

Copyright is owned by the Author of the thesis. Permission is given for a copy to be downloaded by an individual for the purpose of research and private study only. The thesis may not be reproduced elsewhere without the permission of the Author.

How and why does phonics and comprehension skill instruction impact on spelling, reading  
and self-efficacy for struggling adolescent learners?

A case-study

A thesis presented in partial fulfilment  
of the requirements for the degree of

Masters

in

Education (Educational Psychology)

At Massey University Albany

New Zealand

Melanie Nelson

January 2017

## Abstract

The ability to read and write is important to learning; there is a reciprocal relationship between reading and cognitive development, and academic achievement. Adolescents who experience difficulties in spelling and reading have been found to display avoidance behaviour, and low self-efficacy, or over inflated self-efficacy that is incongruent to capability. This case study investigated how and why spelling, reading, comprehension and self-efficacy for four struggling adolescent spellers and readers was impacted by a phonological based and comprehension skills intervention. The intervention implemented was *Agility with Sound*. The children received eight weeks of intervention aimed at improving their spelling, word decoding and comprehension. Pre and post-intervention measures of spelling, decoding, word decoding, and comprehension were taken. Measures of pre and post-intervention self-efficacy, to investigate the influences of phonic knowledge and comprehension skill development on self-efficacy, were also taken. Infield observations and post-intervention student interviews were used to provide an in-depth investigation. There were meaningful increases in word decoding and spelling. Participants reported phonological-based instruction simplified and reduced the ambiguity of word spellings and decoding. The impact on self-efficacy was that judgements were recalibrated to more accurate judgements of capability; although the adolescent learners reported their improved skill knowledge increased their belief they could improve their spelling and reading comprehension overtime. Struggling adolescent children do benefit from explicit phonics instruction. Time constraints reduced the opportunity for the consolidation of skills which impacted on comprehension development for two students, and self-efficacy growth.

## **Acknowledgements**

I wish to acknowledge and thank my supervisors Alison Arrow, Maggie Hartnett, Vijaya Dharan and Keith Greaney for the time and effort they have put into my thesis. I have valued your expert guidance and feedback, and continuing support.

I also am extremely grateful to Betsy Sewell for allowing me to investigate my research questions through her programme.

I would also like to thank the children, parents, teachers and principal of the intervention school, for welcoming me into their school and for taking part in my research.

## Table of contents

Chapter one .....	6
Introduction .....	6
Literacy as a life skill.....	6
Literacy outcomes in New Zealand .....	6
Literacy difficulties and self-efficacy.....	8
Reading and spelling skills .....	8
The rationale .....	9
The research problem .....	9
The present study.....	10
Thesis overview.....	10
Chapter Two .....	12
Literature Review .....	12
Introduction .....	12
Self-efficacy and motivation.....	12
Self-efficacy and skill development.....	13
Theories of reading development .....	15
Word decoding .....	15
The decoding and spelling relationship.....	18
Comprehension in reading.....	19
Interventions with struggling readers .....	20
Interventions to support spelling, reading and comprehension.....	20
Reading and spelling instruction in New Zealand .....	23
Chapter summary .....	25
Research Questions .....	25
Chapter Three.....	26
Methodology .....	26
Chapter introduction .....	26
Research design .....	26
Setting.....	27
Participants .....	28
Ethical considerations and procedures .....	28
The intervention - Agility with Sound.....	30
Study procedures and timeframe.....	30
Measures to support credibility and trustworthiness of the study .....	31
Data collection methods .....	32
Self-efficacy .....	33
Decoding.....	34

Word decoding.....	35
Spelling.....	35
Reading Comprehension.....	36
Agility with Sound.....	36
Student interviews.....	37
Field notes.....	37
Data analysis procedures.....	38
Chapter summary.....	38
Chapter four.....	39
Research findings.....	39
Introduction.....	39
Individual case results.....	39
Jessie.....	39
Foz.....	46
Rodi.....	54
Thunder.....	62
Cross case analysis.....	69
Spelling findings across the cases.....	71
Decoding findings across cases.....	72
Word decoding findings across the cases.....	72
Reading comprehension findings across the cases.....	73
Self-efficacy findings across the cases.....	73
Chapter summary.....	74
Chapter five.....	75
Discussion.....	75
Chapter summary.....	79
Chapter six.....	81
Conclusion.....	81
Summary of findings.....	81
Implications and recommendations.....	83
Limitations of the research.....	84
Considerations for future research.....	85
Conclusion.....	85
References.....	87
Appendix A.....	98
Massey University Human Ethics Committee approval.....	98
Massey University Human Ethics Committee self-efficacy scale addition approval....	98
Invitation to participate letter for the principal and school board.....	98
Principal information sheet.....	98

Care-givers information sheet.....	98
Participant information sheet.....	98
Appendix B.....	107
The <i>Agility with Sound</i> intervention overview.....	107
List of typical lesson tasks.....	107
Appendix C.....	111
Self-efficacy scale.....	111
Semi-structured student interviews.....	111
Appendix D.....	114
Jessie's errors on assessments.....	114
Foz's errors on assessments.....	114
Rodi's errors on assessments.....	114
Thunder's errors on assessments.....	114
Self-efficacy graphs.....	114
Appendix E.....	123
Self-efficacy graphs.....	123

**List of Tables**

Table 4.1 Jessie's self-efficacy pre and post-intervention.....	41
Table 4.2 Jessie's pre and post-intervention assessment scores .....	42
Table 4.3 Foz's self-efficacy pre and post-intervention.....	48
Table 4.4 Foz's Pre and post-intervention assessment scores.....	49
Table 4.5 Rodi's self-efficacy pre and post-intervention .....	56
Table 4.6 Rodi's pre and post intervention assessment scores .....	57
Table 4.7 Thunder's self-efficacy pre and post-intervention.....	64
Table 4.8 Thunder's pre and post-intervention assessment scores .....	65



## Chapter one

### Introduction

#### Literacy as a life skill

The ability to read and write influences all areas of life. It is well known there is a reciprocal relationship between reading and cognitive development. Children who read well and who build good vocabularies will read more and gain access to greater knowledge, which Stanovich (1986) termed the *Matthew effect*. Thus providing children with greater opportunities for educational attainment and employment prospects (Burden, 2005; Fletcher, Parkhill, Fa'afoi, & Taleni, 2010). Children who experience early literacy failure, who read slowly and without enjoyment, will read less and as a result have slower development of vocabulary knowledge, which inhibits further growth in reading and learning, demonstrating a negative *Matthew effect* (Stanovich, 1986). Although, numerous studies have found a link between literacy difficulties and subsequent academic failure, disordered behaviour, poor mental health in children and school dropout (e.g. Morgan, Farkas, Tufis, & Sperling, 2008; Prochnow, Tunmer, & Chapman, 2013; Rodis, Garrod, & Boscardin, 2001; Sutherland, Lewis-Palmer, Stichter, & Morgan, 2008). There is often a belief that children will grow out of their early literacy problems, therefore we should just wait for them to catch up. However, they do not catch up (Clay, 1998).

#### Literacy outcomes in New Zealand

Concern has been voiced by the literacy research community in New Zealand about the high variability of outcomes between good and poor readers (Tunmer, Chapman, Greaney, Prochnow, & Arrow, 2013; Tunmer & Greaney, 2008). The Progress in

International Reading Literacy Studies (PIRLS) is an international assessment of reading comprehension, which measures trends in reading literacy achievement of middle-primary school students. In an overview of the PIRLS 2010/11, Chamberlain (2013) identified that 75% of year 5 (8-9 year olds) New Zealand students were good readers and 25% were weak readers. More alarmingly, at the lowest level 8% were not performing at even the most basic level. These children were not able to locate, retrieve or reproduce information, or make inferences from the text. Further cause for concern was highlighted in The Programme for International Student Assessment (PISA). The PISA is an international standardised study that assesses how well 15-year-old students can meet real-life opportunities and challenges. The PISA 2009 which assessed reading skills, found a large number of 15 year old New Zealand students were struggling at a basic level in their reading and spelling; 18% failed or struggled to perform at a basic reading level; these students could not locate a single item of information in simple text (Telford & May, 2010). As these studies have identified, there is reason to be concerned, and a crucial need for the provision of literacy intervention to prevent a negative *Matthew effect* for struggling adolescent spellers and readers.

The literacy curriculum in New Zealand is rooted in the whole-language model of literacy instruction (Chapman, Greaney, & Tunmer, 2015). Under this model the focus is on teaching reading for meaning, with the philosophy that phonological skills in reading and spelling will follow (Clay, 1998; Goodman & Goodman, 2007). The state supported literacy intervention, *Reading Recovery* which provides 20 weeks of intervention in year 2, has been criticised by many literacy researchers; who assert it does not meet the needs of the most vulnerable of poor readers. The criticism is that the programme does not provide sufficient phonological instruction to provide sustained reading improvements, cannot be accessed by enough struggling readers and is too expensive for many schools (Chapman, Tunmer, & Prochnow, 2001; Reynolds & Wheldall, 2007; Tunmer & Greaney, 2008). Therefore it is up to individual schools to choose which

literacy support (if any) they provide for adolescent children. A common thread I have seen in my work, has been the suggestion by many teachers that if the student would just read more, their literacy would improve. Suggesting the problem is often seen as one of motivation rather than difficulty.

### **Literacy difficulties and self-efficacy**

Longitudinal studies of reading have found that when reading becomes too difficult, children's self-efficacy and motivation for reading declines resulting in avoidance behaviour (Morgan et al., 2008; Prochnow et al., 2013; Sutherland et al., 2008). This avoidance behaviour then results in a spiral of underachievement, when low achievement due to limited proficiency becomes compounded by underachievement due to motivational problems (Wentzel & Brophy, 2014). Students are then at risk of developing more global negative self-beliefs (Rodis et al., 2001). However self-efficacy research has demonstrated the spiral of underachievement can be corrected, by providing direct and explicit reading skills instruction (Klassen, 2007; Pajares, 2006). Subsequently, students employed greater use of metacognitive strategies in their reading, and expressed increased self-efficacy for reading (Chambers Cantrell et al., 2013).

### **Reading and spelling skills**

Proficiency in reading requires the application of both lower and higher order skills. Lower order skills include word decoding and language comprehension, and are necessary to facilitate the application of the higher order skills of, inference making and comprehension monitoring; these skills promote integration of prior knowledge with text information (Nation, 2007). Research on reading difficulties has identified that struggling readers fall into one of three categories; poor at decoding, poor at comprehending, or poor at both (Frankel, Pearson, & Nair, 2011). Furthermore, studies have found that impairment in phonological awareness (an awareness of the sound structure of words)

and poor context-free word recognition ability are major causes of poor reading ability (Spear-Swerling & Sternberg, 1996; Tunmer & Greaney, 2010). Spelling research has also demonstrated that poor phonological and orthographical awareness is a major cause of spelling problems (Allcock, 2009; Moats, 2009). Conversely, research has demonstrated that explicit instruction in phonological awareness promotes spelling and reading development for struggling spellers and readers (Allcock, 2009; Gillon & Mc Neill, 2010; Tunmer et al., 2013; Tunmer & Nicholson, 2011).

### **The rationale**

I have 13 years of experience working with children experiencing literacy learning difficulties. Adolescence is a pivotal time for the formation of self-identity and agency as learners. Adolescents are better able to interpret their competencies against their peers to assess their place in their peer group (Schunk & Meece, 2006). By this time struggling spellers and readers are well aware of their lack of success in comparison to their peers. Many of the children that are referred to me have given up on their learning, or are displaying dysfunctional behaviour because they cannot spell or read. Literacy research supports the teaching of phonological awareness skills for the development of proficiency in spelling and reading. It has been the frustration of seeing the impact of literacy failure which has steered me in the direction of investigating how and why.

### ***The research problem***

Students' beliefs about their abilities to spell and read, influences their writing and reading behaviours, cognitive processes, motivation, and achievement (Chambers Cantrell et al., 2013). A substantial number of adolescent children are struggling in their spelling and reading in New Zealand, placing them at risk of academic failure and disordered behaviour (Tunmer et al., 2013). There is a demand for effective spelling and reading intervention for struggling students in New Zealand. There is a large body of

spelling and reading research which supports that phonological-based skills instruction best supports accurate spelling and fluent word decoding. After which, reading for meaning is facilitated (Chapman et al., 2001; McNeill & Kirk, 2014; Moats, 2009; Nicholson & Dymock, 2015; Tunmer et al., 2013; Tunmer & Greaney, 2008). An increased understanding about the influence of teaching phonological-based skills on the spelling and reading outcomes and self-efficacy of adolescent struggling readers, can inform instructional practices in ways that more specifically address the needs of these students.

### **The present study**

The aim of this study is to investigate how and why an intervention which is based on phonological and comprehension skills instruction influences spelling and reading outcomes for struggling year 7 and 8 students. The investigation adopted a case study research design, to provide an in-depth investigation using observations of the intervention in progress, collection of data on outcomes, and the views of the struggling students themselves. The second aim was to investigate how and why phonic and comprehension training influenced self-efficacy beliefs for spelling and reading.

The research questions that guide this investigation are:

- How and why does a phonic and comprehension skills-based literacy intervention impact spelling, word decoding and comprehension for poor spellers and readers?
- How and why does a phonic and comprehension skills-based literacy intervention impact on self-efficacy in spelling and reading?

### **Thesis overview**

*Chapter one:* introduced the purpose of the research and research questions.

*Chapter two:* reviews the literature on self-efficacy for learning, and spelling and reading self-efficacy research. There is also a review of research on reading development, the decoding and spelling relationship. Followed by, a presentation of studies of reading and spelling intervention research. The chapter concludes with a discussion of reading and spelling instruction in New Zealand, and chapter summary.

*Chapter three:* starts with a presentation of the research design. This is followed by a description of the school setting, and participant selection process. Next is a discussion of the ethical considerations. Followed by a description of the intervention programme, study procedures and timeframe, and measures to support credibility. Then is a description of the data collection methods and data analysis procedure and chapter summary.

*Chapter four:* the research findings begin with a discussion of individual cases and results. This is followed by a presentation of across cases findings, presented in response to the research questions. The chapter closes with a chapter summary.

*Chapter five:* discusses the results of this study in relation to the research questions and within the body of wider research evidence and literature.

*Chapter six:* The concluding chapter begins with a summary of the study findings; followed by a discussion of the implications and recommendations of the study. Then the limitations of the study are presented with considerations for future research. The chapter closes with the conclusions of the study.

## **Chapter Two**

### **Literature Review**

#### **Introduction**

This chapter begins with a discussion of the research on self-efficacy and its influence on motivation. Next is a discussion of the effects of spelling and reading skill development on self-efficacy. This is followed by a discussion of the research literature examining reading and spelling development and research-based interventions. The chapter ends with an overview of reading and spelling instruction in New Zealand.

#### **Self-efficacy and motivation**

Self-efficacy is a person's judgments of their capability to produce desired outcomes through their own actions (Bandura, 2006). Judgements are essentially made on perceived capacity to perform a task rather than on personality or psychological traits or characteristics. The judgements are domain, context, and task specific (Zimmerman & Cleary, 2006). Self-efficacy beliefs are important because they influence an individual's level of effort and willingness to persist until a task is completed (Pajares, 2006). Studies have demonstrated that, children who have high self-efficacy about their capability to perform a learning task are more likely to persist, manage, change and correct faulty performance more quickly than students of similar cognitive ability who were less self-efficacious. Students with higher self-efficacy also tend to be less anxious, process the learning material at a deeper level, and score well in assessments (Schunk & Meece, 2006).

### **Self-efficacy and skill development**

There are four sources of self-efficacy: mastery experience (prior performance experience); vicarious experiences (observing others succeed or fail at a task), and social persuasion (e.g. statements of capability from others) physiological states (e.g. feelings of enjoyment, anxiety, or tiredness while performing a learning task) (Schunk & Meece, 2006). Mastery experience is the most powerful source of self-efficacy (Pajares, 2006). As one's own prior performance on a task directly reveals current ability, whereas the other three sources of self-efficacy are open to misinterpretation. For example, other's efforts do not indicate one's own ability, reassuring statements will fail to work if performance does not increase, and physiological states may not be actually due to efficacy (Pajares, 2006).

High self-efficacy, for most people, has a positive influence on motivation and performance. However, there is evidence that some students with learning difficulties (LD), instead of reporting low self-efficacy, report overly-optimistic efficacy beliefs (Klassen, 2007). That is, there is a miscalibration between actual performance and efficacy beliefs. This incongruence is believed to arise from one or more of, self-protection, faulty understanding of the strategies required to perform a task, and/or personal functioning (Klassen, 2006). Klassen (2007) found in his study of spelling, reading and writing self-efficacy in adolescent students with LD that, miscalibrated self-efficacy was a result of faulty understandings of task demands. As a result of this misunderstanding, they did not have accurate references from which to base their judgements of personal functioning on. Therefore they could neither monitor their progress nor select which strategies to apply to correct performance.

Chambers et al., (2013) used a descriptive research design to investigate differences in reading self-efficacy and sources of self-efficacy for 59 struggling first year college age readers, comparing them to 41 proficient readers. Self-reported self-efficacy was lower



for the struggling readers. Respondents in both groups reported that performance in reading tasks was the most powerful source of self-efficacy information. More specifically, the proficient readers reported it was the knowledge that they possessed the skills to read well which supported their mastery judgements. In particular, it was the knowledge that they knew which strategies corrected reading problems that provided the most powerful source of self-efficacy information. This study exemplifies the important role of skill and strategy development in raising self-efficacy for struggling readers.

Shaw and Berg (2008) investigated a phonics, spelling and vocabulary intervention for five struggling adult spellers and readers aged between 22-65 years of age. The participants were taking part in an adult remedial reading programme with lessons that included phonics drills; sight word reading; spelling and repeated reading. The control group of five struggling adult spellers and readers, continued to learn spelling using rote memorizing methods. The intervention group were taught spelling using *word study*. This method consisted of sorting words into word families, and looking for patterns in words. The experimental group's pre-intervention scores for word spelling and knowledge of spelling features were lower than the control group. At post-intervention scores for both measures were higher for the experimental group. Through post-intervention interviews and measures of spelling self-efficacy, the experimental group reported an increased awareness of phonics, a greater amount and heightened sense of self-efficacy. Participants reported that it was knowledge of which skills and strategies to use in spelling that improved their spelling and self-efficacy for spelling. It gave them a greater appreciation of how the English spelling system worked. Post-intervention interviews and self-efficacy measures were not taken for the control group. This study demonstrated that critical thinking about words and parts of words promotes retention, mastery and self-efficacy for struggling spellers.

The self-efficacy research reviewed highlights the important role of self-efficacy in motivation for learning in the classroom. Accurate task awareness and monitoring of performance is the mechanism that has the most potential to promote proficiency in any given task. Therefore it is imperative that struggling spellers and readers are directly and explicitly taught the skills and strategies required to improve their proficiency (Pajares, 2006).

### **Theories of reading development**

One of the most widely accepted conceptual frameworks of reading is Gough and Tunmer's (1986) Simple View of Reading (SVR). The SVR model proposes that reading is the product of word decoding (decoding is defined as context free word recognition) and linguistic comprehension, with both of these components necessary for reading but neither is sufficient on its own (Gough & Tunmer, 1986). A reader must be able to decode the words in the text and possess sufficient levels of language comprehension to comprehend the text they are reading. Children who experience reading difficulties may be experiencing difficulties in one or both of these variables (Gough & Tunmer, 1986).

### **Word decoding**

Proficient readers are able to decode words using two different processes (Stuart, Stainthorp, & Snowling, 2008). The first is to read automatically (words for which the spelling patterns are known); or by using one of two phonologically based processes, either explicitly sounding out unknown words, or by using their knowledge of spelling-sound relationships to produce estimated phonological representations (the sound structure of spoken words). The reader then refers to their lexical memory to find words that fit the orthographic (spelling) representation and makes sense in the context of the text (Arrow & Tunmer, 2012). The development of sight word reading is crucial, as it

allows the reader to focus attention on comprehending word meaning, as their working memory systems automatically recognises the individual words (Ehri, 2007).

Theories on how sight word memory develops propose there are two types of word/memory connections. Firstly, there are grapho-semantic connections, where words are learnt by rote; with no letter-sound relations involved. The other is visuo-phonological connections, where the specific spellings of words are connected to their pronunciations in memory. Here the reader uses their knowledge of the alphabetic system to build the connection between word and meaning. Reading developmental theory proposes grapho-semantic connections explain earlier forms of sight word reading. Once readers begin to build knowledge of the alphabetic system grapho-phonemic connections take over (Ehri, 2007). As such, the development of proficiency in decoding is seen as a process which takes place over time as children's experience with written language grows (Byrne, 2007; Spear-Swerling & Sternberg, 1996).

Proficiency in reading is frequently conceptualised as developing in stages. Stage theorist, Linnea Ehri (2007), proposes this occurs in four stages. These stages are not distinct, children display individual differences, and may use techniques from other more or less developed stages as they learn to read (Ehri, 2007). The first stage is pre-alphabetic, when children read words by remembering visual or context cues, rather than the alphabetic letters. At this stage children's learning of new words is dependent on how meaningful the words are, rather than the orthographic features (Ehri, 2007). Ehri's (2007) second stage is partial-alphabetic, when children can use the sound values of some letters to form connections between spellings and pronunciations to read some words out of context, although they still lack decoding skills. They may guess words using partial phonetic cues and contextual cues, or mistake words sharing similar letters. Thus their word reading method is too inefficient to be used over the long-term (Ehri, 2007).

English is written using an alphabetic code, where letters (the code) map onto phoneme (the individual sound units of words). To become an efficient reader children must build an awareness of how the alphabetic code works (Neilson, 2009; Roberts, Christo, & Shefelbine, 2011). Phonological awareness is the ability to attend to, identify and manipulate the sounds in oral language (Al Otaiba, Kosanovich, & Torgesen, 2012). It incorporates syllable and onset-rime awareness. At the syllable level it requires an individual to recognise that words can be broken into syllables (e.g. *bas- ket*). In turn, each word or syllable can be divided further into an onset (the initial consonant or consonant cluster that precedes the vowel) and a rime unit (the vowel and following consonants). Phonemic awareness is the ability to notice and manipulate the individual phoneme (the smallest units of speech) in spoken words (Gillon, 2004). As children develop phonemic awareness, they become able to segment, blend, and substitute phoneme. The development of these skills enables the formation of connections between the graphemes (written representation of phoneme) and their pronunciation, increasing the reliability and accuracy of sight-word vocabulary (Ehri, 2007). Using phonic patterns to identify unfamiliar words enables children to begin to learn new sight words without the words being explicitly taught by someone else (Arrow & Tunmer, 2012; Share, 1995).

The third stage is the full alphabetic stage in which children know the relationship between graphemes and phonemes and use this knowledge to read new words. Once children are able to recognise larger print chunks or whole words by sight they have reached the fourth stage, consolidated alphabetic phase (Ehri, 2007). Automaticity in reading occurs when the pronunciation and meaning of words are recognised without expending effort decoding the words (Ehri, 2007, 2014).

