

**An investigation into the effectiveness of
Smart Starts perceptual motor
programme on children's reading ability**

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Abstract

Perceptual Motor Programmes are implemented in more than 300 junior schools around New Zealand (Cropp, 2008). When implemented, many teachers believe the programme improves learning including reading abilities, increases physical activity, and enhances social skills (Broadley & Litterick-Biggs, 2005). Despite continued use of the programme there is very little research to support claims of improved academic readiness, and as a result concerns are raised around the use of a non-validated approach to improve children's literacy learning and learning in general.

This study aimed to examine the effectiveness of a Perceptual Motor Programme on the reading abilities of year one and two children. Participants were 37 year one and two children, aged 5-6 years, from two classes at a low-decile primary school. Children were tested three times over ten weeks of the study using running records and sight word testing as well as non-word reading. One class acted as the control group and did not receive the programme.

Repeated measures ANOVAs revealed a significant time effect over the three time plots for both groups. This time effect is consistent with what you could expect in education where children generally improve over time. However using scores from pre, mid and post testing in all tests, the overall difference between the two groups was non-significant. This result alone clearly disproves the claims of improved reading abilities through the implementation of Smart Starts perceptual motor programme. Sight word testing showed only a marginal time effect due to the scores being high at pre testing creating a ceiling effect where maximum scores had already occurred leaving little room for improvement over time.

When asked to observe one child, teacher observations suggested improved attitudes towards learning and some risk-taking occurring later in the study. This was the case for both children observed, therefore cannot be attributed to the participation of the perceptual motor programme but rather part of the developmental process and current teaching and learning programmes.

The results of this study have implications for the implementation of non-validated interventions in schools. This study outlines the importance of educators using evidence-based practice and research. It explores the purpose, benefits and need for the Smart Starts perceptual motor programme. The use of non-validated approaches take time, money, resources, staffing and energy away from proven practices that improve children's reading abilities.

Introduction

A primary task of schools is to teach young children to read. Teaching children to read is a complex task and is further complicated by the different emergent literacy skills children bring with them upon school entry. Difficulty with early literacy is of particular significance as literacy achievement is the strongest predictor of later reading success (Gillon & McNeill, 2010; Pressley, 1998; Tunmer & Chapman, 2002). It is critical that children have positive early learning experiences to ensure success in later reading achievement. Results from the National Education Monitoring Project (NEMP) (Crooks, Smith, & Flockton, 2008) in reading and speaking showed that year four students from low decile schools scored lower than students from high decile schools on all tasks. The challenge for school leaders and teachers is to plan, implement and effectively teach a diverse range of students each with individual needs. Effective and proven teaching practices that support the development of learning to read are essential if all students are to receive quality teaching.

Teachers are equipped with strategies based on reading approaches that understand: the pathway to literacy is developmental, social and cultural practices shape literacy learning and that students take individual and multiple pathways to their learning (Ministry of Education, 2010). We need to recognise and accommodate different paths to achieve the desired outcome and we need to offer more expert teaching interactions to children who are not assuming normal progress (Clay, 1999). This is often achieved through the use of interventions with proven efficacy such as Reading Recovery (Allington, 2002; Baker et al., 2002; Clay, 2005; McDowall, Boyd, Hodgen, & van Vliet, 2005; Shanahan & Barr, 1995) and Phonological Awareness Programmes (Ball & Blachman, 1988; Blachman, Tangel, Ball, Black, & McGraw, 1999; Cihon et al.; Hatton, Erickson, & Brostek Lee, 2010; O'Leary, Cockburn, Powell, & Diamond, 2010). Alongside these print-based approaches there are many others, including perceptual motor programmes which, are based on the perceived relationship between motor skills and cognitive development. Bulluss and Coles (1998) claimed that the development of motor skills helps to facilitate academic readiness and learning, particularly in the acquisition of written language.

The aims and practices of the perceptual motor programme as outlined by Bulluss and Coles (1998) in their marketing manual may have links to learning to read. For example, the programme aims to improve ocular control. Ocular control is related to eye muscle development. It is the skill of moving the eyes rather than the head to track an object (Bulluss & Coles, 1998). This has a direct link to directionality and tracking words along the page (Dechant, 1991; Williams, 1983). Auditory acuity aims to be developed throughout the programme which links with the ability to listen and hear sounds in words leading to phonemic awareness. While these aims are outlined in the marketing material, Bulluss and Coles (1998) do not link them to a theoretical framework. There is very limited research proving whether or not these aims are achieved through the programme, therefore questioning its validity. Given the limited evidence and the often unproven rationales, there is a case to regard perceptual motor programmes with caution. It is therefore of some concern that they are continuing to be widely used with the expectation that there will be an impact on academic learning, cognitive skills and social development. In a search of the literature, I have been unable to locate any positive New Zealand research on the effectiveness of perceptual motor programmes. Despite this, anecdotal reports suggest that over 300 schools are implementing perceptual motor programmes based upon unsubstantiated claims with no evidence-based practice. Concerns about the current popularity of visual, visual-motor and gross motor training in the treatment of reading disabilities, motivated me to investigate the use of perceptual motor programmes in relation to reading abilities. A review of the literature of motorskills and early reading achievement (Fenton, 1970; Frostig, 1967; Kaufman, 1973; Kavale & Mattson, 1983; Losse et al., 1991; Pagani, Fitzpatrick, Archambault, & Janosz, 2010; Wassenberg et al., 2005) shows great popularity in the 1960's and 70's. However there is very little recent research on the effectiveness of the perceptual motor programme itself. Throughout the perceptual motor programme Smart Start Manual (Bulluss & Coles, 1998) that is the focus for this study, there is the strong belief that a child's perceptual abilities are very important in terms of reading and writing however the research is not conclusive.

This study is important as much of the research on perceptual motor programmes is dated (for example, (Dietrich, 1973; Fenton, 1970; Kaufman, 1973) and does not represent New Zealand Schools. In this study an experimental study was designed to ensure results can claim some reliability and therefore represent perceptual motor programmes in the New Zealand context. Evidence-based practice in education is essential as “...professionals must ensure they are informed about evidence based practice and take an active role in disseminating research to consumers” (Hyatt, Stephenson, & Carter, 2009, p. 334). This study aims to explore the relationship between motor skills and reading, and in doing so review the use of a perceptual motor programme in one junior class and its effect on children’s reading abilities.

Literature Review

This chapter explores theoretical perspectives on emergent literacy and possible links between the development of motor skills with early reading success. The components and principles of programmes are described. This is followed by an exploration of specific studies on the effectiveness of perceptual motor programmes, particularly in the New Zealand context.

Theoretical perspectives underpinning emergent literacy

“Reading is a process by which children can, on the run, extract a sequence of cues from printed texts and relate these, one to the other, so that they can understand the message of the text” (Clay, 1999, p. 22).

The message from Clay, one of New Zealand’s leading researchers in the field of reading, is that reading requires a number of skills to be carried out in the correct order with accuracy and ease in order for reading to happen. Clay highlights the complexity of tasks involved which conveys the challenge within reading acquisition. Competent readers do all of the tasks listed in the quote above without having to think about each element. Beginning readers however must learn to use multiple cues in an integrated and fluent manner. It is for that reason that in studying the effect of a perceptual motor programme on reading abilities it is important to firstly examine the process of reading.

Emergent literacy refers to the early learning of reading and writing skills that emerge continually during development. Emergent literacy is built on a set of beliefs regarding the ways in which children’s early literacy development occurs. Emergent literacy practices in New Zealand schools are underpinned by two perspectives. A Piagetian viewpoint (Piaget, 1959) is where literacy is actively constructed through the child’s interaction with the environment placing a strong influence on the home of each child. A second perspective whereby the social interaction between the adult and child is emphasised, is based on Vygotsy’s (1978) theories on literacy and learning. In both these perspectives the child is the central

figure in constructing learning with an emphasis on the child's interaction with the learning environment including scaffolding and modelling from parents.

McNaughton's (1995) socialisation model of child development provides a framework for considering the influence of a child's environment on the acquisition of emergent literacy knowledge, skills and processes. It is built on the idea that the child constructs meaning within social settings. McNaughton (1995) discusses situated expertise where children come to be expert in the activities within which they participate, for example, participating in story book reading. Becoming an expert involves gaining meaning of the activity so that listening to the stories is learning what story books stand for, what their purpose is and who reads them (McNaughton, 1995). Different activities allow different expertise to form. A process of socialisation begins at birth and continues through the school years and into adult life. Therefore social settings and environment are the starting point in developing the skills to support later success in reading.

Children's development in all areas of listening, speaking, reading and writing are linked, and as a result all early experiences play a critical role in development of these abilities. For example, reading books to children enhances vocabulary, and writing or exploration with letters can support a child in learning sounds and decoding. Gillon and McNeill (2010) state that phonological awareness is one instructional practice that has proven effective in motivating early reading success. Children's awareness of the sound structure of words and their knowledge of how sounds in words relate to print, influence their ability to decode and spell. Phonological deficits are now recognised as a leading cause of reading difficulties (Blachman, et al., 1999; Hatton, et al., 2010; Litt, 2010; O'Leary, et al., 2010). "Developing children's phonological awareness skills and knowledge of letter-sound relationships in preschool and the first year of school will contribute to the building of a strong foundation for decoding and encoding print" (Gillon, 2004, p. 35). Phonological understanding is one aspect that supports word recognition because it helps readers to decode words and use phonological information to access orthographic representations of words and their meanings (Gillon, 2004; Ruddell, Ruddell, & Singer, 1994). During recoding, printed letters are connected to their pronunciations through the use of letter sound rules (phonics). The

contribution phonological awareness makes to word recognition ability then supports readers in making meaning of the text by freeing up cognitive capacity for comprehension (Ruddell, et al., 1994).

According to Clay (1999), during the emergent literacy stage children are exploring the detail of print in their environment. They are writing using symbols and using markings, and are also developing concepts about print forms (for example, books, newspapers and messages) and what it means to read these. This again reinforces the importance of early experiences based on McNaughton's (1995) socialisation model of development. Children must have understandings of the concepts about print (Clay, 1999) such as one-to-one matching, directionality, punctuation and the ability to attend to the text to be successful with reading. Concepts of directionality including one-to-one matching, require some mastery of fine motor skills as children attempt to match one word to one voice utterance in the very early stages of learning to read. It is perhaps this mastery where the learning from motor skill programmes may have some transference, although the focus in the latter tends to be on larger motor movements.

Children learn emergent literacy skills through exposure, opportunity, conversation, play and experiences. All language opportunities and modelling of literacy such as reading to children, are stepping stones in developing young children's own emergent literacy skills. Children's participation in various language and literacy practices at home and in early childhood settings means that they will all bring different literacy knowledge, skills and attitudes to their school learning. They build on existing expertise and use developing knowledge and skills in different ways (Ministry of Education, 2010). Clearly, the years from birth through to age five are an important time for children's development and learning. Providing young children with a variety of emergent literacy experiences, offers a path to improving overall reading achievement.

Once children begin formal schooling, reading acquisition continues in a more structured and focused approach. The New Zealand Ministry of Education text, *Effective Literacy Practice in Years 1 to 4* (2003) draws on three related concepts to underlie understandings about how children acquire literacy. These are; that the

pathway to literacy is developmental, social and cultural practices shape literacy learning, and that children take individual and multiple pathways to literacy. Thus, attainment of reading and writing is set within a holistic, integrated and well balanced approach. All of these experiences are text-based using traditional print materials or increasingly through media and digital technologies.

As commented in the introductory quote from Clay (1999), the process of becoming literate is complex. The literacy learner has to develop knowledge and strategies and an awareness of how to put them together. Current New Zealand teaching practice uses a framework for describing literacy acquisition that encompasses: learning the code, making meaning, and thinking critically. As children learn to decode and encode, to make meaning, and to think critically, they develop knowledge, strategies and awareness, which may be described as the core components of literacy development (Ministry of Education, 2003). This approach to reading acquisition supports the importance of specific skill teaching and building within meaningful, rich-text experiences, while supporting the importance of individual differences and environment.

As educators in New Zealand we understand the importance of recognising that children take different pathways towards becoming literate (Ministry of Education, 2003, 2010). As students move through the school, leaders and teachers face the challenge of maintaining their students' motivation and progress and reducing the disparities between the achievements of different groups (Ministry of Education, 2003). Vaughn, Denton and Fletcher (2010) illustrate in their study that to attain the goal of having students in a school read at standard, students who perform at low levels must make accelerated progress. These students benefit from interventions providing more effective instruction and extended opportunities for practice.

The links between motor learning and emergent literacy

Motor performance is believed by some theorists to be related to reading and language achievement. As a result, several commentators strongly support that motor performance is a prerequisite for learning (Bulluss & Coles, 1998; Capon,

1994; Connell, 2009a; Goddard Blythe, 2000; Hannaford, 1995; Hendy, 2000; Mikaere-Wallis, 2009; Pica, 2008; Wassenberg, et al., 2005).

It is believed readiness for learning requires development in movement and motor skills such as, body image, balance, hand-eye co-ordination, body rhythm and eye muscles (Bulluss & Coles, 1998; Cowley, 2008; Goddard-Blythe, 2000; Pica, 2008; Williams, 1983). Goddard-Blythe (2000) contends that if a child is first physically competent in regard to motor skills, there is a correlated improvement in perceptual abilities which makes learning more effective.

Through the development of body image, children develop body control, an awareness of self and parts of their body as well as directionality. (Bulluss & Coles, 1998). The task of directionality when reading as discussed by Clay (1999), has a particular relevance to subsequent success in learning to read. This directional behaviour of moving in a controlled manner across a line of print is related to motor movement (Clay, 1999). Movement of the eyes rather than the head alone to watch events on either side of the midline is an aspect of ocular control that is vital if the child is to perform without undue stress in reading (Hendy, 2000). The importance of directionality in learning to read therefore suggests a link between motor skills and reading.

As the above statements suggest, over the years there has been a sustained interest in the relation between motor skills and reading ability in children. Most research assumes a relationship between cognitive and motor development, however little experimental evidence exists that supports this assumption and the above connections. While there is some research that supports the link (Pagani, et al., 2010; Son & Meisels, 2006; 2005) none is based in New Zealand context and some have flawed methodology, making it difficult to draw valid conclusions.

In a study of Dutch children aged five to six years old, Wassenberg, *et al.* (2005) aimed to investigate the relation between cognitive and motor performance in a sample including both normally and sub-normally performing children. Random sampling of children ensured that final

participants could be considered a fair sample of the original population. Using information from health records, groups of children were created including a control group giving a total of 452 participants. Testing investigated language, visual perception, construction, attention, fine motor abilities, vocabulary, verbal fluency, patterning and matching, number recall, working memory, attention, motor function and coordination. Wassenberg, *et al.* (2005) concluded that while a global relation between cognitive and motor was not found, it was suggested that specific aspects of cognitive and motor performance are related such as visual motor integration which is a skill required in reading and fine motor performance.

Another study in Canada with 1,820 subjects (Pagani, *et al.*, 2010) agreed there were a multitude of reasons to consider motor skills as a component of school readiness. In the study, kindergarten aged children were measured in cognitive skills through academic testing, and motor skills through gross motor activities such as co-ordination, climbing stairs and physical development, and then followed by fine motor activities such as holding a pen and the ability to manipulate small objects. Pagani, *et al.* (2010) found some associations between fine motor performance at kindergarten level and later academic performance.

In the United States, Fenton (1970) researched the relationship of the sensor-motor skills to reading readiness using 50 first grade students. Fenton provides justification for her research using the rationale that many children were coming into schools lacking in basic perceptual motor skills and as a result were less able to participate in the formal educational activities and therefore, less able to learn from these activities. She supports her research with statements from Frostig (1967) and Kephart (1960) who contended that mental and physical activities are quite closely related, and that motor activities play a major role in intellectual development such as reading (Fenton, 1970). Tests examined visual and auditory discrimination, visual-motor coordination, reading ability and motor skills such as directionality and body spatial awareness. Test scores for the sensory motor skills were somewhat subjective based on a ratings scale of one to five and then totalled.

Reading scores were checked and scored by two different first grade teachers and their assistants, which again posed threat to the validity of the results. The findings of the research found sensory motor-skills are of great value in identifying those children who are very highly or very poorly oriented to the reading process (Fenton, 1970). However this research is somewhat dated and poses questions as to the rigour of its methodology and validity of results.

