable attention in recent literature (Bear & Templeton, 1998; Morris et al., 1995; Schlagal, 2002; Westwood, 1999). Morris and his colleagues stress that students should be instructed at their "instructional level", rather than at their "frustration level". They define the frustration level as being a score of 40 per cent or below on a grade-level spelling test. Their research demonstrated that children taught at their instructional level in below grade-level texts significantly outperformed a comparison group who were taught in grade-level materials at their frustration level. Furthermore, they scored no worse than their normally achieving peers in the grade-level post-test which contained words in which the intervention group had not been instructed. Morris et al. hypothesised that when students were taught at their instructional level, they were better able to consolidate their knowledge of the spelling system at a lower level of complexity, which, in turn, allowed them to learn something about grade-level words though incidental reading and writing.

However, to individualise instruction so as to ensure that every member of the class makes optimum progress can be a difficult and time consuming task, which may become overwhelming for many teachers (Schlagal, 2002; Westwood, 1994). A number of strategies can be used to minimise the burden of individualised instruction, including peer tutoring (e.g., Burks, 2004; Keller, 2002), and grouping children who are currently on the same instructional level (Schlagal, 2002).

Strategy training. Insights from cognitive and metacognitive research have highlighted the value of strategy training in helping students gain conscious control over their own learning (Bruce & Chan, 1989; Westwood, 1999). This may be particularly important for poor spellers, who, in comparison to skilled spellers, have been found to be less efficient in their use of strategies and commonly attribute their successes and failures to factors beyond their control (Ralston & Robinson, 1997). Strategy training packages make use of self-instructions in the form of questions, statements, or mnemonics to guide the student through the task. Training follows a process of modelling and verbalisation of instructions by the teacher, guided practice and feedback as the teacher and student perform the task together, and independent practice as the student internalises the procedures (Bruce & Chan, 1989). Strategy instruction specific to spelling provides students with a plan of action whereby they can take their knowledge about words (phonological, orthographic, and morphological) and apply it to the task of learning a new word, or checking the spelling of a word (Sipe et al., 2002; Westwood, 1999).

The research program

The research described in this paper involved the comparison of the effectiveness of two strategy training programs, both of which contain elements of the instructional principles described above; namely, attention to a combination of visual and language-based strategies, self-correction of errors, and individualised instruction targeted at the spelling age of the child and carried out in a one-on-one tutoring situation. The two training approaches compared in this research were *Look-Say-Cover-Write-Say-Check* and *Old Way/New Way – Mediational Learning.*

Look-Say-Cover-Write-Say-Check. The *Look-Say-Cover-Write-Say-Check* study method is a variation of the popular *Look-Say-Cover-Write-Check* method, which, along with other variations, has been widely promoted in the literature as being an effective means of helping students learn new words (Keller, 2002; Knight & Smith, 2000; Schlagal, 2002; Westwood, 1994). It is widely used in Australian schools (Knight & Smith, 2000; Hammond, 2004), being recommended by several state Departments of Education (e.g., Board of Studies NSW, n.d.).

The *Look-Say-Cover-Write-Say-Check* study method used in this study involved the student (i) looking carefully at the structure of the word and noting salient orthographic, morphological, or structural features; (ii) saying the word aloud so as to focus on spelling-sound correspondences within the word. If necessary the pronunciation of the word may be exaggerated so as to highlight the correct spelling for the "schwa" sound, e.g., "chock-O-late", or "sep-AR-ate"; (iii) covering the word while endeavouring to retain within memory the relationship between the spelling and the sound of the word; (iv) writing the word from memory; (v) saying aloud what has been written so as to check the match between spelling and sound; and (vi) uncovering the original spelling of the word and visually checking to see that his or her spelling attempt is correct. If the word is spelt incorrectly the process is repeated.