### **The decoding and spelling relationship**

Word decoding and spelling (word recoding) are interrelated processes, both requiring orthographic and phonological knowledge (Perfetti, 2007; Shahar-Yames & Share, 2008). While spelling is related to word decoding, it is a more difficult skill. This is because it requires the speller to generate from memory all the letters that correspond to the spoken word, without the ability to refer to context to confirm meaning. It also requires both phonemic knowledge and knowledge of spelling rules (Graham & Santangelo, 2014; Moats, 2009). When spelling unknown words, skilled spellers use their phonological knowledge to segment words into their individual phoneme; they can then apply their orthographic (knowledge of correct spelling patterns) and morphological knowledge (morpheme is the smallest part of a word that has meaning (e.g. ing, er, s) to confirm the spelling (Allcock, 2005; Apel, Masterson, & Brimo, 2014; Kirk & Gillon, 2009). Spelling ability emerges in sequences of overlapping phases similar to Ehri's reading stages (Ehri, 2000). During spelling development, the connections between grapheme and phoneme improve in quality as word-learning and their spellings are linked to pronunciations in memory. The phases move from visual non-alphabetic, to partial alphabetic, full grapho-phonemic, then consolidated grapho-syllabic and grapho-morphemic (Ehri, 2014; Ouellette & Senechal, 2008).

Recent studies have recognised that spelling supports sight word reading, as it is a powerful self-teaching tool in the formation of orthographic knowledge. Spelling forces children to think about the relationship of print to spoken language, sound-letter correspondences, and spelling patterns (Apel et al., 2014; Shahar-Yames & Share, 2008). Due to the interrelatedness of spelling and word decoding, researchers have recommended that spelling and decoding instruction be integrated (Kirk & Gillon, 2009).

## Comprehension in reading

According to the SVR model, reading is the product of two capacities: the capacity to decode and the capacity to understand spoken language (Gough & Tunmer, 1986). Reading builds vocabulary; the more a person reads the more their vocabulary grows (Curtis, 2009). Low vocabulary can have a detrimental effect on comprehension as, if there are too many unknown words in a story a reader will not be able to gain meaning from context alone (Nation, 2007; Stuart et al., 2008). However, as children become more competent in reading they learn to synthesise and analyse their prior knowledge with information in text to gain understanding of the text, and build their vocabulary (Curtis, 2009).

To comprehend text a reader has to construct a situational model (Paris & Hamilton, 2009). To do this the reader must integrate meaning across words, sentences and passages with their prior knowledge using the higher order metacognitive skills of inferencing and comprehension monitoring (Duke & Carlie, 2011; Hogan, Bridges, Justice, & Cain, 2011; Kamhi, 2012; Kintsch & Rawson, 2007; Snow, 2010; Westby, 2014). Inference making and comprehension monitoring, have been proposed as central sources of comprehension development, and a cause of comprehension difficulty (Perfetti, 2007).

Comprehension is also dependent on a reader's *standard for coherence*; which is how deeply a reader reads for understanding (Perfetti, Landi, & Oakhill, 2007). Research has identified that poor comprehenders are less likely to resolve anomalies when text does not make sense (Perfetti et al., 2007; Snow, 2010). This may be because they associate reading with phonological decoding, rather than comprehension (Cain & Oakhill, 1999). Older poor-comprehenders may read like beginning readers, who skip words, guess, or fabricate interpretations of text, and are less likely to practice rereading (Paris & Hamilton, 2009). If readers do not monitor their comprehension, they will then be unable

to make inferences about the text (Perfetti, 2007; Perfetti et al., 2007). Difficulties in inferencing may also be due to a lack of relevant background knowledge, vocabulary, difficulty in accessing the relevant schema knowledge and integrating it with the text due to processing limitations, or because they are unaware that inferences are necessary (Cain & Oakhill, 1999; Kintsch & Rawson, 2007; Perfetti et al., 2007; Westby, 2014). Cain and Oakhill (1999) propose that less-skilled comprehenders comprehend poorly because they fail to know when to use relevant knowledge during reading.

### **Interventions with struggling readers**

Research indicates that a major source of difficulty for struggling readers and spellers is phonemic and grapho-phonemic awareness (Pressley, 2006). Poor spellers and readers struggle with manipulating, segmenting, and spelling phoneme-size units in words, and with decoding unfamiliar words using letter/sound correspondences (Ehri, Satlow, & Gaskins, 2009). The most effective reading interventions are those with phonics instruction that incorporates letter-sound identification with rhyming, blending and segmenting words into onset-rime, and practice in spelling the sounds in words (Al Otaiba et al., 2012). However, Juel and Roeper-Schenider (cited in Adams, 2009) found that it did not always automatically occur to children that the orthographic/phonological skills they were learning should be applied to their text reading. Therefore it is recommended that, to ensure the transfer of phonological decoding to reading, the word content of texts be matched to the phonological/orthographic conventions being taught (Adams, 2009).

### **Interventions to support spelling, reading and comprehension**

Ryder, Tunmer, and Greaney (2008) demonstrated the effectiveness of explicit instruction of phonemic awareness and phonemically based decoding skills, to improve reading skills of struggling readers. Twenty four children aged 6 to 7 years old took part.

The intervention group (n=12) received lessons of 25 minutes over 24 weeks. A matched control group (n=12) continued with their usual classroom programme. The teaching sessions for the intervention group consisted of oral phonemic awareness exercises, including rhyme identification and production, syllable counting and phoneme isolation, segmentation, blending and substitution, and letter and word “chaining” where the children made single changes to a word to make a new word ( e.g. pat, pot, not). Instruction was on explicit word identification, with emphasis on attention to the letter-sound relationships. Post-test results revealed the intervention group significantly outperformed the control group on measures of phonemic awareness, pseudo-word decoding, context-free word recognition and reading comprehension. Follow up assessment confirmed the outcomes were still maintained two years later.

In another study, Conrad (2008) compared the effects of spelling and reading of specific words on the retention of orthographic representations in memory, to examine transfer between skills. (n=42) typically developing readers with a mean age of 7 years, 7 months, participated. The children received either repeated practice spelling or repeated practice reading a list of words containing families of words with shared orthographic rime units. Following practice, word-specific transfer across skills occurred. Children were better able to spell words they had practiced reading and to read words they had practiced spelling. Additionally, they were able to transfer the orthographic learnt to other untaught words. However, Conrad (2008) found spelling appears to set up a more detailed and accurate representation of word representation than reading did; therefore recommended that spelling and word reading is co-ordinated.

Grahame and Santangelo (2014) in their meta-analysis of 53 spelling intervention studies, compared formal spelling instruction with spelling is ‘caught by reading’ approaches (spelling is not formally taught but picked up from reading). Their aim was to investigate the impact of formal spelling instruction on spelling, phonological awareness,



and reading. They found strong support for direct and systematic teaching of spelling being more effective than informal methods. There was also evidence that formal spelling instruction resulted in improved phonological awareness and improved reading skills.

Studies have demonstrated that comprehension can be improved for poor-comprehenders when they are explicitly taught to monitor their comprehension, how to search the text to make inferences and use the context to confirm word meanings (Cain & Oakhill, 1999; Perfetti et al., 2007; Pressley, 2006; Snow, 2010). Manset-Williamson and Nelson (2005) compared the effects of two strategic reading comprehension interventions for children aged between 9 to 14 years with reading difficulties. For the control group, specific comprehension strategies including prediction, summarisation, and question generation, and using prior knowledge were modelled. In the treatment condition, participants received explicit instruction in self-regulation in reading by directly teaching goal setting and self-monitoring, and in using prior knowledge to predict text activity. Participants were taught to "get the gist" and to state the main idea in their own words through examining the text for clues to identify what is important. While both groups made gains in reading comprehension, students in the treatment condition made significantly greater gains than those in the control condition. These results suggest that the more explicit the instruction in comprehension strategy and self-regulatory processing, the higher the likelihood that older children with reading difficulties will make significant gains in reading comprehension.

Research evidence demonstrates that children, who are taught to spell, learn words better than children who do not. Teaching children phonic knowledge draws children's attention to the orthographic patterns which promotes stronger stored representations for reading. Also that children often fail to spontaneously use metacognitive strategies to

support their comprehension, however when taught to use these strategies, poor comprehenders become more efficient readers.

### **Reading and spelling instruction in New Zealand**

Literacy instruction in New Zealand uses a predominately whole language approach to instruction (Greaney, 2004; Greaney & Arrow, 2009; Tunmer et al., 2013). This approach states that reading and spelling develop in the same manner as oral language. Therefore children do not need direct teaching of the phonic parts of words, as through an immersion in a print rich environment, children will instinctively work out the letter-sound rules; with explicit instruction in specific sounds, words, sentences, or correctness of form seen as detrimental to comprehension (Clay, 1998; Goodman & Goodman, 2007; Smith & Elley, 1997). Students are instead encouraged to use multiple cues or the searchlights model of reading to identify unknown words (Pressley, 2006; Tunmer & Greaney, 2010).

The searchlights, or multiple cues model asserts that fluent readers use the multiple sources of prior knowledge, sentence context, syntax cues and book illustrations, before they use the word-level skills of phonological awareness to identify unknown words (Clay, 1991; Greaney, 2011; Stuart et al., 2008). While readers do need to use the skills described in the searchlights model to become skilled in comprehension, the model does not acknowledge that word recognition is a prerequisite for text comprehension (Greaney, 2011). To understand the text, a reader must first decipher the words on the page (Stuart et al., 2008).

Instruction in multiple cues use fails to ensure that children with low levels of literacy skills at school entry gain the necessary knowledge of letter-sound relationships and how words work, leaving them to rely on ineffective word identification strategies.

Beginning readers are misled into thinking that predicting a word is an educated guess, and using multiple cues is better than deciphering the words by either accessing sight word vocabulary or by applying phonic rules (Greaney, 2003; Stuart et al., 2008). To teach children to read via the searchlight method is teaching children to read as poor readers do, as good readers do not need to rely on context to decode words (Greaney & Arrow, 2012; Pressley, 2006; Tunmer et al., 2013; Tunmer & Greaney, 2008).

A recent study found that most teachers in New Zealand do not teach spelling phonetically (McNeill & Kirk, 2014). The whole language approach advocates that spelling is acquired as a by-product of reading, learnt from errors and from visual recognition of spelling (Brann & Hattie, 1995). As a result the teaching of strategies is based on rote learning of morphologically and orthographically unrelated words, because teachers erroneously believe that “English spelling conventions are based on a chaotic and irregular orthography which makes spelling instruction pointless” (Greaney & Arrow, 2009, p. 31). There is no spelling curriculum in New Zealand, but memorisation of weekly spelling lists is common, with lists often related to a topic being studied within the classroom (Kirk & Gillon, 2009). It requires far more than just rote visual memory to be a competent speller. Good spelling requires knowledge of language structures at multiple levels, including phonological awareness, morpheme awareness, awareness of orthographic patterns, and spelling rules (Moats, 2009). Anyone who knows the alphabetic code need not rely on rote memory to spell or recognise written words (Shankweiler & Fowler, 2004).

## **Chapter summary**

Self-efficacy research has identified the important role of self-efficacy in influencing student's motivation and self-regulation towards completing learning tasks. Skill development is the most effective method of increasing task self-efficacy. The tasks of spelling and reading require correct orthographic and phonological knowledge of words, to promote accurate spelling and efficient word decoding. Efficient, fluent word decoding triggers word comprehension, which facilitates comprehension in reading. Intervention research has identified that instruction which explicitly teaches orthographic, phonological, and morphological knowledge and how to apply it to spelling and reading, leads to improvements in spelling and word reading proficiency. Intervention research also demonstrates that poor comprehenders also require, and respond to, explicit instruction in comprehension monitoring and repair, along with inferencing skills.

There are still questions about the type of intervention that works best for pre-adolescent children who have had years of multiple-cue instruction. The literature reviewed has indicated that spelling and reading instruction that explicitly teaches phonological and orthographic awareness most helps struggling spellers and readers. My research questions attempt to examine that gap in the literature review.

## **Research Questions**

- How and why does a phonics and comprehension skills-based literacy intervention impact on spelling, word decoding and comprehension for poor spellers and readers?
  
- How and why does a phonics and comprehension skills-based literacy intervention impact on self-efficacy in spelling and reading?

## **Chapter Three**

### **Methodology**

#### **Chapter introduction**

This chapter outlines the methodological approach used to guide the research. It begins with the reasoning for choosing a qualitative multiple case research design. This is followed by a description of the setting and participants, the ethical considerations and the measures taken to address them. Next is a presentation of the intervention, the procedure and timeframe for the implementation of the intervention. Then the measures taken to support the credibility and trustworthiness of the study are discussed, along with a description of the data collection methods. The chapter concludes with a summary of the data analysis method employed.

#### **Research design**

The aim of this study was to investigate how and why a skills-based intervention impacts on spelling, reading and self-efficacy. This required an in-depth and holistic investigation of the children's outcomes, their perspectives of their intervention experience, and perceptions of their abilities (Bong, 2006). A multiple case study research design was chosen for this purpose. Case study research is a qualitative research methodology which allows for the investigation of a phenomenon in depth using multiple sources of evidence, set in a real-world context (Yin, 2014). This method provides a rich vivid description of the events within the case, and blends the description of these events with an analysis of them (Cohen, Manion, & Morrison, 2011). This enables a researcher to answer descriptive questions such as what happened; and explanatory questions such as how, or why, it happened (Gay, Mills, & Airasian, 2006). From this type of analysis it is possible to then gain an understanding of how the intervention had a particular effect (Gay et al., 2006).

As a research method it has an extensive history in literacy research (Barone, 2011).

A critical characteristic of case study research is that it is a study of a bounded system usually by time, place, or some activity. This boundedness is important because it defines what is included and excluded in the study (Yin, 2014). The boundaries in this study were around the four struggling year 7 and 8 adolescent spellers and readers, who took part in the eight week *Agility with Sound* literacy intervention. A multiple case study design was chosen as this method is used when a researcher is looking for an insight into an issue or experience, and when the phenomenon is considered to not be distinctive to a single person. The studying of multiple cases can provide a better understanding of the phenomenon under investigation, as well as aiding transferability of the findings (Barone, 2011; Stake, 2005).

### **Setting**

The study was undertaken in a New Zealand full primary school (Years 1- 8) in suburban Auckland, New Zealand. In New Zealand most children start school as close as possible to their 5<sup>th</sup> birthday.

The school's literacy curriculum has incorporated instruction in phonics for all year levels, for the past five years. Reading is also based on integrated themes each year. The school does not have their own library, although some classes visit the local library fortnightly, additionally a mobile library visits the school fortnightly. The school also subscribes to the *Duffy Books in Homes* programme that is a charitable trust which provides free books to children, three times a year.

## Participants

A purposeful sampling method was used to ensure 'information-rich' cases were studied (Barone, 2011). Under this method the participants are chosen because they have been identified as possessing the characteristics under investigation (Cohen et al., 2011). The school nominated 14 potential participants who met the criteria of: students in years 7 and 8 who were two years below their chronological age in spelling and reading and who had no significant behavioural difficulties, and were not on the ESOL<sup>1</sup> register of the school. A minimum of four participants is suggested for multiple case study research, and this was considered a manageable number for the sole researcher to teach and study (Creswell, 2013). The research required participants to attend the intervention lessons for five days a week over eight weeks. From the 14 prospective participants, four students were identified who demonstrated sufficient school attendance, and were expected to attend the school for the duration of the study, and for whom caregivers were anticipated to be supportive towards completing homework. To ensure there would be the required four participants for the duration of the study the criteria was reviewed and adjusted to also include two students who were at age in spelling while below age in reading. One female and male in year 7 and two males in year 8 were selected.

## Ethical considerations and procedures

Planning and implementation of the research intervention were guided by the Massey University: *Code of Ethical Conduct for Research, Teaching and Evaluations involving Human Participants (2015)*. Ethics approval was gained from the Massey University ethics committee prior to commencement of the research. Informed consent to undertake the study was obtained first from the school principal, caregivers, and then the children who participated (see Appendixes A). Participation in the study was voluntary, which was clearly stated to all parties. As

---

<sup>1</sup>ESOL - English for speaks of other Languages

such, participants were advised they could pull out of the study at any time if they wished; they could also decline to answer any questions, or to take part in any activities, or lessons they did not wish to do.

The researcher liaised with the participants' teachers while planning the lesson timetables to minimise disruption to the participants' classroom learning. Extra time was scheduled into the intervention plan to ensure participants did not miss-out on any important classroom activities or special events. The researcher was mindful that the students selected were at risk of negative self-perceptions, due to their identified low performance in class. Therefore, care was taken not to draw attention to their participation in the study. At least two of the children did not want to take part if there were other students present, nor did they want others to know they were being provided with assistance. Thus the programme was implemented with gaps of 15 to 20 minutes between individual lessons, and monitoring of student affect was conducted at each teaching session, to ensure student well-being. Achievements and discoveries about language were also discussed and praised at each session. To protect their privacy, pseudonyms have been used in all reporting.

As the researcher is a tutor of a literacy intervention designed for individuals with dyslexia, there was a risk of a conflict of interest. To address this conflict, there was open and honest discussion with the *Agility with Sound* programme developer, and the University ethics committee to address all concerns. Only schools from outside the geographical area from which the researcher drew her fee paying students were approached.



### **The intervention - Agility with Sound**

*Agility with Sound* is a systematic, research-based literacy programme developed in New Zealand, by Betsy Sewell (see Appendix B). The focus was on teaching phonemic, phonological, orthographic knowledge, spelling rules and comprehension strategies to the children. Common sounds and patterns found in English, rather than high frequency words were taught. Starting levels and individual phonological, orthographic knowledge taught were determined from the pre-intervention assessments for each child. Each child progressed through the levels at their own pace. Comprehension strategies taught were how to monitor for understanding, by confirming semantic meaning of unknown words and using context to confirm word meaning; using text content and prior knowledge to make inferences. Skills were taught through modelling, discussion, questioning and practice using the programme's books. A maximum of five books were read by the children. Books selected contained words just learnt.

### **Study procedures and timeframe**

The study was conducted over a 10 to 11 week period during Terms 1 and 2 of the 2016 school year. The pre-intervention assessments occurred during the final week of Term 1. Pre-intervention assessments of self-efficacy, spelling, decoding, word decoding, and reading comprehension were done to determine baseline levels of capabilities and perceptions of competence. The *Agility with Sound* assessment was also administered to determine the starting level for each participant. The intervention phase commenced in week 1 of Term 2, and was implemented for 8 weeks, with additional time made available in week 9 of Term 2, to cover for absences due to sickness or important classroom activities. The intervention phase consisted of approximately 40 sessions consisting of 24 teaching sessions and 16 fluency practice sessions for each participant. Totalling 14 hours and 40 minutes, however, due to illness some sessions were missed.

Post-intervention assessments of self-efficacy, spelling, decoding, word decoding and reading comprehension occurred in either weeks 9 or 10 of Term 2.

The assessments and intervention were administered individually in a withdrawal room in the student's school to avoid disruption to classroom teaching, to protect participant privacy, and to maximise effect (Fuchs & Fuchs, 2006; Walpole, McKenna, & Philippakos, 2011). The researcher was solely responsible for administering the intervention and pre and post intervention assessments, except for the measurement of reading comprehension age, which was done by school staff. During the intervention phase each participant received three 30 minute individualised lessons a week with the researcher, and a 10 minute session for each of the two remaining days of the week for practice and fluency building (see Appendix B). The focus of the intervention activities and programme level were determined individually.

### **Measures to support credibility and trustworthiness of the study**

A strength of qualitative research is the use of multiple sources of evidence, or triangulation of data; this provides a more holistic view of outcomes, and is essential where complex phenomena are being investigated (Cohen et al., 2011). The collection of both multiple quantitative and qualitative data was done to provide stronger validity to the research findings (Barone, 2011). The educational assessments used meet construct validity. The use of the same assessments for pre and post-assessment could risk the internal validity through prior-testing experience however the 12 to 13 week gap between assessments was expected to be long enough to avoid this threat.

Credibility is strengthened by spending enough time in the field to gain enough evidence to provide collaborative support and to investigate opposing explanations

(Yin, 2014). After discussion with the *Agility with Sound* programme developer it was decided that eight weeks of the intervention should be of sufficient length to produce evidence of change in the participants spelling and reading ability. Descriptive validity was accounted for through the keeping of detailed field notes for each individual lesson, describing the activities, interactions and difficulties or progress each student made during a particular session. It was from these notes that the subsequent individual lesson plans were developed. An important feature of any study is that the researcher must make all attempts to control for bias. This was particularly so in this study, with the author undertaking both teacher and researcher roles (Creswell, 2013). Bias was managed through discussion with supervisors, by the triangulation of data collection methods; working to build rapport with the participants to encourage honest and open discussion; the daily taking of carefully detailed reflective field notes, and careful self-reflection throughout the study. Incorporated into the semi-structured interviews were questions to evaluate the social validity of the intervention (see Appendix C). Interpretive validity was controlled for through, returning of draft copies of the interview transcripts for verification by the individual participants. This was to ensure the researchers interpretations were accurate reflections of the participants' meaning and experience (Creswell, 2013).

### **Data collection methods**

The tests selected are widely used achievement tests which are regarded as highly valid and reliable measures of self-efficacy, spelling, decoding, word decoding and reading comprehension. The validity and reliability are important to ensure judgments made from the test scores are accurate. Validity is the extent to which the scores from an instrument can be used to make interpretations about the construct being measured. Reliability is the degree of consistency with which it measures the construct (Ary,

Chester Jacobs, Sorensen, & Walker, 2014). To reduce the possibility that test performance or test anxiety influenced participant's self-efficacy responses, the assessments began with the self-efficacy scale.

### **Self-efficacy.**

Items were drawn from two self-efficacy scales which have been developed and tested in previous studies (see Appendix C). These were the *Self-efficacy for spelling scale* developed by Rankin, Bruning and Timme (1994); and the *Reading skills self-efficacy scale* developed by Piercey (2013).

The *Self-efficacy for spelling scale* (1994) has been tested with children in grades 4, 7 and 10. Internal consistency reliability was reported at .77 for all grade levels; and a reliability of .79 for grade 7. All eight items on the scale were used for this study (Rankin et al., 1994).

*The reading self-efficacy scale* (2013). Eleven items were taken from the self-efficacy for general reading and academic reading sections. Four items from these two sections were not used. Internal consistency reliability for the general reading self-efficacy items was reported at .82, while self-efficacy for academic reading items was reported at .91 (Piercey, 2013).

The adapted scale took approximately 5 minutes to complete. Respondents were asked to rate their level of confidence in their ability to complete a variety of spelling and reading tasks on a 5-point Likert scale ranging from 1 = *I'm sure I can't* to 5 = *I'm sure I can*.

### **Decoding.**

The Pseudoword naming task (PNT) (Richardson & Di Benedetto, 1985) is a test used to measure phonological decoding ability. This tool enables an examination of the child's attempts to decode unknown words while removing the confounding effect of sight words and context cues. Thirty monosyllabic pseudowords are presented as a game in which the student is asked to try to read a list of "funny sounding names." Scoring is based on the number of correct pronunciations, with each correctly sounded phoneme in an attempted reading given a point, with a maximum of 101 points. The test takes approximately 5 minutes to administer. The use of non-words draws heavily on phonological strategies to identify grapheme-phoneme patterns (Neilson, 2009). Internal reliability measures were found to be in the .95-.99 range, and test-retest reliability scores were in the .97-.99 range (<http://www.sedl.org/reading/rad/database.html>); Mental Measure Yearbook 2014, (Retrieved November 27, 2015).

