

# **EFFECTS OF FEEDFORWARD VIDEO SELF MODELLING ON READING FLUENCY AND COMPREHENSION**

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## **Abbreviations**

CA: Chronological age

CBA: Curriculum-based measure

FF: Feedforward

FFVSM: Feedforward video self modelling

NARA: Neale Analysis of Reading Ability

PSR: Positive self-review

RA: Reading age

SRA: Science Research Associates Reading Laboratory

VSM: Video self modelling

WCPM: Words correct per minute

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## **Abstract**

Being able to read at a fluent rate has many advantages to the individual in both educational and wider social contexts throughout life. To be a fluent reader means that the individual can sustain high accuracy while reading at a rate appropriate to the material and the setting, and implies the development of automaticity in the cognitive processes involved in reading. Fluency has not, however, been the focus of much research. In this study an observational learning technique - feedforward video self modelling (FFVSM) - was used to improve children's reading fluency. Eleven primary school children aged between 72 and 108 months, 4 girls and 7 boys, viewed edited video footage of themselves seemingly reading a difficult text at a fluent rate six times over a two week period. The results showed that the majority of the children improved their reading fluency, comprehension and accuracy, as well as their reader self-perception (a proxy measure of self-efficacy). These positive results suggest that FFVSM could be a rapid, cost effective intervention to be used within educational settings to promote fluent reading.

## CHAPTER 1: Introduction and Literature Review

Opening a book is like opening the door. Books inform, educate, and entertain. When a parent first reads to their baby, they have started the infant on the pathway to learning to read. Reading should be an enjoyable experience and one which is shared with family and friends. A fun, supportive environment for learning to read is essential and can be accomplished by providing ample opportunities to read, practise and experience the written word in a relaxed setting. Parents play a key role in their child's early experiences and development of reading skills (Fletcher, Greenwood, & Parkhill, 2010).

Preschools and kindergarten programmes are designed to prepare children for reading. This is achieved through shared reading, storytelling, songs, fun games and exercises to teach basic sound structure, knowledge of the alphabet letters and the sounds of words (Deeney, 2010; Whitehurst & Lonigan, 1998). Mastery of these component skills is necessary in order to develop proficiency in high order skills, which include fluency, accuracy and comprehension (Daly & Kupzyk, 2013). Children who lack opportunities to gain early reading skills are at a great disadvantage in comparison to those who do acquire the skills (National Institute of Child Health, & Human Development, 2000; Nicolson, Fawcett, Moss, Nicolson & Reason, 1999), because lack of core skills which support the development of fluency can have a cumulative effect on later learning and achievement in childhood. This idea is known as the Matthew Effect – *to him that hath shall more be given* (Good, Simmons & Kame'enui, 2001; Stanovich, 1986; Wolf & Katzir-Cohen, 2001).

Early childhood is a vital time for detecting any delays or impediments that may prevent children from succeeding at reading (Greaney & Arrow, 2012; Hempenstall, 2009). Research suggests that early intervention is key for children at risk of developing reading delays (Hasbrouck & Tindal, 2006; Kuhn & Stahl, 2003; Mastropieri, Leinart & Scruggs, 1999). Children who receive intervention are typically able to catch up to peers and then make reasonably normal progress thereafter (Nicolson et al., 1999). Early intervention such as glasses to correct eyesight, or speech and

language therapy for language and pronunciation, should be given to support the development of reading and literacy. Not only is reading essential for success in a school environment it is also fundamental for functioning in society, as the majority of everyday tasks that adults do require some degree of literacy, for example, grocery shopping, using transport, and communicating with friends via emails and text messages (Decker & Buggey, 2012). Attention, memory, language and motivation are foundational components in becoming a competent reader (Snow, Burns & Griffin, 1998). Furthermore, successful readers have phonological awareness skills, can read with fluency, and comprehend what they read (National Institute of Child Health, & Human Development, 2000). There are a number of reading intervention techniques used within schools to support children's development of reading fluency and comprehension. These include, repeated reading, word drills, reading recovery and the use of teacher or peer models (Allington, 1983; Buggey & Ogle, 2012; Clay, 1993; Mastropieri et al., 1999; Pluck, 1995; Welsch, 2006). Although many of these interventions have been proven effective they are high in cost and time. In addition, there are only limited numbers of students who are able to benefit from the one-on-one or small group reading instruction, like many school based intensive interventions are.

The aim of the research reported in this thesis is to examine how an evidence-based behaviour intervention FFVSM can be used to improve reading fluency and comprehension. The method of VSM has proven to be effective in a number of different applications for learning and changing target behaviour. Developments in video technology make the intervention cheap and accessible. In addition methods are easy to learn, and typically rapid behaviour change occurs. There is definite potential for FFVSM techniques to be incorporated into the school and home environment to improve childrens reading behaviour.

### **History and approaches to teaching reading**

The journey to having modern reading interventions and support programmes in New Zealand schools began in 1877 with the Education Act, passed by the government to standardise the reading system (Griffith, Harvey, & Maslen, 1997). Children were divided into six levels with appropriately

graded texts for each group. An alphabetic method was used, where letters and letter combinations were taught first, followed by practice with one, two, then three letter word texts, until children could successfully read complete paragraphs (Griffith, Harvey, & Maslen, 1997). There are now two different approaches to teaching students to read, namely the phonological (sounding out) and the whole language (look and say) approaches.

The phonological approach to reading focuses on teaching the student how to manipulate phonemes (the smallest unit of sound), which includes the blending and segmenting of words (Ehri, Nunes, Stahl & Willows, 2001). In addition, they are taught phoneme-grapheme correspondences, with graphemes being a way of writing down phonemes. In the phonological approach, children are instructed to sound out and blend letters to decode words, through practicing reading words both in isolation and in blocks of text. An advantage of this approach is children are able to use learnt letter sound correspondences to identify unfamiliar words. A limitation of this approach is when a child comes to an unknown word which does not conform to the usual phonemic patterns, they can become confused.

In comparison, the whole language approach encourages children to learn and memorise the whole word (Freppon & Dahl, 1991). Parts of known words are used to read new and unknown words which are rapidly retrieved from memory. The child must have knowledge of the alphabet system and must have repeated exposure and practice with sight words (Ehri et al., 2001). Problems arise with this method when the child comes to a word which they do not know all or part of. They are then reliant on a teacher or parent to give them the word.

Both approaches have their advantages and disadvantages and there has been much discussion surrounding which is best for beginning readers. This disagreement is known as The Great Debate (Chall, 1983) and still continues to this day (Goodwyn & Fuller, 2011). There is a large body of research which has examined the effectiveness of both approaches (e.g., Adams, 1990; Freppon & Dahl, 1991). It appears that combining the two methods is the most effective for teaching children to read (Adams, 1990).

## **Reading intervention in New Zealand Schools**

In New Zealand schools both phonological and whole language approaches are used to support children in learning foundational skills. Alphabet letters and sounds are taught in conjunction with repeated exposure and practice with sight words. There is a response to intervention (multi-tiered approach) to reading support and recovery in New Zealand schools.

The first tier is in class instruction. Children are divided into groups based on their ability. Reading material, instruction, practice and support are provided accordingly (Tunmer, 2008). Children who struggle with reading are grouped together and given support to learn the fundamental skills which they lack and throughout schooling, students' reading performance is closely monitored by the classroom teacher at regular intervals. Any changes in performance either up or down prompts the teacher to make changes to the students' learning material or environment (Linan-Thompson & Vaughn, 2009). Running Record assessment is recommended by the National Curriculum in New Zealand and is a common assessment used by teachers to track changes in students' reading (Ross, 2004). The Running Record assessment involves the student reading a graded passage to the teacher, who records the number of corrects as well as the number and type of errors made (Ross, 2004). Running records provide evidence for the teacher to refer the student for extra support if required.

When children turn six-years-old they are given 6 Year Net test, which is also known as the after one year National Standard (Clay, 2005; Ministry of Education, 2010). The test involves a number of different assessments such as letter identification, recognition of words and sounds, hearing and recording, text reading, writing vocabulary and understanding making connections between text and images (Clay, 2005). The 6 Year Net identifies students who are not meeting age-specific milestones in reading. The bottom 25% of children who are identified as struggling are referred to the Reading Recovery Programme, which is the second tier (Nicolson et al., 1999). The programme involves daily 40 minute sessions for 12 to 20 weeks of individualised instruction with a

trained Reading Recovery teacher (Clay, 1993). The aim of the programme is to help children acquire skills needed to catch up to their peers.

The third tier is for children still struggling after completing the Reading Recovery programme (this is approximately 1% of children) (Clay, 1993). Individualised reading learning plans are developed with a Resource Teacher: Learning and Behaviour (RTLb), who works closely with and monitors progress throughout the child's schooling.

### **Anatomy of Reading**

In order to help children who are struggling with reading, it is important to first understand the key reading processes they had difficulty performing. The overarching goal of reading is gaining knowledge and information from a text (Kuhn, Schwanenflugel, Meisinger, Levy & Rasinski, 2010). Reading fluency entails the ability to correctly read words in a text at a sustained fast pace. For children who are fluent readers, reading is effortless and automatic (Adams, 1990; Logan, 1997; National Institute of Child Health, & Human Development, 2000). The ability to understand and interpret what is being read shows the learner's ability to comprehend (Allington, 1983). This is because oral reading fluency has a direct link to reading comprehension, as skills which are fluent tend to be remembered, generalised and maintained, supporting the development of other related and more advanced skills (Hempenstall, 2009; Hudson, Lane, Pullen, 2005). Therefore, a key component in reading is learning the skills to be able to comprehend a text. Reading fluency and comprehension have a direct link to each other. For fluent readers reading words on the page is automatic and focus can be on constructing meaning (Kuhn & Stahl, 2003; Logan, 1997). Research in both the early years (Shinn, 1992) and later years of schooling (Fuchs, Fuchs, Hosp & Jenkins, 2001) shows that reading fluency is an accurate predictor of comprehension ability. The link between fluency and comprehension supports the theory of automaticity as when an individual is able to perform one behaviour automatically (with speed, effortlessness and without conscious awareness), this allows for the focus to be shifted to another behaviour (comprehending what is being read) (LaBerge & Samuels, 1974). Perfetti (1985) suggests that there are individual differences between students

reading comprehension abilities due to differences in the efficient operation of local processes. Local processes include factors such as symbol and lexical access and retrieval and working memory recognition.

Research has shown that reading aloud supports the improvement of comprehension and understanding of a text (Walczyk & Griffith- Ross, 2007). Reading aloud helps focus attention from distractions and gives auditory feedback to the reader (Walker, 2005). Oral reading fluency has been found to be a strong predictor of reading comprehension, more so than other factors such as retelling or questioning (Fuchs et al., 2001).

Many intervention programmes have focused on improving comprehension directly, through teaching strategies (e.g., direct questioning or using pictures) many of which have been successful (Mastropieri et al., 1999; Welsch, 2006). However, a reader who is not able to read a text at a fluent rate will be unable to benefit from any comprehension training, making it important to address fluency first. In recent years, since the release of the National Reading Panel Review (National Institute of Child Health, & Human Development, 2000) reading fluency has been identified as a vital component of being a proficient reader (National Institute of Child Health, & Human Development, 2000; Fuchs et al., 2001). As a result there has been an increase in fluency research and instruction in the classroom.

**Behavioural processes.** Skinner's (1957) theory of verbal behaviour provides the basic foundational knowledge about learning to read. He suggests that verbal behaviour is a verbal operant, where an operant is defined as a class of behaviours affected by antecedent stimuli and consequences. Learning to produce verbal responses (in oral reading) under the control of antecedent stimuli is essential in becoming a fluent reader, and this is accomplished through discrimination training (Skinner, 1957). Discrimination training involves giving positive reinforcement to the correct response, (e.g., saying the letter "d" when the letter "d" is presented on the page) and withholding reinforcement for incorrect responses. The reinforcement provided in the early training context is

often social (and sometimes tangible) reinforces delivered by a teacher or tutor. However, more complex discrimination training is required to develop word recognition and other reading competencies. Once the individual is a competent reader, reinforcement for reading is provided in a different way and becomes much less dependent on immediate social mediation by teachers or others. Reading is mostly intrinsically reinforced by the content of the material read, for instance, reading exciting and interesting stories which encourages the individual to read more. Reading can also serve more instrumental purposes, for example, helping to avoid adverse situations (e.g., a caution sign telling you the foot path is icy) as well as engagement in positive situations (e.g., a flyer telling there is a free concert in the park). When an individual reads information and responds appropriately, they have correctly understood and comprehended the information conveyed by the text.

## **Fluency**

**Definition of fluency.** Fluency is a combination of accuracy, speed and expression; it is a key component in mastering a new skill or behaviour (Binder, 1996; National Institute of Child Health, & Human Development, 2000). Being able to perform a behaviour at a fluent rate enables efficient and effective functioning every day (Binder, 1996), for example, making breakfast, getting dressed or reading a bus timetable. Behavioural fluency is measured as the number of correct actions or responses (accuracy) that an individual can perform in a set time period (Church, 1999; Mastropieri et al., 1999). Fluent behaviour of any skill, therefore, involves a sustained correct performance at an effective/efficient rate for the task.

**Why fluency is important.** Church (1999) summarises three key reasons to justify why fluency is essential in mastering a behaviour or skill. First, it is necessary for reinforcement and maintenance. Skills which are performed at a fluent rate give the individual personal positive reinforcement as well as attracting praise from others (peers, parents and teachers). Skills which do not generate reinforcement for the individual are not likely to be continued to be used independently, and are therefore unlikely to be maintained (Daly & Kupzyk, 2013). Second, fluency is important for retention. If a skill can be performed automatically without conscious awareness it is more likely to

be retained by the individual even after a period of time with no practice (Hudson et al., 2005). Third, fluency is essential for subsequent learning. When foundational skills have been learnt and can be performed fluently more advanced skills can be built on the fluent skill (Mercer & Miller, 1992). For example, learning the names and sounds of letters must come before learning to read whole words or a short text.

**Importance of fluency in reading.** Foundational skills in literacy are essential for thriving in a school environment. During early years, children learn the basic components which are important for reading and understanding text. Oral reading fluency is an accurate indicator of overall reading competence/ ability, because it gives an indication that the learner is able to translate text into oral language (Fuchs et al., 2001). Oral reading fluency is seen as a necessary skill to be a competent reader. It is a skill that children who are struggling (below their chronological age, CA) in reading typically have problems mastering (Allington, 1983).

In order for fluency building to be successful, children must have acquired grapheme-phoneme relations; that is they can distinguish the alphabet letters and phonemes in the language they are learning to read (Church, Nixon, Williams & Zintl, 2005; Therrien & Kubina, 2006). It is important that specific delays (such as fluency) in academic skills are addressed, as these can have an enduring negative impact on mental, social and emotional wellbeing, and are typically persist into adulthood (Fletcher, Nicholas & Davis, 2011; Rasinski et al., 2005). Such negative outcomes may include low self-esteem, peer rejection, isolation, frustration, lower schooling achievement, and low future income (Burns, 2005).