Old Way/New Way – Mediational Learning. *Old Way/New Way – Mediational Learning*, is promoted as a very effective way of correcting persistent spelling errors (Baxter, 2000). The procedure, developed by Lyndon (1989), has been designed to overcome what has been termed "proactive inhibition", or the interference effect that previous learning has on the ability to acquire new learning, or to "unlearn" an incorrect response (Baxter, 2000). The program uses the child's errors as a starting point for instruction in the following procedure: (i) the student writes the word in the incorrect form; (ii) the teacher and student agree to call this the old way; (iii) the teacher demonstrates the correct spelling for the word and calls this the new way; (iv) the teacher explains the differences between the old way and the new way, e.g., "ar" not

"er"; (v) the student writes the word again in the old way, underneath the first old way; (vi) the student writes the word again in the new way, underneath the first new way and explains the differences; (vii) the student repeats the last two steps five times; (viii) the student writes six short sentences using the newly learnt way of spelling the word (Baxter, 2000). Baxter claims that if the procedure is followed correctly, the student will, in future, spell the word the correct way 80 per cent of the time. There is a great deal of anecdotal evidence testifying to the effectiveness of the *Old Way/New Way – Mediational Learning* program (Personal Best Academy, 2005), but no research was discovered which compared its effectiveness with other spelling remediation programs. However, studies of similar programs involving error imitation and error analysis followed by modelling and practise of the correct spelling are described in the literature (e.g., Goddard & Heron, 1998; Sipe et al., 2002; Wirtz et al., 1996).

The broad aim of the research project reported in this paper was to compare the effectiveness of *Look-Say-Cover-Write-Say-Check* with the effectiveness of *Old Way/New Way – Mediational Learning* for improving the spelling performance of children in the middle to upper primary grades who are poor spellers. A secondary aim was to explore student attitudes to the effectiveness of the program.

The research was undertaken as a small-scale pilot study whereby volunteer primary-aged students from the local community were tutored by volunteer BEd Primary teacher education students from the local tertiary institution. The tutoring was done under controlled conditions with the first author acting as mentor for the tutors.

METHOD

Participants

The participants were 25 students from Years 3 to 6, ranging in ages from 7 to 12 years, who were experiencing difficulty with spelling. For the purposes of this study, spelling difficulty was defined as having a discrepancy of twelve months or more between chronological age and spelling age. Parents and caregivers of the students responded to a brochure left at each of the local primary schools offering free after-school-hours spelling tuition at the tertiary institution as part of a research project into effective spelling programs. The responsibility of parents/caregivers was to transport their children to and from the venue at the designated times for the program. The schools from which the participants were drawn were located in areas of mixed middle and low socio-economic status in a semi-urban district of NSW, Australia.

Thirty-four students actually took part in the intervention program. However, seven had to be withdrawn from the statistical analysis when results of the pre-test revealed that they were not actually remedial students, another withdrew part way through the

program and so did not complete the post-test, and another (one of the youngest children in the group) was withdrawn from the analysis because his extremely low scores on both the pre-test and the post-test indicated that he required far more intensive remediation than was available in this research project. This left a total of 25 students who were poor spellers and who had valid data available for statistical analysis.

As far as possible, the 34 students who took part in the program were randomly allocated to one of two groups: Condition One in which students were trained in the *Look-Say-Cover-Write-Say-Check* procedures, and Condition Two which involved *Old Way/New Way – Mediational Learning*. However, constraints of when parents were available to transport their children to the institution and of when pre-service teachers were available for tutoring, meant that the two groups were uneven in number right from the start. Originally there were 13 participants in Condition One and 19 participants in Condition Two. After data for some of the participants were withdrawn from the analysis for reasons described above, there were 10 participants in Condition One and 15 participants in Condition Two. Characteristics of participants in each of the conditions as they were finally organised are presented in Table 1.

Tutors

The 13 tutors were volunteer pre-service BEd Primary education students in the third or fourth year of their course. All were currently undertaking, or had already undertaken, a class in Curriculum Studies

Table 1

Descriptive Statistics for Participants in Condition One and Condition Two

Condition One

	Age in Years						Total
	7	8	9	10	11	12	
Females	0	0	0	3	2	0	5
Males	0	0	1	1	1	2	5
Total	0	0	1	4	3	2	10

Condition Two

	Age in Years						
	7	8	9	10	11	12	
Females	0	1	1	1	1	3	7
Males	1	1	3	2	0	1	8
Total	1	2	4	3	1	4	15

Grand Total 25

English, taught by the first author, in which they studied effective methods for teaching literacy skills to students in the middle to upper years of primary school. Prior to the commencement of the intervention program, tutors were trained by the first author in tutoring methods for both of the spelling remediation programs, and were closely supervised by her during the program. All tutors were given the choice of either being paid to carry out their responsibilities, or of receiving academic credit for their services, in which case they were not paid. Depending on circumstances and availability at the specified tutoring times, tutors tutored between one and four children, with most tutoring only one. In five cases, tutors were involved in teaching children in both Condition One and Condition Two.