The Consonant Blends and Digraphs Test (CB&DT) developed by Greaney (2001, unpublished) is both a test of phonological decoding and recoding. The student is instructed to "read these word 'bits' that are at the beginning of words." There are a total of 36 blends and digraphs. The consonant blends have to be read with regular fluency without being drawn-out and the digraphs read as a single phonemic unit. In the spelling section the student is instructed to listen carefully for the 'bits' of the words that are missing, which are the same 36 blends and digraphs in the reading section. For example, "spell the 'gl' bit to make glass." Scoring is 1 point for each correctly read and spelt item, with a maximum score of 36 for each assessment. The test takes approximately 5 minutes to administer.

**Word decoding.**

The Burt Word Reading Test (New Zealand Revision) (BURT) (Gilmore, Croft, & Reid, 1981) has been revised and standardised for use in New Zealand, the test assesses word recognition and decoding skills of children aged between 6 and 13 years of age; The test consists of 110 words graded in approximate order of difficulty, and takes approximately 5 to 10 minutes to administer. The student is asked to look at each word carefully and read it aloud. Testing continues until 10 successive words are read incorrectly or not attempted. Scoring is on the number of words read correctly and the raw score is used to give an equivalent age band. The age band used for this study is the age norms for boys and girls. Reliability on test/retest is reported as ranging from .95, to .99. The reliability coefficient for internal consistency was found to be .96 and .97 (Gilmore et al., 1981).

**Spelling.**

The *South Australian Spelling Test* (SAST) (Westwood & Australian Council for Educational Research., 2005) is an Australian standardised test used to assess spelling achievement for students between 6 and 16 years of age (Bissaker & Westwood, 2006). The test consists of 70 words, which increase in difficulty. The test is untimed and takes approximately 15 minutes to administer. The test is administered orally; with each word said individually then said in the provided sentence, the student is required to write their spelling attempts. The test is stopped once the student fails to spell 10 consecutive words correctly. The maximum score is 70. Scores are then calculated to give a spelling age. Test-retest reliability of the SAST is .96 at most year levels (Westwood & Australian Council for Educational Research., 2005).

### **Reading Comprehension.**

Pre and post-intervention reading comprehension was measured using the Prose Reading Observation, Behaviour and Evaluation (PROBE 2) test (Parkin & Parkin, 2011), which was administered by school staff. PROBE 2 assesses reading accuracy, reading behaviour and reading comprehension. It was developed in New Zealand for use with children aged from 5 and 15 years old, and is widely used by schools. There are 20 levels, starting at 5.0-6.0 years of age with the levels going up in 6 month increments. Readers are tested on both fiction and non-fiction texts at each age level; they must score 70% to be recorded as achieving at the age level. The texts use standard international English with no pictures and minimal title clues. The comprehension abilities assessed are literal comprehension, reorganisation, inference, evaluation, reaction, and vocabulary. The children first read the text silently, then aloud, with the option of reading again silently (which was not taken up by the children). The text and questions are on the sheet the children read from, the questions are given verbally but the children are also encouraged to read the questions themselves. The test takes 10 to 15 minutes to administer. No statistical measures of validity or reliability are provided by the programme developers. The manual suggests good face validity, and content validity (Parkin & Parkin, 2011). The Ministry of Education's assessment tool selector states there is some data to support validity and no reliability data available (Ministry of Education, 2015b).

### **Agility with Sound.**

The *Agility with Sound* programme (Sewell, 2015) provided measurement tools to ascertain which level to start individual participants on and to identify where the focus of intervention activities should be, assessment included phonological awareness, pseudoword decoding, spelling, word reading speed. These tests were administered at the same time as the pre assessments to identify where the

participants were experiencing difficulties. This testing took approximately 30 minutes to complete.

### **Student interviews.**

A semi-structured student interview was conducted at the end of the post-intervention assessments to determine the participant's perceptions of the intervention, and its effect on their spelling, reading and self-efficacy. Interviews can provide rich insights that are not accessible through observation or statistical assessment. Using a semi-structured interview method ensured the questions the researcher was interested in having answered were covered, while also allowing participants the freedom to discuss what they felt was relevant to their experience (Ary et al., 2014). The participants were reminded at the end of the intervention they would be interviewed about their perceptions of the intervention, and were asked to think about what they would like to say. In many cultures it is considered highly disrespectful for a child to answer a question from an adult and most individuals regardless of culture are uncomfortable verbalising negative assessments of others' actions (Magee, 2011). To reduce the children's discomfort and to seek honest responses about their intervention experience, it was made clear their views were extremely valuable, and a constructive part of the evaluation of the programme and its delivery. A short list of question prompts was used to guide the interview (see Appendix C). Interviews were audio-recorded to enable the focus of the researcher to be on listening (Sattler & Hodge, 2006); the interviews were transcribed and returned to the participants for review, to ensure accuracy of the participants' experience and views.

### **Field notes.**

Field notes of each individual participant's lessons were made during and immediately after each lesson, and preceding the next participant's lesson. This



was done to avoid any data being forgotten, or confused between participants. Field notes for each participant were kept separately, dated and time stamped. The day's lesson was documented in each case along with a record of the interactions between the researcher and the participant, and any significant behaviour and outcomes observed.

### **Data analysis procedures**

Quantitative data was scored and tabled to compare changes between pre and post-intervention in spelling, decoding and comprehension results. Qualitative data analysis commenced at the beginning of the intervention, with a reflective approach to data analysis taken. A reflective approach was taken to guide interactions and to identify significant features in the learning process. After completion of the intervention transcripts of interviews and field notes of the individual cases were then analysed and coded for categories and themes. This enabled the identification of common themes across cases.

### **Chapter summary**

Using a multiple case study design enabled an in-depth investigation of the research questions. The boundaries of this study were four struggling year 7 and 8 students in a decile 2 full primary school in New Zealand, who took part in the eight week *Agility with Sound* intervention. Ethical, credibility and trustworthiness measures were carefully considered and applied in the planning, intervention application and data collection for this study. This ensured the findings were based on credible and reflective data collection.

## **Chapter four**

### **Research findings**

#### **Introduction**

The research findings begin with a discussion of individual cases. The discussion of individual cases begins with a description of the participant, the pre-assessment findings, and then a discussion of key themes found. This is followed by a discussion of across-cases findings, presented in response to the research questions. The chapter closes with a chapter summary.

#### **Individual case results**

##### **Jessie.**

Jessie was the only female participant in the intervention. She was in year 7 and aged 12 years, 1 month at the time of pre-assessment and 12 years, 4 months at post-assessment. Jessie's home language is Samoan; she was 7 years 7 months old when she immigrated to New Zealand. She started at school in the same year of immigration, at a year 2 level. She spoke only a little English when she started. In years 4 and 5 she was placed in the English for speakers of other languages (ESOL) language group. In years 5 and 6 she worked with a group of eight struggling spellers and readers to build word skills, and on the development of comprehension skills. When Jessie was nominated to participate in the study, her spelling level was at her age; but school records suggested her reading level was five years below chronological age. During this study she received a total of 13 hours of lessons and practice, over 35 sessions.

### **Pre-intervention assessments.**

At the pre-intervention assessment Jessie reported a high self-efficacy with a median score of 5-(*I can*) for her spelling and reading ability. She reported feeling more efficacious for spelling than for reading (see Table 4.1). She stated she does well in her spelling tests, and enjoys reading, but only re-reads the few Duffy books she has at home. "I'm a good reader, but my mum doesn't think so" (Jessie-pre-assessment-April2016). Her self-efficacy beliefs for spelling were consistent with her pre-assessment spelling results; she scored above age, at 12 years, 4 months to 14 years 4 months on the SAST (see Table 4.2). On the CBDT she read 31/36 sounds correctly, on the PNT 25/30 words and 96/101 phoneme correctly (See Appendix D). Likewise her self-efficacy for sounding words out was consistent with her reading on the BURT reading test; she scored above the ceiling level, of 12.03 to 12.09 age range; her extrapolated age range was between 14.07 to 15.01 years. Jessie's self-efficacy for the remaining reading comprehension skills was not reflected in her PROBE 2 scores; she scored below the 8.06 to 9.06 age range, approximately three to four years below her chronological age. The differences in ability and perceived self-efficacy for reading can be explained by Jessie previously associating good reading with good word decoding; at the interview she stated "I tried to read the words, I didn't think about the story" (Jessie-interview-July2016).

### **Phonic knowledge.**

At pre-assessment Jessie displayed vowel and some consonant confusion in reading, and spelling (See Appendix D). *Jessie corrected the confusions e/i, a/u, f/th, v/th*, (field-note-week1-session2-May2016), and continued to use them correctly during the intervention. During sessions *Jessie demonstrated efficient ability in breaking words into sound patterns for example, a-ttr-act-ive* (field-note-week2-session8-May2016).

Table 4.1

*Jessie's self-efficacy pre and post-intervention*

<b>Spelling</b>	<b>Pre-intervention</b>	<b>Post-intervention</b>
I can correctly spell the words in a letter to my teacher	5	5
I can correctly spell the words on a spelling list for my year level	5	5
I can correctly spell words that are not spelt the way they sound	4	4
I can correctly spell the words needed to write a report about my school	4	5
I can correctly spell the beginning (prefixes) and endings (suffixes) to words	5	5
I can correctly spell the words on a grocery list	5	5
I can spell words well enough to find them in the dictionary	4	5
I can correctly add -s, es, or ies to words to make them plural	5	5
<b>Reading</b>		
I am a good reader	4	4
I can learn to be a good reader	5	5
I can remember information I read in my school books	4	4
I can participate in reading in class	5	5
I can check to see if I understand what I am reading	5	5
I can sound out words when I read	5	5
I can understand all the words on a page in my school books	4	4
I can break big words into smaller parts (prefixes and suffixes)	5	5
I can understand the main idea in a story	4	4
I can figure out the meaning of hard words in a sentence	4	4
I can find important information in a passage	5	5

Table 4.2

*Jessie's pre and post-intervention assessment scores*

	Pre Intervention		Post Intervention	
	Raw score	Age level Years/months	Raw score	Age level Years/months
Spelling – SAST	49/70	12.04-14.05	52/70	14.02-15.06
CB&DT - Spelling	35/36	-	35/36	-
Decoding - CB&DT - Reading	31/36	-	30/36	-
Decoding - PNT - words correct	25/30	-	28/30	-
Decoding - PNT - phoneme correct	96/101	-	99/101	-
Word recognition - Burt	95/110	12.03-12.09 <sup>a</sup>	100/110*	12.03-12.09 <sup>a</sup>
Burt extrapolated age range		14.07-15.01		15.05-15.11
Reading comprehension Probe2 - Fiction	60% <sup>b</sup>	8.06-9.06	50% <sup>b</sup>	8.06 - 9.06
Reading comprehension Probe2 - Non Fiction	40% <sup>b</sup>	8.06-9.06	40% <sup>b</sup>	8.06-9.06

<sup>a</sup> ceiling age range for the BURT= 80 raw points.

<sup>b</sup> below 70% indicates reading age is below the tested age.

Although Jessie was able to sound out words to spell and read, she indicated she was not aware that words are made up of analogous orthographic patterns. The consequences of this could be seen in her explanation of how she learnt her spelling words and the uncertainty she expressed in word recognition. She stated that instead of looking for sound patterns when spelling, she memorised the letter order, until she got it right. "I just write them over and over until I get them correct" (Jessie-pre-assessment-April2016). She also was not sure if she had read words correctly.

Jessie: I always tried to sound the words, if I don't recognise it, I asked someone to say it.

Interviewer: To confirm you said it right?

Jessie: Yes.

(Jessie-interview-July2016).

Becoming aware that words contain patterns simplified the spelling and word recognition process for Jessie. “Breaking words into parts helped me to see [the] parts in words. It tells me how to say the words...The parts tell you how to spell the words” (Jessie-interview-July2016).

It also enabled her to become independent in her word recognition, and she was able to use her knowledge of grapheme/sound relationships to manipulate the sounds to apply to other words. *Jessie used her orthographic knowledge to spell the previously unknown word, ‘g-ang-st-er* (field-note-week3-session12-May2016).

I could remember the parts, so I could use them later; [she pointed to two examples on a fluency sheet] like: bungle/bungalow; Tonga/billabong. I don’t need to ask others how to say the words, I can break the word up and do it in my mind (Jessie- interview-July-2016).

### **Spelling rules.**

Not all words are spelt as they sound; therefore knowledge of spelling rules enables a writer to spell these words correctly. While *Jessie’s phonic knowledge was good, she displayed weaknesses in her knowledge of spelling rules* (field-note-week 2-session6-May 2016). Jessie was able to use new spelling rules within one to two lessons, and used this knowledge to correctly spell unknown words, *Jessie was able to apply silent ‘e’ rule for the word ‘extreme’ (an unknown word)* (field-note-week6-session26-June2016). Being aware of the rules simplified spelling for her. “The rules are good they tell you how to say and spell words like ‘mad/made’, and how to use suffixes” (Jessie-interview-July2016).

Becoming more aware of the spelling conventions improved Jessie's spelling and word reading. Jessie's spelling age increased by one to two years, up to the 14.02 to 15.06 age range on the SAST at post-assessment. While she still made some of the same errors from pre-assessment, many displayed a closer phonetical spelling (see Appendix D). Her raw score on the BURT word reading test increased by 5 points, taking her extrapolated word reading age range to 15.05-15.11, an increase of 10 months (see Table 4.2). Small increases occurred in decoding of words and phoneme on the PNT, which were already high at pre-assessment. Decoding on the CB&DT stayed at pre-assessment levels.

Although Jessie's spelling and decoding self-efficacy at pre-intervention were high in the 4-*(mostly can)* and to 5-*(I can)*, at post-intervention Jessie reported "I know my spelling had improved, I'm scoring 100% in [classroom] spelling tests, I didn't do that before" (Jessie-interview-July2016). At post-intervention Jessie's spelling self-efficacy responses increased from 63% scored as 5-*(I can)* at pre-assessment, to 88% at 5-*(I can)*, the remaining 22% stayed at 4-*(mostly can)*. Her self-efficacy for reading did not change.

### **Reading comprehension.**

Although Jessie responded with high self-efficacy for reading, her lowest self-efficacy responses were for remembering and understanding information in reading (see table 4.1). Her difficulty in understanding text was not surprising, as Jessie confirmed during the interview she did not use comprehension strategies, or monitor her reading comprehension "I didn't think about what the words meant...I didn't try to make a picture in my head of the story" (Jessie-interview-July-2016). Furthermore it was apparent within the first week of the intervention that Jessie displayed weaknesses in her vocabulary. *When using sliders, [which make both real and nonsense words], she was unable to identify if these were real words or not, (e.g. jutting, jabbed) or to explain word meanings*

(field-note-week1-session4-May2016). Many words have more than one meaning; Jessie said she usually looked word meanings up, but did not use story context to confirm she was using the correct meaning “I didn’t use to look around the word to check I had the right meaning” (Jessie-interview-July-2016).

As Jessie became familiar with using the comprehension skills, she demonstrated an improvement in her understanding of the text. She was beginning to use story context to determine and confirm word meanings, *Jessie was able to determine the meaning of mishaps - “there was lots of accidents” by referring to the context* (field-note-week5-session23-June-2016), However her vocabulary continued to be weak, for example she *did not know the meanings of whizzing, din, racket* (field-note-week8-session35-June2016). In the last book read, *Jessie was able to identify the main character of the story, which could only be identified by evaluating and reorganising information in the text to make inferences, as the main character was not directly named as a paddle crab* (field-note-week8-sessions 35&36-June2016).

Jessie’s post-intervention score on PROBE 2 did not change from an age range of 8.06 to 9.06, nor did she change her self-efficacy responses. At post-intervention she reported that using the comprehension strategies had improved her understanding and enjoyment in reading.

I know I have got better because I can understand better now. I thought [at pre-assessment] I was good at reading, but I know I can get better, by looking words up, re-reading and thinking about what the words say. Which is what I am doing, [I] am looking words up. I look at the words around it to check meaning, and I think of the picture [build a mental image of the text]. [It] make[s] reading more enjoyable. [I] understand [the text] better when I do that (Jessie-interview-July-2016).



## **Foz.**

Foz was in year 7, aged 12 years old at the time of pre-assessment and 12 years 3 months at post-assessment. He has been at the school since he turned 5 years old. His home language is English. Foz missed a number of lessons due to poor health, and completed fewer sessions than the other participants, completing 11 hours of lessons over 30 sessions.

## **Pre-intervention.**

Foz had to be asked to speak louder a number of times during the pre-assessment as he was very quietly spoken. Before we began he told me he thought he was a good speller, and enjoyed reading (Foz-pre-assessment-April2016). His scores on the SAST, where he scored one to two years below his chronological age, in the 10.02 to 11.02 age range, did not confirm this statement (see Table 4.4). Nor was it reflected in his spelling self-efficacy responses (see Table 4.3). His median response score for spelling was 3- (*sometimes can*), which accounted for 63% of responses. While he reported 5- (*I can*) for *spelling words not spelt the way they sound*, his SAST errors did not corroborate this self-efficacy response (see Appendix D).

Although Foz stated he enjoyed reading, 73% of his reading self-efficacy responses were in the 2- (*barely can*) to 3- (*sometimes can*) range; 46% were 2- (*barely can*). He reported *I can sound words out when I read* 5- (*I can*), which was not corroborated in his assessments, where he exhibited difficulty in isolating phoneme and affixes (see Appendix D for Foz's errors on pre and post assessments). On the CB&DT he scored 20/36 (see Table 4.4). On the PNT, he read 21/30 of words and 89/101 of the phoneme correctly, with an inaccurate use of the silent 'e' rule which accounted for half of his errors; he also exhibited vowel and some consonant confusion. Although he

demonstrated difficulty in decoding, he scored at chronological age in the 12.03 to 12.09 age range on the BURT word test.

On the self-efficacy scale Foz reported *he was a good reader 5-(I can)*, which was not substantiated by his PROBE 2 assessment scores. He scored 3.06 to 4.06 years below his chronological age at the 8.00 to 9.00 age range for fiction and below the 8.00 to 9.00 for non-fiction. He reported high self-efficacy 4-*(mostly can)*, for semantic knowledge of words, but the remaining reading self-efficacy responses were all scored within the 2-*(barely can)* to 3-*(sometimes can)* range. He reported 2-*(barely can)* for *figuring out meanings of hard words, finding information in text, understanding [and] check to see if I understand what I am reading*. These beliefs were congruent with his PROBE 2 assessment, where he scored for vocabulary, but not for text processing.

### **Phonic knowledge.**

Due to his weak phonemic and phonological awareness Foz avoided words he knew the meaning of, but could not spell, "I didn't use the words, because I didn't know how to spell them. [I] didn't know the sounds the letters made" (Foz-interview-July2016). He reported he was unable to read unknown words because "it's hard saying the words." As a result he was using pre-alphabetic, visual imaging to identify words

Foz: I just tried to think about it; think about what letters are there, to see if I knew the word or not.

Interviewer: did you try to sound out the word?

Foz: No, I used to just skip it or ask for help.

(Foz-interview-July2016).

Table 4.3

*Foz's self-efficacy pre and post-intervention*

<b>Spelling</b>	<b>Pre- intervention</b>	<b>Post- intervention</b>
I can correctly spell the words in a letter to my teacher	3	3
I can correctly spell the words on a spelling list for my year level	3	3
I can correctly spell words that are not spelt the way they sound	5	4
I can correctly spell the words needed to write a report about my school	3	2
I can correctly spell the beginning (prefixes) and endings (suffixes) to words	4	5
I can correctly spell the words on a grocery list	2	2
I can spell words well enough to find them in the dictionary	3	3
I can correctly add -s, es, or ies to words to make them plural	3	4
<b>Reading</b>		
I am a good reader	5	4
I can learn to be a good reader	3	3
I can remember information I read in my school books	3	3
I can participate in reading in class	3	3
I can check to see if I understand what I am reading	2	3
I can sound out words when I read	5	4
I can understand all the words on a page in my school books	4	2
I can break big words into smaller parts (prefixes and suffixes)	2	3
I can understand the main idea in a story	2	3
I can figure out the meaning of hard words in a sentence	2	2
I can find important information in a passage	2	3

Table 4.4 Foz's Pre and post-intervention assessment scores.

	Pre Intervention		Post Intervention	
	Raw score	Age level Years/months	Raw score	Age level Years/months
Spelling – SAST	40/70	10.02-11.02	39/70	10.00-10.09
CB&DT - Spelling	34/36	-	34/36	-
Decoding - CB&DT - Reading	20/36	-	33/36	-
Decoding - PNT - words correct	21/30	-	27/30	-
Decoding - PNT - phoneme correct	89/101	-	98/101	-
Word recognition - Burt	80/110	12.03-12.09 <sup>a</sup>	86/110	12.03-12.09 <sup>a</sup>
Burt extrapolated age range				13.03-13.09
Reading comprehension Probe2 - Fiction	90%	8.00-9.00	90%	8.00-9.00
Reading comprehension Probe2 - Non Fiction	60% <sup>b</sup>	8.00-9.00	90%	9.00-10.00

<sup>a</sup> ceiling age range for the BURT reached.

<sup>b</sup> below 70% indicates reading age is below the tested age.

The focus of lessons was on improving his ability to recognise the sounds in words, with a lot of emphasis on vocalising the sounds as he learnt them. As Foz's knowledge of the sounds and orthographic patterns improved he was able to spell unknown words *Foz spelt 'dignify' solely by using the sounds today, he exclaimed – "I didn't know that word"* (field-notes-week9-session27-June2016). *Foz often has to be reminded to check his spelling attempts. He was able to self-correct, when prompted (e.g. attractive/attractive* (field-notes-week9-session30-June2016). Foz reported at post-intervention that breaking words into their constituents made it possible to sound words out when reading, and spell the words he wanted to use in his writing, but had previously avoided. "I'm now trying to sound [words] rather than skipping them [when reading]; in my writing I use harder words now. I can sound them out and hear them in my head...words I wanted to use."

Interviewer: What has helped you sound the words out?

Foz: I know what the parts of words sound like now. The parts make it easier to spell.

(Foz-interview-July2016).

### **Spelling rules.**

Another feature of the lessons he found helpful was learning spelling rules. He said learning the rules, "it helps you to know how to sound the words out," (Foz-interview-July2016). Foz was able to explain and apply spelling rules as they were introduced, *I introduced the double consonant rule which Foz was able to correctly apply double when adding suffixes e.g. stopped, visiting* (field-note-week 2-session8-May2016). Foz stated during the interview that learning the rules helped his spelling, "I write better and I can sound out words and put prefixes and suffixes on words (Foz-interview-July2016).

At post-intervention Foz's decoding scores increased across all assessments (see Table 4.4). His accuracy on the CB&DT increased by 36%, taking it to 33/36 for reading, spelling stayed at 34/36 correct. His PNT score increased by 30% for words, and 9% for phoneme read correctly, he scored 27/30 and 98/101 respectively. Foz scored above the ceiling level on the BURT, his extrapolated score suggested his word decoding level had increased by one year to the 13.03-13.09 age range; one year above his chronological age.

Foz's weak knowledge of phonics and spelling rules impacted not just on his spelling and decoding ability, it also affected his verbal communication. At pre-intervention Foz was almost inaudible when he spoke. As time progressed I became aware- *Foz's speech had become clearer, louder, and he's struggling less with syntax* (field-note-session21-week6-June2016). Foz stated through knowing how to sound words out he

had gained more confidence to converse, “because it helps me to know how to say the words...I know how to say them in front of other people now” (Foz-interview-July2016).