**Conditions essential for fluency building.** Fluency building refers to educational practices designed to increase the fluency of a particular skill. There are a number of key conditions that must be met in order for fluency building, to be successful. Most importantly, before beginning fluency building the student must be phonologically aware and be able to decode words accurately (Chard, Vaughn & Tyler, 2002; Kame'enui & Simmons, 2001). Adequate opportunities for practice must be provided to the learner (Mastropieri et al, 1999). In the case of academic skills, typically additional

practice outside the classroom is needed, because classroom activities do not allow for sufficient practice opportunities (Church, 1999). Church advises that there must be enough items during practice sessions for the learner to make progress. Too few items in the set will create an upper limit on the child's ability to make progress. The child's progress in rate must be recorded at regular intervals so that changes can be traced and compared to standardised norms (National Institute of Child Health, & Human Development, 2000).

## **Reading Fluency**

**Definition of oral reading fluency.** Decoding letter and sound associations accurately is an important skill and essential to reading fluently (Fuchs et al., 2001; Kame'enui & Simmons, 2001). High-speed, instant word recognition of the majority of the words enables the reader to effortlessly and automatically read a text (Hempenstall, 2009; National Institute of Child Health, & Human Development, 2000). A key component in being a fluent reader is being able to read words in a text with a high rate of correct words and a low rate of errors; this also supports understanding and comprehension (Deeney, 2010; Johnson & Layng, 1996). In comparison, for children who are poor decoders of words, reading can be a taxing, slow and frustrating process (Hudson et al., 2005). Poor readers tire easily as they use four to five times more physical energy (glucose & oxygen) to complete the same language related task as a good reader (Richards et al., 2006). Furthermore, the inability to accurately decode words (in particular those crucial to developing meaning) results in an individual being unable to understand and comprehend the overall meaning of the text (Chard et al., 2002; Deeney, 2010). There are four core components which define fluent reading: Automaticity, effortlessness, speed and prosody.

***Automaticity and effortlessness.*** This is essential for reading fluently (Kuhn & Stahl, 2003; Logan, 1997). An individual with automaticity is able to perform behaviour automatically, fluently and without conscious attention or without pausing in order to think about the next word on the page or the next step (Mercer & Miller, 1992; LaBerge & Samuels, 1974). Individuals have a limited

amount of attention to deploy on cognitive tasks (LaBerge & Samuels, 1974), so in order to complete two or more independent tasks at the same time, one of these tasks must be automatic and effortless (Kuhn & Stahl, 2003). For example, when reading, decoding (recognising letters, phonemes and words) must be instant in order to understand and comprehend what is happening in the text (LaBerge & Samuels, 1974).

***Speed.*** The ability for the individual to quickly and automatically read the words on the page. The *power law* (Logan, 1988) states that, as speed of behaviour (reading) increases with practice, there is a decrease in the individuals' reaction time, until an upper limit of performance is reached. Furthermore, the largest performance gains in speed are made earliest in practice (Logan, 1997).

***Prosody.*** This provides natural break points in a block of continuous text (Ramus, Hauser, Miller, Morris & Mehler, 2000). It encompasses, pitch, rhythm, phrasing, expression, stress and pausing in words and sentences (Hirschberg, 2002). For example, a fast rate and a high pitch are characteristics of happiness (Kuhn et al., 2010). Children who read with prosody sound as though they are talking naturally. Prosody is a skill which helps the reader to make appropriate connections between written and oral language (Kuhn et al., 2010; Kuhn & Stahl, 2003). Repeated reading is one way in which children are able to develop prosody in their identification and use of appropriate phrasing (Logan, 1997; Kuhn & Stahl, 2010).

### **Typical reading fluency rates**

Reading fluency is a vital component in measuring reading progress and proficiency (Fuchs & Fuchs, 1992). Curriculum-based measures (CBM) are a set of standardised tests for monitoring students' academic progress and are commonly used by teachers and researchers (Hasbrouck & Tindal, 2006). A popular CBM for assessing components of reading fluency (accuracy and rate) is the one-minute fluency measure (Deeney, 2010). Children are asked to read a graded, previously unseen passage, and reading fluency is calculated by dividing the words read correctly by the time taken for the text to be read, and this gives the number of words read correctly per minute (WCPM)

(Hasbrouck & Tindal, 2006; Mastropieri et al., 1999). Displaying oral reading fluency in this way allows progress to be easily tracked over an intervention period or throughout the school year. The WCPM fluency measure is a tool which is stable, valid and a reliable indicator in determining the child's achievement; teachers can quickly see if the student is meeting expectations for accuracy and fluency (Deeney, 2010; Hamilton & Shinn, 2003; Hasbrouck & Tindal, 2006). In addition the test is inexpensive to administer, unlike other standardised measures, and performance can be compared with that of other individuals within the class or to universal standardised measures (Fuchs et al., 2001).

Although WCPM gives an indicator of the child's level of performance, it does not account for the third component of fluency, which is prosody. There is also some concern about use of this fluency score as the only indicator of the child's reading proficiency when there are many other components involved in being a good reader (Hamilton & Shinn, 2003). Therefore, when measuring the student's rate of oral reading, it is also important to record other information such as the child's ability to correctly use phrasing and expression as well as the type of errors that child is making (e.g. miscues) and this information can give the teacher a broader understanding of the child's reading skill. This qualitative information can be used as a diagnostic tool in analysing student reading achievement (Fuchs et al., 2001). "The Ministry of Education's booklet *Using Running Records*" booklet provides teachers, researchers and professionals with a guide to ensure consistency (Smith, 2000).

There are a number of different published guides on the expected rates of fluency which correspond to a child's year level or CA. These rates give teachers and researchers a rough guideline to determine if the child is on track. Some fluency tests and rates are incorporated within standardised tests, for example Dynamic Indicators of Basic Early Literacy Skills (DIBELS) (Kamii & Manning, 2005) and the Neale Analysis of Reading Ability (NARA) (Neale, 1999). Fluency guidelines have resulted from extensive longitudinal research, with large numbers of participants. Hasbrouck and Tindal (2006) collected a large amount of data starting in 1992 on

children's reading fluency across grades one to eight across three different testing periods throughout the year. They created a table of oral fluency norms dividing each grade into percentiles (10, 25, 50, 75 & 90) each with corresponding WCPM. This table also shows the typical progression of children reading at this level across the three testing periods. For example, a child in grade two (New Zealand year three) reading at the 50<sup>th</sup> percentile level will be reading about 51 WCPM in autumn, 72 WCPM in winter and 89 WCPM in spring, this shows that rate improves over the school year. Teachers and researchers can use this guide to determine on what percentile their child sits in comparison to others, when collecting data.

Good et al (2001) suggests that students who are at or below the following WCPM fluency rates should be provided with extra fluency instruction and support: 10 WCPM (Year two), 50 WCPM (Year three) and 70 WCPM (Year four). In later research Good, Simmons, Kame'enui, Kaminski and Wallin (2002) gave some general guidelines to support teachers in identifying children who may be struggling at the grade one (New Zealand Year two) level. The child reads an unpractised text at the instructional level and the WCPM is calculated (Good et al., 2002). They advise that children reading 40 or more WCPM are at low risk of future reading problems, below 40 WCPM are at some risk and those below 20 WCPM are at high risk of developing reading problems later in life. In standardised reading tests (such as the NARA) passages read by the child are scored and correspond to a reading age (RA) on three key components: rate, accuracy and comprehension (Neale, 1999). The child's CA can then be compared to those scored on the NARA tests. Many standardised tests (such as the NARA) also involve a comprehension component to determine if the child has understanding of what is being read.

### **Fluency Instruction**

As fluency is such an important component of being a proficient reader it is vital that regular instruction and assessment occurs in the classroom (Clay & Imlach, 1971; Snow, Burns & Griffin, 1998). Previous research has highlighted that fluency in the past has been a neglected reading goal (Allington, 1983; Zutell & Rasinski, 1991). A reason for this is that poor fluency has been viewed as

a symptom of poor decoding (Allington, 1983). This is reflected in the absence of fluency-related instruction, individualised intervention and daily lessons from teacher training and teaching manuals (Allington, 1983; Zutell & Rasinski, 1991). Many primary school teachers do not have a clear understanding of fluency and effective instruction, which in turn impacts student learning and achievement (Zutell & Rasinski, 1991).

The report from the National Reading Panel (National Institute of Child Health, & Human Development, 2000) has highlighted the importance of reading fluency and proficiency. As a result of this report there has been a focus on developing teachers' knowledge and resources for screening, diagnosis and monitoring of students' fluency (Hasbrouck & Tindal, 2006). There has also been an increase in reading fluency and comprehension research in order to gain a clearer understanding of its importance (Hamilton & Shinn, 2003; Hudson et al., 2005; Kame'enui & Simmons, 2001; Kuhn & Stahl, 2003).

**Existing interventions for reading fluency.** There are a number of evidence-based intervention techniques which are focused on improving children's oral reading fluency. Many are used on a regular basis within the classroom environments and in reading support programmes. These include repeated reading, word drills and learning from models.

***Repeated Reading.*** Repeated reading involves the students reading the same text (at his/her instructional level) a number of times until the target fluency rate has been achieved (Mastropieri et al., 1999). Texts at the instructional level should be challenging to the reader but still manageable, and students should have an accuracy rate of 93% or higher (Burns, 2007; Hasbrouck & Tindal, 2006; Therrien & Kubina, 2006). Repeated reading allows the child to be exposed to the text multiple times and build up confidence, accuracy and fluency. In a classroom setting the teacher reads the story through once with the children following along in the book, then the children read along, or echo read, with the teacher. Children are then assigned a section to read with the group and lastly the text is taken home for practice (Hoffman, 1987). In conjunction with this method, children are questioned about the text to develop comprehension skills (Stahl & Heubach, 2005; Herman, 1985).

O'Shea, Sindelar and O'Shea (1987) found that students who re-read the same text seven times read at a greater fluency rate than those who only read the passage once, twice or three times. Rashotte and Torgesen (1985) state that for repeated reading to be effective in improving reading fluency over a seven day period each passage must be read four times before the child is presented with the next passage. They found that fluency was greatest when the new passage contained overlapping words and there were no fluency effects when the words in the passage were not overlapping (Rashotte & Torgesen, 1985). Both of these studies show the effectiveness of repeated reading in improving reading fluency of this text (O'Shea et al., 1987; Rashotte & Torgesen, 1985). Although when the text contains new words or is different, the fluency rate decreases, as seen in Rashotte and Torgesen's (1985) study. This means that when students return to regular classroom instruction, the gains made from the intervention may be limited.

**Word drill.** The ability for children to read at a fluent rate can be impacted by their ability to accurately read words. Being able to quickly identify whole words without having to sound out each (one using a phonics approach) supports the ability to increase rate of reading (Welsch, 2006). Words which commonly occur (e.g., *and, the, it, she, he*) are known as sight words and it is beneficial for students to reach these at a level of automaticity. Word drill is a technique commonly used in schools, it involves children learning sight words typically using flash cards.

**Models.** Viewing a successful performance can support an individual's ability to learn a new skill or behaviour. Listening to a teacher, parent or competent peer read (in real life or on a CD recording) is a common method for learning reading skills (Allington, 1983; Buggey & Ogle, 2012; Hudson et al., 2005; Skinner & Shapiro, 1989; Welsch, 2006). These modelling techniques are commonly used with individuals, small groups or teacher-led class reading activities in schools. For example, the Rainbow Reading Programme consists of a set of graded stories which children listen to. The story is modelled/ read at a fluent rate and children follow along in the book. In conjunction with listening to the CD children complete related games and activities to assist with their comprehension

and understanding (Pluck, 1995). The Rainbow Reading Programme combines components of both repeated reading and modelling, it has been found to be effective in increasing children's reading fluency as measured on the NARA (Wheldall, 2000).

### **Modelling and Observational Learning**

Modelling is a valuable component of reading intervention programmes and is based on Bandura's (1997) theory of reciprocal determinism. The theory illustrates that there is a mutual/reciprocal relationship between a person, the environment and their behaviour (Bandura, 1997; Clark & Ste-Marie, 2007). Grusec (1992) outlines each of the three categories and what each encompasses: personal factors including self-perceptions, goals, cognition and biological properties; environmental factors such as instructions, modelling and physical surroundings; and behavioural factors, for example, personal actions and daily activities. There are four main processes through which learning by social modelling occurs; these are: attentional (salience of key items), representational (language & memory), production (motor skill) and motivational processes (reinforcement & incentives) (Grusec, 1992).

There is a broad range of factors which can have both a positive and negative influence on behaviour. Learning predominantly occurs within a social context, one of the strongest environmental influences on behaviour is that of others. People have the ability to change and shape personal attitudes, appearances, thoughts, actions and behaviour, whether this is intentional or not. Members of groups (peer, class or gender) imitate each other's behaviour, and have certain characteristics defining the group from others. Individuals take their peers as a model to learn both socially acceptable behaviours to be included within a group but also to learn new behaviours and skills. Most human behaviour is learnt through observing others (Bandura, 1986). An individual is defined as a model when their behaviour has an influence on the behaviour of another individual. The role of the model is the teacher; they provide a competent performance demonstrating the target behaviour or skill for an observer. In comparison, the role of the observer is to learn from the behaviour viewed and bring

this into their behavioural repertoire. Learning by watching someone perform a behaviour (modelling) is called observational learning (Bandura, 1986). When children are growing up, adults are the people who predominantly provide models for children to imitate, for example when learning how to talk, eat or read (Buggey & Ogle, 2012). Typically, a model is an individual who has mastered or is more competent at the skill or behaviour than the observer (Dowrick & Raeburn, 1995). The observer views the performance gathering information about the context, the behaviour and the consequences the model experiences. Then the individual may then encode and rehearse the observed action to retain the skill which thereby creates a cognitive representation of the skill for future use (Clark & Ste-Marie, 2007). Such observational learning may be behaviourally silent until an opportunity is experienced in which the observer may attempt an overt performance of the cognitively represented behaviour, providing an occasion to both practice the skill and experience whatever consequences may be available for the performance. Through innumerable such experiences learning is translated into performance.

Bandura's (1977) social learning theory (later renamed social-cognitive theory) explains how people learn new behaviours and skills in a social context through observational learning and modelling (Bandura, 1986). There are four different types of models: *direct* (live/in vivo) models, which provide a real-time socially immediate demonstration of a behaviour; *verbal* models, where behaviour is described; *symbolic* models which involve real or fictional characters demonstrating behaviour; and *exemplary* models, where heroes/ villains who are culturally established symbolic models are depicted solving problems or performing in ways valued by the culture.

**Successful Modelling.** For modelling of behaviour to be successful there are four key components that must be present in the observer for observational learning to occur, namely attention, retention, production, and motivation (Bandura, 1977, 1986; Dowrick, 2012; Grusec, 1992).

**Attention.** In order for the observer to learn from the model and imitate this behaviour at a later date, the observer must pay close attention to the modelled actions. There are several variables

in which attention is determined, including the power and attractiveness of the model and the medium through which and location in which the behaviour is viewed. Rapid successful learning is more likely to occur if the individual is able to recognise themselves (physical characteristics) in the model.

