## PARENT TEACHING AND THE DEVELOPMENT OF READING SKILLS OF

### AT-RISK READERS

by

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### Parent Teaching and the Development of Reading Skills of At-Risk Readers.

### Abstract

This study addressed the questions of whether parents can give effective phonological and phonics skills instruction to their own young children, who are at risk for reading difficulties, and whether any positive changes in child attitude and parent confidence occur as a result of the instruction. Early phonological and phonics skills instruction is known to be effective for children at-risk for reading difficulties, but is not always provided in schools. Two groups of families (experimental and "waiting list" control) used a home program (providing phonological and phonics skills instruction, and Paired Reading guidance) for two separate, daily, ten-minute activity and reading sessions, for ten weeks. The program also included a process to address reading motivation, whereby parents used the language of strategies of mediation based on Vygotsky's social learning theories. Significant Time by Group interaction effects were calculated for Word Attack and Phoneme Deletion (Initial Sound). Parent and child pre-test and post-test questionnaires explored changes in motivation and attitude to reading. There were significant positive changes in child attitude to reading, and parent perceptions of progress. Small but significant correlations were also found between parent perceptions and treatment integrity, and between treatment integrity and achievement outcomes. It was concluded that the study provides limited support for the idea that parents of grade 1 children at-risk for reading difficulties can give instruction effectively when given detailed information about all three aspects of early reading.

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# PARENT TEACHING AND THE DEVELOPMENT OF READING SKILLS OF AT RISK READERS

### CHAPTER I

### Introduction

This study was designed to examine the effects of a home intervention program used by the parents of grade 1 children at-risk for reading difficulties. The research literature which links phonological processing abilities and reading provided the main theoretical basis for the intervention program itself, which enabled parents to give extra phonological, phonics and text reading instruction to their own children who were at risk for reading difficulties.

Researchers have emphasized the central importance of the home in communicating aspects of literacy to young children. Children start to learn in the social context of the home, and there are links between the quantity, variety and quality of home literacy opportunities, and children's motivation and success in literacy (Heath, 1983; International Reading Association and the National Association for the Education of Young Children, 1998). Several studies have shown positive effects of parent and child reading projects on children's reading achievement, where a model of how to proceed plus a training session, was given (Hewison, 1988; Topping & Wolfendale, 1985). However, some parents, particularly those who had reading difficulties themselves may lack confidence in their knowledge of **what** should be taught, and **how** to interact successfully with their own children (France & Meeks, 1987; Darling, 1988.) Edwards (1995) describes her conversations with parents of young children before starting a

storybook reading program, which indicated that the parents wanted their children to be successful with reading, but did not have a plan for helping them.

Reading to children is arguably the most popular advice given to parents, but systematic study of the benefits is quite recent. For example the frequency of parental storybook reading has been examined (Scarborough & Dobrich, 1994b), but the quality of parent- child interactions during reading activities may be a more important factor (Senechal, Thomas & Monker, 1995). Those parents who spend time reading to their children may also give other direct teaching about written language skills. Senechal, Lefevre, Thomas & Daley (1998) found support for the view that storybook reading and explicit teaching about reading and writing are independent home literacy practices with different child outcomes. It is important to discover more about how parents can best support literacy development, so as to develop good theoretical models for early intervention schemes, which include parents and children working together. Currently, early intervention plans may not involve parents sufficiently in early preventive work with at-risk readers. At the same time, young, at-risk readers benefit from substantial amounts of support (e.g., Foorman, Fletcher, Francis, Schatschneider & Mehta, 1998; Torgesen, Wagner, Rashotte, Lindamood, Rose, Conway & Garvan, 1999; Vellutino, Scanlon, Sipay, Small, Chen, Pratt & Denckla, 1996).

The present study attempted to combine a model of parent teaching with principles of early intervention for children who are at-risk for reading difficulties. Specifically, the study examined the effects of providing the parents of grade 1 children, previously identified as at-risk for reading difficulties, with a detailed program of reading instruction (involving teaching of phonological and phonics skills, and daily Paired Reading) which

enabled them to capitalize on the advantages of the home, and the parent-child relationship, in working with their own children (Hannon, 1998). The experimental group therefore received larger quantities of explicit reading instruction, and focused interaction about reading with their own parents (by means of the program), during 10 weeks of the study, than regular school instruction only. A "waiting list" control group received regular school instruction, but not the home intervention, over the same period of time. Children in both groups were receiving extra reading lessons in school. The schools were in predominantly middle-class socio-economic areas. The results of a demographic survey are given in Appendix 4.