Experimental design

An Instructional (2) x Testing Occasion (2) repeated measures design was employed, with testing occasions (pre-test and post-test) being the within-subject factor.

Instruction took place after-school-hours in four 20-minute time-slots, with a 5-minute break in between each time-slot. The first 20-minute time-slot commenced at 3.45 p.m. and the last one finished at 5.20 p.m. The first and third of these time slots was devoted to *Look-Say-Cover-Write-Say-Check*, and the second and fourth to *Old Way/New Way – Mediational Learning*. Each subject was involved in one 20-minute session per day, for four days per week, for four weeks (16 sessions in total). The pre-test occurred on the first day of the intervention, and the post-test on the last day, leaving a total of 14 days for instruction.

Measures

As a measure of improvement in spelling achievement, participants were pre- and post-tested with the South Australian Spelling Test (SAST) (Westwood, 1999). The SAST is an orally administered, standardised test of spelling achievement designed for students in the age range from 6 years to 15 years. It consists of 70 words, graded in difficulty, each with an accompanying sentence to put the word in context. The text may be administered individually or to a class group. The test was normed on large representative samples of children in South Australia in 1978 and again in 1993. Test-retest reliability for students in the Year 3 to Year 7 age range was calculated at .96 (Westwood, 1999).

As a measure of attitude to the effectiveness of the intervention program, students were post-tested with a short questionnaire developed by the first author. Each of the items on the questionnaire was set against a four-point Likert scale using faces ranging from "smiley" to "frowny" (see Figure 1 for typical questions in the Student Attitude Questionnaire).

The training program

Training of the tutors. Prior to commencement of the intervention the volunteer pre-service teacher education students were trained in both methods of remediation by the first author. They were also supplied with enough worksheets applicable to the intervention program they would be teaching (*Look-Say-Cover-Write-Say-Check* or *Old Way/New Way – Mediational Learning*) for each child they would be tutoring, and with a list of instructions outlining the procedures to be carried out for each of the 16 sessions of the intervention (see Figure 2 for an example of a worksheet proforma). Because the procedure for *Old Way/New Way – Mediational Learning* required more writing than did the procedure for *Look-Say-Cover-Write-Say-Check*, the worksheet for the latter included other activities such as sentence writing and alphabetising the spelling words. The tutors were also familiarised with the spelling section of the book *What, When, How to Teach English K–6* (Webb, 1998), which is a teacher resource book developed specifically to support the teaching of English curriculum in NSW primary schools.

Training of the participants. The intervention took place in a large classroom in the tertiary institution for four 20-minute sessions per day with a 5-minute break in between. Participants in the first and third sessions for the day were those who had been allocated to Condition One (*Look-Say-Cover-Write-Say-Check*), while participants in the second and fourth sessions for the day had been allocated to Condition Two (*Old Way/New Way - Mediational Learning*). In each session there were several tutor/tutee pairs working in various corners of the room at the same time. If parents/caregivers wished,

1. How did you feel when it was time for spelling class with your Tutor at Avondale College?



Very Happy Happy Sad Very Sad

2. How did you feel about learning new spelling words with your Tutor at Avondale College?



Figure 1. Typical items in the Students' Attitude Questionnaire.

A A A A AR PR RA
AC A S

Student s ame Grade
Day and Date Time to

❖ *Teaching*
Teach three words per session using the suggested method.
❖ *Recording word no.*

ord Old ay *xample* seperate	ew ay *xample* separate	Difference *xample* "par" not "per"

Old ay	ew ay	Difference

rite six short sentences using the ew ay spelling
.
.
.
.
.
.

❖ Comments, Observations, Concerns, etc.

Figure 2. Example of a worksheet proforma.

they could sit in the back of the room and watch the proceedings, and many chose to do so. The first author was present at all times to provide support, guidance and modelling for the tutors as necessary, and also to answer any questions that parents might have.