**Retention.** In general, the model must be observed multiple times in order for observers to remember the key components of the behaviour to perform the skill themselves. Exceptions may arise where the model is highly attractive, the behaviour demonstrated highly salient to the observer, and the consequences highly reinforcing, leading to one or few-trial learning.

**Production.** The behaviour the model is performing must be one which observers are physically or mentally able to achieve. It must be within their *zone of proximal development*, this is the gap between what the child can currently achieve alone and what they can achieve with the help of scaffolding, temporary support- either learning tools or help of others, (Papalia, Olds & Feldman, 1990). The observer must also be given the opportunity to practise the behaviour in order to master it and preferably practice and/or repeatedly observe, it at regular intervals to maintain the skill.

**Motivation.** In order for modelling to be successful, the individual must want to change their behaviour and this motivation must be high enough to provide an incentive for the individual to model the behaviour shown by the modeller.

The combination of these components ensures that the individual is able to successfully transfer behaviour viewed in an external source (the model) to themselves (Grusec, 1992). With a change in behaviour there is most often a change in the individual's self-efficacy or belief about themselves as individuals, which reinforces the maintenance of this new behaviour (Schunk, 2003).

In a landmark study, Bandura, Ross and Ross (1963) examined observational learning of aggression. Children watched an adult model beating and kicking a BOBO doll (a large inflated doll with weighted sand at the base). Later when given the opportunity to be in the room with the same doll the children engaged in the same aggressive behaviour, mimicking the behaviour which they had

seen earlier. Replication of this research has been conducted using different variations, such as changing age and gender of both model and observer, and the form in which the behaviour was presented (in vivo, or via film/video). The powerful influence of incentives and rewards, both those observed being experienced by the model, and those actually experienced by the observer when they imitated was also demonstrated in early research (Bandura, 1965). This research quite clearly highlights the power that a model can have in influencing an observer's behaviour. Coming back to the four different types of models outlined earlier (direct, verbal, symbolic and exemplary) we can see that Bandura, Ross and Ross's (1963) research fits into the direct modelling category. The children observed an adult model and as a result learnt and performed the behaviour. The children were motivated, able to pay attention to the model, retain what they had seen and produce or replicate the behaviour.

Neurologists have found that mirror neurons also have an important role to play in the learning and modelling of behaviour. A mirror neuron is activated when another individual's behaviour is observed and mirror neurons provide "internal representation of other people's actions, intentions or emotions" (Colman, 2009, p. 467). It has been found that the same mirror neurons fire when a monkey is crushing a peanut when doing it himself and when watching another monkey complete the same task (Dowrick, 2012). This idea has also been seen in humans in research using MRI scans of mirror neurons (Fogassi & Ferrari, 2010). Findings from MRI-based studies support early research which found more mirror neurons are fired when the model is the individual or is someone familiar to the individual, rather than a complete stranger (Oberman, Ramachandran & Pineda, 2008). Mirror neurons are not fired unless the behaviour is within the individual's zone of proximal development is a desired goal, and the opportunity arises for the individual to complete the task (Dowrick, 2012; Vygotskii & Cole 1978).

### **Self modelling**

An observational learning technique in which the individual is his/her own model is called *self modelling* (Creer & Miklich, 1970). In this technique, the salience and general impact of the model is

enhanced as the individual is their own model. This is reinforced in earlier research outlining that attractiveness and similarity of the model to the observer is one important variable in determining the likelihood of imitation (Bandura, 1977, 1986; Dowrick, 2012; Grusec, 1992). Self modelling can consist of a short video, audio segment or series of photographs which are used and shows the individual performing the target behaviour (Dowrick, 1999). The individual listens to or views the demonstration a number of times in a short space of time, typically six times over a two-week period (Dowrick, 1999). By viewing the self as a model, the individual learns to imitate the behaviour and bring this into his/her current repertoire of behaviour. By observing a self-model, the individuals are able to recognise their own potential in performing target behaviour and reaching a valued goal (Dowrick, 2012; Ste-Marie, Vertes, Rymal & Martini, 2011).

Self modelling conveniently brings the teacher and the learner together as one (Dowrick & Raeburn, 1995). The individual is learning new behaviours from viewing performance of themselves, the model. This strengthens the power of the model in that the teacher is the closest possible match visually to the observer (Ste-Marie et al., 2011). The availability of video technology editing programmes has come to standardise the modelling procedure (Dowrick, 2012). Each time the individual views the model, it provides an unvarying example of the target behaviour and how to perform it. The video is also easily accessible, in that it can be viewed as many times as desired. Devices with digital recording technology (phones, iPads, still and video cameras) are now very accessible to the general public which make it easy to use this modelling method (Bray & Kehle, 2012).

### **Video Self Modelling (VSM)**

One method of self modelling shown to be effective in reading intervention programmes is VSM. The process of VSM involves filming an individual and editing the footage to show only the target behaviour and playing this edited video to the individual. The steps to creating a VSM have been documented in many journal articles, books and websites making them accessible to

researchers, teachers and parents (Buggey, 2009; Collier-Meek, Fallon, Johnson, Sanetti, Delcampo, 2012; Dowrick, 1991). The individual gains three benefits from watching the video self-model. First, it provides a component performance for the person to learn from, imitate and encode. Second, it shows the person that it is possible to perform the target behaviour. Last, it gives the individual a boost in motivation, self-belief and self-efficacy.

In order for VSM to be effective there are a number of conditions that must be met.

The chosen target behaviour must be within the individuals' *zone of proximal development*-that is it must be a behaviour which is achievable but just out of reach (Dowrick, 2012; Vygotskii & Cole, 1978). Dowrick (1991, 1999) has refined VSM and distinguishes between two related components namely FFVSM and positive self-review (PSR). Both techniques use a strength-based approach, although they vary depending on whether the individual is able to perform (PSR) or not perform the target behaviour (feedforward-FF).

**Positive self-review.** PSR is used when the student is able to perform the target behaviour, but the behaviour does not occur at the desired frequency (Dowrick, 1999, 2012). The individual is recorded until they demonstrate enough of the target behaviour, so a video self-model can be created (Buggey, 2007). Video footage is edited to show the individual performing the skill at the desired rate/competence level (Dowrick, Kim-Rupnow & Power, 2006). Early research using PSR was conducted by Creer and Miklich (1970) with a child whom was hospitalised and had trouble interacting with other people. The researchers found role play of social skills alone was not effective in changing behaviour, but when this was filmed and played back to the child there was a dramatic change in his behaviour. The PSR technique is used in a number of different areas, in particular for sports performance and skills (Dowrick & Raeburn, 1995). For example, to help figure skaters improve their consistency of performing perfect jumps. This was achieved by filming only correctly performed jumps, and playing this back to the skaters (Law & Ste-Marie, 2005).

**Feedforward Video Self modelling.** In comparison, FFVSM focuses on behaviour which the child cannot yet achieve (hence the term *feedforward*), in this context, reading text at a fluent rate.

The child views images of future behaviour rather than reflecting on those which can already be achieved (Dowrick, 1999, 2012). Video footage is taken of components of the behaviour that the child is able to perform and footage is then edited to show the individual seemingly performing the target behaviour successfully. The person then views the video which encourages them to imitate themselves performing this new behaviour, bringing it into their own repertoire (Dowrick & Raeburn, 1977). FF learning has been found to result in more rapid behaviour change than PSR (Dowrick, 1999). FFVSM has been successfully used with people of all ages and abilities in a number of applications, for example, behavioural problems (Buggey, 2005; Dowrick, 1999), motor disabilities (Dowrick & Dove, 1980), sports performance, (Ste-Marie et al., 2011), teaching social skills (Buggey, 2005), cognitive skills (Schunk & Hanson, 1989) and social skills (Creer & Miklich, 1970).

### **Rapid behaviour change**

A feature of FFVSM is the rapidity of behaviour change that may be obtained (Dowrick, 2012). FFVSM interventions occur over a short space of time and video footage is generally viewed six times over a two week period (Dowrick, 1999). The time taken to implement an intervention and to notice change in behaviour is an important factor when considering which intervention to choose. If the intervention works, the individual will be rapidly reinforced for the change in behaviour, which strengthens the use of this target behaviour in the future. In addition, an intervention which is fast causes less stress and costs less money in the long term (Biliadis-Lolis, Chafouleas, Kehle & Bray, 2012).

Kehle, Owen and Cressy (1990) provide an example of how rapid behaviour change can be. In their study, a child who was mute at school was shown a self-model once only, and this resulted in him talking freely at school. In comparison to other treatment methods for children who are mute, VSM is seemingly faster and not as restrictive or intrusive as other interventions (Kehle et al., 1990). In another example, Shirley, had trouble walking without support. She watched a video self-model of herself walking and improved in the magnitude and generality of her walking from watching the two minute video self-model (Dowrick & Raeburn, 1995). Before this, she had received twice weekly

visits to an occupational therapist, with little improvement. These examples show the power that VSM has in changing behaviour, as well as saving money, time and resources.

### **Mechanisms of FFVSM**

Two key ideas are proposed as the mechanisms of how FFVSM works, namely mental time travel and increasing personal self-efficacy (Dowrick, 2012).

**Mental Time Travel (MTT).** MTT enables humans to revisit past events and pre-experience the future, made possible due to the episodic memory (Dowrick, 2012; Suddendorf, 1997; Suddendorf, Addis & Corballis, 2009). An important part of human cognition is having the ability to simulate future events, since this enables effective decision making and beneficial outcomes (Miles, Karpinska, Lumsden & Macrae, 2010; Suddendorf, Addis & Corballis, 2008). Creating images of future success is one of the essential conditions for behaviour change, although without the following prerequisite skills there may be no behavioural shift (Dowrick, 2012). Pre-requisite skills include theory of mind (Premack & Woodruff, 1978), self-concept and language (Howe & Courage, 1997) and social construction (Reese, 2002). This suggests that MTT may not be possible in children until they are between 3 and 5 years old, although research in this area is limited (Suddendorf & Busby, 2003). There is very little research which has examined how MTT can influence the future and its role in supporting behaviour change (Dowrick, 2012) but its importance is emphasised by Bandura (2008) – *Humans can visualise futures and act on the present* (Bandura, 2008, p 15).

**Self-efficacy and belief.** Another possible explanation for the observed rapid behaviour change which occurs in FFVSM is that an individual's self-efficacy is increased as a result of viewing positive images of personal success. The VSM intervention uses a strength-based approach to improving behaviour and skills. Typically research, practice and theorising use a deficit or medical model to conceptualise the treatment of children who have learning and behavioural problems (Seligman & Csikszentmihalyi, 2000), areas of weakness are identified and remediation programmes are designed to correct these (Bellini & McKonnell, 2010). In comparison, VSM focuses on what a

child is able to do and builds their strengths. Participation in VSM research is generally motivating to children involved who get to have a movie made all about them (Buggey, 2007).

Self-efficacy is an individual's perceived ability that he/she is able to perform a skill or behaviour (Dowrick et al., 2006). Self-efficacy must refer to a specific task rather than a general, overall gauge of self-confidence. It can be measured using a Likert scale that has a number of questions which are related to specific behaviours, for example, being in the same room as a spider or touching a spider (Dowrick, 2012). In this study self-perception is used as a proxy measure of self-efficacy. VSM is an evidence based intervention in which the aim is to create a positive perception of the child and show that they are able to achieve the target behaviour (Gelbar, Anderson, McCarthy & Buggey, 2012). When an individual has increased belief in their personal capability it supports task engagement and future success as well as self-regulatory processes (Bandura, 1997). Viewing the cleverly edited video model enables the child to view themselves in a positive light, strengthening self-efficacy and belief. This is an important component in increasing self-esteem as individuals who are typically performing lower than peers have low self-belief. It is presumed that when fluency and generalisation of behaviour increases so does self-efficacy.

VSM supports the change in self-belief through only showing positive/ target components of an individual's behaviour in the video (Dowrick, 2012). Having high self-efficacy about performing an academic task (e.g., reading) is particularly important as this will motivate the individual to independently engage in the behaviour (Dowrick, 1999). This will provide the child with greater practice opportunities, maintain motivation and help the individual to become a self-regulated learner within an educational context (Clark & Ste-Marie, 2007).

There has been very little research which has examined how individuals' self-efficacy changes with rapid behaviour change. A measure of self-efficacy can be difficult to gain, especially with very young children, as they do not have the understanding and ability to rate their thoughts and feelings (Dowrick, 2012). Because of this difficulty, self-efficacy in children is sometimes assessed by various proxy measures – measures that children are able to complete of things that are considered to be

linked to self-efficacy, such as perceptions of the self as being successful, or beliefs about one's success or competence. Edl (2007) measured change in students' self-efficacy after receiving a VSM intervention to improve reading fluency. The Reader Self-Perception Scale was used, which is based on a five-point Likert scale (Henk & Melnick, 1995). There were five subscales: general perception, progress, observational comparison, social feedback, and physiological state. Results revealed that the students' self-perception increased over the intervention period. Clark and Ste-Marie (2007) also used a measure of self-efficacy in their study of teaching children to swim. A 10-point Likert scale was used to measure changes in the children's personal beliefs. The scale consisted of 10 circles, with the smallest representing low self-efficacy, and the largest circle representing high self-efficacy (Feltz & Chase, 1998).

### **Video Self Modelling and Academic Skills**

VSM is a feasible intervention for improving children's academic skills. However, the use of VSM is developing slowly in educational settings, which may be due to the skill, time and technology required (Buggey & Ogle, 2012; Collier-Meek et al., 2012). Research in the field picked up in the middle to end of the 1990's as the availability of recording devices grew. There are two summary tables of educational interventions using VSM, in Buggey and Ogle (2012, p.54) and Prater, Carter, Hitchcock & Dowrick (2012, p.74). This research includes social engagement (Bellini, Akullian & Hopf, 2007; Buggey, 2005; Buggey & Hoomes, 2011), responding to questions in the classroom (Buggey, Toombs, Gardner & Cervetti, 1999; Sherer, Pierce, Pardes, Kisacky, Ingersoll, Schreibman, 2001) learning and behaviour changes (Clare, Jenson, Kehle & Bray, 2000; Dowrick et al., 2006), writing (Delano, 2007), and mathematics skills (Schunk & Hanson, 1989). VSM can be seen to be effective for learners of all ages, ranging from three-year-olds improving peer relationships and play; (Litras, Moore & Anderson, 2010) through to adolescence to high school students being helped with public speaking anxiety (Rickards-Schlichting, Kehle & Bray, 2004).

A literature search was conducted to find research which specifically examined using FFVSM

to improve reading fluency. The search was conducted in all Education, Health Sciences and Psychology/ Sociology data bases available through the University of Canterbury website. The key words used for the search included, video self-model\* OR video model\* OR feedforward AND fluency OR fluent AND reading OR read\* OR literacy. Restrictions were placed on the full text being available and that the article was peer reviewed. There were no restrictions placed on the year published. This search brought up two results: Dowrick et al (2006) and Hitchcock et al (2004).