Foz’s self-efficacy for spelling remained at a median score of 3-(*sometimes can*) (see Table 4.3). He did not change four of eight items, he said this was because he was “more aware of it [what skills are required] and they are still hard to do” (Foz-interview-July2016). He also reported decreased self-efficacy for words not spelt as they sound 5-(*I can*) to 4-(*mostly can*), and spelling words for a report 3-(*sometimes can*) to 2-(*barely can*) because he realised he had overestimated his ability, and because he was challenging himself “I’m using harder words now” (Foz-interview-July2016). He reported more efficacy in spelling affixes 4-(*mostly can*) to 5-(*I can*) and plurals 3-(*sometimes can*) to 4-(*mostly can*). Foz’s results on the SAST reflected the difficulties he was still experiencing with sounding words, and applying spelling rules. His score did not increase post-intervention, however 58% of the pre-assessment errors displayed closer phonological accuracy (see Appendix D).

### **Reading Comprehension.**

Foz reported, being able to recognise grapheme/phoneme relationships and using spelling rules enabled him to comprehend word meanings. “Knowing what the words are, and how to say them, I can read the words correctly and sound them out. [Then] I can hear them in my head, then I know the meaning” (Foz-interview-July2016).

In addition to breaking words into their patterns, vocabulary was also covered. While vocabulary was not formally tested, Foz displayed good semantic knowledge of individual words. During his reading he was taught to look words up if he did not know them, and how to use the context to confirm meanings; which he stated he had not done prior to the intervention (Foz-interview-July2016).

Foz reported that prior to the intervention, when trying to resolve his lack of understanding of text, he would: “ask the teacher or someone else to explain the story, or [I] kept reading” (Foz-interview-July2016). Foz began to show progress in applying the comprehension strategies towards the end of the intervention; in week 8, *Foz was not able to infer that ‘Captain Cook’s ball’ in a passage about the land and sea, was referring to Earth* (field-notes-week8-session24-June, 2016); but the following week, *Foz was able to discern, from using text clues only, that the main character in the last book was a paddle crab, although it was not named as such* (field-notes-week9-session30-July2016). During the interview, Foz stated that being explicitly shown how to find information in the text, to integrate it with prior knowledge, and make inferences had improved his understanding and enjoyment of reading. He had not been able to do this prior to the intervention “it was too hard....Looking for clues, and looking for words that matched what was supposed to be [drawn] in the pictures, made the stories fun to read” (Foz-interview- July2016).

At post-assessment, Foz displayed an improvement in the three skills of reorganising, evaluation and inferencing on the PROBE 2 Assessment. Although his reading age for fiction did not change, his non-fiction reading age increased by one year to a 9.00 to 10.00 age range (see Table 4.4). Foz reported during the interview he believed he was getting better at reading and was now more cognisant of the skills required to comprehend and trying to use them, “but it’s still hard” (Foz-interview-July2016). As a result, he did not change 50% of his reading self-efficacy responses (see Table 4.3). But his statements for 2-*(barely can)* dropped from 46% to 18%, while his statements for to 3-*(sometimes can)* increased from 27% to 64%. Of the responses that did change, he reported a modest increase related to finding, checking, and understanding information in text. Foz clarified his reasons for reducing three self-efficacy responses for reading. These were: *sound out words*, “I don’t skip the hard words now, so it’s still hard.” For, *understand all the words on a page*: “I don’t know all the words, but I look them up, and

check the word in the sentence, it's still hard." *I am a good reader*. "I know I'm not good now, because I know what I have to do now" (Foz-interview-July2016).



**Rodi.**

Rodi was in year 8, with a chronological age of 12 years and 4 months at pre-assessment and 12 years 7 months at post assessment. He has been at the school since the age of five. The school stated that when Rodi found literacy tasks difficult, he would refuse to attempt them, or annoy other students by asking for help. They were concerned; he would habitually give up, rather than attempt to resolve his spelling and reading difficulties. Rodi confirmed he would either “ask someone else, skip it, or just give up” (Rodi-interview-July2016). His home language is English. He received 13 hours 30 minutes of lessons and practice over 40 sessions.

Rodi was diagnosed after the pre-assessment with ADHD, and began taking Ritalin just before commencing the intervention. Rodi still required direction to remain focused on his lessons. He often forgot to do his homework, which impacted on the number of skills and activities which could be covered during scheduled sessions, as the homework activities had to be done during lesson time. Rodi was unwell at the post-assessment, but classroom activities meant the assessment could not be postponed. He attempted all tasks.

***Pre-intervention.***

Rodi expressed very low self-efficacy in his spelling ability, responding with 1-*(I can't)* for 50% of the items (see Table 4.5). During the interview he said, “I would try to sound it [spelling] out, but it didn't always work and I asked for help” (Rodi-interview-July-2016). While he reported 1-*(I can't)* for most spelling items, he scored spelling for his year level as 5-*(I can)*, although acknowledging he was in the bottom spelling group in his class. He reported 4-*(mostly can)* spell well enough to find words in a dictionary; although he admitted “I don't actually look words up” (Rodi-week1-session5-May2016). Rodi's reported difficulty in spelling was reflected in his score on the SAST where he scored

one to two years below chronological age; at the 10.02 to 11.02 age range (see Table 4.6).

His reading self-efficacy was likewise low, stating “I don’t like reading, although I think it is important to be able too” (Rodi-pre-assessment-April2016). His median reading self-efficacy score was 1-*(I can’t)*. While he did not think he was a good reader, he reported 4-*(mostly can)* learn to become one. He demonstrated some difficulty in decoding blends on the CB&DT where he scored 23/36 (see Table 4.6). On the PNT he read 21 of 30 words and 94 of 101 phoneme correctly, 67% of the errors were due to a faulty application of spelling rules (see Appendix D). There was dissonance between Rodi’s reported low self-efficacy 2-*(barely can)* for sounding words out, and his score for BURT word decoding where he scored at age, in the 12.01 to 12.07 age range (see Table 4.6). However, he clearly found it demanding as he read slowly; when he reached 97 words he said he could not read the remaining words.

Rodi displayed significant difficulty in reading comprehension on the PROBE 2 assessments; scoring three to four years below his chronological age. The assessment was stopped at the 9.00 to 10.00 age range by school staff; however his score fell below this age range (see Table 4.6).

Table 4.5

*Rodi's self-efficacy pre and post-intervention*

	Pre- intervention	Post- intervention
<b>Spelling</b>		
I can correctly spell the words in a letter to my teacher	1	1
I can correctly spell the words on a spelling list for my year level	5	4
I can correctly spell words that are not spelt the way they sound	1	4
I can correctly spell the words needed to write a report about my school	1	2
I can correctly spell the beginning (prefixes) and endings (suffixes) to words	3	3
I can correctly spell the words on a grocery list	1	2
I can spell words well enough to find them in the dictionary	4	5
I can correctly add -s, es, or ies to words to make them plural	2	2
<b>Reading</b>		
I am a good reader	1	2
I can learn to be a good reader	4	3
I can remember information I read in my school books	1	5
I can participate in reading in class	3	4
I can check to see if I understand what I am reading	1	3
I can sound out words when I read	2	2
I can understand all the words on a page in my school books	1	4
I can break big words into smaller parts (prefixes and suffixes)	1	3
I can understand the main idea in a story	3	5
I can figure out the meaning of hard words in a sentence	1	1
I can find important information in a passage	3	4

Table 4.6

*Rodi's pre and post intervention assessment scores*

	Pre Intervention		Post Intervention	
	Raw score	Age level Years/months	Raw score	Age level Years/months
Spelling – SAST	40/70	10.02-11.02	44/70	11.02-12.02
CB&DT - Spelling	36/36	-	33/36	-
Decoding - CB&DT - Reading	23/36	-	34/36	-
Decoding - PNT - words correct	21/30	-	22/30	-
Decoding - PNT - phoneme correct	94/101	-	93/101	-
Word recognition – Burt	79/110	12.01 – 12.07	90/110	12.03-12.09 <sup>a</sup>
Burt extrapolated age range				13.09 14.03
Reading comprehension Probe2 - Fiction	50% <sup>b</sup>	9.00 - 10.00	70%	9.00 - 10.00
Reading comprehension Probe2 - Non Fiction	50% <sup>b</sup>	9.00 - 10.00	80%	9.00 - 10.00

<sup>a</sup> ceiling age range for the BURT reached.

<sup>b</sup> below 70% indicates reading age is below the tested age.

### **Phonic knowledge.**

Rodi stated during the interview “[pre-intervention], I tried to break words into parts, but it didn’t always work” (Rodi-interview-July2016). Rodi exhibited vowel and some consonant confusion at pre-assessment. While Rodi demonstrated difficulty in decoding the blends and digraphs (B&Ds) on the CB&DT, he was able to spell them correctly (see Appendix D). *The initial three sessions focused on decoding the vowel and consonant confusions, and blend errors, which were corrected within each lesson (field-notes-week1-sessions1to3-May2016). The following sessions focused on introducing new blends, breaking words into onset-rimes, and looking at the patterns in words; Rodi was able to both read and spell the sounds as they were introduced (e.g. b-ang-le; re-sist-ing; (field-note-week5-session22-May2016); na-tion-al-it-y (field-note-week8-session36-June2016). At post-assessment Rodi corrected his pre-assessment reading errors on the CB&DT increasing his accuracy by 30% to 33/36, while spelling dropped due to*

three errors (see Appendix D). During the interview he stated that learning how to break words into their constituents had improved his phonic knowledge: “I know now, how to use sounds to spell and read...[I] remember the sounds better” (Rodi- interview-July2016).

### **Spelling rules.**

Rodi stated *he was unaware of spelling rules* (field-notes-week1-session5-May2016).

While Rodi was *able to apply spelling rules during the intervention, he’s inconsistent in doing so, having to be reminded to edit his spelling; when prompted he was able to self-correct (e.g. refering/referring)* (field-note-week8-session37-June2016). On the PNT post-intervention (see Table 4.6), he continued to display mixed results in his application of the silent ‘e’ rule, with six of eight errors due to misapplication of the rule (see Appendix D), even though *Rodi was able to explain and use the silent-e rule* (field-note-week7-session35-June2016).

Rodi demonstrated significant increases in both spelling and word decoding ability at post-intervention. While still 5 to 17 months below his chronological age, he displayed an increase of one year, to the 11.02 to 12.02 age range on the SAST (See Table 4.6). His results suggest he needed to edit his spelling to ensure he was applying the rules. On the BURT he was able to read all 110 words; reading 90 of the words correctly, taking his word decoding age range over the ceiling score for the test; his extrapolated age range increased to 13.09 to 14.03; an increase of 20 months (See Table 4.6).

Rodi reported an increase in spelling self-efficacy for 63% of items. The increases were modest; his median score increased from 1 to 2.5 (see Table 4.5). The biggest increase was for *words not spelt as they sound*, from 1-(*I can’t*) to 4-(*mostly can*). He also reported a decrease for *spelling words at his year level*, from 5-(*I can*) to 4-(*mostly can*)

he explained “I scored high [at pre-assessment] because I thought I was good at spelling, but I know now, I’m not” (Rodi-interview-July2016). For responses that did not change, this was because “I’m using harder words now, it’s still not easy to think of spellings of more complicated words” (Rodi-interview-July2016). Overall Rodi reported an increase in self-efficacy for spelling and word decoding, the intervention had shown him that “spelling and reading was not really as hard as I thought it was; [because] I now think of words as having parts and this makes it much easier to sound them out and spell them” (Rodi-interview-July2016).

### **Reading Comprehension.**

Rodi said he did not try to use any of the comprehension strategies before the intervention (Rodi-interview-July2016). While decoding words was not difficult for Rodi during the intervention, *he struggled to recognise if words were real words, or not. After it was explained the importance of semantics to reading (field-note-week1-session5-May2016), he was keen to look words up, using the dictionary each time he comes across an unknown word (field-notes-week3-session14-May2016). Suffixes (er, ed, ing) meanings were a problem for Rodi, he was unable to use these in context (field-note-week5-session20-May2016).* Rodi was inconsistent in explaining suffix meanings, but was able to after two weeks, *Rodi was able to explain and use the suffixes in context (field-note-week7-session34-June2016).*

When reading, *Rodi found it difficult to identify critical words, reorganise information and make inferences from the script, instead he made up his own version of the story (field-note-week2-session6-May2016).* It was explained to Rodi that the purpose of retelling a story was to demonstrate understanding of the text to examiners. Rodi needed reminding when reading to refer back to the text to confirm what the script described.

Rodi's difficulty with reorganising information in text was demonstrated in the first book 'A bad vet', the dialogue referred to the vet as a male on the first page; on following pages where the vet's gender was not mentioned, he illustrated the page with a female vet. Rodi explained he had referred only to the page the picture was on for reference (field-note-week2-session6-May2016).

*In the third book, he was able to refer back to previous pages to look for critical words, relevant information, and integrate the new information to describe the action occurring* (field-note-week7-session30-June2016).

Rodi's reading comprehension score on PROBE 2 increased from being below the 9.00 to 10.00 age range, to a pass at the 9.00 to 10.00 age range for both fiction and non-fiction, demonstrating a 6 month increase in reading age (see Table 4.6). (Assessments at higher age ranges were not done, therefore it is not known if further gains were made). Although this is still below age, he demonstrated improvements in inferencing, evaluation of text, and vocabulary. Rodi reported an increase in reading self-efficacy for 73% of the items on the scale, with an increase in median score from 1 to 3 (sometimes can) (see Table 4.5). His biggest increases were for finding, remembering and understanding information. He stated "I understand better, and it's less hard" (Rodi-interview-July2016). He reported that not knowing semantics still made comprehension demanding. "Working out the meaning of hard words in sentences is hard, [I] still don't know [all] words."

Interviewer: Do you look words up now?

Rodi: I do now. I thought it was a waste of time. Now I see how important it is to my learning to try to read the words and look

up meanings. Because then [I] can understand all the words  
and then I can understand [the text] better  
(Rodi-interview-July2016).

Rodi reported a significant increase in his self-efficacy for remembering information he reads from 1-(*I can't*) to 5-(*I can*). Reporting "I better understand what I am reading." Rodi explained the reason he reported a reduced self-efficacy for - *I can learn to become a better reader* 4-(*mostly can*) to 3-(*sometimes can*), was because he thought he had learnt what he needed to know, "I can't learn anymore, I already know what to do. I just need to keep going...[now] I stop to think about the text, re-read, look for clues, and I look up words I don't know" (Rodi-interview-July2016). As a result of experiencing success in spelling and reading, Rodi expressed a progression towards self-agency in his learning:

When you succeed, you know how helpful it is to do these things, reading and spelling. I know how important it is to improve my spelling and reading; so I do well at school for my future, it will give me a good job and a good life (Rodi-interview-July2016).



**Thunder.**

Thunder was 13 years and 3 months at the time of the pre-intervention assessment, and 13 years 6 months at the post-intervention assessment. Thunder moved to the school in year 2, when he was identified as having high learning needs, he received support from an RTL<sup>2</sup> and was placed in a small group literacy support up to year 6. Thunder has received ongoing support from a teacher-aide in class. Due to concerns over his learning, he was repeating year 8 in the year of the intervention. His home language is English. Thunder received 14 hours and 40 minutes of lessons and practice, over 40 sessions.

Thunder was generally co-operative during lessons; however he refused to do any homework saying “I don’t like homework” (field-note-week6-session26-June2016). His refusal impacted on the number of skills and activities which could be covered, as the homework activities had to be done in lesson time. Thunder’s self-concept for his academic ability was very low.

*Thunder often requires a lot of encouragement to attempt tasks. He often comes to lessons upset saying other students or family have told him he is dumb. When this occurred he will refuse to attempt the activities until reassured he is capable of performing the task. Today, he was particularly upset telling me “you know what? I think I’m the dumbest person in the school, I’m in the lowest group.” I went over the success he has experienced in our lessons, telling him the work he did with me indicated he was not dumb (field-note-week7-session 32-June2016).*

---

<sup>2</sup> Resource teacher: learning and behaviour. RTL<sup>2</sup>’s assist teacher’s to support students with learning and/or behaviour difficulties (Ministry of Education, (2016)

### Pre-intervention.

During the assessments Thunder was co-operative, and attempted all tasks. He indicated he did not have high self-belief in his academic ability, stating before assessment, “I’m not good with words...I’m not good at school. I’m the oldest student at the school all the other kids [my age] have gone to high school.” When asked about his spelling and reading, he reported “I’m okay at spelling, but I don’t like it, and reading is hard” (Thunder-pre-assessment-April2016). Thunder’s pre-assessment scores were consistent with his comments and self-efficacy beliefs; he demonstrated difficulty in spelling, decoding, word decoding and reading comprehension. Thunder’s responses on the self-efficacy scale were congruent with his comments, although mixed.

His median score for spelling self-efficacy was 3-(*sometimes can*) (see Table 4.7). He reported he could correctly *spell the words in a letter to my teacher* 5-(*I can*), but not *spell the words needed to write a report about my school* 1-(*I can’t*). For, *spell words well enough to find them in the dictionary* 4-(*mostly can*); however he could not *spell words that are not spelt the way they sound* 2-(*barely can*); or *spell the words on a spelling list for my year level* 1-(*I can’t*). On the SAST the test was stopped at 50 words, he spelt 35 words correctly. This scored him three to four years below chronological age, in the 9.00 to 10.00 age range.

In reading, his median score was lower at 2-(*barely can*). His reading self-efficacy responses were also mixed: he reported he could *sound words out when I read* 4-(*mostly can*), but did not think *I am a good reader, or can learn to be a good reader* both 1-(*I can’t*). He reported he couldn’t *find important information in a passage* 1-(*I can’t*). While reporting he could *check to see if I understand what I am reading* 4-(*mostly can*), and *understand the main idea in a story* 4-(*mostly can*). He scored 29/36 for spelling, and 31/36 for decoding on the CB&DT assessment. He read 23 of 30 words, and 91 of

Table 4.7

*Thunder's self-efficacy pre and post-intervention*

<b>Spelling</b>	<b>Pre- intervention</b>	<b>Post- intervention</b>
I can correctly spell the words in a letter to my teacher	5	5
I can correctly spell the words on a spelling list for my year level	1	2
I can correctly spell words that are not spelt the way they sound	2	1
I can correctly spell the words needed to write a report about my school	1	4
I can correctly spell the beginning (prefixes) and endings (suffixes) to words	4	5
I can correctly spell the words on a grocery list	5	5
I can spell words well enough to find them in the dictionary	4	4
I can correctly add -s, es, or ies to words to make them plural	2	4
<b>Reading</b>		
I am a good reader	1	5
I can learn to be a good reader	1	5
I can remember information I read in my school books	3	3
I can participate in reading in class	2	5
I can check to see if I understand what I am reading	4	4
I can sound out words when I read	4	5
I can understand all the words on a page in my school books	2	3
I can break big words into smaller parts (prefixes and suffixes)	5	3
I can understand the main idea in a story	4	5
I can figure out the meaning of hard words in a sentence	1	4
I can find important information in a passage	1	1

101 phonemes correctly on the PNT (see Table 4.8). On the BURT, he attempted 80 of the 110 words then said he did not know anymore; putting his word reading age in the 10.09 to 11.03 range, two to three years below his chronological age. Thunder also displayed significant difficulty in reading comprehension on the PROBE 2 assessment; scoring five to six years below his chronological age. On the fiction assessment he read in the 8.00 to 9.00 age range, while on non-fiction he read below the 7.06 to 8.06 range.

Thunder's assessment score's suggest he was over-optimistic in some of his self-efficacy responses for both spelling and reading.

Table 4.8

Thunder's pre and post-intervention assessment scores.

	Pre Intervention		Post Intervention	
	Raw score	Age level Years/months	Raw score	Age level Years/months
Spelling – SAST	35/70	9.00-10.00	36/70	9.02-10.02
CB&DT - Spelling	29/36	-	30/36	-
Decoding – CB&DT - Reading	31/36	-	30/36	-
Decoding - PNT - words correct	23/30	-	26/30	-
Decoding - PNT - phoneme correct	91/101	-	99/101	-
Word recognition – Burt	70/110	10.09-11.03	75/110	11.05-11.11
Reading comprehension Probe2 - Fiction	70% <sup>a</sup>	7.06-8.06	60%	8.00-9.00
Reading comprehension Probe2 - Non Fiction	60% <sup>a</sup>	7.06-8.06	60%	8.00-9.00

<sup>a</sup> scores below 70% indicates reading age is below the tested age.

### Phonic Knowledge.

Thunder demonstrated vowel and some consonant confusion (f/th/v), which was displayed in both his spelling and reading at pre-assessment. He was *able to correct the letter confusions in the first two sessions* (field-note-week1-session2-May2016). Thunder reported he did not sound words when spelling. When asked how he learnt his spelling words he said "I learn words by counting the number of letters and trying to remember what letters are in the words" (Thunder-pre-assessment-April2016).

Thunder's first response when asked to spell words using the tiles was to say it was too difficult, though, through scaffolding, he was successful. *I vocalised the words parts then asked him what is the first part you can hear; then I did the same for the next part until he had spelt the whole word* (field-notes-week2-session6-May2016). By week four he

was, *no longer refusing to try, and was able to sound the words out and spell them himself, for example, captivity, unflinching* (field-note-week4-session17-May2016). He *continues to be very slow to spell, expresses frustration, stating, "This is hard," and requiring reminders to edit his spelling* throughout the intervention (field-note-week8-session-36-June2016).

Thunder reported efficacy in, and demonstrated during the intervention, that he could sound out words, although analysis of his errors on the BURT indicated he did not always attend to all of the phonemic constituents of words resulting in the misreading of them (e.g. explore/explorer; donor/domineer) (see Appendix D). He reported during the interview he had learnt from the intervention to "slow down and read the words properly, I sound them out" (Thunder-interview-July2016), although he was, *still needing reminding to sound all the constituents of words* (field-note-week8-session35-June2016). The misreading of words resulted in a lowered post-intervention PROBE 2 score, when he misread 'were', for 'weren't', and incorrectly answered the questions accordingly.

### **Spelling rules.**

Thunder was able to explain and use the spelling rules as they were presented, however it took him time to think through the rules, and decide which rule applied. At the interview he reported that learning to break words into their phoneme and learning spelling rules helped him to know how to spell.

Spelling rules help me; it tells me how a word's meant to be written. Looking for, and saying the patterns in words, it helps you to hear the sounds. When you spell using the sounds and the spelling rules, spelling is easier. Doing it [the intervention] it made me realise I can spell (Thunder-interview-July2016).

At post-assessment Thunder was not well, had not eaten since the day before, and was very inattentive. Classroom activities meant the assessment could not be postponed. Thunder's scores at post-intervention for spelling displayed a modest increase of two months on the SAST to the 9.02 to 10.02 age range (see Table 4.8). Most post-assessment errors displayed greater phonetical awareness than in pre-assessment (see Appendix D). Decoding accuracy increased on the PNT from 23/30 to 26/30 words correct, and from 91/101 to 99/101 phoneme correct. Thunder's BURT word decoding demonstrated an eight month increase to the 11.05 to 11.11 age range. Although he struggled to decode after the 80<sup>th</sup> word he expressed determination to read all 110 words, which he did, reading four of the remaining words correctly. Thunder still failed to attend to all of the word constituents in some words (e.g. dominer/domineer; reown/renown), though his attempts demonstrated closer accuracy.

