

**SPELD(SA) Longitudinal Study of the Effects on
Reading and Spelling of a Synthetic Phonics and
Systematic Spelling and Grammar Program**

**2010-2011
Interim Report**

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Background

In 2005, Johnston and Watson reported the outcomes of a seven-year study of the effects of synthetic phonics teaching in the first year of school on reading and spelling attainment during the primary school years.

The authors found that after the students' (males and females) first year at school they were, on average, 7 months above chronological age on tests of word reading and spelling.

At the end of the second year at school these same students were, on average, 11 months above chronological age on tests of word reading and spelling (with females nearly two months ahead of males in spelling).

South Australian study

In 2010, SPELD(SA) commenced a 13-year study to investigate what effect the systematic teaching of synthetic phonics, and a systematic spelling and grammar program had on students in the first three years of school. The main goals of the study were:

- to monitor the progress of students who were receiving synthetic phonics and systematic spelling and grammar teaching through use of the Jolly Learning (1992) framework;
- to monitor participating students through to the end of their Year 12 by measuring the development of their reading and spelling skills.
- to review the effects on these students of the teaching of synthetic phonics, and the systematic teaching of spelling and grammar.

The study is following two cohorts of students from the first year at school through to completion of Year 12.

The students in the 2010 cohort were in Reception in 2010 and the 2011 cohort were in Reception in 2011.

This report describes the progress of the 2010 cohort over the first two years of the study.

2010 Cohort

There were 257 Reception students (123 males and 134 females) aged between 4 years 6 months and 6 years 4 months (average age: 5 years 3 months). The students represented ten schools from across the three education sectors in South Australia: Public, Catholic and Independent schools.

One school had only 3 Reception students while the largest group from a single school had 71 Reception students.

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Students were given a pre-test on entry to Reception and subsequently taught through the use of Jolly Phonics and Jolly Grammar instruction during Reception and Year 1. Progress was monitored at the end of each term through curriculum-based measures and students were formally assessed at the end of 2010 and 2011 using the Waddington Reading and Spelling tests (alternate forms).

The Pre-test

The pre-test used to assess students at the beginning of this study was a school entry level test known as SPAT-SE which is a version of the Sutherland Phonological Awareness Test (SPAT) developed by Neilsen (2010). The purpose of the pre-test was two-fold:

1. To establish whether the 2010 cohort is representative of the wider population. If not, any positive results from the Waddington tests might in part be attributable to the particular student sample.
2. To provide a baseline measurement of skills known to predict achievement in literacy. This would enable the researchers to identify any relationships between students' skills at school entry and subsequent reading and spelling scores.

Results of pre-test

The frequency distribution of the scores obtained by the 2010 cohort in the SPAT-SE shows a negative skew, with a mean score of 30.5 and standard deviation of 10.8. This compared very favourably with results obtained in other studies by Neilson, R. (2012, in press) which also showed a negative skew, a mean score of 29.5 and the same standard deviation of 10.8. It can be concluded that there was nothing atypical about the particular cohort in this study. The mean scores for males and females were 30.4 and 30.6 respectively, showing virtually no gender difference.

The Program

Most teachers with students in the study had received at least two hours of training in the Jolly Phonics/Jolly Grammar programs and they were expected to closely follow the manuals.

Midway through each term a test protocol was sent to schools via electronic and hard copy. The subtests measured the skills taught (according to the manual) in that particular term.

Schools returned results to Speld by the end of week 2 of the following term except in Term 4 when results were sent in before schools finished for the year.

Test content was cumulative i.e. fundamental skills, such as knowledge of the sounds of the letters of the alphabet and how to form each letter correctly, continued to be tested until a student had achieved full marks at

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the end of two consecutive terms or to the end of Year 1. Students undertook the Waddington Reading and Spelling tests (alternate forms) at the end of each year.

Analysis of 2010 reading results at the end of Reception

A total of 257 students (123 males and 134 females) undertook the Waddington Diagnostic Reading Test at the end of 2010.

The raw score from this test was converted into a reading age using conversions provided within the Waddington Resource Kit. The Standard Error of Measurement was ± 2 months. This was then compared with students' chronological ages to determine if students were ahead or behind the average level for their age. At the end of their Reception year, the 2010 cohort was reading, on average, 13.1 months above chronological age.