Both of these research studies involved work with first grade students in Hawaii and had an intervention programme which involved both tutoring and VSM. The intensive intervention took place four times for a 25-30 minute period over the course of 35-55 days. A multiple base line design was used, which started with tutoring, then tutoring plus VSM and then just tutoring. The Actual Community Empowerment (ACE) tutoring programme sessions consisted of unison reading, independent reading, echo reading, and discussion of the book and memory games. Both of the research interventions involved a two minute VSM of the child reading a difficult text fluently, which was achieved through echo reading. In addition Hitchcock et al., (2004) used a second VSM which showed the child accurately reading sight words and Dowrick et al's (2006) second VSM showed the child accurately answering comprehension questions related to the text. In both interventions a pre-test and post-test measure was used, including the *Kaufman brief intelligence test* (Kaufman & Kaufman, 1990) the *Woodcock Reading Mastery Tests* (Woodcock, 1998), as well as teacher and student rating scales of reading confidence. Both studies showed great improvement in the students' reading fluency and comprehension levels. The participants in Dowrick et al (2006) improved from 7.2 WCPM to 21.2 WCPM on average. For Hitchcock et al (2004), three participants tripled and one participant quadrupled the number of WCPM which was maintained at the six month follow up.

This research shows the effectiveness of VSM in improving reading fluency when combined with a tutoring programme. Although effective, there are many limitations/ barriers which would prevent this from being applied in a school setting. There was a large amount of time invested in the

training of the tutors and implementing the intervention, with the child required to take part in the ACE programme four times a week. Because of this labour-intensive process, it would not be a suitable intervention to implement with a large group of children.

### **Current Study**

The current research uses FFVSM alone, without the tutoring programme, to determine if this approach is effective in improving the reading fluency and comprehension. Using FFVSM as a stand-alone intervention technique reduces the time taken to implement the intervention, therefore making it more practical to be applied into schools with larger numbers of children. It does not require a lot of time outside of the classroom and could be used as a supplement to regular classroom instruction in order to boost the reading fluency and comprehension levels of any child who is falling behind in reading. Change in reading proficiency will be measured by examining individual shifts in fluency and comprehension, the children's self-efficacy and the teacher perceptions of the intervention will also be examined.

It is predicted that FFVSM will improve the participants reading fluency and related comprehension as measured by WCPM during the intervention period by and using pre-test and post-test measures on the NARA. It is also expected that the participant's self-efficacy will increase from pre-intervention to post-intervention.

## **CHAPTER 2: Method**

### **Setting**

Participants were recruited from three primary schools in New Zealand, one with a decile rating of two and two with a rating of ten. In these schools the higher the decile rating the higher the social economic status of the families served by the school. Each session was conducted in a small reading or resource room at the school. The rooms were quiet, had a table and desk, adequate lighting and were free from other students and most distractions.

## Design

A multiple baseline across participants design was used to determine whether participants individually made an improvement in their reading fluency (rate), comprehension and accuracy. Overall change in RA was measured through the use of a pre-test and post-test after the completion of the intervention. There were three phases, baseline, intervention and follow up.

## Participants

The participants were 11 children (7 boys and 4 girls) aged between 72 and 108 months. They were referred by their classroom teachers, who had identified them as needing to improve their reading fluency. Table 1 provides details of the participants (names are pseudonyms to ensure their anonymity).

Table 1: *The individual characteristics of the participants which include sex, ethnicity, age and school decile.*

		School			
Name	Sex	Age Months (Years)		Decile	Ethnicity
		At Pre-test	At Post-Test		
Charlie	Male	79 (6:6)	80(6:7)	3	Maori/ Samoan
Johnny	Male	82 (6:8)	83 (6:9)	3	NZ/Maori/Dutch
Monty	Male	112 (9:3)	113(9:4)	3	NZ
Bella	Female	116 (9:6)	117 (9:7)	3	Maori
Violet	Female	94 (7.8)	95 (7:9)	3	Cook Island
Alice	Female	109 (9.1)	110 (9:2)	3	NZ
Jack	Male	113 (9.4)	114 (9:5)	3	Maori/ Samoan
Luca	Male	90 (7.5)	91(7:6)	10	Korean
Oscar	Male	84 (7)	85 (7:1)	10	NZ
Sid	Male	106 (8.8)	107 (8:9)	10	Filipino
Freya	Female	102 (8.5)	103(8:6)	10	NZ

Selection criteria for participation in the study were based on results from two different components of the NARA (Neale, 1999). First, participants needed to have a RA score which was not higher than their CA on the rate/ fluency component of the NARA, two children were excluded from the study for this reason. One other participant was excluded because she had completed the NARA test earlier in the week outside of school. Second, to participate in the study the children

needed to have mastered the majority of their letter and sound discriminations, as pretested on the NARA.

The participants received several small rewards contingent on completing components of the testing and intervention. At the completion of the pre-test, the students received a pencil. During the intervention phase the participants collected stickers on a chart, one for each day of the intervention and post-test, seven in total. At the conclusion, participants received a ball with a smiley face on it, as well as a certificate and a copy of their video self-model on a disk. The schools received book donations to their libraries.

### **Assessment**

**The NARA (Neale, 1999).** The NARA consists of a number of standardised tests which assess oral reading ability (Neale, 1999). The test is suitable for children aged 6 to 12 years. The NARA was used both as a pre-test (form 1) and a post-test (form 2), to determine the influence of the intervention. Pre-test scores were also used as inclusion criteria (as described earlier). The main focus of the assessment was on the graded standardised reading passages and related comprehension questions, with particular interest in the children's RA for accuracy, comprehension and rate. Furthermore, as part of the NARA, four additional supplementary tests were administered. First, the child was asked to name the initial and final sounds of five pictures (apple, egg, insect, orange, and umbrella). Second, the child was asked to name the letters and sounds of two sets of alphabetical letters (upper and lowercase). Third, the child was required to complete a spelling test, which involved a set of simple words. Finally, the child was given two auditory tasks and a discrimination task which required the child to determine if two words were the same or different, the other a task where the child was asked to blend sounds of words together to make a complete word.

These sections on the NARA were chosen because the supplementary tests are a clear indicator of whether the children have letter sound discrimination knowledge. Moreover, it was necessary to restrict the time taken to administer each pre-test as it also included the Burt Word

Reading Test, and the self-perception test, to under 30 minute intervals to meet the requirements of the class schedule.

**Science Research Associates Reading Laboratory (SRA; Parker & Scannell, 1973).** The SRA is a set of graded texts and related comprehension questions which was used as a measure of students' reading fluency and comprehension during the intervention phase.

The *Reading Laboratory 1a Power Builder 1973* edition was used. The texts range from RA 6 years and 2 months (78 months) through to 8 years and 5 months (101 months), increasing in intervals of 2 months. Ten different texts are provided at each level of which seven were randomly selected for each child at the appropriate level.

Participants were initially assigned a level on the SRA text which was one year ahead of where their accuracy RA was on the NARA pre-test. During the course of the intervention some of the children were moved down a level if they appeared to be struggling. This was evaluated during the reading fluency tests, which were completed every second day alternating with watching the video self-model. The decision was based on their accuracy levels. Problems arose when the SRA texts did not go down below 6 years and 2 months. Two alternative sources, The Wellington Reading Inventory and the PM Benchmark Kit at the 5.5- 6 year old level were used. There were no supplied comprehension questions for the Wellington Reading Inventory, so the researcher created these using the format of the SRA text questions. The scoring of corrects and errors for fluency during this phase are outlined in Appendix 1.

**Burt Word Reading Test (Gilmore, Croft & Reid, 1981).** The Burt Word Reading Test was used as an indicator to judge at what level the child was reading. The child was given a sheet of words and asked to read as many as they could and stop when the words became too difficult. The number of words read correctly was recorded and a RA range was determined by looking at the supplied table.

### **Reader Self-Perception Scale (Henk & Melnick, 1995).**

The Reader Self-Perception Scale was used to measure the participants' perception of themselves as readers (i.e., as a measure of self-efficacy) (see Appendix 2). A five-point Likert scale was used in the original questionnaire from "strongly agree" to "strongly disagree". Because the participants were aged six to nine years, an emoticon/ picture scale of faces was used, with a smiley face representing "strongly agree", a sad face representing "strongly disagree" and appropriate images in between. There were 33-items on five subscales which included general perception, progress, observational comparison, social feedback, and physiological state. All of the scales had high internal consistency (Henk & Melnick, 1995). These measures were taken at two different times namely at the beginning and at the conclusion of the intervention. This was to determine whether there was any change in the students' reading self-efficacy/ perception.

**Teacher Perception Survey.** The teachers were asked to fill in the Teacher Perception Survey at the conclusion of the intervention (adapted from Edl, 2007). The survey asked classroom teachers their perceptions of childrens' attitudes, confidence, engagement and fluency in oral reading. Additionally, they were asked their thoughts on the benefits of the intervention and if they would use it in the future with students. Questions were answered by highlighting boxes either on a 5 or 3 point Likert scale. The full details of the teacher perception survey can be found in Appendix 3.

### **Apparatus**

To film the children reading, an Apple iPad 2 was put into a hard case shell which was mounted on a tripod. The tripod was set up at a close distance to the child in order to capture quality image and sound. The video self-model was edited on an Apple computer in the iMovie programme then transferred back on to the iPad through iTunes. The children subsequently viewed their video self-model on the iPad in full screen landscape view, with the sound on the loudest volume.

### **Procedures**

**Ethics Approval.** Ethical clearance for the project was gained from the Educational Human Ethics Committee at the University of Canterbury (Appendix 4). Information to all related bodies

(Board of Trustees, Principal, Teachers, Parents and Students) was given and signed consent gained before the research was started in the schools (Appendix 5).

**Recruitment.** Schools in Christchurch, New Zealand were approached and asked if they would like students at their school to be involved in the study. The research project was explained to the school principals and junior/middle school teachers. The teachers then selected students from their classes whom they thought would be suitable for the intervention. As soon as the consent was gained, the screening/ pre-test was conducted and started to determine the students' suitability for the intervention.

**Pre- Intervention.** This phase of the study consisted of a number of different tests to determine the level of the childrens' reading skills, as well as to understand the perception they had of themselves as readers. The NARA, Burt Word Reading Test and the Reader Self- Perception Scale were administered. If suitable for the research, the child was assigned a level on the SRA texts. This level was one year above their RA on the NARA accuracy score.

**Baseline.** The baseline data point for fluency was gained by using an average (across the texts read with less than 16 errors) from the pre-test reading on the NARA. To prepare for the filming of the video self-model, each child read the assigned and unseen passage from his/her level of the SRA texts once through with the researcher and once alone. To film the video self-model the iPad was set to record, capturing only the child in the shot. The child was asked to sit at a chair behind a desk and hold a blank piece of A4 cardboard folded in half. Echo reading was used to capture the performance needed for the video model. At a fluent rate the researcher read the first sentence of the text and the child repeated this back, and so on until the text was finished. The child was asked to sit still during echo reading and look down at the folder cardboard the whole time. The text was not printed on the card so they child was not reading the words, but just repeating them back, as reading could slow them down. The researcher read the text at a fast speed, so that this would be modelled by the child. In addition the child was also encouraged to repeat quickly. If there was an error in the child's

repeating or if it was read at a slow rate, the child moved or looked up then the affected line was repeated.

Video was downloaded into the iMovie programme on an Apple computer. It was edited by deleting where the researcher was talking and where the child paused or made a mistake. There were some cases where the researcher did not notice the child had made an error or was looking up from the page when echoing the passage. In these instances, editing was more complex. If the child was looking up or moving around in his/her seat, a still shot was inserted, or a shot with the audio muted where the child's face was covered by the page. If the child missed a word, or made an error, audio from another section of the text was inserted and stitched together. On one occasion, the video needed to be filmed again as the child was moving around too much in his seat and not looking at the page.

The video self-models were between one and two minutes long. Some of the texts that the children read at the higher level had more words and exceeded the two minutes. These videos were cut down to two minutes (Dowrick, 1999). Cutting these back also reduced the time that children spent out of the classroom during the intervention phase and if it had been any longer than this the children may have found it difficult to attend to the screen. The videos for each child contained an opening shot of the "<child's name> Movie" with a red curtain background. Next was a photograph of the child looking at the page, with the title of the book underneath. The photograph of the child was taken as a still shot from the video footage collected during the filming of the video model. During these first two title pages upbeat music was playing, namely "Acoustic Sunrise" from the iLife sound files. Next the video self-model played, showing the child reading fluently. At the conclusion of the video, a black background came up, with a descriptive praise statement for the child: "Fantastic fast reading of all the words in that story <child's name> Well Done!". While this was shown on the screen, the sound of a crowd clapping was played.

**Intervention.** The intervention involved six sessions over a two week period. Ideally this was

to occur every second weekday, but owing to sickness and unforeseen school events this was not strictly adhered to. Each session comprised four key steps. First, the child was brought into the resource room, was asked to sit down and then watch their video self-model through once on the iPad. Second, the child read a selected text. Then the child then answered five comprehension questions related to the text he/she had just read. This was followed by a second reading of the selected text. The child was given the correct word if they paused for three seconds; this was marked by a T (representing told) under the word on the reading transcript. If the child missed a word this was marked with an X. During reading of the texts the researcher recorded the time taken as well as the number of words read correctly and the number of errors made.

**Follow up.** One week after the intervention was completed the children were tested again on the Burt Word Reading Test, NARA and the Reading Self-Perception Test. Additionally, the child's classroom teachers were asked to complete The Teacher Perceptions Questionnaire. Teachers completed this survey before they were given the results of the intervention to gain their initial perceptions of any changes to the students, attitudes or reading fluency.

### **CHAPTER 3: Results**

The results will be presented by first examining the overall trends and findings of the study, followed by a more detailed analysis of results for each child, including results from the NARA intervention fluency, reading comprehension, student self-perception and teacher perceptions about the intervention. The majority of the results concerning RA will be presented as age in months, however, some translations into years and months will be presented throughout.

#### **Group Results**

The following tables show the pre-test and post-tests results from the NARA in three categories, accuracy, comprehension and rate. Table 2, shows RA in years and months, while Table 3 shows the RA in months. The means in Table 3 show that on average over the two months of the study the children improved in their rate by 11.6 months. On average the comprehension RA scores

did not change. Furthermore, there was a small decrease in average accuracy between pre-test and post-test RA scores.