While Thunder's scores for spelling and decoding did not display significant change, he reported an increase in self-efficacy for spelling, his median self-efficacy score increased from 3-(*sometimes can*) to 4-(*mostly can*), (see table 4.5). He reported he found writing took him longer now "It takes longer to think about how to spell the words and to look them up." For spelling words not spelt the way they sound, 2-(*barely can*) to 1-(*I can't*), he said I scored that lower because "I stop to think about the alternative spellings, which I didn't bother to do before and it slows me down" (Thunder-interview-July2016). He continued to report self-efficacy for *can sound out words*. He decreased his self-efficacy score for *can break big words into smaller parts* 5-(*I can*) to 3-(*sometimes can*). He said "I think I was a bit over-optimistic at first, it's hard, but I know what to do now" (Thunder-interview-July2016).

### Reading comprehension.

Thunder reported that he found knowing how words are spelt helped his reading, “it’s easier to see the word. I look for the parts in words and sound these out, making it possible to think if I’ve heard the word before” (Thunder-interview-July2016). While Thunder’s vocabulary was not formally tested, his semantic knowledge of many of the words covered in the lessons was low. Thunder reported he had not previously looked word meanings up “it was too hard and time consuming, I couldn’t remember the order of the letters...I look words up now, it increases my knowledge, and helped my reading and spelling...I still don’t look all words up though, it takes too long” (Thunder-interview-July2016). Thunder’s low vocabulary knowledge was still making understanding difficult, “I try to use the skills, but I [still] don’t know what some words mean” (Thunder-interview-July2016). His continuing difficulty was reflected on his PROBE 2 scores at post-intervention, where his reading age did not change (see Table 4.8).

Thunder reported that prior to the intervention he knew he had to re-read, but was not sure what strategies to use (Thunder-interview-July2016). He found using the comprehension strategies helped his understanding. He was now aware, he read too fast, without thinking about word meanings. “Stopping to think about the words, finding clues, it makes reading interesting” (Thunder-interview-July2016). While Thunder’s PROBE 2 reading score did not change from a 7.06 to 8.06 age range, his median reading self-efficacy score increased from 2-(*sometimes can*) to 4-(*mostly can*) (see Table 4.7). His biggest reported increases were for *I am a good reader*, and *can learn to be a good reader* 1-(*I can’t*) to 5-(*I can*), and to *can participate in reading in class* 2-(*barely can*) to 4-(*mostly can*). Some of the reading skills he reported as still difficult, or more so, because “I’m now trying to use the strategies, it’s hard, [it] takes more effort and concentration. I know what to do; I just have to do it. I don’t always use it because it’s frustrating having to stop all the time” (Thunder-interview-July2016).

### **Cross case analysis**

The cross case begins with a brief summary of the findings for each individual case. This is followed by a discussion of the common threads and differences found in the findings, these are organised in terms of spelling, decoding, word decoding, comprehension and self-efficacy.

Jessie began the intervention above her chronological age in spelling and word decoding ability but below her chronological age in reading comprehension. Although Jessie was competent in her decoding ability she had not used her phonic knowledge in her spelling. At post-intervention she reported that breaking words into their orthographic patterns and using spelling rules simplified spelling and word decoding. This was demonstrated in her post-intervention results where her spelling and word decoding age levels increased by 1-2 years and 10 months respectively. Her initial competences in these two areas were reflected in her high self-efficacy beliefs at pre-intervention so did not change at post-intervention. Jessie reported high self-efficacy for comprehension at pre-intervention which was not corroborated by her comprehension scores. She had not been aware that the focus of her reading should be on making meaning from text. At post-intervention although her comprehension did not improve, she reported that learning comprehension strategies improved her understanding in reading.

At pre-assessment, Foz's self-efficacy reflected the difficulty he experienced in spelling and reading. His strategy for word decoding had enabled him to decode words at his chronological age. Nonetheless he reported considerable difficulty in identifying grapheme-phoneme relationships for spelling and in decoding unknown words. Due to decoding difficulties he avoided decoding unfamiliar words, which impacted on his ability to understand the text. At post-intervention Foz demonstrated a one year increase in word decoding and reading comprehension age for non-fiction, but none for fiction. His increased orthographic knowledge during intervention was not represented in his post-



assessment spelling score, which decreased by one raw score. He reported he was more aware of what skills he needed to use for spelling and reading success, therefore was more aware of his ability. As a result, his median self-efficacy scores for spelling and reading self-efficacy did not change. He reported that learning to break words into parts and learning spelling rules had assisted him to hear the sounds in words which simplified spelling and reading. As result he was now attempting to spell and read words he had previously avoided.

Rodi expressed very low self-efficacy for spelling and reading at pre-intervention and would often refuse to do either in class. He also reported difficulty in identifying grapheme-phoneme relationships in unknown words. At post-intervention he demonstrated a significant increase of 12 months in spelling age, though still experienced difficulties with spelling rules. His word decoding increased to above age; and his reading comprehension increased by 6 months. Correspondingly his self-efficacy for spelling and reading also increased. He reported he no longer avoided spelling and reading in class and was challenging himself to improve in both areas. He stated that being explicitly shown how to use phonological and comprehension skills made him realise that he had the capability to improve in spelling and reading if he applied himself.

At pre-intervention Thunder reported "I'm not good with words" (Thunder-pre-assessment-April 2016). Some pre-assessment responses on the spelling and reading self-efficacy corresponded with his statements, while some were over confident. His scores on the pre-assessments confirmed his difficulty with spelling and reading. He demonstrated reluctance to attempt spelling during the intervention, but as he began to display improvements in his phonetic and spelling rule knowledge his reluctance diminished. At post-intervention his spelling age had increased by 2 months. Like the other students, he reported that learning to use orthographic patterns and spelling rules

helped his spelling and reading of words. Although he still did not always read all the constituents of the words, which had impacted on his post-intervention comprehension scores, his word decoding age increased by 8 months. At post-intervention he still found spelling and reading difficult, but easier than before the intervention and his self-efficacy increased accordingly.

All the children reported that through gaining an awareness of the skills required to spell, word decode, and comprehend in reading, they were now able to make more accurate judgements about their ability. Furthermore they reported they knew what to do when spelling and reading broke down, and believed they could improve by using these skills, for example, "I know I have got better because I can understand better now. I thought [at pre-assessment] I was good at reading, but I can get better in my reading, by looking words up, re-reading and thinking about what the words say" (Jessie-interview-July2016). "I think I was a bit over-optimistic at first, it's hard, but I know what to do now" (Thunder-interview-July2016).

Rodi and Jessie stated other children would benefit from being shown the skills they had learnt, for example, "it would help kids who are having trouble reading, to do the things we did" (Rodi-interviews-July2016).

### **Spelling findings across the cases.**

Prior to the intervention the children reported using visual cues instead of orthographic knowledge to spell words. They reported they were unaware that they could use grapheme/phoneme patterns and spelling rules to spell words, or that, orthographic patterns could be transferred across words. At post-intervention, increases in spelling age from 2 to 24 months occurred for three of four children. All of the children reported increased knowledge of orthographic patterns and spelling rules, made spelling easier,

because “The parts and the rules tell you how to spell the words, it makes spelling easier” (Jessie-Foz-Rodi-Thunder-interviews-July2016).

### **Decoding findings across cases.**

Changes in decoding at the phoneme level were mixed; Jessie and Rodi, who had the highest scores on the CB&DT at pre-intervention dropped in accuracy by one point. Foz and Thunder, who recorded lower scores at pre-assessment, increased their scores significantly to nine and eleven points above the other two participant’s final score. All were decoding at 83% to 98% accuracy at post-intervention. A similar change in decoding at the phoneme level was seen on the PNT, where Jessie and Rodi, who scored higher at pre-intervention, demonstrated the least change, while Foz and Thunder, who scored lower at pre-assessment, increased to almost, and equal to, the highest scorer at post-intervention. At post-intervention all participants were decoding with 92% to 98% accuracy.

### **Word decoding findings across the cases.**

Prior to the intervention only Jessie was able to sound words out. The three boys instead relied on visual memory to decode words. As a consequence, if they did not recognise a word they could not decode it. A significant increase in word reading on the BURT was recorded for all four participants, ranging from Thunder’s 8 months to Rodi’s 20 months. All four reported that using their orthographic knowledge to sound out words simplified decoding, which made it possible to think about word meaning. Thunder was the only student who reported an increase in self-efficacy for sounding words out. However, all three boys reported they no longer avoided trying to decode unknown words, although attempting ‘*difficult words*’ slowed their reading. Foz cited this as the reason he reported a decrease in his self-efficacy for sounding words out, and Rodi reported no change.

### **Reading comprehension findings across the cases.**

Word decoding difficulties had blocked comprehension for all four children. Because all of the students' resources had been taken up with word decoding, none had used strategies to assist comprehension, nor did they report knowing any. They all struggled with inferencing, did not monitor their understanding, instead carrying on reading rather than attempting to correct it. During the intervention all four participants began to demonstrate an ability to monitor and apply comprehension strategies. All the children reported at post-intervention an increased *standard for coherence*. They reported an awareness of the need, and knowledge of how, to monitor comprehension, improve semantic knowledge, and use context cues to make inferences to improve comprehension. Although only Rodi and Foz demonstrated an increase in reading age on the PROBE2 at post-intervention, all four reported they believed their reading comprehension had improved as they now understood more when reading in class.

### **Self-efficacy findings across the cases**

Median spelling self-efficacy scores did not change for Jessie at 5-(*I can*), and Foz 3-(*sometimes can*), (see appendix E). Both Rodi's and Thunder's median spelling self-efficacy scores increased by one score: Rodi, from 1-(*I can't*) to 2-(*barely can*) to 3-(*sometimes can*), and Thunder 3-(*sometimes can*) to 4-(*mostly can*). At post-intervention, Jessie's, Foz's and Rodi's spelling self-efficacy were calibrated closer to their ability, while Thunder's spelling self-efficacy was higher than his actual ability reflected on the SAST.

Median reading self-efficacy scores did not change for Jessie 5-(*I can*) and Foz 3-(*sometimes can*), (see Appendix E). Both Rodi's and Thunder's median reading self-efficacy scores increased, from 1-(*I can't*) to 3-(*sometimes can*), and 2-(*barely can*) to 4-

(*mostly can*), respectively. Jessie's reading self-efficacy continued to be over-calibrated for the comprehension skills in comparison to her Probe 2 scores at post-intervention; whereas Foz, Rodi and Thunder's scores, demonstrated closer calibration to ability.

### **Chapter summary**

None of the children in this study had been using phonological, orthographic knowledge or spelling rules to spell words prior to the intervention. For Foz, Rodi and Thunder, word decoding was inhibited by using inefficient visual memory strategies to decode or they avoided trying. Jessie was efficient at decoding, but like Rodi and Thunder, did not have sufficient semantic knowledge to understand text. None of the children knew what strategies to apply to correct comprehension breakdowns. All of the children demonstrated improvements in their word decoding ability, three children improved in spelling age. All four reported that learning to recognise orthographic patterns and learning spelling rules simplified both spelling and decoding words. Increases in comprehension age occurred for only Foz and Rodi. All four reported increased motivation to look word meanings up, after having an explicit explanation of importance of semantics to understanding text. They also reported learning how to monitor comprehension; how to use the text to find clues, and how to make inferences from text clues, made understanding easier and reading more enjoyable. Median self-efficacy for spelling and reading remained the same for Jessie and Foz, while Rodi's and Thunder's both increased. Self-efficacy judgements for Foz and Rodi were re-calibrated closer to actual ability at post-intervention, Jessie still over-estimated her comprehension capability and Thunder his spelling capability. All four reported they believed they could improve with practice of the skills they had learnt.

## Chapter five

### Discussion

The objective of this study was to investigate the impact of a phonics and comprehension skills-based literacy intervention on spelling, word decoding, reading comprehension and self-efficacy for struggling adolescent spellers and readers. Each of the research questions is discussed in this chapter, situating the results of this study within the body of wider research evidence and literature.

*Question 1. How and why does a phonics and comprehension skills-based literacy intervention programme impact spelling, word decoding and comprehension for poor spellers and readers?*

The focus of the intervention was to explicitly teach the children grapheme-phoneme relationships. The intervention had the most impact on word decoding, with reading ages increasing for all four students, between 8 to 20 months. This finding is consistent with existing research which has found that through improving children's phonic knowledge, word decoding ability is increased (Conrad, 2008; Kirk & Gillon, 2009; Ryder et al., 2008). English is written using the alphabetic code, where alphabetic symbols represent the sounds we make in speech. It is the knowledge of how letters and letter patterns are translated into phonological forms, which provides children with insight into how to use the alphabetic code (Neilson, 2009). Therefore, by directly developing the children's phonic knowledge they gained the knowledge they required to sound out unknown words.

While all of the children had been exposed to a phonics-based spelling programme, three of the children had not used their knowledge of grapheme-phoneme relationships

to decode unknown words. This highlights an important consideration, in that it cannot be presumed that children will know to transfer their orthographic-phonological skills to reading and spelling (Adams, 2009). Another important finding was that unless children can recognise the words on a page, they will not be able to access the phonological constituents of words. This was powerfully demonstrated in this study, although all the children had access to a wide range of text, and had been taught grapheme-phoneme relationships they still could not instinctively work-out letter sound rules from reading (Tunmer & Nicholson, 2011).

This study was able to demonstrate that as the children gained knowledge of orthographic patterns and how to use them they were then able to transfer this information to other words, speeding up their decoding and word recognition of similarly spelt words. This finding was consistent with research which has identified; the application of phonic knowledge to decipher unfamiliar words facilitates the self-learning of new sight words; which speeds up automatic word recognition, and fluency (Arrow & Tunmer, 2012).

At post-intervention, SAST spelling ages increased for three students between 2 to 24 months. The two children with the highest increases demonstrated more proficiency in applying their phoneme-grapheme knowledge to spelling than the other two children during the intervention. This superior recoding ability and increased spelling outcome signal the important role of phonic knowledge to spelling, and why it should be taught (Allcock, 2005; Apel et al., 2014). Applying spelling rules took longer for the students to master. The difficulty experienced in spelling, further highlighted the important role of explicitly teaching these skills and not leaving their learning to chance.

This study's findings were consistent with Graham and Santangelo's (2014) meta-analysis study of spelling instructional methods which found that direct explicit

instruction of orthographic and phonological knowledge best supports spelling ability. The children all reported that learning the orthographic patterns in words and spelling rules enabled them to better remember the grapheme-phoneme relationships, which facilitated their ability to spell the sounds they heard. This finding is consistent with the view that English conventions are not chaotic and irregular (Greaney & Arrow, 2009). Furthermore, as with Conrad's (2008) study, grapheme-phoneme spelling knowledge facilitated the transfer this knowledge to reading and spelling unknown words.

Prior to intervention none of the children reported using comprehension strategies. This was likely because, all their cognitive energy had been focused on trying to decipher the words, or they did not know they needed to, or because they did not know how.

Consistent with the Greaney, Tunmer, & Chapman, (1997) and Ryder et al., (2008) studies, all of the children reported phonological decoding of unknown words promoted retrieval of semantic meaning from lexical memory; which freed-up energy for strategy use. As existing research recommends (Perfetti et al., 2007), it was essential to explicitly show the students when and where to use comprehension strategies, as well as the benefits of using them.

Unlike the Manset-Williamson and Nelson (2005) study, which found significant changes in reading comprehension following skill instruction; in this study, changes in reading comprehension age occurred for only two of the children at post-intervention. Due to time constraints, only a maximum of five books were read, therefore there was limited skills practice. Analysis of errors on the Probe2 assessments, identified word decoding errors, vocabulary errors and inferencing errors occurred. Inferencing errors could be understood in relation to the cyclical relationship between accurate word decoding, vocabulary development, and comprehension; inferencing cannot occur when word meanings cannot be accessed due to incorrect words decoding, or low vocabulary (Perfetti et al., 2007). Vocabulary development for the four children was compromised



through their avoidance of word decoding, and reading for meaning. All four reported and increased *standard for coherence* for reading. Reading research suggests that, as word decoding improves along with the application of comprehension strategies, both vocabulary and comprehension will improve (Perfetti et al., 2007). Therefore it is not unreasonable to expect comprehension to improve over time, if the students continue to use the skills taught. This belief was also declared by the students themselves.

*Question 2. How and why does a phonics and comprehension skills-based literacy intervention programme impact on self-efficacy in spelling and reading?*

Consistent with Shaw and Berg's (2008) study, all four students stated at the interview that phonological skills instruction had improved their capability to spell and decode, therefore provided them with the opportunity to experience mastery in spelling and decoding. Foz, Rodi and Thunder made their post-intervention spelling and decoding self-efficacy judgements based on the fact they were no-longer avoiding decoding, or spelling difficult words; hence self-efficacy for some items either did not increase, or decreased. While decoding self-efficacy only increased for one student, and spelling self-efficacy for two students; all four reported self-efficacy that was more congruent with spelling and decoding ability at post-intervention. All four students reported that their increased decoding ability enhanced their access to meanings, also providing mastery experiences in comprehension, which enabled them to make more accurate judgements of capability. This was because they could better recognise the sounds in words which triggered their lexical memory, as literacy research identified would occur (Arrow & Tunmer, 2012). These findings are consistent with Klassen's (2007) research which found that, once students are aware of which skills support task proficiency, they are then better able to judge their actual task performance.

The children stated in their interviews that learning what comprehension strategies they could use and when to use them, improved their understanding and enjoyment in reading. Reading comprehension requires multiple skills and takes time to integrate these skills (Duke & Carlie, 2011) and scores for individual items on the reading self-efficacy reflected this. However all the children reported that, knowing they knew which comprehension strategies to use to correct reading problems increased their confidence that, they could improve their understanding overtime. This finding was congruent with the Chambers Cantrell et al (2013) study, of sources of self-efficacy for struggling college age readers. As a result of the children's improved knowledge of comprehension skills and experience of applying them, the children reported higher *standards for coherence* for reading during their interviews. As self-efficacy research has demonstrated, an accurate awareness of performance and the skills required for a task is essential for children to manage and correct faulty performance (Zimmerman & Cleary, 2006).

### **Chapter summary**

Directly, and explicitly teaching phonic skills to the four struggling spellers and readers increased their word decoding ages by between 8 to 20 months. Teaching the children how to use their knowledge of phonic parts facilitated the sounding out of unknown words, and acted as a self-teaching system for new sight words, and to a lesser extent improved spelling. This study was also able to demonstrate that it cannot be presumed that learning phonic parts automatically arises from immersion in text; or that it will occur to children to transfer their phonic knowledge skills to spelling and reading, or between words. Comprehension skill development improves understanding and enjoyment in reading and *standards for coherence*, which promotes practice and proficiency. Instruction in phonic and comprehension skills increases the struggling spellers and readers awareness of which skills support corrective performance, this enabled them to

make more accurate judgements about their actual performance. The children's knowledge that they knew which skills promoted successful spelling and reading, provided the children with reason to believe that they will improve their spelling and reading with time.

## **Chapter six**

### **Conclusion**

This chapter will commence with a summary of the study findings. This is followed by a discussion of the implications of the study and recommendations resulting from those implications. Next is a discussion of limitations of the study, and considerations for future research. The chapter closes with the conclusions of the study.

#### **Summary of findings**

At pre-intervention, decoding was acting as a barrier to reading comprehension for all the children. This was either due to decoding being understood as the purpose for reading, or because decoding failure was blocking word meanings. Three of four children were attempting to decode using partial-phonetic knowledge to decode. For word decoding to improve, these children needed to be explicitly shown how to translate letter patterns into their phonological form. English is written using the alphabetic code, where alphabetic symbols (grapheme) represent the sounds (phoneme) we make in speech. The children did not automatically or instinctively know how to use the code; they had to be taught (Adams, 2009; Tunmer & Nicholson, 2011). All four demonstrated and reported that being taught the regularities in the structure of the words, and the rules which governed their spelling, simplified decoding (Allcock, 2005); and removed the guess-work of decoding. It allowed for the transfer of known orthographic patterns to decode unknown words. This provided a phonological feedback, which stimulated their lexical memory of word meanings (where meanings were known) (Arrow & Tunmer, 2012; Pressley, 2006).

Spelling is more difficult than decoding; as was demonstrated in this study. Spelling requires a synthesis from memory of phonological, orthographic, morphological, and

semantic knowledge to spell correctly, whereas in decoding these constituents are visually present (Moats, 2009). Although only three children increased their spelling age, all four children demonstrated and reported that being taught the regularities in the structure of the words, and the rules which governed their spelling, simplified spelling (Allcock, 2005); as it heightened the predictability of spellings.

The *standard for coherence* in reading was low for these four students, due to a lack of awareness of purpose, or due to deficit in word decoding, or vocabulary, or both. All four children had reported not knowing how to correct comprehension break-downs. The students reported their *standard for coherence* was increased by improving word decoding, and explicit explanation of the purpose of reading and the importance of word meanings to comprehension. Because word decoding had been a barrier to accessing word meaning, the children had not had the opportunity to learn about or apply comprehension strategies. Once the children had been explicitly shown which skills to use and how to apply them to their reading, the children reported increased understanding of text and enjoyment in reading.

Low or overly-optimistic self-efficacy for these four children was due to the students not knowing which skills to apply to be proficient in their spelling, decoding or comprehension tasks. Through teaching the children to use phonic and comprehension skills they experienced more success in their spelling and reading. As a result of their increased knowledge of which skills to apply to be proficient, the children were able to make more accurate judgements of ability. Being able to make accurate judgements of proficiency and having knowledge of which skills and strategies to apply to increase proficiency provided the children with a belief that they could increase their competence in the future.

### **Implications and recommendations**

As this study demonstrated, it cannot be assumed that children will know which skills they must apply to be proficient in spelling and reading. Not all children will automatically and instinctively work out how speech maps onto letters or letter patterns (Tunmer & Nicholson, 2011). Directly and explicitly teaching phonological skills removes the ambiguity of how the alphabetic system works (Allcock, 2009). Not all competent decoders will know which skills they must apply to comprehend or to fix comprehension break-down (Perfetti et al., 2007). Once again, explicit instruction will be required for these children. If adolescent children have not responded to their spelling and reading instruction so far, then corrective intervention must ensure that whatever is blocking progress is addressed.

Learning phonic and comprehension skills provided the children with authentic success. Although not all reported self-efficacy items increased, the children reported, that knowing what to do when spelling or reading broke-down provided them with a belief that they could improve their spelling and reading outcomes in the future.

The recommendations that come from this study are: if struggling adolescent children's specific difficulties in spelling and reading are to be addressed, intervention must be assessment driven; as knowledge of what the specific difficulties are will indicate what help will make a change (Fuchs & Fuchs, 2006). Where phonological awareness is the cause of spelling and reading problems, direct and explicit instruction in phonological awareness must be taught. Teachers must then ensure that children understand they can use their phonological awareness to both spell and decode. When children can decode but do not understand in reading, children must be made aware of the importance of vocabulary knowledge to understanding. They need to be explicitly shown how to monitor comprehension; use text to confirm word meanings; use prior knowledge and text clues to infer meaning. An accurate knowledge of which skills promote success

in spelling and reading provides a platform from which struggling adolescents can monitor and correct their errors (Zimmerman & Cleary, 2006). As well as directly targeting spelling and reading needs, interventions also need to be of sufficient length and intensity to ensure that struggling adolescents have sufficient opportunity for success in using the spelling and reading skills, to ensure self-efficacy is authentically raised (Wentzel & Brophy, 2014).