Using the training methods as outlined above for the respective conditions they were in *(Look-Say-Cover-Write-Say-Check* or *Old Way/New Way – Mediational Learning)*, tutors in each condition followed the same weekly routine.

Week one: On day one of the first week, tutees were pre-tested with the South Australian Spelling Test (Westwood, 1999), and that night the tests were marked by the tutors. The approximate spelling ages were determined from the standardised tables accompanying the test. Based on

their approximate spelling ages, tutors also worked out the grade level that their tutees were working at. On days two and three the tutor selected three words per day which had been wrongly spelt on the pre-test, making a total of six words for the week which were learnt according to the respective training methods. On the fourth day tutees were tested on all six words. They were also tested on a proofreading test developed by each tutor, based on the six words for the week.

Weeks two and three: For the first three days the tutor selected three words per day from the appropriate core list in the teacher's resource book *What, When, How to Teach English K-6* (Webb, 1998), being careful to select words at the grade level corresponding to the tutee's spelling age. On the fourth day, tutees were tested on the spelling of all nine words and tested on a proofreading test developed by each tutor, based on the nine words for the week.

Week four: For days one and two the tutor again selected three new words per day, and on day three the tutees were tested on all the new words from weeks 1 to 4. Day four was allocated to the administration of the South Australian Spelling Test.

An important feature of the intervention was that as new words were being learned according to the respective procedures, the tutors actively prompted the tutees in applicable spelling strategies and spelling rules, e.g., "Exaggerate the sound in the tricky part of the word", or "What letters usually make the *or* sound?" If the tutors could not think of an appropriate strategy or prompt, the first author was immediately available to prompt and mentor them.

RESULTS

Results of the pre- and post-tests of spelling ability were analysed using a Condition (2) x Testing Occasion (2) repeated measures design, while elements of the questionnaire were presented using box plots.

At the conclusion of the program, the participating students were again tested for spelling (Spelling Post-Test). The results for the spelling pre-test and the spelling post-test for both the control and the experimental groups are found in Table 2. Despite the small size of each group, the effect sizes (Cohen's, 1988, coefficient d) for Condition One and Condition Two were found to be 1.1 and 0.8 respectively.

It can be seen, based on raw scores from the SAST, that in general, students subjected to Condition One scored more highly in both the spelling pre-test and the spelling post-test than did their counterparts who were subjected to Condition Two.

Table 3 indicates that while the difference in pre-test means was significant at the 0.05 level, $F(1,24) = 6.9$, $p<.05$, the

corresponding difference in post-test means was not significant. Further, for students in each of Condition One and Condition Two, the mean of post-test scores was significantly higher than the mean of pre-test scores (see Table 4).

In addition, the students were asked to complete a short questionnaire related to their experiences in the program. Each of the items in the questionnaire was set against a four-point Likert scale using faces ranging from "smiley" to "frowny" (see Figure 1 for typical questions found in the Student Attitude Questionnaire).

Four items questioned participating students about their feelings for the spelling remediation program (4, 7, 8 and 16). These were averaged to provide a single attitudinal score. Item 11 questioned students about the way they felt about spelling at school. These

Table 2
Means and Standard Deviations for the Pre- and Post-Tests for Condition One and Condition Two

	Condition One			Condition Two		
	Number	M	SD	Number	M	SD
Spelling Pre-test	10	33.90	4.53	15	27.53	6.69
Spelling Post-test	10	40.40	7.17	15	33.73	8.75

[Note: Condition One = *Look-Say-Cover-Write-Say-Check.* Condition Two = *Old Way/New Way – Mediational Learning*]

Table 3
Significance of Mean Differences for Spelling Pre-Test and Post-Test by Condition Membership

	Sum of Squares	Degrees of Freedom	Mean Squares	F ratio	Sig.
Spelling Pre-test by Condition Membership					
Between Groups	243.2	1	243.2	6.90	0.015
Within Groups	810.6	23	35.2		
Total	1053.8	24			
Spelling Post-test by Condition Membership					
Between Groups	266.7	1	266.7	4.0	0.058
Within Groups	1535.3	23	66.8		
Total	1802.0	24			