Table 2: *Pre-test and post-test RAs on the NARA in accuracy, comprehension and rate. RAs are given in years and months. These are presented as years: months.*

	NARA (RA, years. months)					
	<i>Pre-test</i>			<i>Post-test</i>		
	<i>Accuracy</i>	<i>Rate</i>	<i>Comprehension</i>	<i>Accuracy</i>	<i>Rate</i>	<i>Comprehension</i>
<i>Charlie</i>	6**	6:5	6	6:4	7:6	6:2
<i>Johnny</i>	6	6:4	6:2**	6:3	13*	6
<i>Monty</i>	7:5	9:1	8:8	7:3	7:5	8:1
<i>Bella</i>	6:7	7:2	7:3	7:5	7:9	7:5
<i>Violet</i>	7	7:11	7:3	7:1	7:6	7:5
<i>Alice</i>	6:1	7:3	7:4	6:11	6:6	7:11
<i>Jack</i>	6:7	8:6	6:9	6:11	8:2	7:2
<i>Luca</i>	6**	7:2	6**	6:5	7:6	6:4
<i>Oscar</i>	6:2	6:8	6	6:5	8	6:2
<i>Sid</i>	7:7	8:8	6:3	8	11:8	6:8
<i>Freya</i>	7:11	7:8	6:9	7:5	9:9	7:5

\* Ceiling effect on the test, student scored higher than shown score

\*\* Floor effect on the test, student scored lower than score shown

Table 3: *Pre-test and post-test RAs on the NARA in accuracy, comprehension and rate. RAs are given in months*

	NARA (RA in months)					
	<i>Pre-test</i>			<i>Post-test</i>		
	<i>Accuracy</i>	<i>Rate</i>	<i>Comprehension</i>	<i>Accuracy</i>	<i>Rate</i>	<i>Comprehension</i>
<i>Charlie</i>	72**	77	72	76	90	74
<i>Johnny</i>	72	76	74**	75	156*	72
<i>Monty</i>	89	109	104	87	89	97
<i>Bella</i>	79	86	87	89	93	89
<i>Violet</i>	84	95	87	85	90	89
<i>Alice</i>	73	87	88	83	78	95
<i>Jack</i>	79	102	81	83	98	86
<i>Luca</i>	72**	86	72**	77	90	76
<i>Oscar</i>	74	80	72	77	96	74
<i>Sid</i>	91	104	75	96	140	80
<i>Freya</i>	95	92	81	89	117	89
<i>Mean</i>	80	90.4	81.2	83.4	103.4	83.7

\* Ceiling effect on the test, student scored higher than shown score

\*\* Floor effect on the test, student scored lower than score shown

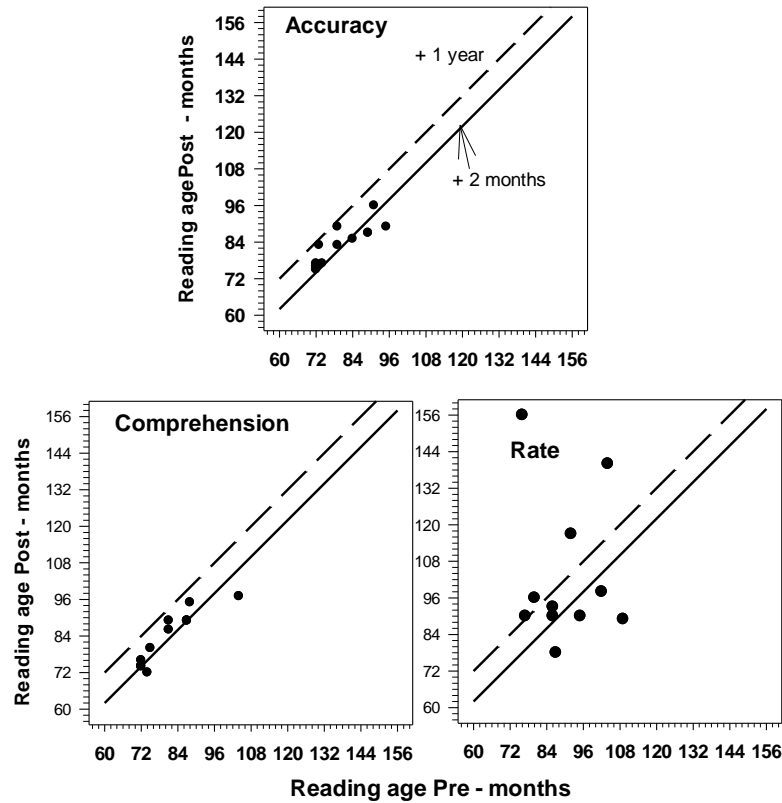


Figure 1: *Modified Brinley plots showing change RA on the NARA (accuracy, comprehension, and rate) from pre to post-test for each individual. The solid line represents an improvement of 2 month (consistent with the passage of time). The dashed line represents an improvement of 1 year.*

The NARA scores can also be looked at using a modified Brinley plot (as developed by Blampied, 2008). As shown in Figure 1, the majority of the students made gains which were larger than the incremental two month improvement expected with no intervention. In all three categories (accuracy, comprehension and rate) students predominantly made improvement in RA of between two months and one year. Four students made gains which were more than one year above their pre-test score. There were also some students who did not even make the incremental two month improvement between their pre-test and post-test scores on the NARA.

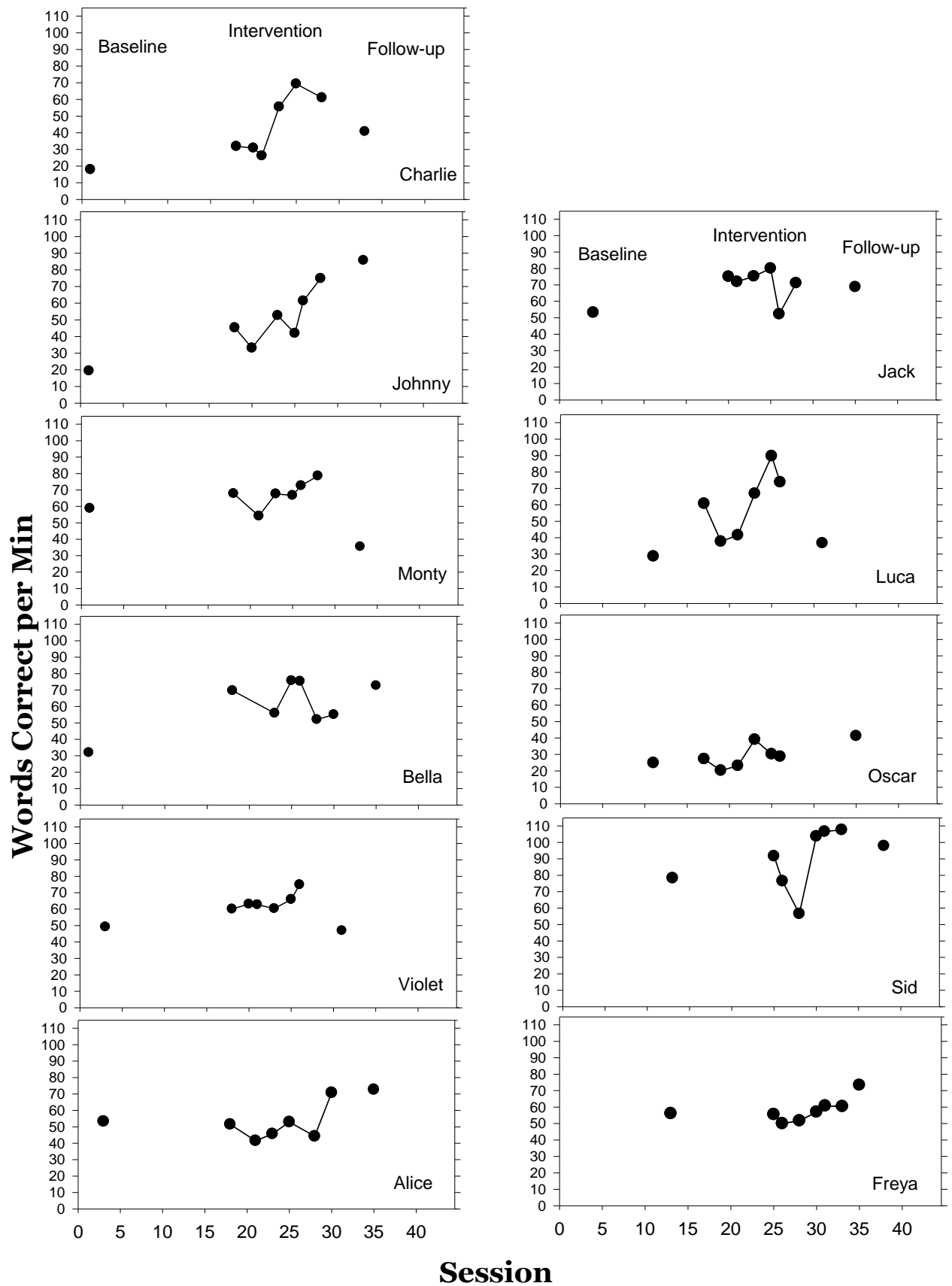


Figure 2: Participant scores in WCPM, during the pre-test, post-test and intervention phase of the study over a two month period.

### **Fluency exhibited during intervention**

The change in the students' intervention fluency can be seen in Figure 2. Seven of the students showed an increase in their reading fluency during the intervention phase. This is seen by the first point in the intervention being lower than the last point in the intervention phase, giving a positive slope. Two of the students made substantial improvement (Charlie and Johnny) while five other students (Monty, Violet, Alice, Luca and Sid) showed significant improvement albeit to a lesser degree. Two of the students (Freya & Oscar) showed very little improvement, with a flat slope and two of the students (Bella & Jack) showed a negative slope and did not make any improvement from the first to the last fluency point during the intervention.

### **Inter-rater reliability**

To ensure reliability of WCPM scores during the intervention phase an inter-rater reliability check was completed. Six of the reading passages were cross coded, and observers had a 91.1% agreement rate.

### **Comprehension correct**

Comprehension was measured at pre-test and post-test on the NARA and at six points during the intervention. These results are presented in Table 4, with numbers one through to six representing each session during the intervention. As can be seen from these results, the majority of the students (apart from Charlie and Oscar) scored a high percentage of comprehension questions correctly (above 60%) and many of the students consistently scored 100%.

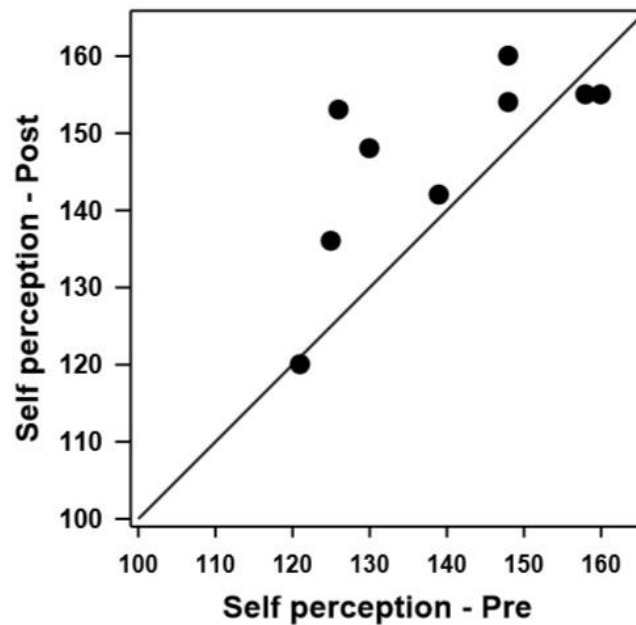
Table 4: *The percentage of comprehension questions answered correctly by each child at nine different intervals*

	NARA	1	2	3	4	5	6	NARA
Johnny	100	100	40	80	100	80	80	25
Charlie	75	31.8	30.9	26.1	55.5	69.3	61	75
Alice	93.8	100	60	100	100	100	100	56.3
Luca	50	100	80	100	100	100	100	100
Jack	50	100	100	100	100	100	100	81.3
Violet	93.8	100	60	100	60	100	60	43.8
Oscar	75	60	40	40	*	60	80	75
Sid	33.3	100	60	80	80	60	80	41.7
Freya	41.7	100	80	60	100	100	80	93.8
Bella	93.8	100	60	100	100	100	100	93.8
Monty	93.8	100	100	80	80	80	100	68.8

\* *Missing data*

### **Student self-perception**

The majority of students increased in their self-efficacy from pre to post-intervention as measured by the Reader Self-Perception Scale. Four elements from the self-perception scale (process, observational comparisons, social feedback, and physiological state) were averaged and can be seen in Figure 3 over the page.



*Figure 3:* A modified Brinley plot showing changes in Reader Self-Perception. The diagonal line represents the line of no change pre-test to post-test. The data points which lie above the line show an increase in self-perception and if the data point is below the line this represents a decrease. One child had missing data in the post-test so this child's data is not included.

The students all varied in their initial self-perceptions, with pre-test scores ranging from 94 to 160, compared with post-test scores ranging from 112 to 160. As seen in Figure 3 all but four of the students made gains in their perception of themselves as reader. One student's score remained constant. The other three students who did not make gains only had a minimal decrease in their self-perception, with reductions of no more than five points.

### **Teacher ratings of the intervention**

The majority of the teachers had a positive perception of the VSM intervention as shown by the Teacher Perception Survey. Most of the teachers (81%) agreed that the intervention was beneficial to the students, although only about half (45%) believed that there was a change in the students reading fluency. The majority of the teachers were unsure if they would use the intervention with other students in the class, the main reason being that they wanted to see results from a larger number of students. When teachers were asked if they noticed a change in the students oral reading attitude, engagement in activities, and confidence the responses were mainly spread over "neutral" and "agree". Several teachers commented that it was difficult for them to see a change over a short period of time.

## Individual Results

Figure 2 shows the change in participants reading fluency (measured by the WCPM) over the pre-test, intervention period and post-test. The data for the pre-test and post-test was taken from the reading passages on the NARA. An average score was calculated across passages read to give WCPM. During the intervention phase the WCPM were averaged from the first and the second reading of the unseen text. The level of the text was the same as the VSM text unless otherwise stated, as some students were moved down levels if the text was too difficult during the intervention.

**Charlie.** On the NARA pre-test for accuracy Charlie scored below the floor of the test (below 72 months). His reading text was pitched at 74 months. During the intervention phase Charlie did not show much change over the first three intervention sessions. He was making more than 1 in 10 errors and was not reading at his instructional level, so was moved to reading material at 65 months. Once this reading level was changed, Charlie's WCPM dramatically increased for the following three sessions, showing a peak at 69 WCPM. At the post-test Charlie's WCPM dropped back down but this was not as low as the initial pre-test. Charlie was a quiet, shy boy who did not speak much during the sessions. He really enjoyed watching the model of himself reading and found joy in seeing the number of stars on his star chart grow larger as he completed each stage of the intervention. He did not make an improvement in his self-perception, which dropped by 5 points. However, the teacher believed that Charlie had a more positive attitude to reading after the intervention was completed. She was unsure if he had made an improvement in his reading fluency.

**Johnny.** Johnny had an accuracy pre-test score on the NARA of 72 months. His reading text was pitched at 84 months. During the first two intervention days Johnny's WCPM was lower than expected. He was struggling with the words in the text and was pausing often to be given the correct word. He was moved down to a RA text level of 76

months. After a small decline, Johnny's rate slowly increased and was maintained at the post-test. During reading sessions Johnny often became distracted, playing with the reading page on the table. He needed a lot of descriptive praise to keep him on task and focused. His model recording needed to be filmed again due to not being able to capture enough shots of him sitting still and looking at the page. Initially, Johnny enjoyed watching his model but during the session, would play around with the volume and rotate the screen around. He made a small change of two points in his self-perception test. The teacher believed the intervention was beneficial and improvement had been made.