The average for females was 14.2 months and for males, it was 12.0 months, demonstrating that while males made significant progress, females were significantly further ahead than males in reading at the end of their first year of school.

- 8 students (3.1%) were statistically below chronological age in reading.
- 17 students (6.6%) were statistically at chronological age in reading.
- 232 students (90.3%) were statistically above chronological age in reading.

Of those above chronological age:

- 112 (43.6% of the total) were between one and two years above chronological age.
- 25 (9.7% of the total) were between two and three years above chronological age.
- 3 (1.2% of the total) were more than three years above chronological age.

A total of 140 students (54.5% of the total) were more than one year above chronological age in reading.

Analysis of 2011 reading results at the end of Year 1

224 students (118 females and 106 males) in this study undertook the Waddington Diagnostic Reading Test at the end of 2011. This included seven students who were not included in the 2010 Waddington Diagnostic Reading Test.

Forty students had either moved school, missed the reading test or their school had dropped out of the study by the end of the second year. These forty students were, on average, 9.3 months above chronological age at the end of the first year (2010) so their non-inclusion is likely to have had minimal effect on the overall results for 2011.

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On average, reading results for 2011 were 14.8 months above chronological age. This result is higher than in 2010 and indicates the positive effect of the program in the first two years of school.

The average for females was 15.8 months and for males it was 13.8 months, again demonstrating that males benefited from the program and females were significantly further ahead of the males. The narrowing of the gap between the two groups (from 2.2 months to 2 months) is not significant.

- 13 students (10 males and 3 females, 5.8%) had results statistically below chronological age. There was a higher percentage of students at the end of their second year at school reading below their chronological age.
- 9 students (4.0%) were statistically at chronological age.
- 202 students (90.2%) were statistically above chronological age

Of those with reading skills above chronological age:

- 96 students (42.9% of the total) were between one and two years above chronological age.
- 35 students (15.6% of the total) were between two and three years above chronological age.
- 4 students (1.8% of the total) were more than three years above chronological age.

A total of 135 students (60.3% of the total) were more than one year above chronological age in reading at the end of their second formal year of school.

Analysis of Waddington spelling results at the end of Reception

A total of 257 students in this program (134 females and 123 males) undertook the Waddington Diagnostic Spelling Test at the end of 2010. The raw score from this test can be converted into a spelling age using conversions provided within the Waddington Resource Kit, with a Standard Error of Measurement of ± 3 months. This can then be compared with students' chronological ages to determine if students are ahead or behind where they might be expected to be in their development.

On average, spelling results for this cohort were 18.1 months above chronological age. This is a significant difference which indicates the positive effect of the program in the first year.

The average for females was 19.0 months and for males it was 17.0 months, demonstrating that while males benefited from the program, the females were significantly further ahead in spelling than the males.

- 2 students (both males, 0.8%) were below chronological age in spelling.
- 10 students (3.9%) were at chronological age in spelling.
- 245 students (95.3%) were above chronological age in spelling.

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Of those above chronological age:

- 125 students (48.6% of the total) were between one and two years above chronological age.
- 58 students (22.6% of the total) were between two and three years above chronological age.
- 8 students (3.1% of the total) were more than three years above chronological age.

191 students (74.3% of the total) were more than one year above chronological age in spelling at the end of their first year of school.

Analysis of Waddington spelling results at the end of Year 1

A total of 222 students in this program (118 females and 104 males) undertook the Waddington Diagnostic Spelling Test at the end of 2011. This included seven students who did not sit for the 2010 Waddington Diagnostic Spelling Test, meaning that 42 students had moved school, missed the spelling test or their school had dropped out of the study by the end of the second year. These 42 students were, on average, 13.3 months above chronological age at the end of the first year so their non-inclusion is likely to have minimal effect on the overall results for 2011.

On average, spelling results for 2011 were 17.7 months above chronological age. This is similar to the 2010 result and is again very significant, clearly demonstrating the positive effect of the program in the first two years.

The average for females was 18.3 months and for males it was 17.0 months, again demonstrating that males benefited greatly from the program, and the females were significantly further ahead of the boys in spelling at the end of the second year of formal schooling. The narrowing of the gap between the two groups (from 1.9 months to 1.3 months) is not significant.