Table 4

Significance of Mean Differences Within Each Condition for Spelling Pre-Test and Post-Test

	N	Diff. in Means	Diff. in St. Err.	St. Error	95% Confid. Intervals Lower	Upper	*t*	*df*	Sig.
Condition One	10	-6.50	3.408	1.078	-8.94	-4.06	-6.03	9	0.00
Condition Two	15	-6.20	4.144	1.070	-8.49	-3.91	-5.80	14	0.00

minor attitudinal scores are represented by box plots in Figure 3. At face value, the results indicate that students indicated feeling happier about the special spelling program than they did about learning to spell at school (median of "feel about learning to spell at school" is 2.0 and median of "feelings about special spelling program" is 3.25).

Figure 4 shows a plot of the results for the spelling pre-test and spelling post-test for both the Condition One students and the Condition Two students. It must be remembered that the intervention treatment was different in each group. The Condition One procedure involved *Look-Say-Cover-Write-Say-Check.* In contrast, the Condition Two procedure involved *Old Way/New Way – Mediational Learning.* Figure 4 shows that the post-test results for both Condition One and Condition Two are greater than the corresponding pre-test results. Table 5 indicates that there were significant main effects for spelling (pre-test and post-test) $F(1,23) = 84$, $p<.01$, and for condition (Condition One and Condition Two) $F(1,23) = 5.4$, $p<.05$. This is consistent with the information in Tables 3 and 4 that provided information about the specific significance of these differences. The importance of this information lies in the fact that there was a significant improvement in spelling scores

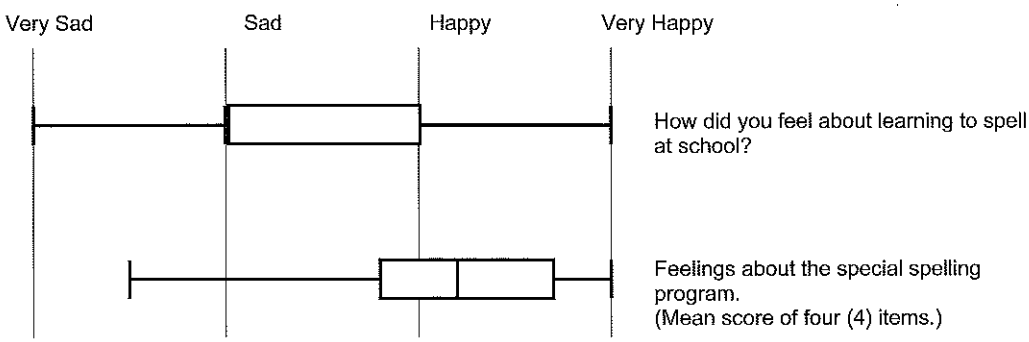


Figure 3. Box plots representing student attitudes to spelling at school and to the spelling remediation program.

for students under both conditions. However, the lack of significant interaction between the pre-test and post-test results against group membership indicates that neither intervention treatment appeared to be more effective or less effective than the other.

In order to confirm this contention, the following index was calculated for each student.

$$Index = \frac{spelling\ post\text{-}test - spelling\ pre\text{-}test}{spelling\ pre\text{-}test}$$

Table 6 shows the mean values in measures of this index against the students within the two conditions. An analysis of variance indicates that the minor difference in mean results for the measures of this index for the two conditions was not significant. Further, the effect size (d = 0.35) indicates that