**Monty.** Monty had an accuracy pre-test score on the NARA of 89 months. His reading text was pitched at 98 months. During the first intervention session his fluency score was fairly consistent with the pre-test score, although there was a small dip in the second session. In the next four sessions Monty showed a steady increase in his WCPM across the intervention period. However, this trend of improvement was not reflected in the post-test score on the NARA. There appears to be no explanation for this drop off in fluency. Monty was a very talkative boy and keen to share what he was doing in class and sports at the weekend. Near the end of the intervention he became bored with watching the model and would gaze around the room, needing to be reminded to look at the video. Monty seemed to grow in confidence about his reading ability during the intervention and in the fifth intervention session telling the researcher how much he had improved and was up to the fourth chapter in his book he was reading at home. Monty's teacher believed the intervention was beneficial and improvement had been made in fluency, he said "Monty has grown in confidence and is much more fluent."

**Bella.** Bella had an accuracy pre-test score on the NARA of 79 months. Her reading text was pitched at 88 months. During the intervention phase there was a dramatic increase in the number of WCPM, from the initial test score, although, there was a lot of bounce in the results during the intervention period. Bella really enjoyed coming along to the sessions and

would jump straight out of her desk and come to the door when she saw the researcher arrive. She really enjoyed watching the model of herself reading, and took an interest in the different stories which were read in each session. At times she doubted her ability to read faster during the second reading of the text. Despite this she made a considerable increase in her tested reader self-perception. Bella's teacher agreed that she had a more positive attitude to reading in the classroom.

**Violet.** Violet had an accuracy pre-test score on the NARA of 84 months. Her reading text was pitched at 98 months. During the intervention phase, Violet showed a steady increase in the number of WCPM. At the post-test, Violet's score was lower than that at the pre-test; this result is not consistent with the increase in fluency made over the intervention period. Violet enjoyed watching herself reading on the video and laughed every time at one point where she said a word in a different way to how she usually talks. She did not like reading the stories through the second time, but was excited that she remembered the difficult words and was able to decrease the time taken. Violet did not improve in her measured self-perception, with the post-test showing slightly lower score. However, the teacher believed she had a more positive attitude towards reading, and the teacher also could see improvements in her reading fluency rates within the first three sessions.

**Alice.** Alice had an accuracy pre-test score on the NARA of 73 months. Her reading text was pitched at 84 months. During the intervention phase Alice's reading fluency remained relatively constant and did not change much from the pre-test score. In the last intervention session there was a steep increase in reading rate. This peak during the intervention phase was retained at the post-test. Alice really enjoyed coming to the sessions and watching the video of herself reading. She had an interest in the stories that she read and would also link these back to her own experience sharing them with the researcher. There was a one-point decrease in Alice's self-perception of herself as a reader. The teacher was

unsure if there was an increase in the students reading engagement or attitude and did not believe that she made an improvement in reading fluency.

**Jack.** Jack had an accuracy pre-test score on the NARA of 79 months; therefore, his reading text was pitched at 88 months. Straight away there was a considerable increase in the number of WCPM as seen by the difference between the pre-test and the first score in the intervention phase. This remained fairly consistent across the intervention, apart from a slight dip in the fifth intervention session. The large improvement made in the intervention period was not to be maintained at follow up and Jack's post-test score was only slightly higher than the pre-test score. Jack followed instructions well; he was always engaged in watching his model each time and smiled when he saw himself reading in the first few viewings. Jack showed a large increase in his reading self-perception score, this was supported by the comments from his teacher who strongly agreed that the intervention had a positive influence on his attitude, engagement in reading and reading fluency.

**Luca.** On the NARA pre-test for accuracy Luca scored below the floor of the test (below 72 months), thus his reading text was pitched at 74 months. During the intervention phase, there was an increase in the number of WCPM from the initial pre-test score. However, this then dropped back down, therefore, the difficulty of the reading material was changed to 65 months. With the easier material in the last three sessions the WCPM steadily increased. This increasing fluency trend was not retained at the post-test, as the score dropped back down to only slightly higher than the pre-test score. Luca's second language was English and at the time he was taking English as a second language (ESOL) lessons. Luca enjoyed watching the movie of himself reading and answering the comprehension questions with each story. There was an increase in Luca's reading self-perception. This increase in self-perception was not consistent with the teacher perceptions. She did not believe that Luca changed in his attitude or engagement in reading or that the intervention had an influence on his reading fluency.

**Oscar.** Oscar had an accuracy pre-test score on the NARA of 74 months and was assigned a reading level of 84 months. During the intervention phase, the number of WCMP remained very stable. Oscar was not making much progress so he was moved down to a reading level of 76 months. There was a small peak at day 4, which was the second day after he had been moved down to an easier text. Oscar showed a small increase from pre-test to post-test. During the initial testing and creation of the model Oscar found it very hard to sit still and concentrate on the page. He kept becoming distracted by the timer, looking out the window, or folding the pages in half. During early reading sessions, he would stop and mention things like “I can’t do this” “It is too hard”. The model was difficult to capture with a lot of reinforcement needed. After the second viewing of the video-model there was a dramatic change in Oscar’s reading behaviour, with him sitting still on the seat and not getting as distracted. Oscar would read along with the model when he was watching it and he always wanted to watch the video model again (although the procedures did not allow) he was delighted when he got to take this home. There was data missing from the self-perception test (due to research error) so it is unclear if there was a gain. The teacher did not believe that Oscar changed in his attitude towards reading or made any improvement in fluency.

**Sid.** Sid had an accuracy pre-test score on the NARA of 91 months and was assigned a reading level of 101 months. During the intervention phase Sid showed a decreasing trend across the first three sessions which dropped below his pre-test score. In the 4<sup>th</sup> session he showed a sharp increase which was maintained across the following two sessions. At the post-test there was a small decrease (in the WCPM) from the end of the intervention period. Sid enjoyed coming to the sessions most out of all the children in the study. When he saw the researcher come to the classroom he would quickly move over to the door to come to the reading session. In the last session he said “I will miss coming to do reading with you”. The teacher believed that the intervention was beneficial to Sid and noticed his confidence

increase in reading activities in the classroom. She said that he was now “motivated during reading lessons and keen to share his learning”.

**Freya.** Freya had an accuracy pre-test score on the NARA of 95 months and was assigned a reading at 101 months. During the intervention phase Freya showed a steady increase in the number of WCPM, although a reasonably slow rate for her age. The upwards trend was maintained at the follow up. Freya seemed to be very concerned about getting all of the words in the story correct and this seemed to have an influence on her fluency rate. The researcher gave her lots of positive praise to try and motivate Freya to read at a faster rate particularly on the second reading “You got most of the words correct in the story that time, well done. This time see if you can try and read it as fast as you can.” This appeared to improve her rate at the beginning of the passage but this seemed to taper out later into the passage. Freya’s teacher noticed almost instant changes in her phrasing and fluency during a one-on-one reading session in the classroom. The teacher told this to Freya which supported her self confidence and self-esteem, which is reflected in the change in self-perception scale measures.

## **CHAPTER 4: Discussion**

The aim of this research was to examine how FFVSM could be practically used within a school environment to make rapid changes to academic reading behaviours (reading fluency and comprehension), and enhance reading self-efficacy. Using digital video technology, each participant (n=11) acted as a model for themselves so that the edited video showed them reading a difficult text at a fluent rate (FFVSM). The video model was viewed by each participant six times over a two week period. It was predicted that the intervention would result in rapid learning and there would be an increase in the participants’ fluency, comprehension and self-efficacy. Each of these components of reading are addressed in relation to the study results in the paragraphs below.

## **Fluency**

Both accuracy and speed are two defining features of fluency (Binder, 1996). The majority of the students in this study increased their fluency from pre-test to post-test on the NARA and throughout the intervention as measured in WCPM. This result supports the hypothesis predicting that FFVSM would improve fluency, and it also shows that many of the children experienced rapid learning of fluency skills over the two months of the intervention, consistent with the predictions of Dowrick (2012). All of the students exhibited discrepancies between their CA at pre-test and their fluency RA as measured on the NARA pre-tests. It is interesting to note the children who made an improvement had varying levels of discrepancy between their CA and RA, which indicates that the intervention was beneficial to children at all different levels of reading delay. Results from previous research also showed that an intervention incorporating VSM and tutoring was effective in improving fluency both in curriculum-based measures of reading and during the intervention (Dowrick et al., 2006; Hitchcock et al., 2004).

## **Comprehension**

Eight out of the 11 participants who improved their fluency also improved in comprehension as measured on the NARA. This positive result is very promising as it exceeds the improvements made in the research by Hitchcock, et al (2004). The current study reinforces the link between comprehension and fluency reported in previous literature (Adams, 1990; Hudson et al., 2005; Logan, 1997; National Institute of Child Health, & Human Development, 2000). There were two students (Monty & Alice) who did not make any positive improvement in either reading or comprehension. A possible explanation for this could be that the students did not develop automaticity with their reading. Being able to read a text at a fluent pace without conscious awareness or pausing allows the individual to concentrate on interpreting the understanding of the text (Logan, 1997; Hudson et al., 2005). Unexpectedly, there was no real trend in the comprehension data collected every second day

(after the child watched their VSM) during the intervention phase. The majority of children scored highly and this may have been because the answers were multi-choice and questions were recall and inference in nature. Lack of evidence of any change over time may, therefore, represent a ceiling effect due to this particular way of assessing comprehension.

### **Self-perception**

This study showed that the majority of the participants made a positive improvement after the intervention about how they viewed themselves as a reader. Self-perception is used as a proxy measure for self-efficacy. An individual's perception of their own capabilities has a considerable impact on his/her ability to perform and master a new behaviour (Buggey, 1997; Dowrick et al., 2006). For many of the participants an improved reading self-perception was noticed early in the intervention and could be seen by the children smiling at themselves reading and saying they thought that they had improved. The participants' self-perception may have also been positively influenced by their peers, parents and teacher if they commented on their improvement or positively on the child's reading performance.

Self-efficacy has not been commonly measured directly in VSM interventions; although this is an area that has been highlighted as needing examination in future research. Given the key role that self-efficacy plays in supporting performance of new skills (Bandura, 1977) the positive change noted through this intervention will potentially support future sustained maintenance of reading fluency and related behaviour. Having a positive self-perception motivates the child to engage in reading related activities independently, which increases practice opportunities for the learner (Schunk, 2003).

### **Unexpected Findings**

Many of the students in this study made greater improvement than would be expected over the two month period, across the three key areas as tested on the NARA, namely reading

fluency, comprehension and accuracy. Particularly noteworthy and not accounted for was the change in the participants' accuracy scores as shown in Figure 1, since accuracy was not explicitly targeted nor was it expected that it would change. A possible explanation for the improvement in accuracy may be from the practice sessions during the intervention period in which the children read the selected text twice through. To determine if this explanation is correct the improvement could simply be measured through pre-test and post-test checks, rather than continuous checks throughout the intervention period. Using this method would also decrease the session time during the intervention.

There were also some unexpected individual results. Oscar made slow progress during the intervention phase and read at a slow pace in relation to his CA. During initial sessions he was unable to sit still in his seat and was fidgeting with the table, his shirt and the page displaying the reading passage. His VSM was difficult to capture and required considerable editing. During the third session there was a noticeable difference in his reading behaviour, where he was sitting up on his seat and holding the page still. This example strongly suggests the potential power of visual learning and a positive model on improving other related reading behaviours not just the targeted reading fluency.

## **Limitations**

The reading material used during the intervention phase varied depending on the level of the text. The higher the level and more difficult the text was the longer the story. The children were required to read the entire text so they could answer the pre-set comprehension questions. For some of the children, the texts were as long as 470 words. It was observed that, as the students moved through the text, their rate of reading became slower and they took more breaks and pauses. This could be attributed to the fact that struggling readers use four to five times more physical energy (requiring glucose and oxygen) to complete the same language-related task than good readers (Richards et al., 2006). This is one of the limitations

of the study as, if the passage was shorter, the child may not tire as easily and would not have to concentrate for as long.

Another limitation of this study was the variability in the content and level of the reading material. Even though the texts used are a well-recognised set of graded texts there may still be some variation in the level of difficulty between passages. In particular, some of the passages contained stories which had specific interest vocabulary (names, places and events); this made reading and comprehension challenging. For example, one text was about Alaska becoming the forty-ninth state of the United States. This topic may not be familiar or of interest to a nine-year-old student living in New Zealand. The participant, Sid, read this story on his third day of the intervention and his unfamiliarity with the topic was shown by the dip in his reading fluency. Future research could attempt to use a current New Zealand source of graded passages, such as those used in the Rainbow Reading Programme (Pluck, 1995).

Although the findings show some promising results, the small number of successful replications of the positive effect of FFVSM on reading fluency means there is limited ability to generalise to the wider population by assuming that FFVSM would be of benefit to every struggling reader. That conclusion requires support from further research which, first, directly replicates the present study, and second by additional systematic replication (Cooper, Heron & Heward, 2007; Hersen, Barlow, Kazdin, 1976). The students who the teachers selected were all reading at a lower rate than their CA, thus narrowing the sample and ability to generalise this to the general population. Further research should be conducted with students who read at their CA but at a low fluency rate, to determine if the intervention was also suitable for these students.

Another limitation of the current study concerns the durability of the changes observed following FFVSM. A final post-test on the NARA was completed one week after

the intervention finished. The intervention and testing occurred over a reasonably short period (two months) of time and rapid behavioural changes were made by some of the students. A limitation of this time frame is that it is not known if the results were maintained over a longer period of time or after the Christmas break. There is potential for a follow up study with a reasonable time lapse between the end of the intervention and post-test. Durability of changes in reading are essential if the improvement in skill are to have substantial and ecologically valid impact on the children who participate in remedial training.

### **Practical Implications**

Reading recovery is a commonly used Ministry of Education funded intervention for reading in New Zealand schools. Children are involved in one-on-one instruction with a trained teacher for about a 20 week period and this makes the programme expensive (Clay, 1993). The Reading Recovery programme covers a broad range of reading skills. In comparison, in this research the VSM intervention focused mainly on reading fluency and comprehension. In addition, it happened over a much shorter time period, with children in this study only having direct contact during the intervention for six sessions (less than 20 minutes each) during a two week period (Dowrick, 2012).

Despite research that shows VSM is an effective and feasible intervention in supporting the learning and development of behaviour and skills, it is under-utilised within New Zealand schools. Limited time, skills and access to technology have been outlined as the major restriction on VSM being embedded within the school environment (Buggey & Ogle, 2012; Collier-Meek et al., 2012).