### **Limitations of the research**

The focus of case study research is on an in-depth exploration of specific participants in a particular context. The study was limited to these four participants, for the purpose of this study four students was deemed sufficient to inform the researcher of the impact of skills training on spelling, reading and self-efficacy of struggling adolescents. This researcher has strived to provide an accurate and full description of the context and setting, to assist the reader to determine the degree to which similarities between the participants and context of this study and other groups and contexts may support transferability of findings.

The study was constrained by time, as the intervention project was required to be completed within 8 weeks. There was insufficient time to teach all of the age specific spelling knowledge tested on the SAST. Additionally, the children read only 5 to 6 books, while the children demonstrated increased strategy use, more practice in reading would have allowed for better consolidation of skills. Time constraints therefore reduced the opportunity for both consolidation of skills and opportunities for mastery experiences, from which greater increases in self-efficacy might have been seen.

### **Considerations for future research**

Spelling and reading are complex tasks, with proficiency taking time to develop. There are cyclical relationships between spelling and reading, and between reading sub-tasks. Follow-up measures would provide additional evidence for the impact of skills training on spelling and reading outcomes and self-efficacy as proficiency develops. The transferability of skills to the classroom environment is another area to investigate.

### **Conclusion**

The aim of this study was to understand how and why phonic and comprehension skills instruction impacts on spelling and reading and self-efficacy in these literacy tasks. The finding of this study was that these four children did not know how to use phonic knowledge to spell or decode words, and consequently could not activate meanings in words when reading. Learning to use phonic knowledge and spelling rules simplified spelling and word decoding because it removed the ambiguity of how the alphabetic code works. Phonic knowledge enabled the children to become more proficient and allowed them to become more self-sufficient in their spelling and reading. Reading comprehension skill development was impaired due to word decoding, vocabulary barriers and no skill awareness for these children. Awareness of comprehension skills, and the strategies for when comprehension breaks-down, supported the children's beliefs that they could improve their understanding overtime.

Positive self-efficacy is important for children's learning as it supports motivation to manage and correct faulty performance. To be successful in a task requires an accurate awareness of what a task entails and an accurate judgment of performance. While the children's self-efficacy judgments were that they expected the tasks of spelling and reading to be difficult, they reported increased confidence in their ability to apply the skills and strategies required to fix their spelling and reading difficulties. This study was



able to demonstrate that building the children's grapheme-phoneme knowledge and comprehension skills knowledge supported both the development of proficient spelling and reading skills, and motivation to persevere and correct faulty performance, from which increased self-efficacy can develop.

## References

- Adams, M. J. (2009). Decodable text: why, when, and how? In E. H. Hiebert & M. Sailors (Eds.), *Finding the right texts: what works for beginning and struggling readers* (pp. 23-46): New York: Guilford Press, c2009.
- Al Otaiba, S., Kosanovich, M., & Torgesen, J., K. (2012). Assessment and instruction for phonemic awareness and word recognition skills. In H. Catts & A. Kamhi (Eds.), *Language and reading disabilities* (3rd ed., pp. 112-145). Boston: Pearson.
- Allcock, J. (2005). Teach students how words work and lay the foundations for literacy success. Retrieved from <http://www.spelling.co.nz/Downloads/Teach%20Students%20How%20Words%20Work.pdf>
- Allcock, J. (2009). *Spelling under scrutiny* (Rev. ed.). Paremata, N.Z.: M.J.A. Publishing.
- Apel, K., Masterson, J., & Brimo, D. (2014). Spelling assessment and intervention: A multiple linguistic approach to improving literacy outcomes. In A. Kamhi & H. Catts (Eds.), *Language and reading disabilities: International Edition* (3rd ed., pp. 152-169). Harlow, England: Pearson.
- Arrow, A., & Tunmer, W. (2012). Contemporary reading acquisition theory: The conceptual basis for differentiated reading instruction. In S. Suggate & E. Reese (Eds.), *Contemporary debates in childhood education and development* (pp. 241-249). Milton Park, Abingdon, Oxon New York: Routledge.
- Ary, D., Chester Jacobs, L., Sorensen, C., & Walker, D. (2014). *Introduction to research in education* (9th ed.). Belmont, Calif.: Wadsworth Cengage Learning.
- Bandura, A. (2006). Guide to creating self-efficacy scales. In F. Pajares & T. C. Urdan (Eds.), *Self-efficacy beliefs of adolescents* (pp. 307-337). Greenwich, CT: IAP - Information Age Pub. Inc.

- Barone, D. (2011). Case study research. In N. K. Duke & M. H. Mallette (Eds.), *Literacy research methodologies* (2nd ed., pp. 7-27). New York: Guilford Press.
- Bissaker, K., & Westwood, P. (2006). Diagnostic uses of the South Australian spelling test. *Australian Journal of Learning Disabilities, 11*(1), 25-33.
- Bong, M. (2006). Asking the right question: How confident are you that you could successfully perform these tasks? In F. Pajares & T. C. Urdan (Eds.), *Self-efficacy beliefs of adolescents* (pp. 287-305). Greenwich, CT: IAP - Information Age Pub. Inc.
- Brann, B., & Hattie, J. (1995). Spelling instruction in primary schools. *New Zealand Journal of Educational Studies*.
- Burden, R. (2005). *Dyslexia and self-concept: Seeking a dyslexic identity*. London: Wiley.
- Byrne, B. (2007). Theories of learning to read. In M. J. Snowling & C. Hulme (Eds.), *The science of reading: a handbook* (pp. 104-119). Malden, MA: Blackwell Pub.
- Cain, K., & Oakhill, J. (1999). Inference making ability and its relation to comprehension failure in young children. *Reading and Writing, 11*(5-6), 489-503.  
doi:10.1023/a:1008084120205
- Chamberlain, M. (2013). *PIRLS 2010/11 in New Zealand: An overview of findings from the third cycle of the Progress in International Reading Literacy Study (PIRLS)*. Wellington: Ministry of Education Retrieved from <http://www.educationcounts.govt.nz/publications/series/2539/114981/125051>.
- Chambers Cantrell, S., Correll, P., Clouse, J., Creech, K., Bridges, S., & Owens, D. (2013). Patterns of self-efficacy among college students in developmental reading. *Journal of College Reading & Learning, 44*(1), 8-34. doi:10.1080/10790195.2013.10850370
- Chapman, J., Greaney, K., & Tunmer, W. (2015). Is Reading Recovery an effective early literacy intervention programme for children who most need literacy supports? In W. Tunmer & J. Chapman (Eds.), *Excellence and equity in literacy education. [electronic resource] ; the case of New Zealand* (pp. 41-70): Basingstoke, Palgrave Macmillan, 2015. Retrieved from

- <http://ezproxy.massey.ac.nz/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=cat00245a&AN=massey.b3408203&site=eds-live&scope=site>
- <http://ezproxy.massey.ac.nz/login?url=http://link.springer.com/10.1057/9781137415578>.
- Chapman, J., Tunmer, W., & Prochnow, J. (2001). Does success in the reading recovery program depend on developing proficiency in phonological-processing skills? A longitudinal study in a whole language instructional context. *Scientific Studies of Reading*, 5(2), 141-176.
- Clay, M. M. (1991). *Becoming literate: the construction of inner control*. Auckland N.Z.: Heinemann.
- Clay, M. M. (1998). *An observation survey of early literacy achievement* (Third edition. ed.) Auckland N.Z.: Heinemann.
- Cohen, L., Manion, L., & Morrison, K. (2011). *Research methods in education* (7th ed.). Abingdon, Oxon New York: Routledge.
- Conrad, N. J. (2008). From reading to spelling and spelling to reading: Transfer goes both ways. *Journal of Educational Psychology*, 100(4), 869-878. doi:10.1037/a0012544
- Creswell, J. W. (2013). *Qualitative inquiry & research design: Choosing among five approaches* (3rd ed.). Los Angeles: SAGE Publications.
- Curtis, M. (2009). Teaching adolescents who struggle with texts: Research and practice. In E. H. Hiebert & M. Sailors (Eds.), *Finding the right texts: What works for beginning and struggling readers* (pp. 227-249): New York: Guilford Press, 2009.
- Duke, N., & Carlie, J. (2011). The development of comprehension. In M. L. Kamil, P. D. Pearson, E. Birr Moje, & P. Afflerbach (Eds.), *Handbook of reading research* (Vol. IV, pp. 199-228). New York: Longman.
- Ehri, L. (2000). Learning to read and learning to spell: Two sides of a coin. *Topics in Language Disorders*, 20(3), 19-36.
- Ehri, L. (2007). Development of sight word reading: Phases and findings. In M. J. Snowling & C. Hulme (Eds.). *The science of reading: a handbook* (pp. 135-154). Malden, MA: Blackwell Pub.

- Ehri, L. (2014). Orthographic mapping in the acquisition of sight word reading, spelling memory, and vocabulary learning. *Scientific Studies of Reading, 18*(1), 5-21.
- Ehri, L., Satlow, E., & Gaskins, I. (2009). Grapho-phonemic enrichment strengthens keyword analogy instruction for struggling young readers. *Reading & Writing Quarterly, 25*(2-3), 162-191.
- Fletcher, J., Parkhill, F., Fa'afai, A., & Taleni, T. (2010). Motivating Pasifika students in literacy learning. In J. Fletcher, F. Parkhill, & G. Gillon (Eds.), *Motivating literacy learners in today's world* (pp. 148). Wellington, N.Z.: NZCER Press.
- Frankel, K., Pearson, P. D., & Nair, M. (2011). Reading comprehension and reading disability. In A. McGill-Franzen & R. L. Allington (Eds.), *Handbook of reading disability research* (pp. 219-231). New York: Routledge.
- Fuchs, D., & Fuchs, L. S. (2006). Introduction to Response to Intervention: What, Why, and How Valid Is It?, 93.
- Gay, L. R., Mills, G. E., & Airasian, P. W. (2006). *Educational research: competencies for analysis and applications* (8th ed.). Upper Saddle River, N.J.: Pearson Merrill Prentice Hall.
- Gillon, G. (2004). *Phonological awareness: from research to practice challenges in language and literacy*. Retrieved from <http://ezproxy.massey.ac.nz/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=cat00245a&AN=massey.b2769658&site=eds-live&scope=site>
- <http://ezproxy.massey.ac.nz/login?url=http://massey.ebib.com.au/patron/FullRecord.aspx?p=849051>
- Gillon, G., & Mc Neill, B. (2010). Phonological awareness: Motivating early literacy success. In J. Fletcher, F. Parkhill, & G. T. Gillon (Eds.), *Motivating literacy learners in today's world* (pp. 148). Wellington, N.Z.: NZCER Press.
- Gilmore, Croft, & Reid, G. (1981). Burt word reading test - New Zealand Revision. Retrieved from <http://toolselector.tki.org.nz/Assessment-areas/English/Reading>

- Goodman, Y. M., & Goodman, K. (2007). Whole language: Alive and well. In M. Taylor (Ed.), *Whole language teaching, whole-hearted practice: Looking back, looking forward* (pp. 202-211). New York: Peter Lang.
- Gough, P., & Tunmer, W. (1986). Decoding, reading, and reading disability. *Remedial and Special Education (RASE)*, 7(1), 6-10.
- Graham, S., & Santangelo, T. (2014). Does spelling instruction make students better spellers, readers, and writers? A meta-analytic review. *Reading & Writing*, 27(9), 1703-1743. doi:10.1007/s11145-014-9517-0
- Greaney, K. (2003). *First to fourth to thirteenth and (in all probability), still dropping? New Zealand's international literacy results: Some personal thoughts about the reasons for the 'gap'*. A paper presented at the New Zealand & Australian Association of Research in Education Conference Auckland, New Zealand.  
<http://www.aare.edu.au/publications-database.php/3805/first-to-fourth-to-thirteenth-and-in-all-probability-still-dropping-new-zealands-international-liter>
- Greaney, K. (2004). Factors affecting PAT reading comprehension performance: a retrospective analysis of some year 4-6 data. *New Zealand Journal of Educational Studies*, 1, 3-21.
- Greaney, K. (2011). The multiple cues or "searchlights" word recognition theory: implications for reading recovery. *Perspectives on Language and Literacy*, 37(4), 15-18.
- Greaney, K., & Arrow, A. (2009). An analysis of year 4 and year 8 spelling errors from an expressive writing task in the 2006 National Education Monitoring Project. *Kairaranga*, 31-36.
- Greaney, K., & Arrow, A. (2012). Phonological-based assessment and teaching within a first year reading program in New Zealand. *Australian Journal of Language and Literacy*, 35(1), 9-32.
- Greaney, K., Tunmer, W., & Chapman, J. (1997). Effects of rime-based orthographic analogy training on the word recognition skills of children with reading disability. *Journal of Educational Psychology*, 89(4), 645-651.

- Hogan, T. P., Bridges, M. S., Justice, L. M., & Cain, K. (2011). Increasing higher level language skills to improve reading comprehension. *Focus on Exceptional Children*, 44(3), 1-20.
- Kamhi, A. (2012). Perspectives on assessing and improving reading comprehension. In A. Kamhi & H. Catts (Eds.), *Language and reading disabilities* (3rd ed., pp. 172-188). Boston: Pearson.
- Kintsch, W., & Rawson, K. (2007). Comprehension. In M. Snowling & C. Hulme (Eds.), *The science of reading: a handbook* (pp. 209-226). Malden, MA: Blackwell Pub.
- Kirk, C., & Gillon, G. (2009). Integrated morphological awareness Intervention as a tool for improving literacy. *Language, Speech, and Hearing Services in Schools*, 40(3), 341-351. doi:0161-1461/09/4003-0341
- Klassen, R. (2006). Too much confidence? The self-efficacy of adolescents with learning disabilities. In F. Pajares & T. C. Urdan (Eds.), *Self-efficacy beliefs of adolescents* (pp. 181-200). Greenwich, CT: IAP - Information Age Pub. Inc.
- Klassen, R. (2007). Using predictions to learn about the self-efficacy of early adolescents with and without learning disabilities. *Contemporary Educational Psychology*, 32(2), 173-187. doi:10.1016/j.cedpsych.2006.10.001
- Magee, J. (Ed.) (2011). *New to New Zealand: Ethnic communities in Aotearoa: a handbook* (5th ed.). Hamilton, N.Z.: Ethnic New Zealand Trust.
- Manset-Williamson, G., & Nelson, J. M. (2005). Balanced, strategic reading instruction for upper-elementary and middle school students with reading disabilities: A comparative study of two approaches. *Learning Disability Quarterly*, 28(1), 59-74. doi:10.2307/4126973
- Massey University. (2015, 2013, April, 08). Code of Ethical conduct for research, teaching and evaluations involving human participants. Retrieved from <http://www.massey.ac.nz/massey/fms/Human%20Ethics/Documents/MUHEC%20Code%202013.pdf>

- McNeill, B., & Kirk, C. (2014). Theoretical beliefs and instructional practices used for teaching spelling in elementary classrooms. *Reading & Writing, 27*(3), 535-554.  
doi:10.1007/s11145-013-9457-0
- Ministry of Education. (2015b, 2 December 2015). Assessment tool selector. Retrieved from <http://assessment.tki.org.nz/Assessment-tools-resources/Assessment-tool-selector>
- Moats, L. (2009). Teaching spelling to students with language and learning disabilities. In G. A. Troia (Ed.), *Instruction and assessment for struggling writers: Evidence-based practices* (pp. 269-289). New York: Guilford Press.
- Morgan, P. L., Farkas, G., Tufis, P. A., & Sperling, R. A. (2008). Are reading and behaviour problems risk factors for each other? *Journal of Learning Disabilities, 41*(5), 417-436.
- Nation, K. (2007). Children's reading comprehension difficulties. In M. Snowling & C. Hulme (Eds.), *The science of reading: A handbook* (pp. 248-265). Malden, MA: Blackwell Pub.
- Neilson, R. (2009). Assessment of phonological awareness in low-progress readers. *Australian Journal of Learning Difficulties, 14*(1), 53-66.  
doi:10.1080/19404150902783427
- Nicholson, T., & Dymock, S. (2015). *The New Zealand dyslexia handbook*. Wellington, NZ: NZCER Press.
- Ouellette, G., & Senechal, M. (2008). Pathways to Literacy: A study of invented spelling and its role in learning to read. *Child Development, 79*(4), 899-913.
- Pajares, F. (2006). Self-efficacy during childhood and adolescence: Implications for teachers and parents In F. Pajares & T. C. Urdan (Eds.), *Self-efficacy beliefs of adolescents* (pp. 339-367): IAP - Information Age Pub.
- Paris, S., & Hamilton, E. (2009). The development of children's reading comprehension. In S. E. Israel & G. G. Duffy (Eds.), *Handbook of research on reading comprehension* (pp. 32-53). New York: Routledge.
- Parkin, C., & Parkin, C. (2011). *PROBE 2: Reading comprehension assessment kit*. Wellington, N.Z.: Triune Initiatives.



- Perfetti, C. (2007). Reading ability: Lexical quality to comprehension. *Scientific Studies of Reading, 11*(4), 357-383.
- Perfetti, C., Landi, N., & Oakhill, J. (2007). The acquisition of reading comprehension skill. In M. J. Snowling & C. Hulme (Eds.), *The science of reading: a handbook* (pp. 227-247). Malden, MA: Blackwell Pub.
- Piercey, R. (2013). *Reading self-efficacy in early adolescence: which measure works best?* (Doctoral dissertation), University of Kentucky. Retrieved from Kentucky University's electronic Theses and Disertations [http://uknowledge.uky.edu/edp\\_etds/10/](http://uknowledge.uky.edu/edp_etds/10/)
- Pressley, M. (2006). *Reading instruction that works: The case for balanced teaching* (3rd ed.). New York: Guilford Press.
- Prochnow, J., Tunmer, W., & Chapman, J. (2013). A longitudinal investigation of the influence of literacy-related skills, reading self-perceptions, and inattentive behaviours on the development of literacy learning difficulties. *International Journal of Disability, Development & Education, 60*(3), 185-207.  
doi:10.1080/1034912x.2013.812188
- Rankin, J. L., Bruning, R. H., & Timme, V. L. (1994). The development of beliefs about spelling and their relationship to spelling performance. *Applied Cognitive Psychology, 8*(3), 213-232. doi:10.1002/acp.2350080303
- Reynolds, M., & Wheldall, K. (2007). Reading Recovery 20 years down the track: Looking forward, looking back. *International Journal of Disability, Development and Education, 54*(2), 199-223. doi:10.1080/10349120701330503
- Richardson, E., & Di Benedetto, B. (1985). The Pseudoword naming task *Decoding Skills Test*. Retrieved from <https://www.sedl.org/cgi-bin/mysql/rad.cgi?searchid=210>
- Roberts, T. A., Christo, C., & Shefelbine, J. A. (2011). Word recognition. In M. L. Kamil, P. D. Pearson, E. Birr Moje, & P. Afflerbach (Eds.), *Handbook of reading research* (Vol. IV, pp. 229-258). New York: Routledge.
- Rodis, P., Garrod, A., & Boscardin, M. L. (Eds.). (2001). *Learning disabilities & life stories*. Needham Heights, MA: Allyn & Bacon.

- Ryder, J., Tunmer, W., & Greaney, K. (2008). Explicit instruction in phonemic awareness and phonemically based decoding skills as an intervention strategy for struggling readers in whole language classrooms. *Reading and Writing: An Interdisciplinary Journal*, 21(4), 349-369.
- Sattler, J. M., & Hodge, R. D. (2006). *Assessment of children: Behavioural, social and clinical foundations* (5th ed.). San Diego: J.M. Sattler.
- Schunk, D., & Meece, J. (2006). Self-efficacy development in adolescence. In F. Pajares & T. C. Urdan (Eds.), *Self-efficacy beliefs of adolescents* (pp. 71-96). Greenwich, CT: IAP - Information Age Pub.
- Sewell, B. (2015). *Agility with Sound: Manual*. Christchurch, New Zealand: Agility with Sound Ltd.
- Shahar-Yames, D., & Share, D. L. (2008). Spelling as a self-teaching mechanism in orthographic learning. *Journal of Research in Reading*, 31(1), 22-39.  
doi:10.1111/j.1467-9817.2007.00359.x
- Shankweiler, D., & Fowler, A. E. (2004). Questions people ask about the role of phonological processes in learning to read. *Reading & Writing*, 17(5), 483-515.
- Share, D. L. (1995). Phonological recoding and self-teaching: sine qua non of reading acquisition. *Cognition*, 55(2), 151-218.
- Shaw, D. M., & Berg, M. A. (2008). Effects of a Word Study Intervention on Spelling Accuracy among Low-Literate Adults. *Adult Basic Education and Literacy Journal*, 2(3), 131-139.
- Smith, J. W. A., & Elley, W. B. (1997). *How children learn to read: Insights from the New Zealand experience*. Auckland, N.Z.: Longman.
- Snow, C. (2010). Reading comprehension: Reading for learning. In P. L. Peterson, E. L. Baker, & B. McGaw (Eds.), *International encyclopaedia of education* (3rd ed., pp. 413-418). Oxford: Elsevier.
- Spear-Swerling, L., & Sternberg, R. L. (1996). *Roads to reading disability. Off track: When poor readers become "learning disabled"*. Boulder, CO: Westview Press.

- Stake, R. E. (2005). *Multiple case study analysis*. New York: The Guilford Press.
- Stanovich, K. E. (1986). Matthew effects in reading: Some consequences of individual differences in the acquisition of literacy. *Reading Research Quarterly*, 21(4), 360-407.
- Stuart, M., Stainthorp, R., & Snowling, M. (2008). Literacy as a complex activity: deconstructing the Simple View of Reading. *Literacy*, 42(2), 59-66.
- Sutherland, K. S., Lewis-Palmer, T., Stichter, J., & Morgan, P. L. (2008). Examining the influence of teacher behaviour and classroom context on the behavioural and academic outcomes for students with emotional or behavioural disorders. *Journal of Special Education*, 41(4), 223-233. doi:10.1177/0022466907310372
- Telford, M., & May, S. (2010). *PISA 2009: Our 21st century learners at age 15*. Wellington, NZ Retrieved from <http://www.educationcounts.govt.nz/publications/numeracy/PISA-2009/pisa-2009-our-21st-century-learners-at-age-15/an-overview-of-pisa>.
- Tunmer, W., Chapman, J., Greaney, K., Prochnow, J., & Arrow, A. (2013). Why the New Zealand National Literacy Strategy has failed and what can be done about it: Evidence from the Progress in International Reading Literacy Study (PIRLS) 2011 and Reading Recovery monitoring reports. *Australian Journal of Learning Difficulties*, 18(2), 139-180. doi:10.1080/19404158.2013.842134
- Tunmer, W., & Greaney, K. (2008). Reading intervention research: An integrated framework. In G. Reid, A. Fawcett, F. Manis, & L. Siegel (Eds.), *The saga handbook of dyslexia* (pp. 241-267). London: Sage.
- Tunmer, W., & Greaney, K. (2010). Defining Dyslexia. *Journal of Learning Disabilities*, 43(3), 229-243. doi:10.1177/0022219409345009
- Tunmer, W., & Nicholson, T. (2011). The development and teaching of word recognition skill. In M. L. Kamil, P. D. Pearson, E. B. Moje, & P. P. Afflerbach (Eds.), *Handbook of reading research* (Vol. IV, pp. 405-431). New York: Longman.
- Walpole, S., McKenna, M. C., & Philippakos, Z. A. (2011). *Differentiated reading instruction in grades 4 & 5 : strategies and resources*. New York: Guilford Press.