More recently a large study was carried out by Son and Meisels (2006) in Detroit exploring the relationship of young children's motor skills to later reading achievement. A total sample of 21,260 children attending kindergarten in the fall of 1998 participated. Children's motor skills were assessed in the fall of kindergarten, and reading achievement was assessed in the fall of kindergarten and the spring of first grade. The time interval between initial and later achievement testing was between 15.9 and 21.5 months. The average age of the sample in the early September of the 1998 kindergarten year was 65 months. Fine motor, eye-hand coordination and gross motor skills were measured and cognitive achievement was measured in the domain of reading. Reading achievement was assessed using letter identification, letter-sound association and the beginning and end of words, recognising words and reading words in context. Results found visual motor skills had significantly higher correlations with cognitive achievement than did gross motor skills. Overall results suggested that visual motor skills are related to reading and therefore are able to successfully identify children at risk for academic underachievement at the outset of schooling (Son & Meisels, 2006).

Clearly there is an ongoing suggested link between movement and learning. Some of the above research supports this idea, that through improved motor skill, improved reading abilities will follow (Pagani, et al., 2010; Son & Meisels, 2006; Wassenberg, et al., 2005).

Perceptual Motor Programmes

Perceptual motor programmes are designed to develop motor skills based on the belief that perceptual and motor experiences underpin early learning and that children who have underdeveloped perceptual motor skills will have difficulty learning basic academic skills such as reading. Programmes provide planned movement experiences in seeing, hearing, touching, making perceptual judgements and reacting through carefully sequenced activities which children enjoy doing such as running, hopping, skipping, jumping, balancing, crawling, climbing, throwing, catching, bowling, sliding etc. (Connell, 2009b). Perceptual motor programmes use a variety of common and specially design equipment for preschool and early primary children to help facilitate their perceptual motor development and enhance learning readiness.

“Smart Start with PMP” is an Australian programme developed in 1987 in Australia by Bulluss and Coles, who are two Australian primary school teachers. This perceptual motor programme is currently implemented in a number of New Zealand schools. Bulluss and Coles (1998) claimed in the manual for teachers that “the programme is part of the total curriculum package... where children are introduced to the pre-requisite skills needed for formal learning in areas such as Reading, Writing, Word Study and Mathematics” (Bulluss & Coles, 1998, p. 20). This perceptual motor programme is a programme which uses facets of music, fitness, dance, gymnastics, or physical education in order to develop children’s perceptions. The programme is run in a manner that children learn a skill, work on the skill, and build on that skill. It is also believed by Bulluss and Coles (1998) that it develops good social skills and self esteem. They maintain that, by providing effective experiences and modes of operation, the child will have opportunities for more effective learning in the classroom.

The programme comprises 200 sequential activities in the form of two sets of cards, a Teachers’ Manual, classroom language activity sheets; parent support material and a promotional video. Six readiness skills are aimed to be developed in the perceptual motor programme. They are language, memory,

visual, auditory, motor and social. Each of the six readiness skills are discussed below.

Language

Ruddell, Ruddell and Singer (1994) observed clearly defined developmental stages of children's language where children's language moves from the pre-symbolic to the symbolic. The perceptual motor programme language follow-up aligns with these stages. The language follow-up challenges the children to take the language they have experienced first-hand in the equipment session such as on, over, under, around and through and translate this knowledge in a written activity in the classroom. In this activity Bulluss and Coles (1998) claim the child will draw on motor experiences to transfer from the real to the symbolic form .

Memory

The programme includes a number of 'memory' training activities to help develop sequential, short term, visual and auditory memory. The manual outlines a specific procedure for giving a memory sequence to support the child and teach them how to work with a sequence. Boulton-Lewis and Catherwood (1994) suggested that unless a strategy such as repetition is used to retain it, children can only hold information for a few seconds. Short term memory aims to be developed through the use of repetition during the perceptual motor programme's memory activity which aims to support children in holding information for a longer period of time.

Bulluss and Coles (1998) claim, "When they start school, many children do not have the sequential memory space to cope with the instructions, the routines and skill tasks which the teacher expects of them" (p. 102). However in my role as a junior classroom leader and teacher for several years I suggest that children do cope with given instructions. It is the role of the teacher to ascertain how many instructions are able to be processed at one time, and if this is considered, children are able to follow instructions. As a result of this claim, visual and auditory memory is strengthened during the memory activities through the use

of pictures and sequenced instructions. Five to six year old children can generally recall a set of three to four shapes in order when prompted with visuals (Williams, 1983). The perceptual motor programme aims to support this development of visual memory throughout their activities.

Visual

Ocular pursuit refers to the smoothness and efficiency with which a child can follow a moving target. Smooth and continuous movements are needed to shift the eyes along a line in a book and to shift from one line to the next. Bulluss & Coles (1998) believe that many children come to school with poor eye muscle control and that they move the head rather than move the eyes alone to watch events on either side of the midline. These are aspects of ocular control that are vital if the child is to perform without the undue stress in the reading (Dechant, 1991). It is suggested that children with poor eye muscle control may not be able to direct their eyes to the word they want and will often skip or re-read some words (Bulluss & Coles, 1998). They conclude that the problem can often be overcome simply with eye exercises that develop fitness, tracking ability and convergence. Therefore in an equipment session, one station every session is devoted to eye tracking in the first year of the programme and then in subsequent years systematically and as often as necessary.

Auditory

Auditory acuity is the recognition of discrete units of sound. Children who have poorly developed auditory skills have difficulty following directions, poor sound discrimination, phonemic awareness and poor comprehension (Bulluss & Coles, 1998; Dechant, 1991). This in turn can effect classroom participation and more specifically reading. Through motor development and language follow up activities throughout the perceptual motor programme, Bulluss and Coles (1998) believe they can develop the readiness skill of auditory acuity essential to learning to read and participate in the classroom. However as a new participant implementing the programme, I struggled to see this link to the development of auditory acuity come through.

Motor

The authors of perceptual motor programmes imply that relatively simple exercises can fundamentally change the neural structure of the brain and facilitate learning to read. They contend that the carefully planned movement experiences in the programme, aim to develop motor skills in children to prepare them for the onset of formal learning. Perceptual motor programmes aim to develop within children perceptions of self, awareness of one's body parts and the ability to control all parts with time and space so that what is executed looks and feels good. It is contended by Bulluss and Coles (1998) to be an essential part of learning to read. Directionality of the body is developed to support children's knowledge of their own midline, so that they avoid later difficulties with word and letter reversals (Bulluss & Coles, 1998; Cropp, 2008). Experiences through movement that cross the midline, develop inner ear balance and build fundamental motor skills are all believed to be linked to supporting reading acquisition (Connell, 2009b; Cropp, 2008; Hendy, 2000).

Social

The group work, stations and participation in the perceptual motor programme all work towards developing risk-taking, turn-taking and building of confidence within the children. The activities challenge the children to persevere, build independence, care for others and co-operate (Bulluss & Coles, 1998). When translated into the classroom setting Bulluss and Coles (1998) argue that children who have come to terms with their social situation have more time and attention to learn instead of worrying about who is sitting next to who, or whose turn it is to read next, and in turn, reading is believed to improve.

In order to develop the six readiness skills, the perceptual motor programme comprises of sessions including floor, equipment and language follow-up sessions. The Smart Start Manual (Bulluss & Coles, 1998) outlines that four equipment sessions, plus one floor session per week, is ideal (see Figure 4. session outline). With the inclusion of language follow-up activities this is just over three hours per week.

Some of the aims outlined suggest children will develop skills that allow them to have more attention and focus when learning to read in the classroom. For example, the skill of balance is developed in the programme so that a child may give full attention to the task at hand such as reading, rather than spending valuable time practising “getting balance” (Bulluss & Coles, 1998). Other aims include clearer links with reading acquisition, for example, the development of auditory acuity to strengthen phonemic awareness. This is a specific aim outlined in the Smart Start marketing manual. Phonemic awareness is supported by Gillon (2004) as an essential skill in learning to read. However she advocates the use of explicit teaching of phoneme knowledge which is supported by research (Cihon, et al.; Gillon, 2004; Pullen & Justice, 2003; Shapiro & Solity, 2008) that convincingly demonstrates that explicit instruction in phonemic awareness is essential for preventing reading failure for young participants.

Research on the effectiveness of Perceptual Motor Programmes on improving learning

Some research has found a connection between motor skills and reading. Additionally there continues to be a strong belief that perceptual motor programmes improve not only motor skills but also improve children’s reading. (Bulluss & Coles, 1998; Connell, 2009a; Cowley, 2008; Cropp, 2008; Hannaford, 1995; Hendy, 2000; Pagani, et al., 2010; Pica, 2008; Wassenberg, et al., 2005). However; although they contend reading abilities are improved, there is a lack of convincing research to support these claims. As Broadley and Litterick-Biggs (2005) concluded, it would appear that rather than basing the use of perceptual motor programmes on sound evidence and research, many school leaders hold a blind optimism for the success and benefits of the programme.

In 1973 numerous published motor skill readiness programmes appeared on the market and were offered to schools as a means of developing sets of skills considered by the authors to be prerequisite to academic skills such as reading (Kaufman, 1973). Perceptual motor programmes are one of those readiness

programmes designed for that exact reason. However it would seem that the wide acceptance of perceptual motor intervention techniques have been based, for the most part, on informal, subjective evidence rather than experimental investigations (Kavale & Mattson, 1983). Despite positive reviews from practitioners and marketers (Bulluss & Coles, 1998; Capon, 1994; Connell, 2009b; Cowley, 2008; Cropp, 2008; Hendy, 2000; Losse, et al., 1991; Mikaere-Wallis, 2009; Pagani, et al., 2010; Wassenberg, et al., 2005) studying perceptual motor programmes, motor skills and reading, it is not established whether academic gains follow.

To reiterate, much research that has been done has failed to demonstrate that perceptual motor training activities are effective academic interventions. For example, a study by Dietrich (1973) set out to determine the relative effectiveness of perceptual motor training, and individualised reading instruction on the reading achievement, perceptual motor development and behaviour adjustment of children with reading problems. Findings indicated that many assumptions involved in the use of perceptual motor programmes for reading and general educational development needed careful examination (Dietrich, 1973). The perceptual motor group performed the most poorly in reading compared to the other two groups. Secondly, the perceptual motor training was also not effective in bringing about significant changes in perceptual motor development itself, nor did it have any effect on behaviour (Dietrich, 1973). This study found that perceptual motor programmes do not improve motor skills and that there was no improvement in reading.

Kavale and Mattson (1983) reported on a meta-analysis of perceptual motor programmes. Their goal was to “systematically combine the results of independent studies in order to draw as much information as possible from existing evidence” (Kavale & Mattson, 1983, p. 165). Research reviewed by Kavale and Mattson (1983) clearly demonstrated that perceptual motor training activities are ineffective academic interventions. Positive results in research were believed to be flawed in methodology due to small sample sizes and other limiting factors. More controlled research produced consistently negative evidence (Kavale & Mattson, 1983). Based on claims and subjective criteria, if nothing else, perceptual motor training programmes could be expected to improve perceptual/sensory motor abilities.

However in this meta analysis of perceptual motor training no dramatic improvements in such functions were found.

More recently Hammill (2004) completed an extensive review of more than 450 studies of the specific abilities related to reading. A major goal of his study was to identify and teach children to use those abilities that have the most relevance for learning to read. Hammill (2004) found that the correlation between perceptual motor skills and reading abilities was small and went as far as to state that training in just the perceptual motor skills aspect specifically would have no benefit for reading (Hammill, 2004).

In reviewing research on perceptual motor programmes, Hyatt, *et al.* (2009) highlighted that The Australian Council for Learning Disabilities (1987) issued a strong statement against the use of perceptual motor testing and training to improve academic performance. They based this recommendation on the lack of scientific evidence supporting such practices. Hyatt, *et al.* (2009) state that,

“given the lack of impact of older perceptual motor programmes on reading and that the exhaustive review of the correlates of reading carried out by Hammill (2004) found only small correlations between reading and perceptual motor skills, it is hard to be optimistic that these newer programmes will be any more successful than the older programmes” (p. 317).

These findings negate the assumption held by perceptual motor training advocates that the programmes have a direct effect on cognitive development related to reading achievement. This concurs with the earlier meta-analysis of Kavale and Mattson (1983).

The above studies suggest that to use a perceptual motor programme as a reading intervention could be ineffective and inappropriate. They highlight the popularity of perceptual motor programmes in the 60's and 70's and demonstrate that its ineffectiveness was revealed within a short period of time. A more recent study by Stephenson, Carter and Wheldall (2007) reported on the analyses of the information about the uses and the rationales for perceptual motor programmes drawn from the websites of Australian schools. Many websites claimed that the perceptual motor programme assisted with the development of fine motor skills, essential in the

learning of reading and writing. With Kavale and Mattson's (1983) meta analysis in mind, Stephenson *et al.* (2007) concluded that any level of use in schools is of concern as the general claims that perceptual motor programmes will benefit cognitive, sensory or motor development for all children are unsustainable. "Given the evidence and the speculative, unproven and often simplistic nature of their theoretical rationales, there is a compelling case to regard them (perceptual motor programmes) with far more caution than any other interventions" (Stephenson, *et al.*, 2007, p. 15).

In a New Zealand study, Broadley and Litterick-Biggs (2005) also investigated the reasoning behind the use of perceptual motor programmes as a non-validated approach. They randomly selected eight teacher or principal participants from a possible 15 who were implementing a perceptual motor programme in their school with year one and two children. The eight participants were spread over six schools and included no more than one principal and one teacher in the same school. Analyses of face-to-face interviews found all participants identified the perceptual motor programme as having a positive influence on the increased academic opportunities for the students. However, from their analyses of the interviews Broadley and Litterick-Biggs suggested that the participants held a blind optimism for the programme with no prior or subsequent evaluation and little understanding of how to assess and evaluate the programme. What is suggested is that developing the perceptual motor ability of a student will impact positively on their self confidence and consequently result in improved classroom behaviour and increased ability to engage in class activities. According to Broadley and Litterick-Biggs (2005) this remains to be proven, and it is not established whether academic gains follow.

The concerns of these researchers reflect those of my own. The results of the above two studies and my personal experiences and conversations with some leaders in education, prompted the need for my own research using an experimental methodology in an effort to provide valid and reliable findings.

Overall Summary

In this chapter I have identified some theories surrounding the emergent literacy stage and explored possible links between the development of motor skills and learning to read. The research reviewed is inconclusive in establishing a clear link between the two. This demonstrates further, the need for evidence-based practice particularly for children who are “at risk” of reading failure.

Research Question

This study addresses the following question:

Does the implementation of Smart Starts perceptual motor programme into the current classroom programme accelerate children’s reading ability at a greater rate and/or beyond those children participating in the regular classroom programme alone?

Methodology

Study Design

Quantitative research is designed to give numerical results to reflect trends. Leedy and Ormrod, (1985) when describing quantitative research investigations stated that:

“Progress is relative. We measure progress by noting the amount of change between what was and what is” (p. 229).

The essential feature of experimental research is that investigators deliberately control and manipulate the conditions which determine the events in which they are interested (Cohen, Manion, & Morrison, 2000). Key features of experimental research are random allocation, control of the key variables, the giving of the special treatment and the comparison with one group to another. In this particular research investigation the normal classroom literacy programme is the key variable and the Smart Start Perceptual Motor Programme the intervention special treatment.

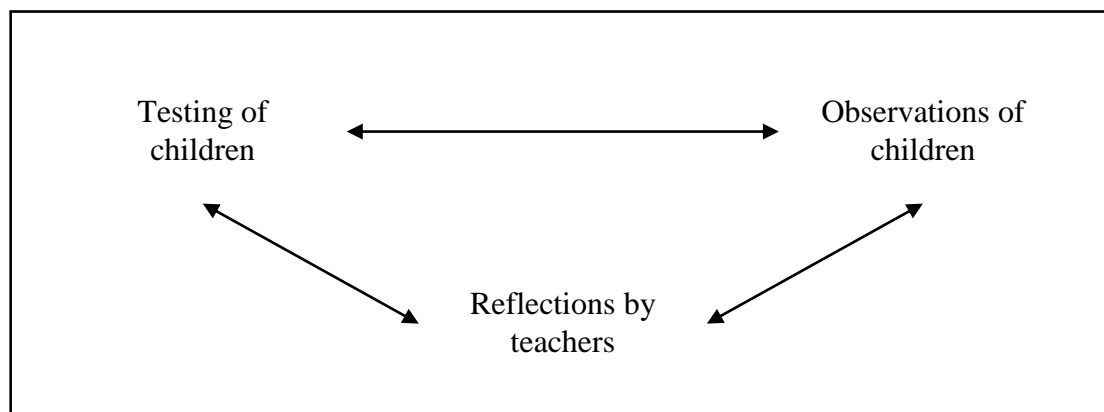
Quasi experimental research involves the use of intact groups of subjects in an experiment, rather than assigning subjects at random to experimental treatments (Wiersma, 1995, p. 139). This is often best suited to research in education as classes of children must stay intact. Quasi experiments include assignment, but not random assignment of participants to groups. This is because the experimenter cannot artificially create groups for the experiment (Creswell, 2008). My research is Quasi experimental as it uses two intact classes as the subjects with specific assignment of treatment to one group. Specific assignment was necessary as only one teacher had participated in the training.