The study also attempted to evaluate parent perceptions, and child attitudes both before using the intervention, and afterwards, by means of structured questionnaires. Parents were asked to rate their own child's reading confidence, motivation and skill levels, and their own levels of confidence to work with their own children using a specially designed questionnaire. Children were given a reading attitude survey (McKenna & Kear, 1990). Therefore, the study attempted primarily to conduct a quantitative analysis of change in reading and phonological processing skills, but also sought to explore whether there were any qualitative advantages of receiving parental instruction in reading at home during grade 1 for children at risk for reading difficulties. Better progress by the experimental group children would be one indication that a large potential resource exists (specifically guided parental help), which is currently underused, and which could be mobilized in the real world situation, to improve reading standards, and reduce the incidence of reading failure.

The Need for Early Intensive Help for Children At Risk for Reading Problems Three recent training studies strongly suggest that there is a great need to mobilize substantial amounts of extra support for children at-risk for reading difficulties, in the earliest stages of learning to read (Foorman et al.,1998; Torgesen et al.,1999; Vellutino et al.,1996). These training studies began with the testing of phonological, and other reading related skills of kindergarten children. A group of children who were at- risk for reading difficulties was identified after testing. The at-risk children were given intensive intervention programs of instruction in phonological awareness, phonics and text reading, with very successful results. The interventions used were successful in keeping most reading at-risk children at grade level by the end of grade 2. Such results are hard to achieve with reading at-risk children, but it was shown that they could be achieved when the daily, explicit individual literacy support was provided at a critical time, which appeared to be mid- kindergarten to at least the beginning of grade 2.

Children must first be identified as at-risk for reading difficulties before help can be given, since phonological deficits can easily remain "hidden" in kindergarten, and even in grade 1. Reliable screening tests are commercially available (e.g. Muter, Hulme & Snowling,1997; Torgesen & Bryant, 1994) which can predict whether or not kindergarten children are at-risk for reading difficulties. Therefore educators have an opportunity to use such tests, and then to intervene effectively with their reading at-risk groups (typically 25-30% of each kindergarten class) before failure sets in. Unfortunately there is no widespread, routine use of such systems. One obstacle to their implementation is resources. Schools, or school districts, may not yet be convinced that it is worthwhile to replicate the amount of daily individual help given in the projects (which had research

funding). Another barrier may be inadequate teacher and parent understanding of the origins of reading difficulty. Yet another barrier to implementation might be a lack of awareness of the large numbers of students who have suffered from reading difficulties.

Vellutino et al. (1996) noted that there should be enough extra instruction to rule out any effects of a poor educational history, which might be the main problem for some children found to be at-risk for reading difficulties. They provided sufficient amounts of extra instruction during the time from mid kindergarten to mid grade 2, to compensate adequately. They hypothesized that there would be children with poor educational preparation for reading, as well as children with "constitutional" weakness, and also some children with both. They demonstrated that early identification, followed by approximately 80 - 30 minute sessions of daily individual instruction did result in success for most children at risk for reading difficulties. A control group of identified poor readers received school remediation only rather than intensive daily tutoring. After only one term there was a: "dramatic increase in the performance levels of the tutored groups" (Vellutino et al. p. 613) in comparison to controls.

The study by Foorman et al. (1998) provided 4 - 20 minute sessions weekly, over a period of 2.0 years (>100 hours), and the study by Torgesen et al. (1999) also provided about 70-80 hours of individual help, with similar patterns of instruction. All these studies examined type of instruction (e.g. explicit and direct phonics teaching, as opposed to an indirect method, with no direct teaching of phonics principles). They also examined how intensive instruction should be, and by definition, the quantity of extra help necessary to make a difference to children at risk for reading difficulties. Their success in maintaining most at risk children at grade appropriate reading levels (when they would

otherwise have fallen behind) can be contrasted with some data about U.S. and U.K. reading standards during the 1990's (Fletcher & Lyon, 1998; National Assessment of Educational Progress, 1994; NFER, 1996; Shaywitz, Escobar, Shaywitz, Fletcher & Makuch, 1992). Large numbers of children (44% of fourth graders in many states of the USA, and at least 25% of second year school children in the UK) were found to be significantly behind age and grade appropriate levels in reading during the mid 1990s. The children who were underachieving were not identified at an early stage as at- risk for mild, or severe reading problems, and therefore not given extra help.

Early identification is now more widely accepted as a very important practice. The conclusions of research on which early identification and intervention are based have accumulated over the last 30 years, becoming strengthened by converging evidence over that time period. For parents and educators the central message from this literature is that beginning readers are starting to learn an abstract, alphabetic print system, so that assumptions that reading will be as natural a process as learning to speak for all children, are false. Liberman (1971), and Liberman, Shankweiler, Fischer & Carter (1974) demonstrated that children who easily became successful with written language understood that speech could be segmented into words and syllables, and could also access even smaller sub-lexical units called phonemes. Without this understanding of speech, children had difficulty with the writing system. Since phonemes are represented in print by letters, learning to read requires a conscious awareness of phonemes as individual segments words. The complex phonological information contained in speech only can be processed without a specific awareness of phonemes, but not the phonological information in written language.