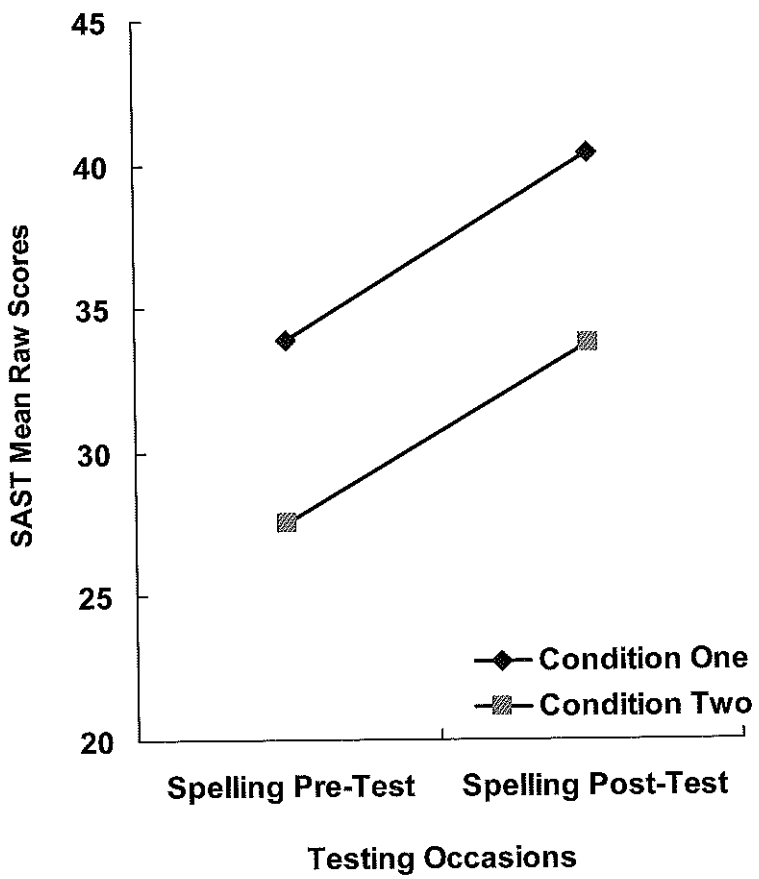


Figure 4. Mean raw scores of the experimental conditions for the South Australian Spelling Test across testing occasions.

Table 5
Results for Analysis of Variance for Condition One and Condition Two Across Testing Occasions

	Sum of Squares	*df*	Mean Square	F Ratio	Sig.
Tests Within-Participants					
Spelling Pre-Test Post-Test (Main Effects)	483.9	1	483.9	84.6	0.00
Interaction Spelling Tests * Condition Membership	0.3	1	0.3	0.04	0.85
Error	172.5	23	7.5		
Tests Between Participants					
Intercept	55135.0	1	55130.0	698.9	0.00
Condition Membership (Main Effects)	509.6	1	509.6	5.4	0.02
Error	2173.5	23	94.5		

the probability of predicting the condition membership for a particular participant from his or her index score would be virtually equivalent to tossing a coin. This suggests that, while both interventions clearly influenced student learning, neither one was more or less effective than the other.

DISCUSSION

Research has indicated a number of principles which underlie best practice in spelling intervention for children who are poor spellers. As indicated in the introduction, these principles include (a) a combination of traditional and language-based practices, (b) the use of error-detection and self-correction procedures, (c) the individualisation of instruction at the instructional level of the child, and (d) the use of a strategy training package to help the child take control of his or her own learning. The present study, which was based on these principles, provides evidence for the value of an intervention based on current theory and research in spelling development. In a relatively short time (sixteen 20-minute sessions spread over a period of four weeks) participants in both Condition One (*Look-Say-Cover-Write-Say-Check)* and Condition Two *(Old*

Table 6
Significance of Mean Differences for Measures of Index by Condition Membership

	N	M	SD	Sum Squares	Deg. of Freedom	Mean Squares	F	Sig.
Condition One	10	0.188	0.085	0.013	1	0.013	0.75	0.40
Condition Two	15	0.233	0.152	0.387	23	0.017		
Total	25	0.215	0.129	0.400	24			

Way/New Way – Mediational Learning) made significant mean improvement in their spelling scores from pre- to post-test.

When the mean raw scores were converted to spelling ages it was revealed that students in Condition One had improved their mean spelling ages by a total of 17 months, from a mean of 9 years 2 months at the pre-test to a mean of 10 years 7 months at the post-test. Students in Condition Two improved their mean spelling ages by a total of 13 months, from a mean of 7 years 10 months at the pre-test to a mean of 9 years and 1 month at the post-test. As discussed earlier, both groups showed significant improvement with effect sizes of 1.1 for Condition One and 0.8 for Condition Two.