Quantitative research best suited the investigation as the experimental design allowed a direct comparison to be made between the outcomes of the original literacy programme and the intervention programme. It was important to me, to test the validity of the perceptual motor programme using a quantitative design, particularly with the already strong belief in the programme in a number of schools

including the study school. Studies already mentioned demonstrated that unless a control group is present to prove otherwise, practitioners will assume any success as a direct result of the perceptual motor programme. This would clearly prove accurately without suggestion or feeling the effectiveness of an intervention, therefore leaving no questions in its validity or further implementation. Using one single method can render only partial insight from one perspective, therefore to ensure all aspects are being considered the research included qualitative aspects through the use of reflective journals and teacher observation. Research had shown that despite negative results, schools were still implementing perceptual motor programmes. As team leader in a school that worked hard to ensure best practice, I was interested to see and hear their reactions to the programme to see if they believed in the programme without data to concur. It was important to compare the data with the thoughts and feelings of practitioners through a reflective journal and see if they aligned. This mixed method approach using multiple data collection is described as triangulation (Bogden & Biklen, 2003; Creswell, 2008; Gay & Airasian, 2000; Wiersma, 1995).

“Mixing methods for triangulation seeks convergence, corroboration, and correspondence of results across the different methods. Different methods are used to increase the validity of constructs and inquiry results by counterbalancing known method biases and limitations” (Richardson, 2001, pp. 252-253).

In this study triangulation involving multiple data collection procedures were used. Diagram one shows their interconnections amongst the observations of children, reflections by teachers and the testing of children. See Figure 1. below (Wiersma, 1995).

*Figure 1.**Triangulation Involving Multiple Data-Collection Procedures (Wiersma, 1995)*

While the pre, mid and post testing data were the main contributors to research data, weekly observations of children and reflections of participating teachers would show similar trends as the testing data, thus corroborating the conclusions from the pre, mid and post tests (Creswell, 2008).

Setting

Researcher Position

Positioning in the school was an important part of completing this research. In my role as Junior Team Leader at the research school it was important that programmes were well thought out and constantly reflected on, to best meet the needs of the children. As part of this the principal of the school and I had a discussion around the popularity of perceptual motor programmes. I had noted through anecdotal discussions with teaching colleagues, that perceptual motor programmes were being run in many New Zealand Schools and teachers perceived that there were benefits to learning, particularly in reading. Given the wide use of the programme within other schools, the principal was very keen to implement the programme in our school. However, she questioned the current research around the programme. I explained that although there was little current research, there was some dated research, most if not all of which, strongly suggested a perceptual motor programme does not improve children's ability to read (Broadley & Litterick-Biggs,

2005; Dietrich, 1973; Kavale & Mattson, 1983; Stephenson, et al., 2007). We discussed the conflicting beliefs about the perceptual motor programme and our concern that over 300 New Zealand schools (Cropp, 2008) are currently running a perceptual motor programme with little to no research evidence to support its use. Both the principal and I felt it was important to trial the programme within our own school where I would be able to follow up the programme with rigour through research. As part of my role as Junior Team leader, the principal supported the idea of introducing a perceptual motor programme in our school with the aim of researching the effects of a perceptual motor programme on junior children's reading abilities.

School

The Christchurch primary school was selected based on my position within the school and the rationale described above. The school was a contributing primary school from years 1-6 with a roll of approximately 270; 150 boys and 120 girls in 2009. Ethnic composition of the school consisted of New Zealand European/Pākehā 56%; Māori 17%; Pacific 9%; Asian 5%; Other 13% (Education Review Office, 2009, p. 163). The school was in a lower socio-economic area as rated by the New Zealand Ministry of Education. The Ministry ranks schools based on a socio-economic scale of one (being the lowest) to ten (Ministry of Education, 2009a). A low-decile ranking indicates a significant number of disadvantaged children. The school was ranked at decile three.

Participants

Classes

When selecting classes of children to be participants in the research, a number of issues needed to be considered. In exploring basic types of design errors Rummel (1964) explains a group error can occur where extraneous factors can have a systematic effect on one group. For example, one group of pupils may be taught differently to another group resulting in a systematic effect on all pupils in that class only. In using same school samples I attempted to control different factors such as

ethnic make up, socio-economic backgrounds, teaching and learning programmes and quality of learning expectations thus avoiding any threat to validity (Gay & Airasian, 2000). In using two groups of children from the same school I aimed to control as many factors as possible which created the opportunity to compare.

In completing analysis of baseline data where pre-test results were compared between both classes I eliminated the threat to validity that can occur with differential selection of participants. Gay and Airasian (2000) described how:

“Differential selection of participants usually occurs when already formed groups are compared, thereby raising the threat that the groups were different before the study even begins” (Gay & Airasian, 2000, p. 375).

Because initial group differences may account for post-test differences, analysis of pre-test data was important to counter this threat of validity. The pre-intervention analysis suggested that there was no significant evidence for a difference between the classes.

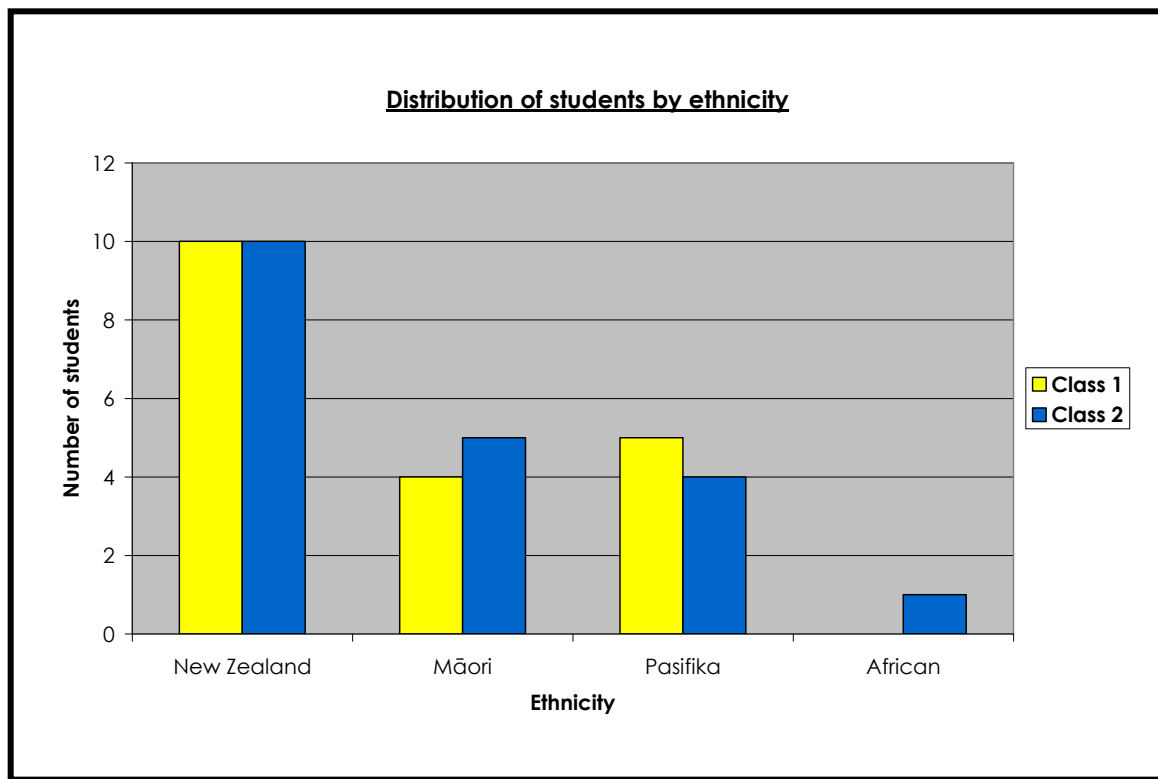
The two classes chosen were selected as they were the only two junior classes consisting of year one and two junior children. This aligned with Bulluss and Coles (1998) who market that Smart Starts perceptual motor programme is necessary in supporting children’s learning and development in the first three years of school.

Forty-three (43) school children from two year one and two classrooms within the school were invited to participate. Informed consent was collected from parents and caregivers as well as participants. At the beginning of the study, class one had 21 children and class two had 22. However, in class one, one child moved to another school during the second term and one child in class two moved to another school during the second term. One child in class one was not eligible to participate due to his involvement in the Reading Recovery programme (Clay, 2002) and one child in class two due to her predicted involvement in the school’s Reading Recovery programme. The Reading Recovery programme is a school-based early literacy intervention designed to reduce the number of children with literacy difficulties in schools. Reading Recovery provides daily one-to-one teaching during a withdrawal session for six-year old children who have made slow progress with literacy learning in the first year of school. The programme aims to move children through

one reading level per week depending on attendance. It is supported and partially funded by the New Zealand Ministry of Education as part of the Literacy Strategy. Because the Reading Recovery programme guidelines aim to move children through one reading level each week in the process of acceleration, I would expect the child's reading results to increase at a much greater rate than the other children. This could have resulted in the data being affected by high scores. In class two, two outliers were removed at baseline phase due to very high scores in all tests. It is important to remove the outliers as their scores are so different. This large difference alters the distribution and affects assumptions of normality making it more difficult to draw accurate conclusions. Therefore, 37 children (19 in class one and 18 in class two) participated.

In class one, 53% of the students were male (N=10). The average age in class one was six years and one month (sd=5.4) ranging from five years and nine months to six years and ten months at the beginning of the study. In class two, 33% of the students were male (N=7). The average age in class two was six years and one month (sd=5.2) ranging from five years and seven months to six years and nine months at the beginning of the study.

At the beginning of the study the ethnic composition of the study classes including all children is relatively consistent to that of the school (see Figure 6.) suggesting an accurate representation of the population. Around half of the children in both classes were New Zealanders of European descent, class one = 53%, Class two = 50% (see figure 6). Twenty one percent in class one identified their heritage as Māori along with 25% in Class two. In class one, 26% self-identified as Pacific Islander. In class two, 20% self-identified as Pacific Islander and 5% identified as from African heritage. All children, excluding one child from class one (Filipino) and two children from class two (Filipino and Somali) spoke English as the main language in the home. The distribution of children by ethnicity in each class is shown in Figure 2.

Figure 2.***The distribution of students by ethnicity***

In class one, three children were identified by the school as English Speakers of Other Languages (ESOL) which involved them having extra support during class. This support was received during reading time and involved the teacher aide listening to the children read and engaging the children in the text through simple questioning and discussion. Five children in class one were identified by the classroom teacher as requiring extra learning support through Special Education Grant (SEG) during reading or writing. The SEG is Government funding to support special programmes in school. In both classes SEG support included two hours of teacher aide time per class per week during reading. During this time the teacher aide supported the identified children in reading activities such as puzzles, reading of big books, and making and learning their sight words. In class two, three children were identified by the school as ESOL which involved them in extra support during class. This in-class support was also during reading and involved the same practice as in class one. Three children in class two were identified by the teacher as requiring extra learning support through SEG during reading and writing.

In both class one and class two, one child received extra support through Referred Teacher of Learning and Behaviour (RTLB) for learning in all areas. The decision was made by the principal and myself as the researcher that if any child was to be identified and accepted into another programme such as RTLB or Reading Recovery during the study then this would be allowed. Ethically it was agreed it would not be appropriate to exclude a child in need from an intervention proven to be successful with our students in the past.

Individual child in each class

One child, from each participating class, was chosen based on similar age, current reading ability and the same gender in an attempt to control factors to make a more accurate comparison. The classroom teachers were asked to complete anecdotal notes and weekly reflections on a child considering and noting any change in behaviour and attitude and also milestones such as writing their name or being able to read more sight words.

Teachers

The teacher in class one (T1) was a 21-year-old female New Zealand European beginning teacher, trained in New Zealand with a Bachelor of Teaching and Learning. She was in her first year of teaching. The teacher in class two (T2) was a 37-year-old male European New Zealand teacher, trained in New Zealand with a degree in horticultural science and a graduate diploma in primary teaching. He had nine years teaching experience, including four years teaching in the United Kingdom. Both teachers had been teaching in the junior school for less than two years.

As team leader in the Junior Team I had viewed both teachers' planning, programmes and observed teaching. This put me in a position where I was able to observe that classroom programmes were dedicating similar time, activities and opportunities during reading. This helped to further eliminate group error (Rummel, 1964) by controlling extraneous factors such as different programmes and teaching approaches.

Teacher two had received training in the perceptual motor programme earlier in the year and ongoing support. As a result of this Teacher two and class two were assigned to be the intervention group. The Junior Team also consisted of one other team member who was implementing the perceptual motor programme with her year one class. While her class did not participate in the research, this teacher took part in team reflections on the perceptual motor programme as part of the research.

Data Collection

Tests

Four tests were used to gain a broad picture of the children's ability in reading. The following tests were also chosen as they align with some of the aims of the perceptual motor programme and would prove or disprove claims. These tests provided comprehensive information regarding the decoding and word attack skills of the children. The tests were as follows:

1. Marie Clay Word Reading

Clay (2002) developed standardised word tests to measure reading achievement. These word tests were based on the principle of sampling from the child's reading vocabulary. These word lists were compiled from the high frequency words in the reading materials that have been used in New Zealand schools. The score indicates the extent to which a child is accumulating a reading vocabulary (Clay, 2002). Successive tests indicate whether a progressive change has occurred in the child's reading of words. (See appendix VI for sample of testing sheet)

2. Sight Word Test

Alongside this test was the testing of 60 sight word (See appendix VII). This list was compiled by the school's trained Reading Recovery Teacher of 13 years and the New Entrant Teacher at the time. They used Spell-Write Essential List One (Croft, Philips, & Ridder, 1983), Marie Clay's Word Reading test and the frequently used vocabulary in the PM books. Once again successive tests indicated whether a progressive change occurred.

3. Sutherland and Gillon Non-Word Reading Task (2006)

The Sutherland and Gillon list of non-words aligned with Shaywitz (2003) who concluded that “the ability to read nonsense words is the best measure of phonological decoding skills in children” (Shaywitz, 2003, p. 133). Furthermore, based on Hammill’s (2004) best predictors of reading, phonemic awareness is one of the key factors in children learning to decode and read more fluently. Therefore, improved scores in this test would suggest improvement in an aspect of their reading ability. Bulluss and Coles (1998) claim that, during the perceptual motor programme readiness skill of auditory acuity will be strengthened which will result a child developing a stronger phonemic awareness. This test will ascertain whether or not this aim is achieved during the perceptual motor programme. Children were given a list of 30 non-words to read. This determined the ability to decode words phonetically using phonemes you can see. (See appendix VIII)

4. Running Record

“Running Records provide an assessment of text reading” (Clay, 2002, p29). When Running Records are taken in a systematic way Clay (2002) believed they provided evidence of how well children are learning to direct their knowledge of letters, sounds and words to understanding the messages in the text. “From the time a child tries to retell a story from the pictures in a book, until the reader has become a silent reader, Running Records, can plot a path of progress” (Clay, 2002, p51). Aspects of ocular control are targeted during the perceptual motor programme to promote development of eye tracking, a skill that has been identified as vital if children are to perform without the undue stress in reading. Significant improvements in this test from the intervention group might suggest strengthened ocular control proving yet another claim of Bulluss and Coles (1998). The children in this investigation read an allocated text and were scored based on correct responses, errors and self corrections (See appendix IX for example of recording sheet). Behaviours such as pausing, sounding out the letters, chunking of words and fluency were observed by the teachers testing. These could not be included in analysis as they are based on teacher observation and therefore were much less reliable. Performance is recorded at three levels of text difficulty (Clay, 2002).

- An easy text (95 to 100 percent correct)

- An instructional text (90 to 94 percent correct)
- A hard text (80 to 89 percent correct)

In this particular research project the PM Benchmark Kit (Nelley & Smith, 2000) was used as a tool for testing the children. The kit includes 30 levelled texts ranging progressively from emergent level (level 1) to reading age 12 (level 30). Each benchmark text has a prepared Reading Record and Assessment Record sheet. As part of the assessment comprehension questions are on the assessment record sheet. These questions ask the children to recall and explore details from the text as well as bring their own background knowledge. Children were required to score 80% or above in the comprehension questions at that particular level as this was customary practice in our school. I felt that the other word reading tests accounted for decoding abilities and wanted to see the impact the perceptual motor programme had on children integrating all three of the cueing systems of language (Harris, Turbill, Fitzsimmons, & McKenzie, 2001) to read and gain meaning from text.