- 6 students (4 males and 2 females, 2.7%) had results statistically below chronological age.
- 14 students (6.3%) were statistically at chronological age.
- 202 students (91%) were above chronological age in spelling at the end of the second year of formal schooling.

Of those achieving above chronological age:

- 86 students (38.7% of the total) were between one and two years above chronological age in spelling
- 52 students (23.4% of the total) were between two and three years above chronological age in spelling
- 11 students (5% of the total) were between three and four years above chronological age in spelling.
- 1 student (0.5% of the total) was over four years above chronological age in spelling.

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150 students (67.6% of the total) were more than one year above chronological age in spelling.

Subtests of the SPAT-SE pre-test as good predictors of Waddington results

The following table provides the Pearson correlation coefficients between each of the subtests and the total of the SPAT-SE pre-test and the raw Waddington scores for reading and spelling in 2010 and 2011.

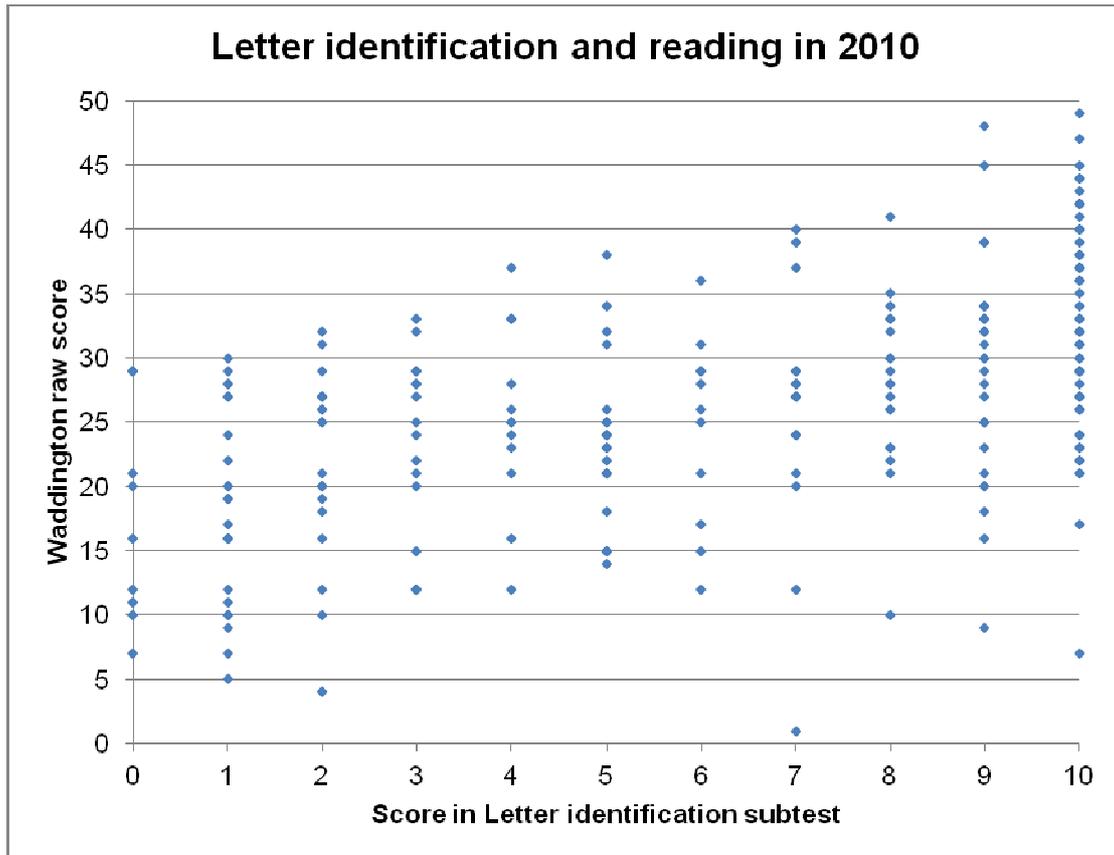
	Syllable Isolation	Rhyme Detection	First Sound Identification	Letter Identification	Name Writing	TOTAL
2010 spelling	0.30	0.33	0.47	0.53	0.43	0.55
2010 reading	0.36	0.41	0.48	0.52	0.45	0.59
2011 spelling	0.26	0.29	0.39	0.45	0.33	0.47
2011 reading	0.37	0.36	0.41	0.46	0.35	0.53

Table 1: Pearson correlation coefficients

These correlation coefficients provide a measure of the degree to which two sets of numbers are correlated. To be highly correlated (in other words, that one is a good predictor of the other), coefficients should be of the order of .85 or better.