Wentzel, K. R., & Brophy, J. E. (2014). *Motivating students to learn* (4 ed.): New York: Routledge, 2014.

Westby, C. (2014). Assessing and remediation text-comprehension problems. In A. Kamhi & H. Catts (Eds.), *Language and reading disabilities* (3rd ed., pp. 189-251). Boston: Pearson.

Westwood, P., & Australian Council for Educational Research. (2005). Spelling approaches to teaching and assessment. 2nd. Retrieved from <http://ezproxy.massey.ac.nz/login?url=http://search.ebscohost.com/login.aspx?direct=true&scope=site&db=nlebk&db=nlabk&AN=147184>

Yin, R. K. (2014). *Case study research: Design and methods* (5th ed.). Los Angeles: SAGE.

Zimmerman, B. J., & Cleary, T. J. (2006). Adolescents' development of personal agency: The role of self-efficacy beliefs and self-regulatory skill. In F. Pajares & T. C. Urdan (Eds.), *Self-efficacy beliefs of adolescents* (pp. 45-69). Greenwich, CT: IAP - Information Age Pub. Inc.

## **Appendix A**

Massey University Human Ethics Committee approval.

Massey University Human Ethics Committee self-efficacy scale addition approval.

Invitation to participate letter for the principal and school board.

Principal information sheet.

Care-givers information sheet.

Participant information sheet.



**MASSEY UNIVERSITY**  
TE KUNENGA KI PŪREHUROA

30 October 2014

Melanie Nelson  
[REDACTED]  
[REDACTED]  
[REDACTED]

Dear Melanie

**Re: HEC: Southern A Application – 14/72**  
**Investigating the “Agility with Sound” programme as a literacy intervention for**  
**Maori and Pasifika learners**

Thank you for your letter dated 30 October 2014.

On behalf of the Massey University Human Ethics Committee: Southern A I am pleased to advise you that the ethics of your application are now approved. Approval is for three years. If this project has not been completed within three years from the date of this letter, reapproval must be requested.

If the nature, content, location, procedures or personnel of your approved application change, please advise the Secretary of the Committee.

Yours sincerely

Dr Brian Finch, Chair  
**Massey University Human Ethics Committee: Southern A**

cc: Mrs Vijaya Dharan  
Institute of Education  
PN500

Dr Keith Greaney  
Institute of Education  
PN500

A/Prof Sally Hansen, Director  
Institute of Education  
PN500

Mrs Roseanne MacGillivray  
Institute of Education  
PN500

---

Massey University Human Ethics Committee  
Accredited by the Health Research Council  
Research Ethics Office, Research and Enterprise

Massey University, Private Bag 11222, Palmerston North 4442, New Zealand T 06 3505573; 06 3505575 F 06 350 5622



MASSEY UNIVERSITY  
TE KUNENGA KI PŪREHUROA

31 May 2016

Melanie Nelson  
[REDACTED]  
[REDACTED]  
[REDACTED]

Dear Melanie

**Re: HEC: Southern A Application – 14/72**  
**Investigating the “Agility with Sound” programme as a literacy intervention for struggling readers**

Thank you for your letter dated 25 May 2016 outlining the change you wish to make to the above application.

The addition of a self-efficacy scale to the data collection has been approved and noted.

If the nature, content, location, procedures or personnel of your approved application change, please advise the Secretary of the Committee. If over time, more than one request to change the application is received, the Chair may request a new application.

Yours sincerely

Mr Jeremy Hubbard, Chair  
Massey University Human Ethics Committee: Southern A

cc Dr Alison Arrow  
Institute of Education  
PN500

Dr Maggie Hartnett  
Institute of Education  
PN500

Prof John O'Neill, Director  
Institute of Education  
PN500

Mrs Roseanne MacGillivray  
Institute of Education  
PN500

---

Massey University Human Ethics Committee  
Accredited by the Health Research Council

Research Ethics, Research and Enterprise

Massey University, Private Bag 11222, Palmerston North 4442, New Zealand T 06 951 6841; 06 951 6840  
E hmasethics@massey.ac.nz; alison.alathies@massey.ac.nz; jro@massey.ac.nz; www.massey.ac.nz

Dear Madam/Boards of Trustees

My name is Melanie Nelson. I am undertaking this study as part of a Master's Degree in Educational Psychology at Massey University. My study involves the use of a phonics-based literacy intervention, to improve the literacy outcomes of year 7 and 8 students, who are experiencing reading and spelling difficulties. This study has been approved by Massey University Human Ethics Committee, approval number 14/72. I would like to extend to your school and school community, an invitation to participate in this research.

If you agree to take part, I will request you to identify students who meet the selection criteria, which is:

- a) Students in years 7 and 8, who have been identified as being at least two years below their chronological age in reading and spelling.
- b) Students who are not in the ESOL register of the school.
- c) Students who do not exhibit significant behaviour problems.

The school will be asked to nominate staff members who will be able to act as cultural liaison person and interpreters when communicating with family/whānau. The school will be provided with information sheets to be given to family/whānau of the nominated students. Translated copies of information sheets in families/whānau first language can be arranged where needed.

The project is expected to start in term one of 2016, with the recruitment and obtaining of informed consent. The intervention will start the last week of term one, 2016, and run for 10 weeks until the end of term two. The project is expected to be completed by the end of term two 2016. An information sheet that outlines the project in detail is attached herewith.

A report for each individual participant will be written, and explained to the participants and their caregivers/whanau, and teachers. Additionally a meeting and summary of the results will be given and explained to the school.

Yours sincerely

Melanie Nelson



**How and why does a phonological skills-based literacy intervention impact on spelling, reading and self-efficacy for struggling adolescent learners?  
INFORMATION SHEET FOR PRINCIPALS AND BOARD OF TRUSTEES.**

My name is Melanie Nelson. I am undertaking this study as part of a Master's Degree in Educational Psychology at Massey University. My study involves the use of an intervention, to help improve the reading and spelling outcomes of year 7 and 8 students, who are experiencing difficulties in these subjects. I have eight years' experience in literacy intervention, and am specifically trained to teach the programme *Agility with Sound*.

**Project Description**

Studies show that most students who struggle with reading and spelling have difficulty in recognising the sounds in words; studies also show this can be overcome by direct, methodical instruction in how to identify these sounds. I will be working individually with selected students using a phonics-based intervention to improve the students' reading and spelling abilities for a period of eight weeks. The aim of my study is to assess whether this intensive phonics-based literacy intervention can improve the literacy outcomes of year 7 and 8 students who are experiencing difficulties in reading and spelling. Pre and post intervention tests of reading and spelling levels will be undertaken to measure the effectiveness of the intervention. Students' views of the intervention will also be sought.

*Agility with Sound* which is a new programme developed in New Zealand, is aimed at supporting older children who are struggling in their reading and spelling. This programme has been used in Intermediate schools in Christchurch details of which can be obtained on the programmes website <http://agilitywithsound.co.nz/>. Students who have had this intervention have been reported to show increases in reading levels measured by running records, e-asTTle reading levels, and Burt Word recognition test.

**Participant Identification and Recruitment selection**

Participants for the intervention will be four students who are not on the ESOL register of the school, who are two years below their chronological age in reading and spelling who have no significant behavioural difficulties. Your school will be requested to identify these students based on your assessment data. Due to the time commitment for the intervention, only four students will be selected to participate in the study. Identification and recruitment and pre testing of participants will be carried out during term one of 2016.

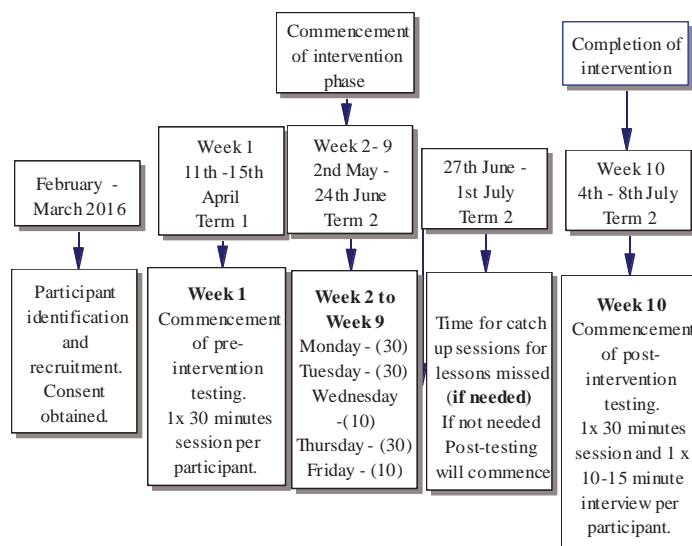
If you agree to participate, you will be provided with information sheets to be given to family/whānau of the nominated students. These can be translated into the families/whānau first language if needed. You will also be asked to nominate staff members who will act as the cultural liaison person for families/whānau and as interpreters, if needed. I will meet with the interested family/whānau along with your school cultural advisors to explain the project, and answer any further questions they may have. Once consent from family/whānau is obtained, then students will also be provided with the information about the study, to obtain their informed consent.

**Project Procedures and Timeline**

I will be working individually with the students the last week of term one to the end of term two, 2016. The programme will be fully implemented on site at school, and will involve a variety of activities to build word recognition skills and fluency in reading. Pre-intervention testing will be administered individually to gauge their reading and spelling levels, and to plan their intervention. During the intervention, each student will individually receive three 30 minute lessons, and two 10 minute fluency and revision lessons a week. They will also be given worksheets to take home, to practice reading the sounds they have learnt. At the completion of the eight week intervention, a post-test of their reading and spelling to find out the impact of the intervention will be administered; along with a 10 to 15 minutes interview to discuss their experience of participating in this intervention. All the sessions with students will occur outside their regular classroom in a school designated space.

The intervention is designed to align with classroom literacy instruction, with greater emphasis on the phonic-based literacy instruction. Therefore no discomfort, incapacitation, risk or harm is deemed likely. The timing and space for pre- and post-assessments and the actual intervention sessions will

be negotiated with classroom teachers to be least disruptive. I will be flexible with the timings of the lessons for every participant. I have allowed for an extra week, so that students do not miss important classroom activities, and time for unexpected events, such as student absence.



### Data Management

The information collected will be used primarily to write my Master's thesis. All the information collected during this study will only be accessed by me and my supervisors. It will be kept strictly confidential, stored in locked drawers in the researcher's office. All electronic data will be stored in password protected devices. All the collected information will be destroyed after five years.

A summary report for each individual student will be provided to the school and family/whānau. To protect the identity of students, their family/whānau and the school, no real names will be used throughout in the thesis and any published articles.

### Participant's Rights

*The following are the rights of all participants and they are under no obligation to accept this invitation. Those that agree to participate have the right to:*

- *withdraw from the study at any time during the intervention;*
- *ask any questions about the study at any time during participation;*
- *decline to answer any particular question during the end interview;*
- *request not to audio record the end interview;*
- *provide information on the understanding that their name will not be used (unless they give permission to the researcher)*
- *be given access to a summary of the project findings when it is concluded.*

### Project Contacts

Should you have any questions you are most welcome to contact myself on [REDACTED], or by email at [REDACTED].

Or my supervisors:

Dr Alison Arrow 06 356 9099 ext: 84460 email: A.W.Arrow@massey.ac.nz

Dr Maggie Hartnett 06 356 9099 ext: 84409 email: M.Hartnett@massey.ac.nz

This project has been reviewed and approved by the Massey University Human Ethics Committee: Southern A, Application 14/72. If you have any concerns about the conduct of this research, please contact Dr Brian Finch, Chair, Massey University Human Ethics Committee: Southern A, telephone 06 350 5799 x 84459, email humanethicsoutha@massey.ac.nz.

## **How and why does a phonological skills-based literacy intervention impact on spelling, reading and self-efficacy for struggling adolescent learners?**

### **FAMILY/WHĀNAU INFORMATION SHEET**

#### **Who am I**

My name is Melanie Nelson. I am undertaking this study as part of a Master's Degree in Educational Psychology at Massey University. My study involves the use of an intervention, to help improve the reading and spelling outcomes of year 7 and 8 students, who are experiencing difficulties in these subjects. I have eight years' experience in literacy intervention, have been trained, and am certified to teach the programme, for this intervention.

#### **What is this study about**

Studies show that most students who struggle with reading and spelling have difficulty in recognising the sounds in words; studies also show this can be overcome by direct, methodical instruction in how to identify these sounds. The intervention I will be using is *Agility with Sound* which is a new programme developed in New Zealand, aimed at supporting older children who are struggling in their reading and spelling. This programme has been used in intermediate schools in Christchurch.

#### **Who will be participating**

If you give your consent, your child will be one of four students involved in the study as they have been identified as being two years below their chronological age in reading and spelling and who do not have significant behaviour difficulties. The school has nominated your child, as they believe they might benefit from taking part in the intervention. I will meet with you along with (Name of staff member who will act as cultural advisor), if needed to explain the project and answer any further questions you may have with regards to the intervention. If you consent for your child's to participate, I will meet with them, to provide them with information about the study, and ask they would like to take part.

#### **What will happen during the study**

I will be working individually with your child in term 1 and term 2, 2016. The programme will be fully implemented on site at school, and will involve a variety of activities which focus on building the skills essential for reading and spelling proficiency.

**Week 1** - your child will be taken out of class for **30 minutes** to (room location), for testing of their reading and spelling, so that I can implement the appropriate intervention later.

**Week 2** - your child will be taken out of class to room (\_\_\_) for a **30 minute** lesson, **three times a week**. The intervention will include teaching your child the sounds in words, word reading and the skills to understand what they are reading. **For each of the two remaining days of the week** - I will be taking your child out of class for **10 minutes** to practice and build their fluency in reading.

**These lessons will continue for eight weeks.**

**Week 10** - they will be taken out of class to room (\_\_\_) for a **30 minute post-test** of their reading and spelling. This test is to find out the improvements they have made in reading and spelling compared to the beginning of the intervention.

**Following on from the post-test** I will also **spend about 10 to 15 minutes** talking to your child about their experience of participating in this intervention.

**During the eight weeks** when your child is having the lessons, they will be given worksheets to bring home. These are to practice reading the letter sounds they have learnt; could you please make sure your child reads these one to two times each day.

You may be concerned that withdrawing your child from their regular classroom lessons for long periods of time can have an impact on their learning. To ensure that your child does not miss important classroom lessons, I will meet with your child's teachers to plan suitable times for your child

to attend the testing and intervention lessons, so that it is the least disruptive to the classroom programme.

### **When will the study take place**

Pre-intervention testing will be done the last week of term one 2016, with the intervention commencing week 1 of term two. Post intervention testing and interviews will occur the last week of term two. I intend to complete the entire study by the end of term two, 2016. I have allowed for an extra week, to allow for unexpected events, such as your child being absent from school.

### **What will happen to the information gathered during the study**

The information collected will be used primarily to write my Master's thesis. All the information collected during this study will only be accessed by me and my supervisors. It will be kept strictly confidential, stored in locked drawers in the researcher's office. All electronic data will be stored in password protected devices. All the collected information will be destroyed after five years.

A summary report of your child's intervention will be provided to you and the school. To protect the identity of your child, your family/whānau and the school; no real names will be used throughout in the thesis and any published articles.

Should you wish the final report be translated into your language, it can be arranged.

### **What are your rights**

*You are under no obligation to accept this invitation. If you decide to participate, you have the right to:*

- *withdraw your child from the study at any time during participation;*
- *ask any questions about the study at any time during participation;*
- *request not to audio record the end interview;*
- *provide information on the understanding that your name will not be used (unless you give permission to the researcher);*
- *be given access to a summary of the project findings when it is concluded.*

*The following are the rights of your child; they are under no obligation to accept this invitation. Those that agree to participate have the right to:*

- *withdraw from the study at any time during the intervention;*
- *ask any questions about the study at any time during participation;*
- *decline to answer any particular question during the end interview;*
- *request not to audio record the end interview;*
- *provide information on the understanding that their name will not be used (unless they give permission to the researcher);*
- *be given access to a summary of the project findings when it is concluded.*

### **Who should you contact**

Should you have any questions you are most welcome to contact myself on [REDACTED], or by email at [REDACTED].

Or my supervisors:

Dr Alison Arrow 06 356 9099 ext: 84460 email: A.W.Arrow@massey.ac.nz

Dr Maggie Hartnett 06 356 9099 ext: 84409 email: M.Hartnett@massey.ac.nz

This project has been reviewed and approved by the Massey University Human Ethics Committee: Southern A, Application 14/72. If you have any concerns about the conduct of this research, please contact Dr Brian Finch, Chair, Massey University Human Ethics Committee: Southern A, telephone 06 350 5799 x 84459, email humanethicsoutha@massey.ac.nz.

## Investigating the *Agility with Sound* programme

### STUDENT INFORMATION SHEET

#### Hello (Student name)

My name is Melanie Nelson and I want to help you to become a better reader.

#### What we will be doing

In the last week of term 1, I will take you out of class, and you will do one short test of reading and spelling. We will also do one short test of reading and spelling at the end of term 2. During term 2, I will take you out of class 3 times each week for, learning to sound words, reading, picture drawing, worksheets, and some card games. For the other two days of each week we will do a 10 minute practice lesson together in your class.

#### ***You don't have to take part in this study if you don't want to. If you do decide to then:***

- *You can stop taking part in the study at any time;*
- *You can ask me or your parents any questions about the study at any time;*
- *You can say you don't want to answer question during our talk about the lessons;*
- *You can say you don't want me to record the talk;*
- *You can be sure that your name will not be used in any writing about this study;*
- *You can ask, and get, a written copy of the work we did for 8 weeks and the talk we had.*

## Appendix B

The *Agility with Sound* intervention overview

List of typical lesson tasks

### ***Agility with Sound Programme***

Lessons are designed to be implemented as either 30 minute or 10-15 minute lessons, using a number of different activities. It is recommended that no more than 5 minutes is spent on each activity. Fluency and reading practice are also encouraged to take place either at school or at home. <http://agilitywithsound.co.nz/> Retrieved October 3<sup>rd</sup> 2015.

The intervention always commences with a short diagnostic assessment to establish the baseline reading level of each child to ascertain the starting point in the intervention and where emphasis of the intervention should be placed. There are eight levels of intervention, each level is highly structured and sequenced; the manual provides scripted instruction for the tutor at each level.

There are a number of different activities in each level to practice letter-sound combinations and word recognition. Children read and spell, the sounds using, letter tiles; fluency reading sheet; sliders of word chunks and syllables; and word puzzles. Once children are able to recognise the letter-sounds patterns being taught in each level they then, begin to read the supplied books which contain the words just learnt.

To support comprehension the books are read with the teacher, who models and coaches the comprehension strategies of inferencing, monitoring, and using text structure; there is a teacher's edition for each book which guides using these skills. To monitor the children are using effective comprehension strategies, the activity of the text is discussed with the teacher, and there are spaces for the children to illustrate the text activity.

#### **The intervention**

The content of each session was dependent on the specific needs of each child.

##### Phonological awareness

Each lesson began with the introduction of 2 to 4 decodable words (e.g. monster). Using grapheme tiles the teacher and child practiced saying the sounds until the child could pronounce the entire phoneme correctly. For example the sounds in the words were manipulated by moving the tiles apart (e.g. m- on; st; er); removing tiles and asking the child to sound the parts present, and parts missing. The child was then asked to write the sounds on a whiteboard.

Word-chaining was another activity used to help the child identify and manipulate the sounds in words, and to reinforce these skills. Using the grapheme tiles, the child made the first word in the change then changes the letters to make the next word (e.g. get - net- not-hot), after using the tiles the child practiced writing and manipulating the words on the white board.

#### Onset-rimes

Fluency sheets, the purpose of these sheets was to teach the children to think of words as a series of known parts; to develop their skills of recognising the parts and processing them quickly. The children were shown how to break up the words, then asked to colour the word rimes, for example the 'at' part in all the words on the sheet. This sequence of activities was repeated for other rimes; each rime in a different colour. When suffixes were introduced, they were asked to colour these, for example 'ing', 'ed', 'er', in different colours. Once all the words had been coloured the child was asked to read in sequence left to right across the page. Fluency sheets were taken home for practice.

Another activity to support onset rime learning, were the sliders. Cards with lists of onsets were placed beside a card with a list of rimes. The child slid the rime card up and down to say the word. Some were real words some were not, the Meanings of words were discussed and looked up in a dictionary, where the child did not know meanings.

#### Word recognition

The crossword worksheets are designed to reinforce the fluency sheets. The researcher initially assisted the children with each sheet to ensure they knew what was expected of them. The children were shown how to find the words; using their knowledge of the onset- rimes just learnt, and asked to colour code each rime.

#### Spelling

The children were given up to 10 words from the words sounds, or spelling rules that were being worked on, for their weekly spelling practice.

#### Reading

In each level, stories were used to practice and consolidate the skills learned, and to practice comprehension strategies. The children read out loud to the researcher. When a student did not know a word meaning, we looked for clues within the text, and looked the words up in a dictionary. The passage with the unknown word/s was then re-read, to support



reading comprehension. The researcher followed the teacher edition of the story, which has cues for asking comprehension questions. From these prompts, the researcher stopped to discuss with the student what was happening in the story, and to model comprehension strategies. This was done by checking for clues in the text, such as, looking for key words, monitoring what the author had stated and what was inferred, and applying the information to real life situations. The participants were told that they should be able to picture in their mind the events in the book as they read; if they do not then they needed to use the strategies of checking for words they do not know the meaning of, re-read the text.

To monitor the children were using effective comprehension strategies; the books had spaces for the children to illustrate the pages. To be able to illustrate the page they had to use the comprehension strategies. The drawings were an important part of the reading process, and were discussed with the student before they drew the pictures and after they had drawn them.

Typical tasks included in each lesson of 30 minute duration and 10 minute follow up sessions, lesson activity was dependant on the individual needs of each student.

<b>Lesson length</b>	<b>Lesson activities</b>	<b>Time spent on each activity</b>
30 minutes	Phonological awareness training - Using grapheme tiles to identify phoneme sounds. (Identify spellings and sounds).	5 minutes
	Word chaining	5 minutes
	Reading onset-rime fluency sheets, colouring in onset, then rimes.	5 minutes
	Spelling	5 minutes
	Word find worksheets	5 minutes
	sliders cards, reading words made by sliding side by side different onset and rimes, list 5-10 real words	5 minutes
	Book reading	5 minutes
	Discussion about the story and requires the child to draw a picture to describe what is happening on the page.	5 minutes
	Onset-rime fluency re-cap	
10 minutes	Onset-rime fluency reading re-cap.	5 minutes
	Tiles, worksheets, sliders (dependent on what the focus is).	5 minutes
	Book reading and discussion	5 minutes

## **Appendix C**

Self-efficacy scale

Semi-structured student interviews

**Self - efficacy in spelling and reading scale adapted from the spelling efficacy scale by Rankin et al (1994), and Reading self-efficacy scale by Piercey (2013).**

**You don't have to answer any of these questions, you can say you don't want to, that is okay.**

### Instructions

I'm going to ask you about your reading and spelling. This is not a test, different people will have different answers. **I want you to circle which number you think best describes what you think you can do.**

It's really important that you answer *how you think you can do right now*, not what you would like to be able to do.

Using the scale from 1 (I'm sure I can't) to 5 (I'm sure I can), answer the questions below.

	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
	-----				
mostly I'm sure		I barely	I sometimes I		
I can	I can't	can	can	can	

Let's practice.