Each child underwent the tests over two sessions. All word reading tests; Clay word reading, sight word and non-word reading were tested in the one session while the Running Record testing took place in a different session. If the child showed fatigue or restlessness short breaks were given. All tests were administered by the same person for all children. They were conducted in the junior team office in the school by an experienced classroom teacher.

Observation and Reflection

The intent of naturalistic observation is to record and study behaviour as it normally occurs (Gay & Airasian, 2000). For example, it might include classroom behaviour of the student in group discussions. Creswell, (2008) discussed two types of observations that can be made; descriptive and reflective. In this study I asked the teachers to record observations on an observational sheet (see appendix V) which guided them in recording any changes or gains that child may have made. This was important in allowing me to explore the teacher's perceptions. Examples given to the teachers were: the child has learnt to hold their pen correctly, is able to flip on the monkey bars, balance on the playground or wriggle less on the mat, learns new

sight words or perhaps shows an improvement in reading. These examples were chosen to demonstrate to the teacher that their observation could be from a fine motor skill to a gross motor skill, academic or social. Teachers were to record anything at all they had observed even if it was not an example, academic, social or behavioural. It was explained to them that there were no limitations to what they recorded as observations. If the teacher felt they had observed no specific change they were free to leave the observation box blank. Alongside this observation was the opportunity for teachers to reflect and note their personal thoughts related to this change or gain in the child. Once again they were free to leave this box empty if they did not feel they had anything to add. This information supported the researcher so that they were later able to reflect upon these and make their own “personal thoughts that relate to their insights, hunches or broad ideas or themes that emerge” (Creswell, 2008, p. 225). As the classroom teacher, the observers had the advantage of being well known and unobtrusive (Creswell, 2008), also giving them the opportunity for unscheduled observations where Deobold (1979) believed “a more normal view of behaviour may be obtained” (p. 163). The purpose of the observation was to provide anecdotal information on any changes or progress the nominated child may have made during the school term. From the teacher observations and anecdotal notes, as the researcher, I wanted to explore the development or impact of the intervention or classroom programme, as this would provide some triangulation (Wiersma, 1995) to corroborate themes, results and ideas.

Weekly team reflections from the junior team teachers implementing the perceptual motor programme for the first time were also recorded to add to the understanding of the impact, implementation, benefits and challenges of the programme. As team leader and researcher I provided time each meeting where I asked the teacher’s involved “any thoughts on this week?” Once the conversations began I would prompt further thoughts by saying statements such as “can you tell me more” and “I am not quite sure what you mean by that”. At the end of the reflection I would read to the team what I had recorded in the minutes and asked “have I recorded accurately what you were saying to me?”

Procedure

Two classes were used in the study, a control group (class one) and an intervention group (class two). Because only one of the teachers had received the perceptual motor programme training (teacher two) this class was chosen for the intervention group. The intervention lasted ten weeks. This tied in with the school terms but more importantly as the leader responsible for implementing effective based practices within my team, I believed ten weeks was long enough for the intervention to show results. More than ten weeks with still no results would lead me to question the effectiveness of a programme when there are other research-based interventions that are effective, for example, Reading Recovery and Phonological Awareness programmes.

1. Pre- intervention probes

Both groups, 19 in class one and 18 in class two were pre-tested at week one to obtain baseline data in reading ability. During the ten-week experiment the control group continued with the normal classroom programme which included as part of the curriculum daily fitness sessions. The intervention group also continued with the normal classroom programme with the Perceptual Motor Programme added alongside.

2. Mid – way probes

At week five, both groups were re tested using the same tests as at pre-testing. Mid-way probes were carried out to ensure a clear picture of success if results were significantly different between the two groups. I wanted to determine if successful, at what point did the intervention begin to take effect. For the running record test a second kit was used that contained 30 different levelled texts, to ensure the same book wasn't being read as during pre-testing.

3. Post- test probes

At the end of the experiment, during week ten, both classes of children were tested for a final time using the same pre-and mid-tests to obtain post-test data. For the running record testing kit one was used again. As an educator the assumption was made that most children would not be reading at the same level as ten weeks earlier

during pre-testing, therefore a different text would be used. See table 1 for timeline of procedure. The pre-test/post-test method allows the researcher to compare two sets of data over time. This is described by Cohen et al (2000) as a “true experimental design: the pre-test/post-test control group design” (p213).

Data Analysis

Table 1

Data Collection Schedule

	Class One Control Class	Class Two Intervention Class	
	Pre-Intervention Probes		Fortnightly reflections by team members participating in Ongoing anecdotal notes and reflection on one case study from each class by the teacher
Week 1	Regular Literacy, Fitness, and Physical Education Programme	PMP Intervention Regular Literacy, Fitness and Physical Education Programme	
Week 2	Regular Literacy, Fitness, and Physical Education Programme	PMP Intervention Regular Literacy, Fitness and Physical Education Programme	
Week 3	Regular Literacy, Fitness, and Physical Education Programme	PMP Intervention Regular Literacy, Fitness and Physical Education Programme	
Week 4	Regular Literacy, Fitness, and Physical Education Programme	PMP Intervention Regular Literacy, Fitness and Physical Education Programme	
Week 5	Regular Literacy, Fitness, and Physical Education Programme	PMP Intervention Regular Literacy, Fitness and Physical Education Programme	
	Mid-Way Probes		
Week 6	Regular Literacy, Fitness, and Physical Education Programme	PMP Intervention Regular Literacy, Fitness and Physical Education Programme	
Week 7	Regular Literacy, Fitness, and Physical Education Programme	PMP Intervention Regular Literacy, Fitness and Physical Education Programme	
Week 8	Regular Literacy, Fitness, and Physical Education Programme	PMP Intervention Regular Literacy, Fitness and Physical Education Programme	
Week 9	Regular Literacy, Fitness, and Physical Education Programme	PMP Intervention Regular Literacy, Fitness and Physical Education Programme	
Week 10	Regular Literacy, Fitness, and Physical Education Programme	PMP Intervention Regular Literacy, Fitness and Physical Education Programme	
	Post-Intervention Probes		

Testing data were analysed using a Statistical Package for the Social Sciences (SPSS), a computer programme used for statistical analysis to determine significant differences, if any, in the pre, mid and post-test data over time within classes and between classes. Exploratory data analysis was used to understand the shape and distribution of test scores at baseline and summary measures were calculated (mean, median, standard deviation). Independent samples t-tests were carried out at baseline phase using pre test data from both classes. As discussed in the study design, analysis of baseline data was important in finding no significant evidence for a difference between the classes at the beginning of the study ensuring a more accurate comparison between classes at the end of the study (Field, 2000). Analysis of Variance (ANOVA) was carried out to look for an interaction. This was the main analyses used as evidence for specific effects such as rate of improvement and overall improvement between classes. Finally, Analysis of Covariance (ANCOVA) was used for detecting the difference between groups pre and post intervention. ANCOVA is a more powerful test as it allows for other variables which may influence the outcome and controls them. It reduces within group error variance and eliminates any unmeasured variables that may confound the results, such as, the difference in ages of children. ANCOVA adjusts the endpoint to adjust for difference in mean at the baseline.

Observation data collected by the two classroom teachers were used as well as fortnightly team reflection. The teacher reflection also gave the opportunity to understand a different theme related to the implementation of this new programme, giving some insight into the feelings around the benefits, challenges and implementation of the programme. The observation information was read through and any indicators of reading or reading acquisition were highlighted to compare between two subjects to gain insight into whether it was developmental progress or had possible links to the programme. Any other significant points of interest were also highlighted and commented on.

Intervention Measures

Perceptual Motor Programme

Class two, the intervention class, participated in the perceptual motor programme as part of the study. Specific professional development training covering the rationale for use of this intervention and explanation of how to implement the programme was delivered by Gill Connell. Connell is a primary trained teacher who specialised in music, child development and motor development. Gill has trained with Bulluss and Coles who are both consultants for perceptual motor programmes and created the teacher manual for Smart Start with PMP. Connell established Moving Smart Limited, to provide assistance for those working in Child and Motor Development. Moving Smart offers programmes such as perceptual motor programmes to foster children's natural, move to learn style (Connell, 2009b). The teacher training took six hours and included discussion on the following:

- 1) What is a perceptual motor programme
- 2) The perceptual motor programme model
- 3) Samples of lesson plans, evaluation, language sheets and floor session
- 4) Required equipment list

The teacher of class two, two teacher aides, and I attended and participated in the training session. Teachers were able to contact Connell at any time regarding use of the equipment.

The perceptual motor programme was run by a trained teacher aide in the school hall and was overseen by myself as the team leader. The perceptual motor programme has children work through a sequence of experiences to develop perceptual abilities, perceptions of time and space, and orientation and perceptions of sequence. Bulluss and Coles (1998, p. 7) believe these aspects to be "very important in terms of reading". The programme comprises of sessions including floor, equipment and language follow-up sessions. The floor session is an introduction to equipment and language that will be part of the equipment session the next day. The equipment session consists of stations aimed to develop the six readiness skills as discussed earlier in the literature review.

Every concept experienced in the equipment session was aimed to be reinforced in the classroom through a language follow-up activity run by the classroom teacher. Smart Start outlined that “four equipment sessions plus one floor session per week, is ideal” (Bulluss & Coles, 1998, p. 32). During this research, the school opted for the second recommendation of three sessions per week including one floor and two equipment sessions. Teacher two was requested to ensure their class attended all perceptual motor programme sessions. During the ten weeks of this study the perceptual motor programme was integrated into class two’s topic programme where the focus was “physical me”. This supported the teacher in managing the timetable to ensure all curriculum areas were still being taught while a new programme was introduced.

Routine Class Teaching

The New Zealand Curriculum (Ministry of Education, 2009b) served as the basis of teaching method in both classes. During teaching of reading in both classes, children were encouraged to learn through play, experience and hands-on activity when they were not involved in the guided reading session with the teacher. There was also a strong element of visual and grapho-phonetic teaching to support children in reading. Both teachers ran a similar reading programme where an instructional reading programme is run for an hour a day, four times a week. Both teachers had assessed children to create ability based groups which they take for a guided reading session four times a week. During these guided reading sessions, the other children were able to engage in a range of reading related activities such as reading and listening on the computer, puzzles, letter games, making letter shapes with playdough, writing with chalk, word stories, sight word games, reading big books, library corner and follow-up comprehension activities. The reading programme also included weekly poetry, and sharing a big book with a follow-up activity in both classrooms. A phonological awareness interchange was part of the regular programme throughout all classes in the junior school. This was implemented four days a week for 20 minutes each session.

In both classes, fitness was a regular part of the programme occurring every day for up to ten minutes a session. These sessions included energisers such as running, skipping, crawling, jumping, balancing, obstacle course on the playground equipment, follow the leader, and sprints or ball skills.

Ethical Considerations

Permission to carry out this study was sought from the principal and the Board of Trustees from the school concerned. Written permission was also received from the two teachers involved in the study. This study received ethics approval from the Educational Research Human Ethics Committee at the University of Canterbury as shown in Appendix I.

Participants were able to freely choose whether to participate in the research overall, or in aspects of it. Participation in this research was voluntary. As the researcher, I was obliged to deal with participants and the research in an honest and truthful way ensuring sensitivity and good judgement (Cohen, et al., 2000). All processes were explained and outlined clearly to ensure understanding and avoid any unnecessary issues or conflict. Before agreeing to participate in the research a detailed letter informing the participant of the research was given outlining exactly what the researcher's intentions and expectations were (See appendix II). By providing information letters alongside consent forms, the parents and children were well informed of the purpose and intention of the study and their obligation to decline participation. This was accompanied by a consent form. A consent form gaining permission to complete reading tests with the child was also included. This was to be read to the child with the parent and discussed. The child then had the option to sign and consent to testing and possible photographs during the course of the research. Participants, both parents and children gave consent on the basis of their knowing what they were taking part in. The information page and the letter of consent included:

- 1) Voluntary participation – giving the option to participate

- 2) Right to withdraw – notifying them that they were able to withdraw at any time
- 3) Informed consent – ensuring that they were fully aware of the procedure and what was expected of them
- 4) Transparency – treating them with honesty and truthfulness especially in relation to the purpose (Snook, 2003).

In the case of issues or conflict the offer of a neutral person is important to lend support in addressing these. In this research the person was one of my supervisors, Jo Fletcher. If the participant for any reason felt uncomfortable with the research all they had to do was inform me they wished to withdraw. No reason was required. Additionally I adhered to Snook's (2003) guideline that, "researchers are obliged to record, analyse and publish their data in ways which prevent the recognition of individuals" (p166). Also, to ensure anonymity the participant's names were changed.

Summary

The study involved a research method from a mixed method design (Jang, McDougall, Pollon, Herbert, & Russell, 2008). Pre, mid and post-tests were used to compare the difference between a control and intervention group. Teacher observation and reflection were also used to support testing data. The school was chosen based on the researcher's position.

The results of this process are given in the results and analysis section in the next chapter.

Results

All statistical analyses were carried out using a Statistical Package for the Sciences (SPSS). Independent Samples T-Test was first used at baseline phase to better understand group difference. Repeated Measures Analysis of Variance (RMANOVA) was used to compare mean scores across all three time points to test for significant difference over time, within groups and difference in rate of improvement between the two groups. Analysis of Covariance (ANCOVA) was used as a follow up to compare baseline and final scores of all four tests to identify differences over time, within groups and rate of improvement.

A significant level of 0.05 was used to evaluate the statistical outcome of the various measures. Potential violations of the assumptions were considered and there was no evidence that they would invalidate the conclusions of the analyses.

Baseline Phase

Campbell and Stanley (1963) identify differential selection of subjects as a threat to experimental validity. This is an effect due to the groups of participants not being equivalent. For example, “The experimental group in an instructional experiment consists of a high-ability class, while the control group is an average ability class” (Wiersma, 1995, p. 114). Therefore analysis of baseline data is important to determine equality at the beginning of the research.

At baseline in group one N=19 and in group two N=18. Exploratory data analyses were used to understand the shape and distribution of test scores at baseline. Summary measures were calculated (mean, median, standard deviation) and are included in Table 1. Tests one, three and four had fairly symmetric distributions whereas test two (sight words) was left skewed. The median was calculated for each group at pre-test to gain a better understanding of the data (see table 1). When there is a large difference between the mean and the median such as in test two this tells us the data is skewed as the mean gets “pulled” in the direction of the tail of the distribution. The median for test two shows that over half of the participants scored

60 (the top score) in group 1 and half of the participants scored 57 or more in group two.

The Independent-Samples T-Test procedure compares means for two groups of cases (Field, 2000). It is important that the sample means are equal so that any difference in the post test phase response is due to intervention and not to other factors in the two groups (Field, 2000). Analysis using independent samples t-test for pre tests one, two, three and four revealed no significant group difference ($p > .05$) on running records, sight words, Clay word reading and non-word reading measures (see Table 2).

Participant's results plotted over three time points showed consistent outliers with little or no improvement over time. It was important to remove the outliers as their scores are so different. This large difference alters distribution and affects assumptions of normality making it more difficult to draw accurate conclusions.

Descriptive data for each group are displayed in Table 2 below. Due to the removal of one outlier in each group and missing data in the pre testing phase in group one $N = 17$ and group two $N = 17$.

Table 2*Descriptive data for both groups on all four reading tests*

Test	Group	Mean	Std. Deviation	T-test for equality of means
1 Running record	One	12.53	5.52	t= 1.750
	Two	9.35	5.05	df= 32 p= .090
2 Sight words	One	54.94	11.28	t= 1.110
	Two	49.76	15.58	df= 32 p= .275
3 Clay word reading	One	12.06	3.33	t= 1.378
	Two	10.35	3.87	df= 32 p=.178
4 Non-word reading	One	11.06	7.75	t= 1.518
	Two	7.12	7.38	df= 32 p=.139

Intervention Phase

Using results from all pre, mid and post tests Repeated Measures Analysis of Variance (RM ANOVA) was used to compare mean scores over time. The RM ANOVA also tested whether or not one group improved significantly more than another over time and the difference in rate of improvement over time between the groups.