- It can be concluded that none of the pre-test scores were useful in predicting the scores obtained in the Waddington tests at the end of Reception or Year 1.

As an example, the following graph illustrates this lack of correlation. It shows that for every starting score in the Letter Identification subtest, students have obtained a wide spread of marks in the Waddington Reading test in 2010.



Graph 1: Letter identification and reading in 2010

In many respects, this may be expected because there has been emerging evidence from the Waddington test results that the program which has been provided to these students has had a significant and positive impact.

- The pre-test scores may well be good predictors of performance at the end of Reception and Year 1 without this program, but the positive effects of the program have negated this predictive ability.

Correlation between age and Waddington results

The Pearson correlation coefficient for age as at the 2010 Waddington test and the Waddington spelling score was 0.29 and the corresponding coefficient for the Waddington reading score was 0.28. The correlation between age and Waddington results in 2010 was therefore very weak.

The corresponding Pearson coefficients in 2011 are 0.07 and 0.10, indicating virtually no correlation between age and Waddington results in 2011.

Correlation between number of terms in Reception and Waddington results

There is no correlation between the number of terms in Reception and Waddington results in either 2010 or 2011. The Pearson correlation coefficients for 2010 spelling and reading were 0.04 and 0.08 respectively and for 2011 were 0.04 and -0.01 respectively.

Conclusion

By the end of their second year of formal schooling, students in this study, aged between 6 years 5 months and 8 years 2 months (average age 7 years 1 month), had made a very strong start with the development of their reading and spelling skills. The average gain in reading (14 months above chronological age) and spelling (17.7 months above chronological age) is greater than that of the students in the Clackmannanshire study whose reading and spelling scores were 11 months above chronological age at the end of their second year at school.

Although the study is in the early stage it appears that the effects of the program may be diminishing in spelling but not in reading. While this is to be expected since the effects of training programs usually wash out (Johnston & Watson, 2005), in Scotland the effects of the program were evident in both reading and spelling for at least six years after the training was completed - the point at which the students stopped being tested. In the Clackmannanshire student sample, the reading abilities of both females and males were on a par at the end of the first year (Reception) but females were ahead of males in spelling at the end of Year 1. In South Australia, the females were ahead in reading and spelling at the end of Reception and at the end of Year 1.

Comment

This study demonstrates that the program of synthetic phonics, systematic spelling and grammar instruction used to teach these students offers the potential to develop students' reading and spelling skills during their first two years of school, regardless of the students' level of ability in skills known to predict reading and spelling achievement at school entry.

Furthermore, the analyses conducted in this study indicate no correlation between literacy achievement and age or number of terms spent in Reception. What does appear to make a difference to reading and spelling achievement is the program that the students are taught and what they learn from it.

The percentage of students with reading and spelling scores below chronological age increased over the two years. It will be important to

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provide additional instruction and practice both at school and at home to enable these students to develop automaticity in the skills taught in Reception and Year 1 so that the gap between their reading and spelling skills and the level expected for their age and grade does not get wider.

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The National Inquiry into the Teaching of Literacy (2005) states that: the incontrovertible finding from the extensive body of local and international evidence-based literacy research is that for children during the early years of schooling (and subsequently if needed), to be able to link their knowledge of spoken language to their knowledge of written language, they must first master the alphabetic code – the system of grapheme-phoneme correspondences that link written words to their pronunciations. Because these are both foundational and essential skills for the development of competence in reading, writing and spelling, they must be taught explicitly, systematically, early and well.

This interim report supports this recommendation.

The next report will describe the curriculum-based measures devised to test students at the end of each term on the sub-skills covered in the first two years of the Jolly Learning Program.