The current research shows that FFVSM has some benefit in improving children's reading fluency, comprehension, accuracy and self-efficacy in a short period of time. Two major pieces of research (Dowrick et al., 2006; Hitchcock et al., 2004) that have used VSM

to improve reading fluency have used an accompanying tutoring programme in conjunction with the VSM. Using VSM without the tutoring programme such as in this study makes it a more viable intervention for use in schools.

Video self models are relatively straightforward for teachers or others to create after a small amount of tutoring and instruction in the hardware and software needed (Buggey, 2009; Collier-Meek et al., 2012; Dowrick, 1991). The method could be taught to teachers and parents during a series of afterschool workshops where techniques could be learnt and practised until fluency of the new skills is reached. In addition, older students could create video models for themselves or classmates to help improve academic skills they would like to focus on. Teaching the skill to parents and students could reduce the teacher time outside paid class time, and help eliminate this obstacle to using VSM at school.

Recently in the media there has been discussion about the use of iPad/ tablets and iPods within schools. Many institutes have short term goals to have each child owning or having access to the technology. The devices have video capability (front and back camera) with a built in microphone. Currently there is an iMovie app available on iDevices to download, although it is not advanced enough to do fine grain editing. If this app were developed further, there could be real potential for the integration of VSM into schools. For example, parents could help children create their own video self-models which could be filmed, edited and played back on the iPad or iPod. Viewing the one to two minute video self-models could be done during homework sessions, for example, before reading the nights' homework book. Children could be given a goal, for example, to read 100 WCPM and progress toward this goal could be recorded by the child themselves. There would not be a lot of additional time needed to support this intervention on the teacher's behalf. Monthly fluency measures using standardised testing could be used to monitor students' progress towards set goals. As the students increase their reading ability and fluency rates, a new

VSM can be created, increasing the level of difficulty or the focus of the behaviour (e.g., reading comprehension or pausing at full stops) could be changed.

### **Future Research**

There are numerous opportunities for future research to increase knowledge and investigate how VSM in particular FFVSM can be used to improve children's reading competency, skill and related behaviours. Following on from the explained implications above, future researches could trial a whole class approach and incorporate VSM into classroom homework exercises. Children could create video self-models for each other. These could be edited and viewed at the start of the term for two weeks, on every second day (Dowrick, 1999). Self-monitoring could occur with regular teacher standardised tests to look at change in overall reading fluency. Using VSM with a class of students who will be both below, meeting and above their CA in reading and have various levels of fluency would examine the benefits to the more general population. In addition, viewing regular monitoring over the school term would determine whether the rapid learning that occurs is maintained (Dowrick, 2012). Combinations of VSM and peer-tutoring are also possible where the major benefits to the peer tutor may lie in the opportunity to practice the creative use of digital technologies, while the tutee benefits from the focus on their reading (Greenwood, Arreaga-Mayer, Utley, Gavin, Terry, 2001; Mynard & Almarzouqi, 2006).

The reading material used in this study was pitched at a level that was about one year ahead of where the child was reading, based on the accuracy RA from the pre-test on the NARA. The one year advance was chosen as an estimate of the level at which the child would be able to read at the instructional level but still be within the zone of proximal development (Vygotskii & Cole, 1978). Four of the children were moved down to an easier text level as they had a large number of errors and they were not making fast progress in fluency. Five of the students caught up to the level that their video model and reading

material was pitched at. Three of these students were those who had their reading level moved down. Using a text which is in the individual's zone of proximal development is an important component and contributes to the success of VSM. This is because one of the explanations for the success of the intervention is mental time travel (MTT), as the target behaviour must be within the zone of proximal development, the opportunity must arise and the goal desired by the individual (Dowrick, 2012; Vygotskii & Cole, 1978). Future research could examine using a text that was closer or further away from the child's accuracy RA to examine the boundaries of the zone of proximal development and determine the influence this may have on fluency development.

There are similarities between the procedures used for repeated reading, for example, Rainbow Reading (Pluck, 1995) and those used in this study using VSM (Dowrick, 1999). Both involve repeated exposure to the same text a number of times, through either reading (repeated reading) or viewing (VSM). This repetition allows the child to achieve or view mastery. Benefits include gaining self-confidence and self-esteem, learning key words and appropriate phrasing and building fluency. Future research could investigate which of these two evidence-based research programmes has more benefits to the struggling learner and this could be achieved by comparing two different treatment groups. In addition to a matched group design, a control group could be added to strengthen the research design and increase the validity and reliability of the study.

## **Conclusions**

This research shows that FFVSM is a viable intervention technique that can be used to improve children's reading fluency and comprehension. For the majority of the children in the study, rapid behaviour change occurred after participating in a two week intervention, in which the video model was watched six times. Results showing improvement in fluency and comprehension support previous literature, which reinforces the importance of oral reading fluency in gaining understanding of what is being read. Improvement by the majority of the

participants highlights the power that the FFVSM in changing reading and related behaviours. Research findings emphasise why teachers need to recognise the significance of measurable fluency goals in the curriculum.

Given the increased availability of technology such as iPads and iPods, there is real potential for using FF learning within an educational context. VSM is an evidence-based intervention technique which combines the teacher (model) and learner (observer) as one, which enables all children to have individualised support to assist learning and development of new and existing behaviours. This research illustrates how barriers such as limited time, money and skill could be eliminated or at least minimised so the VSM could be used as a practical and effective tool for struggling readers in New Zealand schools (Buggey & Ogle, 2012).

## CHAPTER 5: References

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## **APPENDIX 1:**

### **Rules for scoring reading passages**

Credit the child with any corrects or corrected words.

No penalty for trials which are eventually correct.

If a word is added in it is counted as an error.

*Omissions:* If a line or sentence is omitted each word is counted as an error.

*Repeated errors:* If the child makes an error and then substitutes this word repeatedly it counts as an error every time. But substitution of a proper name (e.g. Harry for Hemi) is counted only the first time.

*Multiple errors and self-corrections:* if a child makes two or more errors (e.g. reads a phrase wrongly) each word is an error. If a child then corrects all these, each corrected word is a self-correction (correct).

*Broken words:* If a word is pronounced as two words (a/way) this is not counted as an error. Unless what is said is matched to a different word e.g. pitcher for picture.

*Try that again:* When a child is in a tangle, this instruction which does not involve teaching can be given. It counts as one error and only the second attempt is scored.

*Fewest errors:* If there are alternative ways of scoring responses a general principal is to choose the method that gives the fewest possible errors.


*(Adapted from Clay, 2000)*


**APPENDIX 2:**  
**The Reader Self-Perception Scale**


*Researcher to read to the child*


Listed below are some statements about reading. I will read these out to you and after I read each question you need to colour in the face which shows how you feel. Here is an example to try:


*Example:* I think chocolate ice cream is the best

If you are really positive that chocolate ice cream is the best, then colour in ----- 

If you think that chocolate ice cream is good but maybe not great, then colour in---- 

If you can't decide if chocolate ice cream is best or not, then colour in ----- 

If you think that chocolate ice cream is not all that good, then colour in ----- 

If you are really positive that chocolate ice cream is not very good, then colour in ---- 

1. I think I am a good reader



2. I can tell that my teacher likes to listen to me read



3. My teacher thinks that my reading is fine



4. I read faster than other kids



5. I like to read aloud



6. When I read I can work out words better than other kids



7. My classmates like to listen to me read



8. I feel good inside when I read



9. My classmates think that I read pretty well



10. When I read, I don't have to try as hard as I used to



11. I seem to know more words than other kids when I read



12. People in my family think I am a good reader



13. I am getting better at reading



14. I understand what I read as well as other kids do



15. When I read I need less help than I used to



16. Reading makes me feel happy inside



17. My teacher thinks that I am a good reader



18. Reading is easier for me than it used to be



19. I read faster than I could before



20. I read better than other kids in my class



21. I feel calm when I read



22. I read more than other kids



23. I understand what I read better than I could before



24. I can work out words better than I could before



25. I feel comfortable when I read



26. I think reading is relaxing



27. I read better now than I could before



28. When I read, I recognise more words than I used to



29. Reading makes me feel good



30. Other kids think I am a good reader



31. People in my family think I read pretty well



32. I enjoy reading



33. People in my family like to listen to me read



Thanks for answering all of the questions.



(Adapted from: Henk, & Melnick, 1995)

## APPENDIX 3:

### Teacher perspective on the intervention

#### Teacher Perception Survey

Student

name:

Date:

Please highlight the response that best matches your perception of the above named student.

- 1. I think the child now has a more positive attitude to reading after completing the video self modelling intervention.**

Strongly disagree      Disagree      Neutral      Agree      Strongly Agree

- 2. There has been a shift in the student's engagement in oral reading activities.**

Strongly disagree      Disagree      Neutral      Agree      Strongly Agree

- 3. How would you rate the student's confidence in engaging in reading activities post video self modelling?**

Very Low      Low      Average      High      Very High

- 4. Have you noticed a change in the student's reading fluency?**

Yes      No      Not Sure

*Comment:*

- 5. Do you believe the video self modelling intervention was beneficial to the student?**

Yes      No      Not Sure

*Comment:*

- 6. Do you think you would use video self modelling with other students' in your class after this study is completed?**

Yes      No      Not Sure

*Comment:*

**Additional Comments:**

## APPENDIX 4



### HUMAN ETHICS COMMITTEE

Secretary, Lynda Griffioen  
Email: [human-ethics@canterbury.ac.nz](mailto:human-ethics@canterbury.ac.nz)

Ref: 2012/15/ERHEC

16 July 2012

Cathy Robson  
Department of Psychology  
UNIVERSITY OF CANTERBURY

Dear Cathy

Thank you for providing the revised documents in support of your application to the Educational Research Human Ethics Committee. I am very pleased to inform you that your research proposal "The effects of feedforward video self modelling on fluency and comprehension in school aged children" has been granted ethical approval.

Please note that should circumstances relevant to this current application change you are required to reapply for ethical approval.

If you have any questions regarding this approval, please let me know.

We wish you well for your research.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Nicola Surtees'.

Nicola Surtees  
Chair  
Educational Research Human Ethics Committee

*"Please note that Ethical Approval and/or Clearance relates only to the ethical elements of the relationship between the researcher, research participants and other stakeholders. The granting of approval or clearance by the Ethical Clearance Committee should not be interpreted as comment on the methodology, legality, value or any other matters relating to this research."*

## APPENDIX 5

### **The Effects of Feedforward Video Self modelling on Fluency and Comprehension in School Aged Children**

#### **Information Sheet for Teachers**

My name is Cathy Robson and I am currently undertaking a research project for my studies towards a Master of Arts in Psychology at the University of Canterbury. I am interested in how feedforward video self modelling can be used in a schooling environment to increase reading fluency and comprehension skills in children. Video self- modelling is a technique based on observational learning in which individuals view back edited footage of their behaviour, which encourages them to model this target behaviour.

I would like to ask your support of my research through:

- Identifying students' from your class who you feel need to improve their reading fluency. I envisage that up to 10 students will be involved from your school, although, more students may be initially screened to determine their suitability. It will not be known until this process is complete how many students will be specifically from your class.
- Providing assistance to gain consent from the students and their parents/ caregivers.
- Organising suitable times when the students' can take periods of time out of the classroom, for testing and viewing their video self-model. The initial testing/screening process will be 30 minutes. If selected for the study the students will be required for 10 minutes to record the video, then six 10 minute periods over two weeks for viewing the video and to complete a short reading test and related comprehension questions. Finally, the student will be required for 30 minutes after this to complete curriculum based reading tests.
- Completing a short questionnaire at the conclusion of the study which will take approximately 5 minutes for each student in your class who participated in the study.

Participation in this study is voluntary. The students or their parents/caregivers have the right to withdraw at any time, including withdrawal of any information, provided it is practically achievable. I will take particular care to ensure the confidentiality of all data gathered for this study and ensure the participants anonymity in any publications of the findings. All raw data will be held securely and kept for a minimum period of 5 years following completion of the project and then destroyed. This is standard procedure in accordance with the University of Canterbury Policy. The resulting assignment will not contain any identifying details about the teachers, students, families, school or any other professionals who work at the school. There are no foreseeable risks associated with this research. The results from this research will be used for my Masters thesis which will be presented to my supervisors and external markers. Completed theses are available publicly through the University of Canterbury Library. Additionally, the results may be published as a research article and/or presented at an educational conference. You will be given a copy of all the results for each student in your class which includes: curriculum based measures, fluency and comprehension results and the self-perception questionnaire results. Furthermore, you will receive a general summary of the overall results of all the participants in the study.

If you have any questions about the study, please contact me ([car107@uclive.ac.nz](mailto:car107@uclive.ac.nz)). If you have a complaint about the study, you may contact either my supervisors Neville Blampied ([neville.blampied@canterbury.ac.nz](mailto:neville.blampied@canterbury.ac.nz)) and Lawrence Walker ([lawrence.walker@canterbury.ac.nz](mailto:lawrence.walker@canterbury.ac.nz)) or the Chair, Educational Research Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch, ([human-ethics@canterbury.ac.nz](mailto:human-ethics@canterbury.ac.nz)). If you agree to participate in this study, please complete the attached consent form and return it to me in the envelope provided by (date to be determined). I am looking forward to working with you and thank you in advance for your contributions.

Cathy Robson

## **The Effects of Feedforward Video Self -Modelling on Fluency and Comprehension in School Aged Children**

### **Consent Form for Teachers**

I have been given a full explanation of this project and have been given an opportunity to ask questions.

I understand what will be required of me and I agree to have students from my class participate in this project with my support as outlined in the information sheet.

I understand that any information or opinions I provide will be kept confidential to the researcher and that any published or reported results will not identify me.

I understand that all raw data (video recordings, reading curriculum based results, fluency and comprehension test results, questionnaires) will be held securely and kept for a minimum period of 5 years following completion of the project and then destroyed. This is standard procedure in accordance with the University of Canterbury Policy.

I understand that I will receive a copy of the data and results for each student in my class who is involved in the study. Additionally, I will receive a general summary of results from all of the participants in the study. I have provided my email details below for this. I understand that if I require further information I can contact the researcher, Cathy Robson (car107@uclive.ac.nz). If I have any complaints, I can contact the study supervisors Neville Blampied (neville.blampied@canterbury.ac.nz) or Lawrence Walker (lawrence.walker@canterbury.ac.nz) or the Chair of the University of Canterbury Educational Research Human Ethics Committee, Educational Research Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch (human.ethics@canterbury.ac.nz).

By signing below, I agree to participate in this research project.

Please post this consent form to the researcher in the envelope provided by (date to be determined), thank you.

Name: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Email address: \_\_\_\_\_

## **The Effects of Feedforward Video Self Modelling on Fluency and Comprehension in School Aged Children**

### **Parent/ Caregiver Consent Form**

I have read and understood the attached information sheet and have been given the opportunity to ask questions about the project.

I understand what is required of my child and understand that participation is voluntary. I understand I have the right to withdraw my child, at any time, including withdrawal of any information, provided it is practically achievable.

I understand that I will receive a copy of my child's results collected in the study and I have provided my email address below.