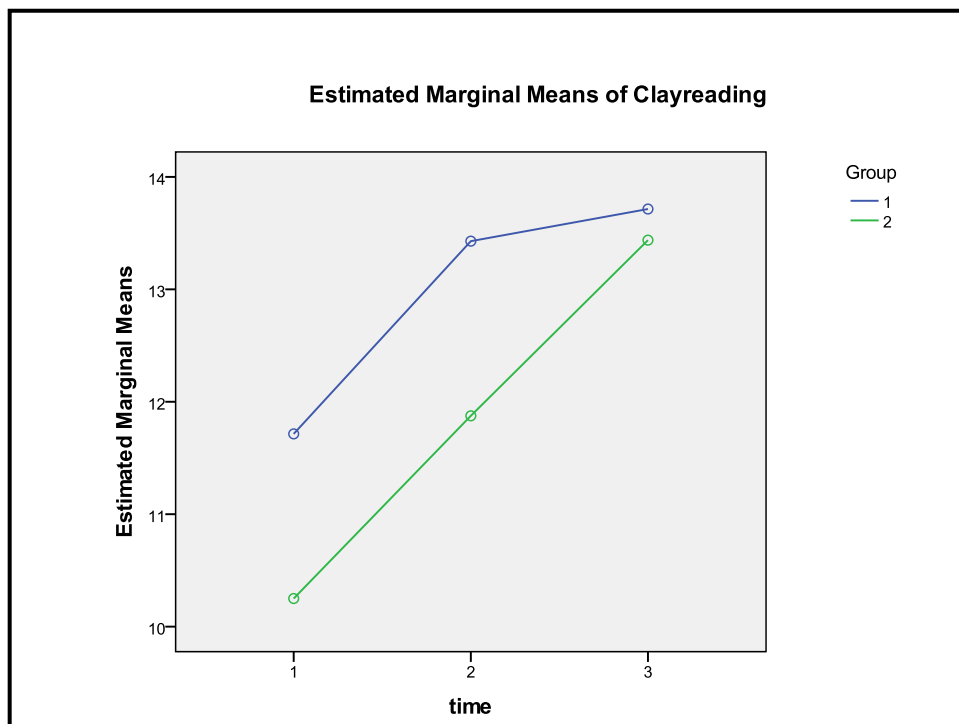
RM ANOVA requires complete data on all 3 time points (pre, mid and post) as a result of missing data 5 participants were removed for this analysis. One participant had no pre test data, 3 participants had no mid test data and one participant had no post test data. In group one N=14 and in group two N=16.

Clay word reading

RM ANOVAs performed on pre, mid and post Clay word reading tests revealed a significant time effect ($F= 26.290$; $df=2, 56$; $p< .0005$). The overall difference between the two groups was non-significant ($F=.995$; $df=1, 28$; $p=.327$). There was a non-significant difference in rate of improvement between the groups ($F=1.932$; $df= 2, 56$; $p=.154$). See Figure 3.

Figure 3.

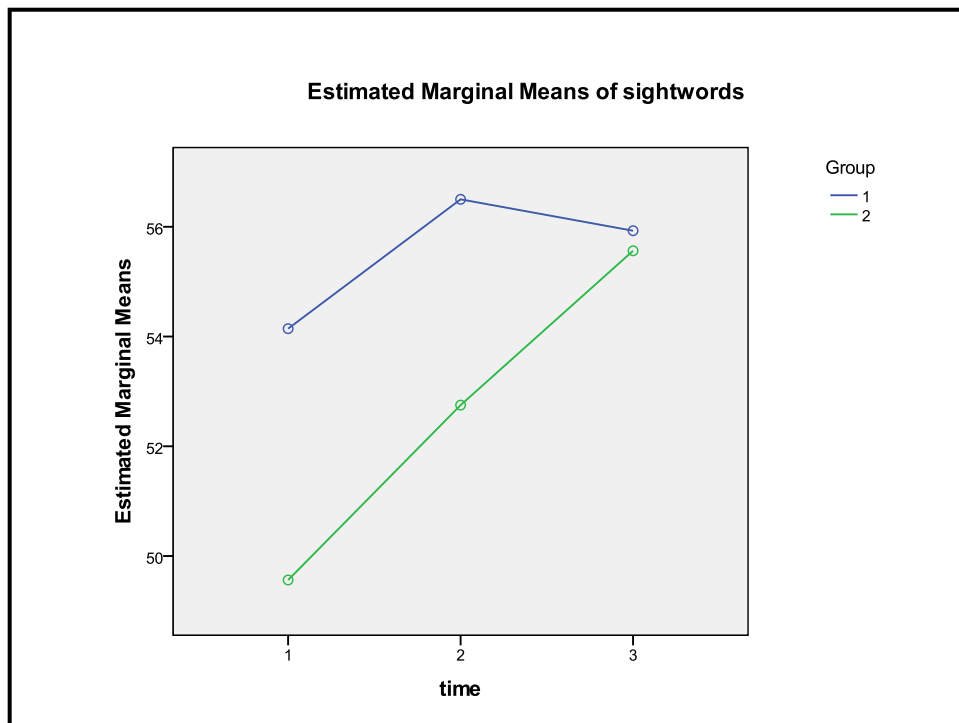
RM ANOVA Results performed on pre, mid and post Clay word reading for both group one and two



Sight Words

Figure 4 shows results from RM ANOVAs performed on pre, mid and post sight word tests. This showed a marginal time effect ($F=3.490$; $df=1.254, 35.109$; $p=.061$). The Greenhouse Geisser adjustment was made to the numbers of degrees of freedom in an Analysis of Variance because the repeated observations do not obey the usual assumptions of having constant variance. The marginal time effect is likely due to the ceiling effect where nine children in group one and four children in group two had scored the maximum score in the pre testing stage leaving little room for improvement over time. The overall difference between the two groups was non-significant ($F=.530$; $df=1, 28$; $p=.473$). RM ANOVAs also showed a non-significant difference in the rate of improvement between the groups ($F=1.083$; $df=2, 56$; $p=.346$).

Figure 4.
RM ANOVA Results performed on pre, mid and post sight word tests for both groups one and two

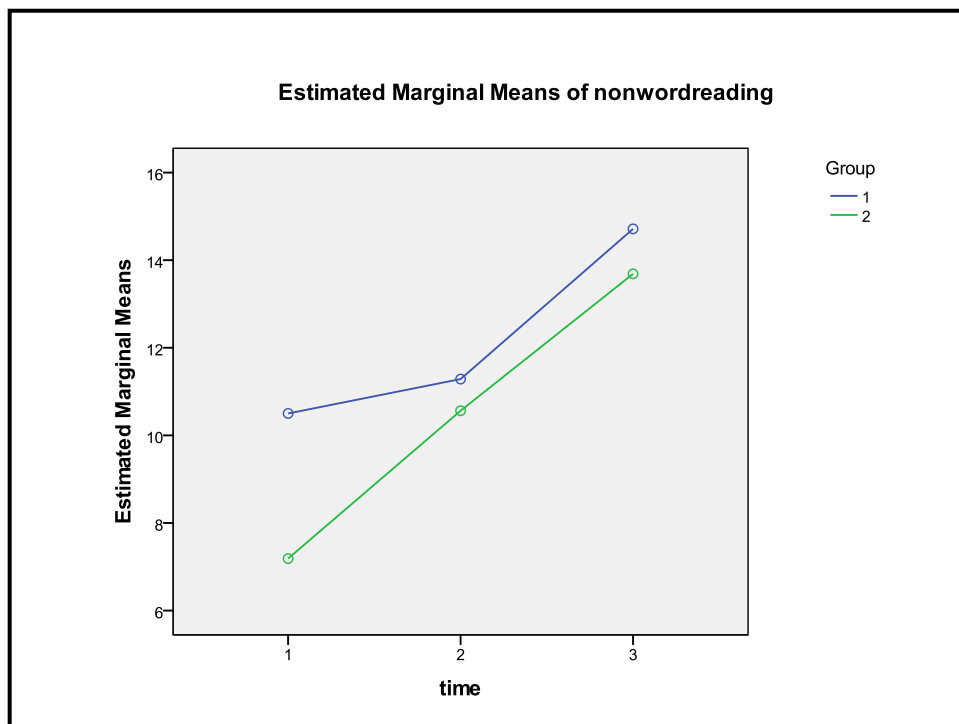


Non-Word Reading

RM ANOVAs performed on pre, mid and post non-word reading tests as shown in graph 4 revealed a significant time effect ($F=19.327$; $df=2, 56$; $p<.0005$). The overall difference between the two groups was non-significant ($F=.376$; $df=1, 28$; $p=.545$). RM ANOVAs also showed a non-significant difference in the rate of improvement between the groups ($F=1.327$; $df=2, 56$; $p=.273$).

Figure 5.

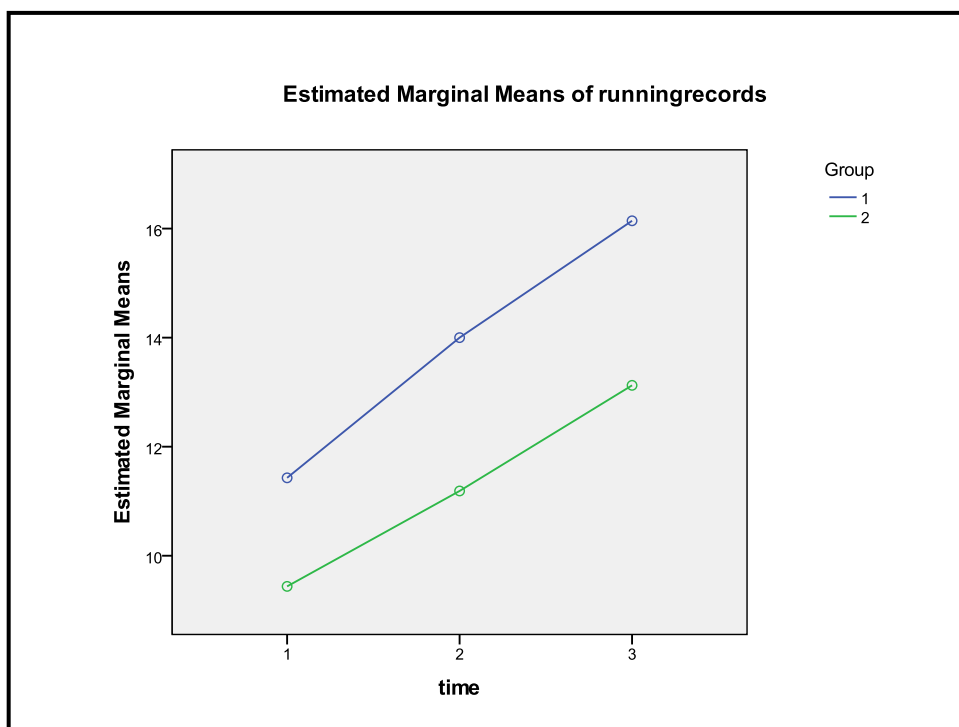
RM ANOVA Results performed on pre, mid and post non word reading tests for both group one and two



Running Record

RM ANOVAs performed on pre, mid and post running record tests revealed a significant time effect ($F=82.817$; $df=2, 56$; $p<.0005$). The overall difference between the two groups was non-significant ($F=1.903$; $df=1, 28$; $p=.179$). RM ANOVAs also showed a non-significant difference in rate of improvement between the groups ($F=1.385$; $df=2, 56$; $p=.259$) (See Figure 6. below).

Figure 6.
RM ANOVA Results performed on pre, mid and post running



Overall RM ANOVAs performed on all pre, mid and post intervention tests revealed that while both groups improved over time there was no significant difference between the two groups or the rate of improvement between the two groups.

Post test results

Analysis of Covariance (ANCOVA) is a more powerful test for detecting the difference between groups pre and post intervention. It allows for other variables which may influence the outcome and controls them. It reduces within group error variance and eliminates any unmeasured variables that may confound the results for example, the difference in ages of children. ANCOVA adjusts the endpoint to adjust for difference in mean at the baseline. The adjusted means (see Table 3) take into account the differences between the pre scores.

Because pre and post test data are required for the analysis of covariance, two participants were not used as one did not have pre test data and one did not have post test data. In group one N= 17 and in group two N=16. Results of ANCOVA performed on all available pre and post test data can be seen in table 3 showing significant difference between pre and post test results for both groups which is expected over time in the classroom. However no significant difference was found between groups overall or the rate at which they improved (see Table 3 over page). No significant outcome overall is significant for educators in the classroom. I agree that the claims made by the marketers of this perceptual motor programme cannot be justified based on this non-significant result.

Table 3

Comparison of baseline and final scores on all four reading tests for both group one and two

Test	Group	Pre Mean	Post Mean	Adjusted Mean	F	df	P
1 Running record	One	12.53	17	15.66	1.734	1	.198
	Two	9.35	13.13	14.55		30	
2 Sight word	One	54.94	56.53	55.36	.308	1	.583
	Two	49.76	55.56	56.81		30	
3 Clay reading	One	12.06	13.88	13.43	.995	1	.336
	Two	10.35	13.44	13.92		30	
4 Non word	One	11.06	14.47	13.12	1.020	1	.321
	Two	7.12	13.69	15.13		30	

Teacher observations of case study

In this study the first classroom (class one) teacher one ran her regular classroom programme including literacy, numeracy, fitness, physical education, the arts and topic. In the second classroom (class two) the children participated three times a week in Smart Starts perceptual motor programme as part of their topic study, as well as continuing with the teaching of the regular classroom programme with teacher two. This programme consisted of the same curriculum areas as above in class one. Both teachers one and two were given a weekly observation sheet to fill out at the end of each week for the ten weeks of the study as discussed earlier.

Results

Teacher One and Child (control class)

Teacher one commented in week one the child “could successfully read two more sight words this week now knowing four out of six”. Teacher one also commented early in week two that child one “gives up easily and won’t try new things”. In Week four, teacher one followed up by noting that child one has “poor attention span but he is trying”, when directed to participate in a one on one game with the teacher. Teacher one observed child one developing more confidence in their own ability stating child one is “becoming more confident in his reading – pointing to each word – is memorising the book for the week” this was recorded in week five which was positive after noting an initial reluctance toward learning in week two. Teacher one also noted later in the research that the child had developed some new strategies and “made connections in reading and showed pride in his success”. During week ten, teacher one was pleased to note that child one had made “a major jump from week one where [he] knew little and wouldn’t give things a try or retain them. He is starting to retain more information the more he is exposed”. Overall as the term progressed child one appeared to gain slightly more confidence in himself as a learner based on the teacher’s observations in week ten and specifically in weeks eight noting he was “slowing down” when reading which is “a great start for him” and that “he seems a lot happier in class now” during week nine.

Teacher Two and Child (intervention class)

During week two, teacher two noted a change in attitude with the child feeling more positive about their writing recording “[he] seems more positive about his role as a writer”. He reflected that this occurred after a small success of recording the correct first phonemes in his story the day before. In week four, teacher two wrote “more great reading, we celebrated [his] success this week”. This was then followed up by teacher two in week six recording child two was “more willing to attempt his writing independently even if he risks getting it wrong – confidence and risk taking developing”. Teacher two observed child two developing more confidence in their own ability as a reader and writer throughout the term starting in week two, which was positive after an initial reluctance toward learning. Teacher two also noted later

in the research that the child had “gained some sight words and self-correction strategies” when reading. In week nine, teacher two observed child two participating in a throwing and catching hand-eye coordination activity during the perceptual motor programme and noted that child two enjoyed the activity and “does have very good hand-eye coordination”. Teacher two also observed during the programme evaluation that child two succeeded in each task in all areas of balance, locomotion, hand-eye co-ordination and fitness. This is interesting to note as it could suggest that despite low reading ability his motor skills were well developed.

Over the course of the term both teachers recorded reluctance toward learning in their child. Both children were low progress readers. Early on in the research (weeks two and three) both case studies from the control and intervention group were invited to participate in another intervention, child one, RTLB and child two, Reading Recovery. Ethically the school felt they could not disadvantage the children by restricting them from this support. Because the intervention of Reading Recovery and support from a Referred Teacher of Learning and Behaviour are treatments that have shown positive results with children both in the research school and others it would not have been in the best interest of the child to exclude them as a result of this study.

Table 4**Raw scores on all tests for both child one and two**

	Pre Test Scores					Post Test Scores			
	Running record	Sight words	Clay word reading	Non-word reading		Running record	Sight words	Clay word reading	Non-word reading
Child one	L1	2	1	0	Child one	L1	5	1	0
Child two	L1	2	0	0	Child two	L3	14	0	4

Over the ten week study a change in attitude was observed by both teachers as well as some improvements in reading, sight words, letter sound relationship or writing. Overall there was no significant point of change that stood out or exceeded the other child's. Both showed different levels of progress or change at some point during the research as well as an element of willingness to try new things toward the end of the ten weeks. This suggests to me that inclusion in the perceptual motor programme had no effect on the development or attitude of child two that would not necessarily be present in a child of similar age, gender and ability participating in classroom programme. However, because of the secondary intervention of RTLB support and Reading Recovery any conclusions drawn from these teachers' observation of the two children can only be tenuous in regards to the effect of the perceptual motor programme.