One factor which most likely contributed to this significant improvement was the one-on-one tutoring by the pre-service teacher education students, in a situation in which they were applying knowledge of word-structure instruction gained from one of their teacher education subjects. Moreover, as indicated earlier, the first author, who was also the lecturer for that subject, was constantly available to provide support, guidance, and modelling for the tutors, as necessary. According to Spear-Swerling and Brucker (2004), initial training in the teaching of word-level skills, along with ongoing guidance are central to effective tutoring by novice teachers.

The findings, however, must be interpreted in the context of a number of limitations and considerations which would need to be addressed in any further large-scale studies designed to build on this one. First, the volunteer nature of selecting the participants caused some problems, as this made it impossible to form two instructional groups of approximately even numbers and approximately the same mean for spelling ages. As the program relied on parents to transport their children to and from the venue, the researchers had to accept that, because of home or work circumstances, some parents could only come at certain times. This meant that there were more participants in Condition Two than in Condition One. It also meant that participants in Condition Two *(Old Way/New Way – Mediational Learning)* were on average younger, and had lower pre-test scores, than did participants in Condition One. This may have had some effect on the outcome, as *Old Way/New Way – Mediational Learning* was the more intensive of the two interventions, requiring a lot more writing than did the other intervention. It was observed that some of the younger boys, in particular, found this to be rather onerous. It may be that the nature of *Old Way/New Way – Mediational Learning* is more effective for older students, and certainly anecdotal evidence from the first author would support this, as she has found *Old Way/New Way – Mediational Learning* to be very effective with individual pre-service education students who were having difficulty with spelling.

The volunteer nature of the program also meant that, to keep faith with the parents, all students who were brought along had to be accepted into the program, even though some proved not to be in need of remediation. This reduced the number of participants in each condition who could be included in the statistical analysis, hence the small number of participants must be considered when interpreting the results.

As alluded to above, in learning to spell, the actual process of handwriting itself may be another factor for future research. It was observed that virtually all of the children in the intervention program had problems with handwriting due to poor pencil grip. In fact, some of the instructional time was taken up with the tutors training the children how to hold their pencils correctly and how to form the letters neatly and accurately. Westwood (1999) suggests that kinaesthetic memory may be involved in the storage and retrieval of spelling patterns, and that spelling development may be inhibited by laboured handwriting and uncertain letter formation.

One factor to be considered in future studies is the process of selecting words to be learnt in the respective interventions. According to Baxter (2000), *Look-Say-Cover-Write-Say-Check* is an excellent way to learn new words, but *Old Way/New Way – Mediational Learning* is more suited for correcting persistent errors. Perhaps future research could look at selecting words which students persistently spell wrong in their written work as the basis for comparing the effectiveness of the two interventions.

Another limitation was that in this pilot study no attempt was made to liaise with the schools, either to discover what form of spelling instruction was being used in the respective classrooms, or to work with the teachers on transferring the skills learned in the intervention program into their written work at school. Anecdotally it was learned that at least one teacher had started using *Old Way/New Way – Mediational Learning* in her classroom, as a result of hearing about it from the parents of one of her students who was involved in the program. Future research could be aimed at collaborating with teachers in implementation of the respective programs in their own classrooms.

A further limitation was the actual timing of the intervention in after-school-hours. Anecdotal evidence suggested that a number of the boys, especially, would rather have been playing sport than learning spelling. Once again, a school-based intervention would help to alleviate this problem.

Finally, as alluded to earlier, there was no follow-up testing built into the design of this small-scale study, so there is no way of determining whether students maintained their new-found skills over time. It would be possible to build into a large-scale study opportunity for follow-up testing, maintenance, and generalisation of skills learned.

In conclusion, despite these limitations, this research has shown that an individual tutoring program involving either *Look-Say-Cover-Write-Say-Check* or *Old Way/ New Way – Mediational Learning* may have significant and powerful effects, at least in the short-term, for improving the spelling ability of children in the middle to upper grades of primary school. Further research is recommended to determine the effects in the long term. Future research could also explore some of the other issues raised, such as the relationship between handwriting and spelling, the effect of different methods of selecting the words to be learned, and strategies for incorporating the tutoring programs into a classroom setting.

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Note: Examples of the teaching and testing materials used in the training sessions are available on request from Barbara Fisher, Faculty of Education, Avondale College, PO Box 19, Cooranbong, NSW, 2265.