Reading is central in our school systems and time for extra reading instruction soon runs out, as the highly reading dependent curriculum marches on. The learning specialist and teacher, Vail (1990) described it this way: "For the unidentified or unaided dyslexic, schooling becomes a roadblock, instead of a roadway. In first and second grades, the curriculum, not to mention parental hopes, family pride and student self-concept, focus on learning to read and write". (Vail, 1990. p. 16.) "In undiagnosed students, those generalized hopes which had kept everyone afloat disappear. Daily evidence contradicts such phrases as, 'She'll read when she's ready'. These students learn to mistrust themselves: 'If I can't do what everybody else can, there's something bad the matter with me'. At the same time (end of Grade 2) the curriculum shifts from learning to read, to reading to learn." (Vail, 1990. p. 18).

Very low results of reading surveys involved grade 4 students (US National Office of Assessment, 1994) and were associated with the "whole language" approach to teaching reading in schools, especially from 1985 to the end of the last decade (Hall & Moats, 1999). Whole language stresses an immersion in rich children's literature, which all educators would approve of. However the integral assumption that <u>all</u> children will learn to read "naturally" through exposure to the literature is widely recognized as incorrect (Adams, 1990; Chall 1996; Snow et al., 1998; Stahl, 1998).

In response to such poor and widespread reading results, many educational policies changed completely, as in California (Honig, 1996), or were substantially revised as in the UK National Literacy Strategy (DFEE, 1998). Many educators have attempted to define a "balanced literacy" approach (Freppon & Dahl, 1998; Stahl, 1998), which is a blending together of the best of phonics and whole language teaching approaches. Whole

language reading teaching methods mean that there will be a policy of not breaking language down into its component parts. Goodman (1989b) responded to a suggestion that direct instruction in skills should be included in whole-language principles in this way: "One cannot reconcile direct instruction with natural learning. Meaningful predictable authentic texts are incompatible with carefully controlled vocabulary and decontextualized phonics instruction" (Goodman, 1989b, p. 69). Most proponents of whole language like Goodman rejected eclecticism in reading teaching that would allow some combination with other instructional methods. Phonics teaching is a systematic emphasis on teaching the decoding of words, involving the alphabetic principle that letters can represent sounds, and hence is incongruent with the traditional view of whole language instruction.

Although balanced literacy teaching in schools is likely to be quite different from place to place (Allington, 1994), research on reading disability suggests that wellbalanced literacy instruction will be helpful but insufficient for many reading at-risk children, and that careful early intervention schemes are also needed (Snow et al.,1998). Early intervention schemes are often poorly specified (International Reading Association & National Association for the Education of Young Children, 1998). In addition reductions in educational budgets may threaten the implementation of early reading programs for groups of children at risk for reading difficulties. The provision of large amounts of extra support by individual schools, for large numbers of children, is likely to be financially unrealistic in many places.

In summary, to avoid the widespread reading underachievement of the recent past, schools should identify and teach many children who need better phonological processing

skills, a good knowledge of the alphabetic principle and phonic decoding skills in order to succeed with written language at an early stage. Time is short because of school curriculum demands, and large quantities of effective *extra* teaching may be necessary. All of these factors make it worth examining the possibility that parents can replicate the success of instruction given in successful longitudinal intervention studies. If they can, parents and schools might have a valuable, possible course of action, which is not reliant on official policy or educational funding, and which can supplement school programs.

There is no doubt that school systems alone *can* realistically take action which is much more effective than in the past. The present study took place in the North Vancouver school district, where very systematic, early intervention procedures are implemented, followed by a careful range of intensive phonics and guided reading programs. The results were examined by a large longitudinal study, and indicated that most children originally at risk for reading difficulties could be given effective instruction so as not to become reading disabled during the next two years (Lesaux & Siegel, 2001). In this longitudinal study, 928 kindergarten children were tested and 23.8% of English speaking children, and 37.2% of ESL speakers were identified as at risk for reading failure. The schools were given the results, and then implemented phonological and phonics skills training during the next two years. In grade 2, it was found that 4.2% of English speakers, and 3.72% of ESL speakers were reading disabled. The system of identifying children who are at risk for reading difficulty, and providing early intervention programs continues in North Vancouver.

However, from the general point of view of parents of young children, such procedures are not available in all areas. "Early intervention" schemes may or may not

exist, and may (like balanced literacy methods) be implemented very differently from place to place. With or without official school early intervention procedures, a vehicle for obtaining specific parental help for children at-risk for reading difficulty in grades 1 and 2 might be of use to many school districts.