Team Reflections on the perceptual motor programme

Fortnightly team meetings gave the opportunity for teacher two and the one other Junior Team staff member participating in the perceptual motor programme with their class to reflect on programmes currently running. As a result thoughts and opinions were shared on the implementation of the perceptual motor programme during the ten week research. While teacher one did not comment as her class did not take part, teacher two and a teacher also taking PMP with her class (teacher three) commented on the programme. As team leader and researcher I provided time each meeting where I asked the teacher's involved about "any thoughts on this week?" Once the conversations began I would prompt further thoughts by saying statements such as "can you tell me more" and "I am not quite sure what you mean by that". At the end of the reflection I would read to the team what I had recorded in the minutes and asked "have I recorded accurately what you were saying to me?"

Three main themes emerged throughout each team reflection on the programme. These were demand of teacher and parent time, student enjoyment and value in the programme. The first issue was the huge demand the two teachers felt the programme placed on them. Both teachers were feeling the 40 minute sessions, three times a week was demanding of their teaching and learning time commenting. Teacher three said: "It is a big part of the timetable and means my numeracy is at 2pm which is taxing". The total time out of the regular classroom programme to participate in the perceptual motor programme was two hours per week. Both teachers agreed it was working for now, "as it replaces our topic study but what will the implications be next term when we have to fit it in as well as topic and the arts?" They questioned what is being taken out of the programme if we are adding this in. In addition to taking up teaching time the teachers were feeling the demands of the programme in their own time.

The use of new and big equipment as part of the perceptual motor programme led both teachers to comment that session explanations from the manual were "full on and difficult to translate... requiring more than just turning up". The teachers felt the programme and accurate use of the equipment was "a lot to organise, follow up and understand, to ensure [they were] delivering the programme properly".

Both teachers also expressed frustration with the demand the programme placed on ensuring and organising parent helpers. With five stations in the equipment sessions the perceptual motor programme required at least three parent helpers to run those stations safely and effectively. During week four reflection it was minuted that there were “great parent helpers”. However, by week six, the two teachers observed that the lack of committed and consistent parent helpers made it difficult to administer each station productively so that it was beneficial to the children. They commented on their frustration by noting the perceptual motor programme is “pointless without parent help” and found obtaining reliable parents an ongoing challenge.

A second theme that was consistently throughout each reflection was student enjoyment. Both teachers felt despite some of their personal frustrations, the children “love it” and that “there are no behaviour problems because they are so engaged”. They commented that while for “some children it is irrelevant... children are enjoying it”. This was commented on during week four when it can also be noted that parent helpers were “great” and teaching the stations with the children well.

Thirdly, was a discussion during week six around the value of the programme where I asked the question “have you noticed any changes in children’s learning?” Teacher two commented it provided “opportunities for turn taking, sharing and co-operation” as well as some of the New Zealand Curriculum’s Key Competencies (Ministry of Education, 2009b) such as managing self, participating and contributing and relating to others. Teacher three commented “I don’t know that it is helping learning or even will help learning” but acknowledged it did have other benefits. Both teachers did not feel they could attribute the successes in reading in the classroom to the perceptual motor programme. One teacher reflected “as an experienced teacher with a strong literacy programme where in the past children have improved in their reading it would be naïve to attribute this year’s reading achievement to the programme just because it is something new”. Teacher two followed up that comment by saying, “It will be interesting to see the study results to see if reading skills were accelerated as a result of the perceptual motor

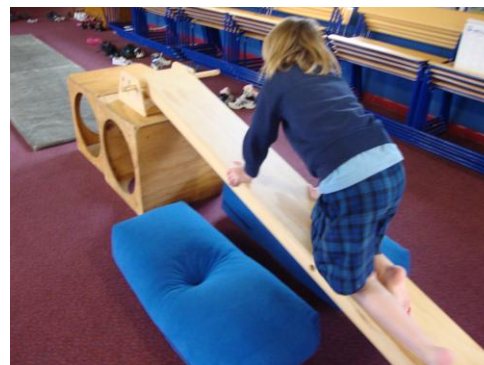
programme”. They also commented that the language follow up sessions weren’t “really needed” and that the children “seemed to know it already”.

As the team leader and researcher, during a reflection session in Week six, I prompted both teachers two and three who had been implementing the perceptual motor programme, to look forward to how it could run in Term three after recapping our reflections and thoughts from the term. It came through strongly that the floor sessions where equipment was introduced was unnecessary for our children and agreed upon reflection “we could drop that easily”, and “don’t even need the language follow up really”. It was also interesting to note that despite their comments on the demanding issues of the perceptual motor programme and the absence of improved learning within the classroom teachers involved had an underlying positive feeling toward the perceptual motor programme throughout each reflection session. This can be seen in the language used during each reflection. For example, in four out of the five reflection sessions a teacher commented on the children’s attitude toward the programme – “children are enjoying it”, and “children LOVE IT”. Words like “great”, “good”, “excited”, “looking forward to” and “so engaged” were also used in each reflection. In two out of the five reflections there was a discussion around the value in the programme towards to development of key competencies. Overall, the two teachers didn’t want to lose the programme altogether. They concluded “one equipment session a week would suffice” to provide another opportunity to develop the other skills and values that had been observed “as long as it was in the afternoon”.

Because the perceptual motor programme is a total programme with specific guidelines and needs to be run in accordance with the guidelines for it to work successfully it did not continue at all during term three. After four weeks without the perceptual motor programme both teachers reflected, that the children and other staff members had noticed the absence of the programme. When asked if they had noticed a change in behaviour, learning or attentiveness, both responded with “no”. From this, alongside the quantitative results of the study, I conclude that the perceptual motor programme did not improve the participating children’s reading levels in a positive way. Furthermore, the implementation of the programme was found to be a very intensive process that upon reflection was not a vital part of the

junior team's teaching and learning programme due to a number of factors. The main one was the time it was taking away from the other curriculum areas such as literacy and numeracy with very little benefits if any at all to the children other than enjoyment and some opportunity for possible further development in other social skills.

Photographs of some intervention group children participating in a session – June 2010



Discussion

This study introduced a perceptual motor programme into a junior school setting as research in action to gain further information on the programme and to determine its place within the junior school. The hypothesis tested was that participation in the perceptual motor programme intervention would improve reading. In this particular research there was no correlation between the perceptual motor programme and improvement in reading levels during the ten weeks. Overall there was statistical significance between pre and post-test data for both the intervention and control group. It is to be expected in a classroom that over time children will improve in their reading ability. However, the more important finding was that no significant difference was found between groups overall or the rate at which they improved. This proves the claims made by the marketers of perceptual motor programmes cannot be justified, as there was clearly no greater improvement in the intervention group than the control group. These findings are consistent with the work of other researchers such as Hyatt, Stephenson, & Carter, 2009; and Dietrich, 1973 who also concluded that perceptual motor training had no significant effect on reading achievement. A range of other researchers (for example Broadley & Litterick-Biggs, 2005; Kaufman, 1973; Kavale & Mattson, 1983; Stephenson, Carter, & Wheldall, 2007) support these claims concluding that a perceptual motor programme was not an effective intervention in improving children's learning. This study clearly demonstrates the Smart Start perceptual motor programme does not improve reading outcomes and therefore it provides some insight into the use of perceptual motor programmes in junior classrooms as an intervention to improve reading.

The use of a non-validated approach

Perhaps the biggest reason to proceed with caution when implementing a perceptual motor programme, is that these programmes are based mainly on a marketing claim that has yet to prove itself. While the use of a non-validated approach may not pose imminent threat to safety of individuals, it could deprive children of exposure to effective interventions, waste valuable time, and provide false hopes that may lead

to feelings of discouragement after the approach fails to produce the desired outcome (Hyatt, et al., 2009). My research further strengthens the work of Stephenson, et al., who claim that perceptual motor programmes are “predicated on the belief that perceptual and motor experiences underpin early learning and that, children who have underdeveloped motor processing will have difficulty learning basic academic skills” (2007, pp. 6-7). In the rationale section of Bulluss and Coles Smart Start manual, they claim that “the development of the child’s perceptual abilities, perceptions of space and time and orientation and the perceptions of sequence are very important in terms of reading and writing and one of the best ways of learning these things is in terms of physical activity” (Bulluss & Coles, 1998, p. 7). This belief leads them to explain throughout their manual that the programme will improve reading in statements such as, the perceptual motor programme “...is part of the total curriculum package... where children are introduced to the pre-requisite skills needed for formal learning in areas such as reading” (Bulluss & Coles, 1998, p. 20), and that the development of the child’s perceptual abilities are “very important in terms of reading” (Bulluss & Coles, 1998, p. 7). Clearly, it is the persuasive marketing materials and belief around the relationship between cognitive development and motor development that is the driving force behind perceptual motor programmes and perhaps also its popularity in other schools.

Un-proven Claims

Despite much reading and discussion around perceptual motor programmes, the perceived benefits are based merely on claims that are still yet to be rigorously proven by research. Even alongside explicit teaching of reading skills such as vocabulary and experience with text within the regular classroom programme, the perceptual motor programme did not enhance or accelerate reading ability in this study. Results of pre and post-test data showed no significant difference between groups overall or the rate at which they improved. This aligns with the research findings of Dietrich (1973) and Hammill (2004), who concluded that a perceptual motor programme was not effective in improving reading. From this we can conclude that to use a perceptual motor programme as an intervention to raise reading levels would be unsuccessful and a waste of valuable learning time, money

and resources. It could be suggested that this association is underpinned by the lack of a strong theoretical base that links the development of motor skills to those of reading.

Reading acquisition and teaching of reading skills within the perceptual motor programme

Children learn to read through specific, directed, skills-based teaching. Drawing on research in the fields of emergent literacy theory, research and reading (Clay, 2005; Foorman, Francis, Fletcher, Schatschneider, & Mehta, 1998; Gillon, 2004; Hammill, 2004; Ministry of Education, 2003; Pressley, Roehrig, Bogner, Raphael, & Dolezal, 2002), there is evidence that reading acquisition is a skills-based process. This is balanced by the interaction of specific information such as grammatical structure, meanings of words and sentences and phonemic awareness, where children develop and rely on language cueing systems (Harris, et al., 2001), and immersion in high quality literacy environments (such as those advocated by the Ministry of Education, 2009), and exposure to a range of meaningful and authentic literacy experiences (Bartlett, 1932; Bergeron, 1990; Dechant, 1991; Tracy & Morrow, 2006).

Some elements of the perceptual motor programme support reading acquisition using practices in line with current reading theory. Firstly, the perceptual motor programme aims to develop all of the readiness areas of auditory, visual, motor, social, language and memory, but in particular the motor area. Some explicit links to reading and reading acquisition theory can be seen in the activities during the programme that aim to develop auditory, visual and language readiness areas. For example, it attempts to develop auditory skills of phonemic awareness, a tool, which is strongly supported by Gillon (2004) as necessary in reading acquisition. Activities that develop children's visual perceptions during the perceptual motor programme support discrimination of letters and words, this is argued by Dechant (1991) as vital as the matching of letters and words is insufficient on its own.

Secondly, during the programme's language follow-up activity, specific language understanding of the concepts of words and how to use them in a variety of ways

aims to be developed. This supports Ruddell, Ruddell and Singer's (1994) developmental stages in language. The language follow-up component at the conclusion of each perceptual motor programme session aims to develop children's perceptions about the world and promotes concepts of language through experiences so that children can have a full understanding of language and all its vagaries (Bulluss & Coles, 1998). However, the explicit teaching of the skills that are part of reading acquisition such as concepts about print, the cueing systems, and experiences with text are not included.

As a result, even with some language development through activities in the perceptual motor programme within a social context approach where children physically experience the language of 'in', 'over', 'through' and 'around', this study demonstrates it is not transferred to the development of improved reading levels. While immersion in language and meaningful experiences are definitely important, attention to print and development of phonemic awareness is also imperative. It has to be a balance of both (Pressley, et al., 2002), The perceptual motor programme does not provide this balance.

Time Tension

The time required to implement the perceptual motor programme imposed greatly on the teaching time of other curriculum areas. The amount of time the programme required was an issue that was highlighted strongly through the teacher reflections. When implemented accurately in accordance with the manual guidelines (Bulluss & Coles, 1998), the perceptual motor programme requires over two hours per week of the classroom programme. Because the perceptual motor programme does not directly teach the explicit skills of literacy or numeracy, teachers found it difficult to justify and commit time to this programme. Teachers felt this time commitment placed pressure on the other subject areas which meant that in order to participate fully in the programme, they had to choose another curriculum area to drop from their timetable.

However, despite concern surrounding the time it took, teachers in the study enjoyed aspects of the programme. They indicated that the children developed and

consolidated skills such as turn taking, sharing, risk taking and perseverance all of which had ‘value’ in the classroom context. In addition, the children enjoyed participating in the perceptual motor programme, therefore justifying a ‘trade off’ of what the teachers could drop from their classroom programme in order to keep the perceptual motor programme. This then posed a potential threat to literacy time and a possible loss of explicit teaching time in reading, writing and oral language.

Most children arrive at school in the emergent literacy (Clay, 1996) stage of learning, where many children have experienced early literacy experiences that have impacted on their literacy growth and development to prepare them for formal instruction in reading and writing (Van Steensel, 2006). Children from a low-income or ethnic-minority home, such as the children in this study, are commonly seen as having had fewer emergent literacy experiences before they arrive at school (Adams, 1990; Davie, Butler, & Goldstein, 1972; Van Steensel, 2006). As a result children from a lower decile school often still require those literacy experiences to support the development of emergent literacy, as well as extra time and resources to support and accelerate these children toward success. Taking away explicit teaching time and evidence-based practice from these children to implement a programme because “they liked it” was a difficult concept for me to grasp in my role as the researcher and team leader at a low decile school.

Staffing and Support

This study also concludes that a perceptual motor programme monopolises teacher aide time as it requires guidance and support. Bulluss and Coles (1998) make it very clear in the manual that the programme requires resources of time, money, staff, helpers, space, and equipment, and that it succeeds best when there is total school commitment. They list some pertinent questions to support schools in making the decision of whether or not a perceptual motor programme is right for their school and their children. They urge “do not ignore them or gloss over them as the answers to the above will impinge upon the effectiveness of the perceptual motor programme” (Bulluss & Coles, 1998, p. 30). The importance of these considerations was supported by the comments during team reflections. The teacher reflections and participation in implementing the perceptual motor programme for the first time,

agree wholly with the above caution as they found the programme “a lot to organise, follow up and understand”. As a result of the large commitment and demands on resources, it is difficult to justify allocation of these resources to the programme when results of this study have shown no improvements in reading. It does not appear to be cost effective to designate a teacher aide to supporting and organising this perceptual motor programme. I contend that the teacher aide is a valuable resource that should be in the classroom supporting teachers and other programmes such as phonological awareness programmes, teaching of vocabulary, and creating experiences with text, to develop specific literacy skills.

New Zealand Teaching Practice

The development of motor skills is already a part of New Zealand teaching and learning programmes. Current New Zealand practices as guided by the New Zealand Curriculum (2007) already encompass aspects of the perceptual motor programme in the Physical Education Curriculum. For example, while it can be agreed that fundamental skills are essential, it must also be recognised these important skills are already part of the curriculum. Level one achievement objective of the Health and Physical Education curriculum is to “develop a wide range of movement skills, using a variety of equipment and play environments” (Ministry of Education, 2009b). Therefore during physical education, the fundamental skills of balance, walking, running, dodging, jumping, hopping etc are taught, practised and discussed eliminating the need for aspects of the perceptual motor programme. It may be however, that large motor co-ordination activities might be particularly beneficial for the early childhood sector, with children age two years old to four years old.

In addition, the ocular control exercise each session also occurs within the classroom in a number of different ways. For example, following the pointing stick during big book shared reading, energisers that encourage children to track a floating feather, and participating in guided reading sessions. Balance is addressed during musical statues and other energisers. Fine motor skills are part of the junior programme with paint, colouring, play dough and threading letters on a string. Gross motor skills are often part of playtime on the playground or a quick obstacle

course as a fitness fun game, which Hendy (2000) believes all nurture motor skills and therefore cognitive development. Bulluss and Coles (1998) state that is a programme which uses facets of music, fitness, dance, and physical education in order to develop children's perceptions. However these programmes are already being advocated as part of the New Zealand National Curriculum Guidelines (Ministry of Education, 2009b) once again raising questions around the need and relevance of the perceptual motor programme.

Alternative Physical Education Programme

The teacher reflections in this study suggested that components of the perceptual motor programme were already part of their physical education programmes. A perceptual motor programme could be explored as a successful programme to run as an alternative to physical education during the winter terms. The perceptual motor programme covers all aspects of the level one Physical Education Curriculum and fundamental skills in an organised, systematic and thorough way that ensures children are experiencing all of the motor development skills they need. With the time pressures of school timetables and meeting standards it may be that the other curriculum areas of physical education, fitness, dance and drama are compromised from the timetable. Perceptual motor programmes could be believed to be a solution to ensure these achievement objectives are being met and supporting the development of children's motor skills.