	1	2	3	4	5
I can sing a song in tune					
I can hop on 1 foot for 1 minute					
I can pat my head and rub my tummy at the same time					

**Remember that you can circle any number from 1 to 5.**

### Spelling

	1	2	3	4	5
I can correctly spell the words in a letter to my teacher					
I can correctly spell the words on a spelling list for my year level					
I can correctly spell words that are not spelt the way they sound					
I can correctly spell the words needed to write a report about my school					
I can correctly spell the beginning (prefixes) and endings (suffixes) to words					
I can correctly spell the words on a grocery list					
I can spell words well enough to find them in the dictionary					
I can correctly add -s, es, or ies to words to make them plural					

### Reading

	1	2	3	4	5
I am a good reader					
I can learn to be a good reader					
I can remember information I read in my school books					
I can participate in reading in class					
I can check to see if I understand what I am reading					
I can sound out words when I read					
I can understand all the words on a page in my school books					
I can break big words into smaller parts (prefixes and suffixes)					
I can understand the main idea in a story					
I can figure out the meaning of hard words in a sentence					
I can find important information in a passage					

## INTERVIEW QUESTIONS.

### Questions about the intervention

1. *How did you find taking part in the programme?*
2. *What was good about? Why was it good?*
3. *What parts did you like the best? Why?*
4. *What do think wasn't so good about it? Why?*
5. *What parts didn't you like?*
6. *If we could change anything about the programme, what would you change?*
7. *Do you think it helped you with your reading? How has it helped, what do you do now that you didn't do before?*
8. *Do you think it helped you with your spelling and writing? How has it helped, what do you do now that you didn't do before?*

## Appendix D

Jessie's errors on assessments

Foz's errors on assessments

Rodi's errors on assessments

Thunder's errors on assessments

Self-efficacy graphs

## Jessie's assessment results

*Jessie's errors on the SAST pre and post intervention assessments*

Pre-intervention		Post intervention	
Item	Response	Item	Response
for	four	for	✓
thin	fin	thin	✓
dart	dutt	dart	✓
orchestra	awguister	orchestra	✓
familiar	fimilliar	familiar	familliar
enthusiastic	infustiastic	enthusiastic	inthusiastic
signature	signatre	signature	✓
breathe	breath	breathe	breath
permanent	pumanent	permanent	purmanent
sufficient	✓	sufficient	sufficent
cemetery	✓	cemetery	sematery
leisure	leasure	leisure	leasure
fraternally	pretenely	fraternally	friturnally
definite	difinete	definite	✓
apparatus	approtis	apparatus	aporatus
mortgage	morgage	mortgage	morchug
equipped	equipt	equipped	equiped
subterranean	supprainien	subterranean	subterainian
miscellaneous	misselaniais	miscellaneous	misalaneous
exaggerate	excadrate	exaggerate	excadurate
embarrassing	embarrasing	embarrassing	embarrasing
conscientious	contientious	conscientious	contiancheous
seismograph	sizemaghraph	seismograph	sizemagraph

✓ indicates a correct spelling of the word.

*Jessie's errors on the CB&DT pre and post intervention assessments*

Pre-intervention				Post-intervention			
Reading		Spelling		Reading		Spelling	
Item	Response	item	Response	Item	Response	Item	Response
gn	Don't know	<u>gn</u> aw	knaw	gn	Don't know	<u>gn</u> aw	knaw
gh	✓	<u>gh</u> ost	✓	gh	Don't know	<u>gh</u> ost	✓
kn	kin	<u>kn</u> ew	✓	kn	kw	<u>kn</u> ew	✓
pl	✓	<u>pl</u> ate	✓	pl	pla	<u>pl</u> ate	✓
qu	✓	<u>qu</u> een	✓	qu	q	<u>qu</u> een	✓
sch	✓	<u>sch</u> ool	✓	sch	sh	<u>sch</u> ool	✓
tw	tr	<u>tw</u> in	✓	tw	✓	<u>tw</u> in	✓
wh	ha	<u>wh</u> en	✓	wh	✓	<u>wh</u> en	✓
wr	Don't know	<u>wr</u> ite	✓	wr	✓	<u>wr</u> ite	✓

Required spelling responses are underlined. Word parts in grey were presented on the response sheet.  
✓ denotes a correct response.

*Jessie's errors on the PNT pre and post-intervention*

Pre-intervention item	Response	Post-intervention item	Response
fute	fut	fute	✓
voze	voz	voze	✓
grake	krake	grake	✓
trobe	trope	trobe	✓
zoin	✓	zoin	zion
woaf	woof	woaf	wolf

✓ denotes a correct response.

*Jessie's errors on the BURT pre and post-intervention*

<b>Pre-intervention Item</b>	<b>Response</b>	<b>Post-intervention Item</b>	<b>Response</b>
of	off	of	✓
serious	✓	serious	surious
scramble	srample	scramble	✓
refrigerator	don't know	refrigerator	✓
reputation	repatation	reputation	✓
philosopher	phil(i)sopher	philosopher	✓
microscopical	micros( )opical	microscopical	✓
perpetual	perpatual	perpetual	peresual
influential	influental	influential	✓
renown	reknown	renown	reknown
champagne	champan	champagne	Champpagne
hypocritical	hypotical	hypocritical	hyprotical
palpable	payble	palpable	✓
fatigue	faticue	fatigue	faticue
poignancy	poiuncy	poignancy	✓
subtlety	sublety	subtlety	sublety

## Foz's assessment outcomes

*Foz's errors on the SAST pre and post intervention assessments*

Pre-intervention		Post intervention	
Item	Response	Item	Response
sure	shore	sure	shure
women	woman	women	woman
beautiful	beutaful	beautiful	beutiful
orchestra	orgestra	orchestra	orcestra
appreciate	apreshate	appreciate	apreshate
familiar	✓	familiar	familliar
enthusiastic	enthoseastic	enthusiastic	inthoosiastic
signature	signatcher	signature	signicher
breathe	breath	breathe	breath
permanent	permanant	permanent	✓
sufficient	sufficient	sufficient	sificent
surplus	surplace	surplus	serplace
customary	✓	customary	customery
especially	esentially	especially	esepilly
materially	materilly	materially	meterally
cemetery	semitary	cemetery	semetery
leisure	leashure	leisure	lesure
fraternally	praternually	fraternally	furternally
successful	sucseffly	successful	succsecfull
definite	definate	definite	defenit
exhibition	exabishitoin	exhibition	exibishon
apparatus	aperatis	apparatus	aperatise
mortgage	morgage	mortgage	morgage

✓ indicates a correct spelling of the word.

*Foz's errors on the CB&DT pre and post intervention assessments*

Pre-intervention				Post-intervention			
Reading		Spelling		Reading		Spelling	
Item	Response	item	Response	Item	Response	Item	Response
bl	bill	<u>black</u>	✓	bl	✓	<u>black</u>	✓
cl	kill	<u>clap</u>	✓	cl	✓	<u>clap</u>	✓
fl	fill	<u>fly</u>	✓	fl	✓	<u>fly</u>	✓
gh	✓	<u>ghost</u>	gost	gh	✓	<u>ghost</u>	✓
gn	gin	<u>gnaw</u>	knaw	gn	✓	<u>gnaw</u>	knaw
gr	-	<u>grass</u>	✓	gr	gra	<u>grass</u>	✓
kn	kin	<u>knew</u>	✓	kn	✓	<u>knew</u>	✓
ph	p	<u>phone</u>	✓	ph	✓	<u>phone</u>	✓
pl	pla	<u>plate</u>	✓	pl	✓	<u>plate</u>	✓
pr	pra	<u>press</u>	✓	pr	✓	<u>press</u>	✓
qu	✓	<u>queen</u>	✓	qu	qua	<u>queen</u>	✓
sch	sic	<u>School</u>	✓	sch	Scha	<u>School</u>	✓
sl	sill	<u>slow</u>	✓	sl	✓	<u>slow</u>	✓
sm	sim	<u>small</u>	✓	sm	✓	<u>small</u>	✓
sn	sin	<u>snail</u>	✓	sn	✓	<u>snail</u>	✓
squ	qui	<u>squeeze</u>	✓	squ	✓	<u>squeeze</u>	✓
thr	thra	<u>throw</u>	✓	thr	✓	<u>throw</u>	✓
wh	w	<u>when</u>	✓	wh	✓	<u>when</u>	✓
wr	w	<u>write</u>	✓	wr	✓	<u>write</u>	griite

Required spelling responses are underlined, and word parts in grey were presented on the spelling response sheet.

✓ denotes a correct response.



*Foz's errors on the PNT*

Pre-intervention		Post-intervention	
item	Response	item	Response
wob	woba	wob	✓
pag	page	pag	✓
sath	sav	sath	✓
voze	voz	voze	✓
soné	sony	soné	✓
roud	rolled	roud	✓
zoin	zion	zoin	zion
woaf	wilof	woaf	wolf
froice	✓	froice	frooce
fleach	flesh	fleach	✓

✓denotes a correct response.

*Foz's errors on the BURT pre and post-intervention*

Pre-intervention		Post-intervention	
Item	Response	Item	Response
known	✓	known	know
quickly	quick( )	quickly	✓
encyclopaedia	cyclopaedia	encyclopaedia	cyclopaedia
theory	theory	theory	✓
scarcely	scarkly	scarcely	scarly
labourers	✓	labourers	labour
apprehend	aperehend ed	apprehend	apprehended
reputation	repütation	reputation	✓
philosopher	philos( )pher	philosopher	philophere
contemptuous	comtem( )po( )s	contemptuous	Contempt( )ous
mercenary	merconesery	mercenary	✓
glycerine	glycorine	glycerine	✓
unique	✓	unique	unquite
microscopical	micro-scop-ic-al *	microscopical	✓
perambulating	peramūbulating	perambulating	✓
renown	re( )own	renown	✓
physician	phycīcan	physician	physic Tan
champagne	champing	champagne	champion
exorbitant	exorbitant	exorbitant	✓
atrocious	a-tro-cī-ous *	atrocious	atroceTous
constitutionally	constoutionly	constitutionally	constutonally
contagion	contagone	contagion	contāgion
palpable	polābail	palpable	paypayable
melancholy	mencoly	melancholy	✓
eccentricity	exkenricity	eccentricity	✓
fatigue	fartigue	fatigue	fatigūe
phlegmatic	phlegūmag	phlegmatic	philleggmatic
fallacious	falla cious	fallacious	✓
alienate	alien	alienate	ainto
poignancy	poigūisy	poignancy	piogancy
phthisis	piethesis	phthisis	fisis
ingratiating	✓	ingratiating	ingratiting
subtlety	subtely	subtlety	subtellety

✓denotes words read correctly.

\* - Foz was not able to say the word as a whole word.

## Rodi's Assessment results

*Rodi's errors on the SAST pre and post intervention assessments*

Pre-intervention		Post intervention	
Item	Response	Item	Response
seem	seen	seem	✓
from	form	from	✓
women	woman	women	✓
answer	ansewr	answer	✓
beautiful	beuatiful	beautiful	beuatiful
orchestra	achistra	orchestra	ocrestra
appreciate	apriteate	appreciate	✓
familiar	firmally	familiar	formiliae
enthusiastic	intuseasstic	enthusiastic	inthuseastic
breathe	✓	breathe	breath
permanent	perminate	permanent	perminate
sufficient	satishinate	sufficient	satishinate
customary	✓	customary	costumary
especially	aspeshally	especially	aspeshally
materially	materialy	materially	marterily
cemetery	cemeterry	cemetery	cemertary
leisure	lesiure	leisure	lesiure
fraternally	fruturnally	fraternally	frutuenally
successful	successful	successful	succesful
definite	defenate	definite	defenate
exhibition	exabiton	exhibition	✓
apparatus	apartiss	apparatus	aperatise
mortgage	morgage	mortgage	morgage
equipped	equiped	equipped	equipied
subterranean	subteranim	subterranean	subteraineum
politician	polition *	politician	pollitation
miscellaneous	misalaneis	miscellaneous	misalaneus
exaggerate	exadgerate	exaggerate	exadgerate
guarantee	garrante	guarantee	garrantee
conscientious	conchiantis	conscientious	concheanchise
seismograph	sizemogpraha	seismograph	sizemograph

\*cut off for scoring.

*Rodi's errors on the CB&DT pre and post intervention assessments*

Pre-intervention				Post-intervention			
Reading		Spelling		Reading		Spelling	
Item		item	Response	Item	Response	Item	Response
bl	bka	<u>black</u>	✓	bl	✓	<u>black</u>	✓
br	bra	<u>brown</u>	✓	br	✓	<u>brown</u>	✓
cl	cla	<u>clap</u>	✓	cl	✓	<u>clap</u>	✓
fl	fla	<u>fly</u>	✓	fl	✓	<u>fly</u>	✓
gh	g	<u>ghost</u>	✓	gh	✓	<u>ghost</u>	✓
gl	gla	<u>glass</u>	✓	gl	✓	<u>glass</u>	✓
gn	gin	<u>gnaw</u>	✓	gn	gin	<u>gnaw</u>	knaw
kn	kin	<u>knew</u>	✓	kn	✓	<u>knew</u>	✓
pl	pla	<u>plate</u>	✓	pl	✓	<u>plate</u>	✓
ph	pha	<u>phone</u>	✓	ph	p	<u>phone</u>	✓
pr	pla	<u>press</u>	✓	pr	✓	<u>press</u>	✓
sch	shsh	<u>school</u>	✓	sch	✓	<u>school</u>	✓
squ	✓	<u>squeeze</u>	✓	squ	✓	<u>squeeze</u>	squeeze
thr	thra	<u>throw</u>	✓	thr	✓	<u>throw</u>	✓
wh	✓	<u>when</u>	✓	wh	✓	<u>when</u>	ween
wr	wr	<u>write</u>	✓	wr	✓	<u>write</u>	✓

Required spelling responses are underlined. Word parts in grey were presented on the response sheet.  
 ✓ denotes a correct response.

*Rodi errors on the PNT pre and post-intervention*

Pre-intervention		Post-intervention	
item	Response	item	Response
pag	page	pag	✓
blesh	bleesh	blesh	✓
mide	midē	mide	midē
fute	fut	fute	✓
sonē	son	sonē	sonē
clave	calve*	clave	claw
chove	✓	chove	chov
trobe	trob	trobe	trob
drime	✓	drime	drim
roud	road	roud	✓
zoin	✓	zoin	zion
froice	froice	froice	frice

\*Rodi said "calve, not clave"

*Rodi errors on the BURT pre and post-intervention*

Pre-intervention		Post-intervention	
Item	Response	Item	Response
steadiness	steadiness	steadiness	✓
nourishment	norishment	nourishment	✓
commenced	comenced	commenced	✓
trudging	truding	trudging	✓
scarcely	scarly	scarcely	scarly
labourers	✓	labourers	labours
urge	urage	urge	✓
apprehend	✓	apprehend	apearant
binocular	bōncollar	binocular	binocolor
domineer	do-mineer	domineer	domine
economy	economy	economy	✓
ultimate	ultamate	ultimate	✓
humanity	humility	humanity	✓
contemptuous	contemptuose	contemptuous	✓
glycerine	glyorine	glycerine	julycerny
perpetual	pertibula	perpetual	prertual
influential	Influenlinal	influential	influential
perambulating	✓	perambulating	pramulating
renown	reknown	renown	✓
physician	phsican	physician	physique
champagne	champ-ain	champagne	champ- agne
hypocritical	✓	hypocritical	hypoticritical
atrocious	✓	atrocious	atro-ous
constituionally	conta - don't know	constituionally	✓

## Thunder's Assessment results

*Thunder's errors on the SAST pre and post intervention assessments*

Pre-intervention		Post intervention	
Item	Response	Item	Response
van	✓	van	fan
thin	fin	thin	fin
seem	sem	seem	✓
friend	freand	friend	✓
done	✓	done	dinne
any	cakes *	any	enay
great	✓	great	grate
beautiful	beutifull	beautiful	beutiful
orchestra	akestra	orchestra	orgesta
equally	esulleley	equally	✓
appreciate	preasatente	appreciate	appesated
familiar	furmilla	familiar	fimiya
enthusiastic	inthesastack	enthusiastic	inthestice
signature	sinater	signature	sinnature
breathe	breath	breathe	breather
permanent	perment	permanent	prement
sufficient	serfement	sufficient	sufent
surplus	suples	surplus	surpules
customary	Not presented	customary	cusmery
especially	Not presented	especially	espully

\* cakes, was part of the sentence given for semantics.

*Thunder's errors on the CB&DT pre and post intervention assessments*

Pre-intervention				Post-intervention			
Reading		Spelling		Reading		Spelling	
Item	Response	item	Response	Item	Response	Item	Response
gn	gin	<u>gnaw</u>	<u>noaw</u>	gn	gwin	<u>gnaw</u>	<u>noaw</u>
kn	kin	<u>knew</u>	<u>koew</u>	kn	✓	<u>knew</u>	✓
ph	✓	phone	✓	ph	p	phone	✓
sch	stch	<u>school</u>	<u>Scool</u>	sch	✓	<u>school</u>	✓
sn	✓	snail	✓	sn	sna	snail	✓
spr	spa	<u>spring</u>	<u>sping</u>	sp	spa	<u>spring</u>	✓
squ	skin	<u>squeeze</u>	<u>sqeeze</u>	squ	✓	<u>squeeze</u>	<u>sqeeze</u>
<u>scr</u>	✓	<u>scream</u>	<u>sceam</u>	<u>scr</u>	✓	<u>scream</u>	<u>skeam</u>
str	✓	strap	✓	str	✓	<u>strap</u>	<u>straap</u>
thr	✓	throw	✓	thr	th	<u>throw</u>	<u>trhow</u>
tr	✓	tree	✓	tr	✓	<u>tree</u>	<u>rtee</u>
✓	✓	<u>write</u>	<u>riite</u>	wr	w	<u>write</u>	✓

Required spelling responses are underlined. Word parts in grey were presented on the response sheet.  
✓ denotes words read correctly.

*Thunder's errors on the PNT pre and post-intervention*

Pre-intervention		Post-intervention	
item	Response	item	Response
blesh	blish	blesh	✓
mide	✓	mide	mid
voze	foze	voze	✓
drime	dime	drime	✓
roud	✓	roud	road
woaf	woof	woaf	✓
dail	dial	dail	✓
prew	✓	prew	peru
froice	forest	froice	✓
spound	✓	spound	spound

✓ denotes words read correctly.

*Thunder's errors on the BURT pre and post-intervention*

<b>Pre-intervention Item</b>	<b>Response</b>	<b>Post-intervention Item</b>	<b>Response</b>
known	✓	known	now
explorer	explore	explorer	✓
steadiness	standings	steadiness	steadness
encyclopaedia	Wikipedia	encyclopaedia	anyc-p-dia
commenced	✓	commenced	commended
circumstances	circlisied	circumstances	✓
scarcely	scarily	scarcely	✓
urge	arge	urge	✓
binocular	binōcircular	binocular	binoculars
domineer	donor	domineer	dominer
melodrama	medeldrama	melodrama	mounredormara
ultimate	✓	ultimate	Ultimatē
philosopher	professor	philosopher	✓

✓ denotes words read correctly.

## Appendix E

### Self-efficacy graphs

#### Median spelling self-efficacy

Median scores for spelling parts of word scale items

I can correctly spell words that are not spelt the way they sound

I can correctly spell words well enough to find them in the dictionary

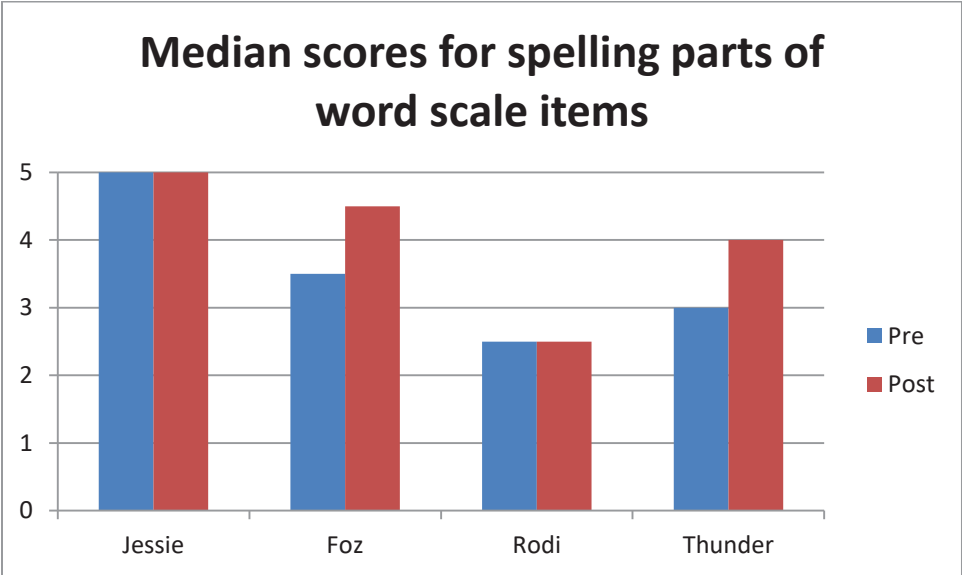
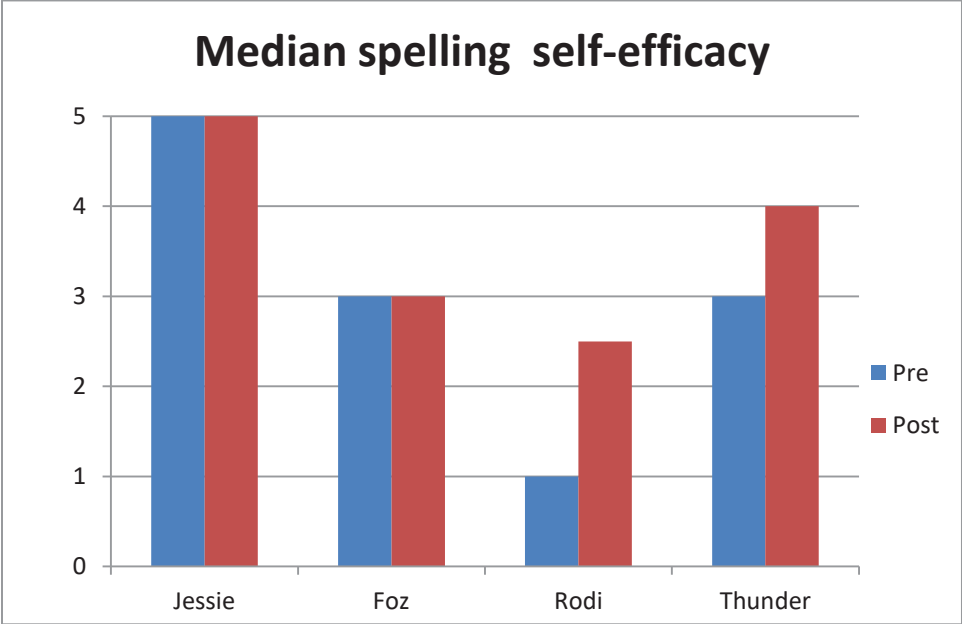
#### Median reading self-efficacy

I can sound words out when I read

I can check to see if I understand what I am reading

I can find important information in a passage

I can understand the main idea of story



Graph includes self-efficacy scale items - I can correctly spell the beginning (prefixes) and endings (suffixes) to words  
- add -s,es, or ies to words to make them plural