I understand that any test results and video footage showing my child will be kept confidential and only viewed by the child, the teacher, the principal, the researcher, the researcher's supervisors and an external marker. Any published or reported results will not identify me or my child. Completed theses are available publicly through the University of Canterbury Library. I understand that all raw data will be held securely and kept for a minimum period of 5 years following completion of the project and then destroyed. This is standard procedure in accordance with the relevant University of Canterbury Policy.

I understand that if I require further information I can contact the researcher, Cathy Robson (car107@uclive.ac.nz). If I have any complaints, I can contact the project supervisors Neville Blampied (neville.blampied@canterbury.ac.nz) or Lawrence Walker (lawrence.walker@canterbury.ac.nz) (project supervisors) or the Chair of the University of Canterbury Educational Research Human Ethics Committee, Educational Research Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch (human.ethics@canterbury.ac.nz).

By signing below, I am giving my consent to my child's participation in this project. Please post this consent form to the researcher in the envelope provided by (date to be determined), thank you.

Name: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Email Address: \_\_\_\_\_

## **The Effects of Feedforward Video Self -Modelling on Fluency and Comprehension in School Aged Children**

### **Information for Parents/ Caregivers**

My name is Cathy Robson and I am currently undertaking a research project for my studies towards a Master of Arts in Psychology at the University of Canterbury. I am interested in how feedforward video self modelling can be used in a schooling environment to increase reading fluency and comprehension skills in children. Video self- modelling is a technique based on observational learning in which individuals view back edited footages of their behaviour, which encourages them to model this target behaviour.

I would like to gain your permission for your child to take part in my study to help improve their reading fluency and comprehension. The study will involve:

- Testing your child on a number of curriculum based measures to determine their suitability for the study, this is expected to take 30 minutes.
- If your child is selected for the study I will create a 1-2 minute video of your child which will be edited to show them reading fluently, filming of this video will take about 10 minutes.
- This will then be watched by the child 6 times over two weeks. After every viewing the child will read a previously unseen passage and answer related comprehension questions. Each session is expected to take 10 minutes.
- Finally at the conclusion of this period they will be again tested on a set of curriculum based measures, taking 30 minutes.
- The testing, filming, creation of the video and testing will be all run by the researcher. The child's classroom teacher will be only asked to complete a short questionnaire at the completion of the study.
- Suitable times to remove the child from the classroom will be discussed with the child's teacher.

Participation in this study is voluntary. You or your child have the right to withdraw your participation at any time, including withdrawal of any information, provided it is practically achievable. I will take particular care to ensure the confidentiality of all data gathered for this study and ensure the participants' anonymity in any publication of the findings. All raw data will be held securely and kept for a minimum period of 5 years following completion of the project and then destroyed. This is standard procedure in accordance with University of Canterbury policy. The resulting assignment will not contain any identifying details about the teachers, students, families, school or any other professionals who work at the school. There are no foreseeable risks associated with this research.

Completed theses are available publicly through the University of Canterbury Library. The results from this research will be used for my Masters thesis which will be presented to my supervisors and external markers. Additionally, results may be published as a research article and/or presented at an educational conference. You will be given a copy of all the results collected for your child which includes: the completed video self-model, curriculum based measures, fluency and comprehension results and the self- perception questionnaire. Furthermore, you will receive a general summary of the overall results of all the participants in the study.

If you have any questions about the study, please contact me ([car107@uclive.ac.nz](mailto:car107@uclive.ac.nz)). If you have a complaint about the study, you may contact either my supervisors Neville Blampied ([neville.blampied@canterbury.ac.nz](mailto:neville.blampied@canterbury.ac.nz)) and Lawrence Walker ([lawrence.walker@canterbury.ac.nz](mailto:lawrence.walker@canterbury.ac.nz)) or the Chair, Educational Research Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch, ([human-ethics@canterbury.ac.nz](mailto:human-ethics@canterbury.ac.nz)). If you agree for your child to participate in this study, please complete the attached consent form and post it to me in the envelope provided by (date to be determined). I am looking forward to working with your child and thank you in advance for your contribution.

Cathy Robson

## **The Effects of Feedforward Video Self modelling on Fluency and Comprehension in School Aged Children**

### **Information Sheet for Students**

(For the parent/ caregiver to read to the child)

Cathy Robson is doing a project at the university. She is going to work with your teacher to help you with your reading. She will listen to you read and ask you some questions about your reading. Then Cathy is going to make a movie of you reading, she will help you by saying the story first so you can just copy her. When we are finished you are going to watch the movie six times over two weeks. As well as reading some short stories and answering some questions. You, your parents/caregivers, Cathy and her supervisors are the only ones who have a copy of the movie. The results of your reading will be given to your parents/caregivers, principal and The Chair of the Board of Trustees so they can see how you are going. Cathy's finished project using code names will be put in the library at the University for other people to read. Others will not know who you are or where you live or go to school.

As you have been chosen for this study you will be given a code name, so that no one will know your name, your teacher's name, your parents/ caregivers name or the school's name. The only person to see this video will be Cathy, her supervisors, your teacher and parents/caregivers, the video will not be shown to anyone else.

If you have any questions about the research project you can ask your parent/ caregiver, teacher or

Cathy. If you change your mind about being in the project, that's fine too. All you have to do is tell your parent/ caregiver or teacher or Cathy.

Thanks for helping me with my project.

Cathy Robson

## **The Effects of Feedforward Video Self modelling on Fluency and Comprehension in School Aged Children**

### **Consent Form for the Student**

(For parent/ caregiver to read to the child)

My parents/ caregivers have told me about your project. I am happy to be a part of this project to help me with my reading.

I know that any information collected about me and the video footage of me reading will only be seen by Cathy, me, my parents/caregivers, Cathy's supervisors and the person marking her project. I know that my parents/caregivers, my teacher, principal, Chair of the Board of the Trustees and me will receive a copy of my results. Cathy will not use my name or my parent/ caregivers, whanau, teachers or school names in the project. I understand that all raw data (videos, questionnaires and reading results) will be locked away and kept for a minimum period of 5 years following completion of the project and then destroyed. I know that Cathy's finished project using code names will be put in the library at University for other people to read. Others will not know who you are or where you live or go to school.

I understand that if I don't want to be in the study I just need to tell you now. I understand that I can change my mind about being in this project and no-one will mind. I know that if I have any questions I can ask my parents/caregiver/whanau, Cathy or my teacher.

Please post this consent form to the researcher in the envelope provided by (date to be determined), thank you.

Child's name: \_\_\_\_\_

Signed by child (or on behalf of child): \_\_\_\_\_

Parent/ Caregiver signature: \_\_\_\_\_

Date: \_\_\_\_\_

[Note: The parents/caregivers will also receive a full information sheet and will be required to complete a consent form as well before the child can take part in this research.]

## **The Effects of Feedforward Video Self modelling on Fluency and Comprehension in School Aged Children**

### **Information sheet for the Principal**

My name is Cathy Robson and I am currently undertaking a research project for my studies towards a Master of Arts in Psychology at the University of Canterbury. I am interested in how feedforward video self-modelling can be used in a schooling environment to increase reading fluency and comprehension skills in children. Video self-modelling is a technique based on observational learning in which individuals view back edited footages of their behaviour, which encourages them to model this target behaviour.

The project will involve:

- Meeting with junior and middle school teachers from your school to ask for their help in identifying students they feel need to improve their reading fluency. (This will take about 5 to 10 minutes)
- Gaining consent from you, the Chair of the Board of Trustees, classroom teachers, students and their parents/ caregivers.
- Students will be tested on a number of curriculum-based measures to determine their suitability for the study. I envisage that up to 10 students will be involved from your school, although, more students may be initially screened to determine their suitability. It will not be known until this process is complete how many students involved will be specifically from each class.
- The initial testing/screening process will be 30 minutes. If selected for the study the student will be required for 10 minutes (to film the footage for the video), six times for 10 minutes over a two week period for viewing the video self-model and completing a short reading test and then for 30 minutes at the conclusion of the study to be tested on curriculum based measures.
- The child's classroom teacher will be asked to complete a short questionnaire at the completion of the study for each child who participates in the study from their class.

Participation in this study is voluntary. The students or their parents/caregivers have the right to withdraw from the study at any time, including the withdrawal of information, providing it is practically achievable.. Completed theses are available publicly through the University of Canterbury Library. I will take particular care to ensure the confidentiality of all data gathered for this study and ensure the participants' anonymity in any publications of the findings. All raw data will be held securely and kept for a minimum period of 5 years following completion of the project and then destroyed. This is standard procedure in accordance with University of Canterbury policy. The resulting assignment will not contain any identifying details about the teachers, students, families, school or any other professionals who work at the school. There are no foreseeable risks associated with this research. The results from this research will be used for my Masters thesis which will be presented to my supervisors and external markers. Additionally, the results may be published as a research article and/or presented at an educational conference. You will be given a copy of all the data collected for each student at your school which includes: video recordings, curriculum based measures, fluency and comprehension results and the self-perception questionnaire.

If you have any questions about the study, please contact me ([car107@uclive.ac.nz](mailto:car107@uclive.ac.nz)). If you have a complaint about the study, you may contact either of my supervisors: Neville Blampied ([neville.blampied@canterbury.ac.nz](mailto:neville.blampied@canterbury.ac.nz)) and Lawrence Walker ([lawrence.walker@canterbury.ac.nz](mailto:lawrence.walker@canterbury.ac.nz)) or the Chair, Educational Research Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch, ([human-ethics@canterbury.ac.nz](mailto:human-ethics@canterbury.ac.nz)). If you agree for your school to participate in this study, please complete the attached consent form and post it to me in the envelope provided by (date to be determined). I am looking forward to working with your school and thank you in advance for your contributions.

Cathy Robson

## **The Effects of Feedforward Video Self modelling on Fluency and Comprehension in School Aged Children**

### **Consent form for the Principal**

I have been given a full explanation of this project and have been given an opportunity to ask questions.

I understand what will be required of the students and teachers and I agree for this research project to take place at my school.

I understand that I will receive a copy of the results for each student at my school that takes part in this research. I have provided my email details below for this. I understand that all raw data (video recordings, reading curriculum based results, fluency and comprehension test results, questionnaires) will be held securely and kept for a minimum period of 5 years following completion of the project and then destroyed. I understand that completed theses are available publicly through the University of Canterbury Library. This is standard procedure in accordance with the University of Canterbury Policy.

I understand that if I require further information I can contact the researcher, Cathy Robson (car107@uclive.ac.nz). If I have any complaints, I can contact the study supervisors Neville Blampied (neville.blampied@canterbury.ac.nz) or Lawrence Walker (lawrence.walker@canterbury.ac.nz) or the Chair of the University of Canterbury Educational Research Human Ethics Committee, Educational Research Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch (human.ethics@canterbury.ac.nz).

By signing below, I agree for this research project to take place at my school.

Please post this consent form to the researcher by (date to be determined) in the envelope provided, thank you.

Name: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Email address: \_\_\_\_\_

## **The Effects of Feedforward Video Self modelling on Fluency and Comprehension in School Aged Children**

### **Information sheet for the Chair of the Board of Trustees**

My name is Cathy Robson and I am currently undertaking a research project for my studies towards a Master of Arts in Psychology at the University of Canterbury. I am interested in how feedforward video self modelling can be used in a schooling environment to increase reading fluency and comprehension skills in children. Video self modelling is a technique based on observational learning in which individuals view back edited footages of their behaviour, which encourages them to model this target behaviour.

The project will involve:

- Meeting with junior and middle school teachers from your school to ask for their help in identifying students they feel need to improve their reading fluency.
- Gaining consent from yourself, the Principal, classroom teachers, students and their parents/ caregivers.
- Students will be tested on a number of curriculum based measures to determine their suitability for the study. I envisage that up to 10 students will be involved from your school, although, more students may be initially screened to determine their suitability. It will not be known until this process is complete how many students involved will be specifically from each class.
- The initial testing/screening process will be 30 minutes, if selected for the study the student will be required for 10 minutes (to film the footage for the video), six times for 10 minutes over a two week period for viewing the video self-model and completing a short reading test and then for 30 minutes at the conclusion of the study to be tested on curriculum based measures.
- The child's classroom teacher will be asked to complete a short questionnaire at the completion of the study for each child who participates in the study from their class.

Participation in this study is voluntary. The students or their parents/caregivers have the right to withdraw at any time, including withdrawal of any information, provided it is practically achievable. Completed theses are available publicly through the University of Canterbury Library. I will take particular care to ensure the confidentiality of all data (video recordings, reading curriculum based results, fluency and comprehension test results, questionnaires) gathered for this study and ensure the participants anonymity in any publications of the findings. All raw data will be held securely and kept for a minimum period of 5 years following completion of the project and then destroyed. This is standard procedure in accordance with University of Canterbury policy. The resulting assignment will not contain any identifying details about the teachers, students, families, the school or any other professionals who work at the school. There are no foreseeable risks associated with this research. The results from this research will be used for my Masters thesis which will be presented to my supervisors and external markers. Additionally, the results may be published as a research article and/or presented at an educational conference. The Principal will be given a general summary of the results from all of the students who participated at your school.

If you have any questions about the study, please contact me ([car107@uclive.ac.nz](mailto:car107@uclive.ac.nz)). If you have a complaint about the study, you may contact either my supervisors Neville Blampied ([neville.blampied@canterbury.ac.nz](mailto:neville.blampied@canterbury.ac.nz)) and Lawrence Walker ([lawrence.walker@canterbury.ac.nz](mailto:lawrence.walker@canterbury.ac.nz)) or the Chair, Educational Research Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch, ([human-ethics@canterbury.ac.nz](mailto:human-ethics@canterbury.ac.nz)). If you agree for your school to participate in this study, please complete the attached consent form and post it to me in the envelope provided by (date to be determined). I am looking forward to working with your school and thank you in advance for your contributions.

Cathy Robson

## **The Effects of Feedforward Video Self modelling on Fluency and Comprehension in School Aged Children**

### **Consent form for the Chair of the Board of Trustees**

I have been given a full explanation of this project and have been given an opportunity to ask questions.

I understand what will be required of the students and teachers and I agree for this research project to take place at my school.

I understand that I will receive a summary of the results, without identifying individual students, through the Principal from this study. I understand that all raw data (video recordings, reading curriculum based results, fluency and comprehension test results, questionnaires) will be held securely and kept for a minimum period of 5 years following completion of the project and then destroyed. I understand that completed theses are available publicly through the University of Canterbury Library. This is standard procedure in accordance with the University of Canterbury Policy.

I understand that if I require further information I can contact the researcher, Cathy Robson (carl07@uclive.ac.nz). If I have any complaints, I can contact the study supervisors Neville Blampied (neville.blampied@canterbury.ac.nz) or Lawrence Walker (lawrence.walker@canterbury.ac.nz) or the Chair of the University of Canterbury Educational Research Human Ethics Committee, Educational Research Human Ethics Committee, University of Canterbury, Private Bag 4800, Christchurch (human.ethics@canterbury.ac.nz).

By signing below, I agree for students at my school to participate in this research project. Please post this consent form to the researcher by (date to be determined) in the envelope provided, thank you.

Name: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_