Relevance for all children

Some, if not all children, have already developed many of the fundamental motor skills that are developed in the perceptual motor programme and believed to be pre-requisites to reading. For example, according to Williams (1983) by the age of five nearly 60% of all children show efficient tracking with eye and head movement naturally separated. Six year olds track with nearly the efficiency of the average adult (Williams, 1983).

For those schools that do manage to manipulate their timetable and prioritise time over other teaching areas, have the funding, staffing and parent helpers to

implement a perceptual motor programme, there is a need to look closely at the “one size fits all” approach underpinning the perceptual motor programme. Both teachers participating in this study commented that for “some children it [the perceptual motor programme] is irrelevant”. In an evaluation of perceptual motor programmes, Kaufman (1973) makes a justified statement. He states that

“upon evaluation PMP assumes that all children require all activities, it fails to provide a means for identifying and selecting children requiring training in a particular skill, for example the ocular training. Furthermore the progress made in learning a skill cannot always be evaluated and measured resulting in the teacher having no way of knowing if the child failed to learn the skill”
(Kaufman, 1973, p. 23).

My study justified these comments further in finding the programme to be a one size fits all approach with no opportunity to follow up on the assessment and needs of the children. As professionals and educators we know that each child is at their own age and stage of learning and require an approach based on their own individual needs. To assume all children require all of the activities at the same time offered in perceptual motor programmes goes against what we know about children and their learning.

What is of concern, is the unfathomable acceptance and belief in this programme, which has been shown through studies such as Litterick-Biggs and Broadley (2005). Despite concerns of the educators highlighted and discussed in this study, there is still the overarching acceptance for the programme from staff in schools implementing perceptual motor programmes in New Zealand. Concerns of time pressures, staffing and resource pressures, unproven claims of a link between motor skill and reading and a one size fits all approach are all discussed and shown to be reinforced in this research. It would seem that the perceived benefits, and the marketing claims, appear to be enough to encourage teachers to continue or newly implement a perceptual motor programme. This is clearly not research evidence-based practice. So why are teachers and principals justifying the use of this programme in schools?

This research concurs with the study by Litterick-Biggs and Broadley (2005). During my ten week study, reflections around the implementation of the perceptual motor programme always had a positive undertone with both teachers commenting on similar benefits as in Litterick-Biggs and Broadley's (2005) study. Teachers enjoyed the extra writing promoted through the language follow-up, the student engagement and enjoyment in physical activity as well as the opportunity for sharing, turn taking and risk taking. However, in both studies none of the teachers had assessed or evaluated the children or programme to determine if these benefits were in fact accurate or actually happening as they perceived them to be. I contend that this raises concerns about the way that well marketed teaching programmes can dupe teachers into implementing learning programmes without the research evidence to support their decisions.

Development of social skills

In teacher reflections, teacher two in particular enjoyed the opportunities during the perceptual motor programme "for turn taking, sharing and co-operation." During week two, teacher two noted a change in attitude with the case study child feeling more positive about their writing, this was then followed up in week six by noting the child was "more willing to attempt his writing independently even if he risks getting it wrong" In contrast teacher one commented early in week two that child one "gives up easily and won't try new things". The Smart Start Manual outlines in its aims that the programme develops confidence in self and develops students who are successful. Observations within this study showed evidence that the programme appeared to do this. However the observations of the control child by the end of the ten week study also showed a gain in confidence with the teacher recording "he seems a lot happier in class now". While the perceptual motor programme does provide challenging activities, many of these activities, experiences and opportunities are already part of the junior school programme. This reinforces the main finding, that a perceptual motor programme is not a valuable and necessary programme to be implemented in schools.

Despite teachers recognising a number of issues with the running of the programme they could not overlook the fact, "the children love it". As stated by Litterick-Biggs

and Broadley (2005) in their study and as can be noted similarly in this study “overall there was an unquestioning acceptance by participants of the need for and benefits of within the primary school curriculum” (Broadley & Litterick-Biggs, 2005, p. 22). The marketing materials and programme appeals to educators as successful and worthwhile in improving learning. However as educators with an obligation to provide programmes that are proven best practice this is of concern. Time, money and resources need to be directed toward proven best practice to support our children in succeeding as readers. Based on the results of both of these studies, and as is suggested by the participation of so many other schools in perceptual motor programmes, some teachers are not using evidence-based practice but rather their own perceptions of what they ‘think’ works.

To conclude the findings of this study I argue against a relationship between the perceptual motor programme and improvements in reading. Thus, I do not support the claim raised by marketers and researchers (1998; Connell, 2009b; Goddard Blythe, 2000; Hendy, 2000; Sasse, 1979) of a link between motor development and improved reading levels. While these researchers and others argue the link between cognitive and motor development, there is not a strong enough research base to prove that a perceptual motor programme will improve motor development and therefore reading.

In this study the perceptual motor programme did not improve reading levels and considering the huge demands of the programme, the principal and staff decided their time, money, staff, space and resources were better invested elsewhere to improve reading. They felt that in particular the teacher aide time could be used to support reading in the classroom and individualised phonemic awareness programmes. The perceived benefits can be achieved in current teaching and learning programmes and therefore they do not justify the need for a very demanding programme that takes away from vital teaching and learning time. Without strong evidence to show that a perceptual motor programme does in fact improve reading it is not an effective intervention to implement in schools, if the expectation is that students will gain in their control over early reading strategies.

While there is some evidence to suggest that children with motor difficulties are more at risk of difficulties in reading (Losse, et al., 1991; Wassenberg, et al., 2005), there is perhaps no assessment in place to determine if children even need the programme. The general claims that perceptual motor programmes will benefit cognitive, sensory or motor development for children are not proven and this study reinforces this.

Limitations of the Current Research

There are some points to consider when interpreting the results from this study and when replicating a similar study.

Smart Start is a programme that is advised by Bulluss and Coles (1998) to begin immediately in the first formal school year and continue throughout years one and two. In this study, a snapshot of the perceptual motor programme and reading achievement was taken with year one and two children. These children ranged from age five years and seven months to six years and nine months and as a result had all been at school at least seven months to over a year and a half. Bulluss and Coles make it clear that the perceptual motor programme “prepares children for formal learning” (Bulluss & Coles, 1998, p. 20). The year one and two children in this study perhaps had already developed the skills the programme aimed to offer and as a result did not make the gains in learning that are expected by the programme.

In the beginning of the study, 22 children participated in the ten week intervention. In a more long term study the research would begin with the New Entrant children commencing a perceptual motor programme upon school entry as Bulluss and Coles (1998) intended, and follow them through until the completion of the programme. A control group could also be followed upon school entry to the end of Year two to allow a comparison. A larger sample size for a longer intervention period would allow for a more critical evaluation of the effects of the treatment. However given that after 10 weeks there was no change or improvement in reading skills it could be considered unethical subjecting children to this programme for any longer as the gains were insignificant.

The perceptual motor programme in the research school was not yet a strong and well established programme. The programme was set up and implemented for the first time at the beginning of this ten week study. Bulluss and Coles (1998) note the intensity of the implementation phase of the programme, “[it is] hard, demanding, heavy work, requiring real commitment to the programme” (Bulluss & Coles, 1998, p. 30). In the teacher reflection sessions, staff agreed wholly with this, commenting “it is a lot to organise, follow up and understand to ensure we are delivering the

programme properly”. This could have had an impact on how the programme was run. For example, not all equipment was known to staff so this took time to find and ensure it was being used by the children appropriately. Each station was new and on a tight timetable of only five minutes. Teachers including myself, often felt that they were not teaching the station effectively until at least the third group. The preparation was very demanding and for some sessions classes did not get the full 30 minutes as the equipment was not ready. Parent helpers also were difficult to organise so that there were consistent helpers who knew the programme and were able to support the children effectively. These are all issues that came from team reflections. The above factors suggest the intervention group participating may have not been receiving the strongest and most effective programme.

Limitations of the research design were that it was a relatively small sample size and only implemented in one school over a short period of time with no long term follow up on children’s progress.

Finally, the control group teacher provided all of the fundamental skills as part of the physical education curriculum achievement objectives, as well as many other opportunities to develop fine, gross and perceptual motor skills as part of the schools teaching and learning programmes. This could suggest the control group, while not participating in the perceptual motor programme were still receiving similar opportunities to develop these skills which could have contributed to the improvement in those children’s reading. Ideally, this study would have been more accurate if the control group was more controlled in the participation of activities involving the development of motor skills.

Future Directions

Based on the findings of this current study there are further questions to be explored as well as changes to current practice that need be considered.

Future investigations may be needed to research more closely the link between motor skills and cognitive development. While this study and earlier previous studies have found that a perceptual motor programme did not improve reading (Dietrich, 1973; Hammill, 2004; Kavale & Mattson, 1983), based on studies (Losse, et al., 1991; Pagani, et al., 2010; Wassenberg, et al., 2005) that question of the link between motor skill and cognitive development argue otherwise. However, the research is limited and therefore the debate ongoing suggesting the need for future research. Further research should explore the effectiveness of one-size-fits-all ready marketed programmes that claim to improve reading and learning in general. Whilst, I am aware of the lure that pre-packaged programmes hold for teachers and school leaders, without doubt all educators need to ensure these are research-based effective practices.

Finally, is the recommendation that schools ensure they are being informed consumers of research and implement evidence-based practices. Children will benefit from the use of proven methods to improve reading based on reading theories and research that has shown success through both qualitative and quantitative result. For example, this includes Reading Recovery or phonological awareness programmes. In this study and in studies by Litterick-Biggs and Broadley (2005), Stephenson, Wheldall and Carter (2007), and Hyatt, Stephenson and Carter (2009), it has been observed that schools are influenced by programmes being run in other schools creating a collective efficacy for the programme. It is vital to children's learning that validated approaches are implemented and followed by appropriate student assessment and evaluation. In Timperley, Wilson, Barrar and Fung (Timperley, Wilson, Barrar, & Fung, 2007), teacher professional learning and development, they discuss elements in professional learning contexts that will impact positively and substantially on students. Alongside providing time, opportunities to interact and consistency with wider policy trends is engaging external expertise. These external experts are often researchers who have extensive knowledge in their area and therefore are discussing and sharing ideas based on research and proven best practice. It is important to that teachers are researchers and current professional development promotes this.

References

- Adams, M. J. (1990). *Learning to Read: Thinking and learning about print*. Cambridge, MA: MIT Press.
- Allington, R. (2002). Research on Reading/Learning Disability Interventions. In A. Fartstrup & S. Samuels (Eds.), *What Research Has To Say About Reading Instruction. 3rd Edition* (pp. 261-290): International Reading Association.
- Baker, S., Berninger, V., Bruck, M., Chapman, J., Eden, G., & Elbaum, B. (2002). Evidence-based research on Reading Recovery. Retrieved Retrieved March 15, 2005, from <http://www.education-news.org/Curriculum/Reading/ReadingRecoveryisnotsuccessful.htm>
- Ball, E., & Blachman, B. (1988). Phoneme segmentation training: Effect on readign readiness. *Annals of Dyslexia*, 39, 208-225.
- Bartlett, A. (1932). *Remembering: A study in experimental and social psychology*. UK: Cambridge University Press.
- Bergeron, B. S. (1990). What does the term Whole Language mean?: Constructing a definition from the literature. *Journal of Reading Behavior*, 22(4), 301-329.
- Blachman, B., Tangel, D., Ball, E., Black, R., & McGraw, C. (1999). Developing phonological awareness and word recognition skills: A two-year intervention with low-income, inner-city children. *Reading and Writing: An interdisciplinary Journal*, 11, 239-273.
- Bogden, R. C., & Biklen, S. K. (2003). *Qualitative Research for Education: An introduction to Theories and Methods* (4th ed.). United States of America: Pearson Education Group Inc.
- Boulton-Lewis, G., & Catherwood, D. (Eds.). (1994). *The Early Years: development, learning and teaching*. Melbourne: The Australian Council for Educational Research Ltd.
- Broadley, G., & Litterick-Biggs, A. (2005). Smart Start with PMP: Implementation, management, and evaluation. *Research Information for Teachers*, 2, 21-25.
- Bulluss, J., & Coles, P. (1998). *A perceptual Motor Programme: A manual for teachers* (3rd ed.). Victoria, Australia: P.J. Developments.
- Campbell, D., & Stanley, J. (1963). Experimental and quasi-experimental designs for research on teaching. In V. Richardson (Ed.), *Handbook of Research on Teaching*. Washington DC: American Educational Research Association.
- Capon, J. (1994). Perceptual Motor Programmes: What are they. *First Steps: Kiwi Gymparoo*(11).
- Cihon, T. M., Psychology., T. C. S. o. P., Gardner, R., Morrison, D., Paul, P. V., & University, T. O. S. Using Visual Phonics as a Strategic Intervention to Increase Literacy Behaviours for Kindergarten Participants At-Risk for Reading Failure. *Journal of Early and Intensive Behavior Intervention*, 5(3), 138-155.
- Clay, M. (1996). *Emergent reading behavior*. University of Auckland. Auckland.
- Clay, M. (1999). *Becoming Literate: the construction of inner control*: Heinemann Education.
- Clay, M. (2002). *An Observation Survey of Early Literacy Achievement* (2nd ed.). Auckland, New Zealand: Heinemann.

- Clay, M. (2005). *Literacy Lessons Designed for Individuals*. China: Heinemann Ed.
- Cohen, L., Manion, L., & Morrison, K. (2000). *Research Methods in Education* (5th ed.). London, United Kingdom: Routledge Falmer.
- Connell, G. (2009a). *Moving to Learn*. Christchurch, New Zealand: Moving Smart Ltd.
- Connell, G. (2009b). Perceptual Motor Programme Retrieved 16 May, 2009
- Council for Learning Disabilities. (1987). Measurement and training of perceptual and perceptual-motor functions. *Journal of Learning Disabilities* 20, 350.
- Cowley, V. (2008). *Supporting Perceptual Motor Programmes*. Christchurch, New Zealand: University of Canterbury.
- Creswell, J. W. (2008). *Educational Research: planning, conducting, and evaluating quantitative and qualitative research* (3rd ed.). New Jersey Pearson Prentice Hall.
- Croft, C., Philips, D., & Ridder, P. (1983). *Spell-Write An Aid to Writing, Spelling and Word Study: The New Zealand Council for Educational Research*.
- Crooks, T., Smith, J., & Flockton, L. (2008). *National Education Monitoring Project: Reading and Speaking Assessment Results*. Dunedin: Educational Assessment Research Unit.
- Cropp, A. (2008, 31 May). Back to Basics. *Listener*, 213, 28-29.
- Davie, R., Butler, N., & Goldstein, H. (1972). *From Birth to Seven*. London: Longman Group.
- Dechant, E. (1991). *Understanding and Teaching Reading: An Interactive Model*. New Jersey: Lawrence Erlbaum Associates, Inc.
- Deobold, B. V. D. (1979). *Understanding Educational Research: an introduction* (4th ed.). United States of America: McGraw-Hill.
- Dietrich, C. (1973). An experimental analysis of perceptual motor approaches to learning problems. *University of Wisconsin-Stevens Point. Office of Education*, 93(4), 381-392.
- Education Review Office. (2009). Shirley School Report: Education Review Office.
- Fenton, L. (1970). *Comparison of Sensory-Motor Skills With Reading Readiness In Predicting Initial Reading Achievement*. Master of Arts in Education (Reading Specialist), Cardinal Stritch College, Wisconsin
- Field, A. (2000). *Discovering Statistics using SPSS for Windows*: SAGE Publications.
- Foorman, B. R., Francis, D. J., Fletcher, J. M., Schatschneider, C., & Mehta, P. (1998). The role of instruction in learning to read: Preventing reading failure in at-risk children. *Journal of Research in Reading*, 29(2), 143-161.
- Frostig, M. (1967). *Educating Children with Learning Disabilities*. New York: Appleton-Century-Croft.
- Gay, L. R., & Airasian, P. (2000). *Educational Research, competencies for analysis and application* (6th ed.). New Jersey: Pearson Education.
- Gillon, G. (2004). *Phonological awareness: from research to practice*. New York: A Division of Guilford Publications, Inc.
- Gillon, G., & McNeill, B. (2010). Phonological awareness: Motivating early literacy success. In J. Fletcher, F. Parkhill & G. Gillon (Eds.), *Motivating Literacy Learners in Today's World*. Wellington: NZCER Press.
- Goddard-Blythe, S. (2000). Early learning in the balance: priming the first ABC. *Support for Learning*, 15(4).
- Goddard Blythe, S. (2000). Early learning in the balance: priming the first ABC. *Support for Learning*, 15(4).

- Hammill, D. D. (2004). What we know about correlates of reading. *Exceptional Children*, 70, 453-468.
- Hannaford, C. (1995). *Smart Moves*. Arlington, Virginia: Great Ocean Publishers Co.
- Harris, P., Turbill, J., Fitzsimmons, P., & McKenzie, B. (2001). *Reading in the primary school years*. NSW: Social Science Press.
- Hatton, D. D., Erickson, K. A., & Brostek Lee, D. (2010). Phonological Awareness of Young Children with Visual Impairments. *Journal of Visual Impairment and Blindness*, 743-752.
- Hendy, T. B. (2000). Jungle Gym or Brain Gym? Playgrounds can improve academic readiness! *Parks and Recreation*, 35(6), 84-91.
- Hyatt, K., Stephenson, J., & Carter, M. (2009). A Review of Three Controversial Educational Practices: Perceptual Motor Programs, Sensory Integration, and Tinted Lenses. *Education and Treatment of Children*, 32(2), 313-342.
- Jang, E. E., McDougall, D. E., Pollon, D., Herbert, M., & Russell, P. (2008). Integrative Mixed Methods Data Analytic Strategies in Research on School Success in Challenging Circumstances. *Journal of Mixed Methods Research*.
- Kaufman, M. (1973). Perceptual and Language Readiness Programmes: Critical Reviews *Reading Aids Series*.
- Kavale, K., & Mattson, P. D. (1983). "One Jumped off the Balance Beam": meta-analysis of perceptual-motor training. *Journal of Learning Disabilities*, 16, 165-173.
- Kephart, N. (1960). *The Slow Learner in the Classroom*. Columbus: C. E. Merrill Books.
- Leedy, P. D., & Ormrod, J. E. (1985). *Practical Research: Planning and Design*. Upper Saddle River, New Jersey: Merrill Prentice Hall.
- Litt, D. (2010). Do Children Selected for Reading Recovery Exhibit Weaknesses in Phonological Awareness and Rapid Automatic Naming? *Literacy Teaching and Learning*, 14(1 & 2), 89-102.
- Losse, A., Henderson, S., Elliman, D., Hall, D., Knight, E., & Jongmans, M. (1991). Clumsiness In Children-Do They Grow Out Of It? A 10-Year Follow-Up Study *Developmental Medicine and Child Neurology*, 33, 55-68.
- McDowall, S., Boyd, S., Hodgen, E., & van Vliet, T. (2005). Reading Recovery in New Zealand: Uptake, implementation, and outcomes, especially in relation to Maori and Pasifika students. *New Zealand Council for Educational Research Te Runanga*.
- McNaughton, S. (1995). *Patterns of emergent literacy: Processes of development and transition*. New York: Oxford University Press.
- Mikaere-Wallis, N. (2009). *Early Brain Development and how it Impacts Teachers*. Christchurch, New Zealand.
- Ministry of Education. (2003). *Effective Literacy Practice in Years 1-4*. Wellington, New Zealand: Learning Media.
- Ministry of Education. (2007). *The New Zealand Curriculum*. Wellington: Learning Media Limited.
- Ministry of Education. (2009a). *Deciles* Retrieved 8 May 2009
- Ministry of Education. (2009b). *The New Zealand Curriculum*. Wellington, New Zealand: Learning Media Limited.

- Ministry of Education. (2010). *The Literacy Learning Progressions; Meeting the Reading and Writing Demands of the Curriculum*. Wellington: Learning Media Limited.
- Nelley, E., & Smith, A. (2000). *PM Benchmark Kit, Teachers' notes*. Melbourne: Nelson ITP.
- O'Leary, P. M., Cockburn, M. K., Powell, D. R., & Diamond, K. E. (2010). Head Start Teachers' Views of Phonological Awareness and Vocabulary Instruction. *Early Childhood Education Journal* 38, 187-195.
- Pagani, L., Fitzpatrick, C., Archambault, I., & Janosz, M. (2010). School Readiness and Later Achievement: A French Canadian Replication and Extension. *Development Psychology*, 46(5), 984-994.
- Piaget, J. (1959). *The language and thought of the child*. London: Poutledge and Kegen Paul.
- Pica, R. (2008). Learning By Leaps and Bounds: Why Motor Skills Matter. *Young Children*(July), 48-49.
- Pressley, M. (1998). *Reading instruction that works: the case for balanced teaching*. New York: Guilford Press.
- Pressley, M., Roehrig, A., Bogner, K., Raphhael, L. M., & Dolezal, S. (2002). Balanced Literacy Instruction. *Focus on Exceptional Children*, 35(5), 1-14.
- Pullen, P. C., & Justice, L. M. (2003). Enhancing phonological awareness, print awareness, and oral language skills in preschool children. *Intervention in School and Clinic*, 39, 87-89.
- Richardson, V. (Ed.). (2001). *Handbook of Research on Teaching* (4th ed.). Washington, DC: American Educational Research Association.
- Ruddell, R. B., Ruddell, M. R., & Singer, H. (1994). *Theoretical Models and Processes of Reading*: International Reading Association.
- Rummel, J. F. (1964). *An Introduction to Research Procedures in Education*. New York: Harper and Row Publishers.
- Sasse, M. (1979). *'If only we'd known...'*. Victoria: ANSUA.
- Shanahan, T., & Barr, R. (1995). Reading Recovery: An independent Evaluation of the Effects of an Early Intervention for At-risk Learners. *Reading Research Quarterly*, 30(4), 958-996.
- Shapiro, L. R., & Solity, J. (2008). Delivering phonological and phonics training within whole-class teaching. *British Journal of Educational Psychology*, 78, 597-620.
- Shaywitz, S. (2003). *Overcoming Dyslexia: a new and complete science-based program for reading problems at any level*. New York, United States of America: A.A. Knopf.
- Snook, I. (2003). *The Ethical Teacher*. Palmerston North, New Zealand: Dunmore Press Ltd.
- Son, S., & Meisels, S. (2006). The Relationship of Young Children's Motor Skills to Later Reading and Math Achievement. *Merrill-Palmer Quarterly*, 52(4), 755-778.
- Stephenson, J., Carter, M., & Wheldall, K. (2007). Still jumping on the balance beam: continued use of perceptual motor programmes in Australian schools. *Australian Journal of Education*, 51(1), 6-8.
- Sutherland, D., & Gillon, G. (2006). The development of phonological representations and phonological awareness in children with speech impairment. *International Journal of Language and Communication Disorders*, 42, 229-250.

- Timperley, H., Wilson, A., Barrar, H., & Fung, I. (2007). *Teacher professional learning and development*. Wellington: Ministry of Education.
- Tracy, D. H., & Morrow, L. M. (2006). *Lenses on Reading: an introduction to theories and models*. New York: The Guilford Press.
- Tunmer, W., & Chapman, J. (2002). The theoretical contexts of reading: How children learn to read (and why some don't). In P. Adams & H. Ryan (Eds.), *Learning to read in Aotearoa New Zealand. A collaboration between early childhood educators, families and schools*. Palmerston North: Dunmore Press.
- Van Steensel, R. (2006). Relations between socio-cultural factors, the home literacy environment and children's literacy development in the first years of primary education. *Journal of Research in Reading*, 29(4), 367-382.
- Vaughn, S., Denton, C., & Fletcher, J. (2010). Why intensive interventions are necessary for students with severe reading difficulties. *Psychology in the schools*, 47(5), 432-444.
- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. MA, Harvard University Press, Cambridge.
- Wassenberg, R., Kessels, A. G. H., Kalff, A. C., Hurks, P. P. M., Jolles, J., Feron, F. J. M., . . . Vles, J. S. H. (2005). Relation between Cognitive and Motor Performance in 5- to 6- Year-Old Children: Results From a Large-Scale Cross-Sectional Study. *Child Development*, 76, 1092-1103.
- Wiersma, W. (1995). *Research Methods in Education, an introduction*. Massachusetts: Simon and Schuster.
- Williams, H. G. (1983). *Perceptual and Motor Development*. New Jersey: Prentice-Hall, Inc.

Appendix I – Human Ethics Committee Approval Letter

Aleisha

Thank you for your response to the Educational Research Human Ethics Committee's comments on your recent application.

I am pleased to advise that the Committee has considered and approved your revised documentation as outlined in the letter attached.

Regards

Lynda

Lynda Griffioen

Secretary

Ethics Committees

Hours: Monday & Friday 8.30am-2.00pm and Wednesday 12.30-5.30pm

University of Canterbury

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Appendix II – Parent Information Sheet



Information for Parents/Caregivers

Dear Parents/Caregivers

My name is Aleisha Klomp. I am The Room One teacher at Shirley Primary School. As part of my Masters I am researching the very popular Perceptual Motor Programme that is currently being run in over 300 schools in New Zealand. My main aim is to determine the effects has on children's ability to read and I would like your child to participate in this research. I will be observing and testing two groups of children. One class will be implementing the Perceptual Motor Programme alongside the classroom Literacy programme and the other class will continue on with their teacher in the regular Literacy Programme without the intervention of .

As part of the data collection process I will be asking your child to complete a reading test with me During Week ten of Term One 2010. I will complete mid way probes during week five and at the end of term two during Week ten. I will use the data and information I get when writing and talking about this research. I will also be taking photos to document my research. Your child will not be named if they appear in a photo.

Each of the students will have a code name so no-one else will know their test scores. The school or participants will not be named at any point in the research.

If you agree for your child to take part in the research, please sign the consent form below. Attached is also a letter for you to read with your child and sign for them on their behalf. If you have any questions about this project you can talk to me or to Jo Fletcher jo.fletcher@canterbury.ac.nz. If you have any complaints you may also contact the Chair of the University of Canterbury Ethics Committee; see contact details below. If you or your child changes their mind about working with me, that is fine, too; all they have to do is say so.

Thank you for thinking about helping me. I am looking forward to working with your child.

Signed: _____
University of Canterbury College of Education

Date: _____

1. This project has received ethical approval from the University of Canterbury Educational Research Human Ethics Committee.

2. Complaints may be addressed to:
Dr Missy Morton, Chair, Educational Research Human Ethics Committee
University of Canterbury
Private Bag 4800, CHRISTCHURCH
Telephone: 345 8312

Appendix III – Parent Consent Form



Declaration of Consent to Participate

I have read and understood the information provided about this research project.

I understand that my child's participation is voluntary and that I may withdraw them at any time prior to publication of the findings.

I understand that my child will be working with a Teacher: Maaïke Dirkze to complete Reading Tests.

I understand that my child's photo may be taken while they participate in and that they will not be identified by face or name.

I understand that any information my child provides will be kept confidential to the researcher and that any published or reported results will not identify my child or the school.

I understand that all data from this research will be stored securely at the University of Canterbury for five years following the study.

I understand that I can request a report on the findings of this study.

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

Name: _____

Child's Name: _____

Date: _____

Signature: _____

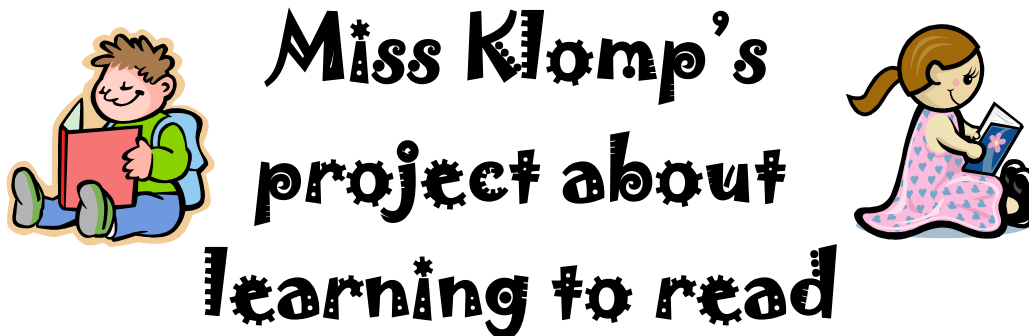
Please **return this completed consent form by Friday 26 March 2010**

Thank you for your contribution to this study.

Aleisha Klomp
 Shirley Primary School
 11 Shirley Road
 Shirley
 Christchurch
 Ph: 3852019
aleisha.klomp@shirleyprimary.school.nz

1. This project has received ethical approval from the University of Canterbury Educational Research Human Ethics Committee.

3. Complaints may be addressed to:
 Dr Missy Morton, Chair, Educational Research Human Ethics Committee
 University of Canterbury
 Private Bag 4800, CHRISTCHURCH Telephone: 345 8312



Miss Klomp wants to find out more about what makes children superstar readers!

Miss Klomp said that if I want to I will do some reading with Mrs D so that she can tell me how amazing I am. Miss K might also like to take a photo of me being a superstar!

Miss Klomp said that if I don't want to read with Mrs D, I can tell my family, teacher, or Miss K.

I want to join in with this project

I don't want to join in with this project

My name is _____

Appendix V – Teacher Observation Recording Sheet

Teacher observation of one child

At the end of each week or as you notice any change, please take some time to record what you have observed. The child may suddenly be holding their pen correctly or perhaps is now able to swing on the monkey bars. You may have noticed their ability to focus in class has developed and they wriggle less during mat time. Please remember this is your observation and interpretation so note down anything that you notice during the term. If there has been no change then simple write no change in that week 😊

Week	Significant or Minor gains or changes in child	Your personal thoughts
One		
Two		
Three		
Four		
Five		
Six		
Seven		
Eight		
Nine		
Ten		

Appendix VI – Word Reading Score Sheet

(Clay, 2002)

WORD READING SCORE SHEET		
Use any one list of words		
Name: _____	Date: _____	TEST SCORE: <input type="text" value="/15"/>
Age: _____ Date of Birth: _____		STANINE GROUP: <input type="text"/>
Recorder: _____		
Record incorrect responses beside word		
LIST A	LIST B	LIST C
I	and	Father
Mother	to	come
are	will	for
here	look	a
me	he	you
shouted	up	at
am	like	school
with	in	went
car	where	get
children	Mr	we
help	going	they
not	big	ready
too	go	this
meet	let	boys
away	on	please

Appendix VII – Sight Word Recording Sheet

	Date			Date	
to			an		
is			they		
a			she		
i			yes		
up			will		
the			day		
and			that		
go			after		
we			play		
my			not		
am			help		
here			then		
this			school		
at			all		
he			down		
in			get		
you			where		
big			got		
like			good		
are			had		
can			have		
Mum			with		
going			has		
me			let		
on			one		
said			now		
went			little		
come			who		
Dad					
look					
no					
for					
TOTAL			TOTAL		

Childs Name:

**60 Word High
Frequency Word
List**

**Teacher's
Recording Sheet**

**(children read
across their sheet)**

Appendix VIII – Non-word Reading Task

(Sutherland & Gillon, 2006)

Non-word reading task stimuli

This task was presented at trial 3 only. The instructions presented to children. “Here are some words. They are made-up words. I want you to try and read them to me.”

Word presented	Correct response (Transcription)
1. vab	/væb/
2. kos	/kɒs/
3. sim	/sɪm/
4. dup	/dʌp/
5. mov	/mɒv/
6. tob	/tɒb/
7. zug	/zʌg/
8. hud	/hʌd/
9. tiz	/tɪz/
10. sep	/sep/
11. plob	/plɒb/
12. bling	/blɪŋ/
13. bruch	/brʌtʃ/
14. trock	/trɒk/
15. twud	/twʌd/
16. cliz	/klɪz/
17. thrad	/θræd/
18. whan	/wæn/
19. gluff	/glʌf/
20. swek	/swek/
21. feen	/fi:n/
22. poy	/pɔi/
23. zie	/zai/
24. hoob	/hub/
25. yoat	/jout/
26. mape	/meɪp/
27. roit	/rɔɪt/
28. gice	/gais/
29. pute	/put/ or /pjut/
30. lawp	/lɒp/

Appendix IX – Running Record Sheet

(Clay, 2002)

RUNNING RECORD SHEET					
Name: _____		Date: _____	D. of B.: _____	Age: ____ yrs ____ mths	
School: _____		Recorder: _____			
Text Titles	Errors Running Words	Error Ratio	Accuracy Rate	Self-correction Ratio	
Easy _____	_____	1: _____	_____ %	1: _____	
Instructional _____	_____	1: _____	_____ %	1: _____	
Hard _____	_____	1: _____	_____ %	1: _____	
Directional movement _____					
Analysis of Errors and Self-corrections					
Information used or neglected [Meaning (M), Structure or Syntax (S), Visual (V)]					
Easy _____					
Instructional _____					
Hard _____					
Cross-checking on information (Note that this behaviour changes over time)					
Page	Title	Count		Analysis of Errors and Self-corrections	
		E	SC	Information used	
				E MSV	SC MSV