There is another, related issue which the present study sought to examine concerning the effects of reading difficulty on the motivation of children as young as those in grade 1. Children are able to indicate feelings of failure in the first year of school, even if they do not, at that time, extend them to self-perceptions of globally low ability (Wigfield & Karpathian, 1991). Aspects of reading self-concept have been shown to be quite differentiated within sub-components of academic domains, so that actual reading performance may be affected by the end of the first year of schooling (Chapman & Tunmer, 1995). Parents may be uniquely placed to give specific feedback to their children, which could improve their attributions in the face of early reading difficulties, and their feelings of self-efficacy about reading and reading-related tasks. Attributions are what we believe to be the causes of our successful or failing experiences, and selfefficacy is a term for those beliefs we have about how capably we can learn and carry out particular skills. A child's self-efficacy beliefs about the early aspects of reading she or he meets are likely to predict motivation for reading (Schunk,1989).

Therefore, successful home instruction, given by parents, plus systematic early intervention procedures in schools, plus balanced literacy methods, could result in new and more positive outcomes for a large group of children, their families, their schools and ultimately society. It is impossible to calculate the personal and family loss, and distress, which results from reading failure, underachievement at school and low self-esteem.

Some research has examined long-term effects of school failure and learning disability (Barwick & Siegel, 1996; McBride & Siegel, 1997), and other writers have described the likely long-term economic and social costs to society, which are also impossible to calculate (Hall & Moats, 1999). Therefore it is important to investigate the effectiveness of specific programs for parents to use with their own children.

## The Case for Early Identification and Intervention in Schools

The purpose of the present study is so closely linked to the case for early screening and identification policies and procedures, that this case is now summarized. There are at least eight persuasive reasons why school districts should specify and follow early identification and intervention policies.

The first reason is our knowledge that kindergarten and grade 1 classes will always contain children who could be placed theoretically along one continuum according to cognitive ability, and along another orthogonal continuum according to likely success with reading, on the basis of their phonological skills (Stanovich, 1988; Stanovich & Siegel, 1994). Therefore, it is dangerous to assume that signs of good cognitive ability mean that good reading will follow. It is much safer to conduct a test of phonological processing skills, which will give an estimate of how clearly a child's phonological representations of spoken language have developed. This status correlates highly with likely future reading success or difficulty (see Snow, Burns & Griffin, 1998, for a review).

Second, a large body of intervention study research indicates that after phonological skills testing, when at risk children have been systematically identified, early phonological skills instruction (starting in kindergarten) can be given which has

significant and long term results (Reading Panel of the NICHD, 2000). Third, phonological interventions started during kindergarten, can be very appropriately integrated into the kindergarten curriculum, taking the form of individual, or small group games. These activities are fun, as well as effective (Lundberg, Frost & Petersen, 1988). If phonological instruction does not begin in kindergarten for children at risk of reading difficulties, it may be quite urgently needed by Grade 1, and will then be competing for teaching time with explicit phonics teaching (Ball & Blachman, 1991). The question of how early an "early intervention" scheme starts is therefore an important one. Parental instruction at home, could provide a timely extra boost to children's phonological and phonics skills, in the case of later starting, or under-resourced schemes, or no schemes.

Fourth, if a school, or school district has no early screening and intervention policy at all, it must be assumed that identification of a child's need to have early extra help with reading is mainly subjective. A need may be perceived by both parents and teachers, or by only one of them. If intervention plans do exist, they will be offered to those identified subjectively. Other children who are at risk for reading difficulties will not be identified, and will not get important early, extra teaching. It is likely that school intervention programs will only have the momentum and support they really need within the school, if well-specified policies, and clear procedures exist. Where they do not, the availability of a specific and comprehensive program for parents to use at home could be an important resource for schools.

Fifth, the curriculum of grade 1 proceeds for all children whether they have good, or weak phonological skills, so that by the end of the year, the range of their scores on component reading skills (without specific interventions for the at risk group), may be

very wide indeed. It is often a decisive year for those children with phonological skill deficits. All children begin to be immersed in the world of print, and may receive more direct phonics teaching, or more embedded phonics teaching (Foorman et al.,1998; Torgesen et al.,1999) depending on their particular school and class. Children at-risk for reading difficulties are in danger of never gaining sufficient fluency (Stahl & Kuhn, 2002), motivation (Wigfield, 1997) and practice (Stanovich, 1986) to become successful readers. They are at-risk for having a negative attitude to reading from the earliest time of experiencing phonological processing difficulties (Chapman & Tunmer, 1995; McKenna & Kear, 1995). A sixth point is that several tests of phonological processing skills, which have high reliability, and are reasonably easy to use, are published and available to schools (Bryant & Torgesen,1994; Muter, Hulme & Snowling,1996; Torgesen, 2000). The tests identify children with both mild, and more severe phonological deficits. If any children prove to be "false positives" in a systematic identification system, they simply get a helpful intervention, which can be dropped if found to be unnecessary.

Seventh, intervention is itself another useful way for teachers to assess the severity of reading difficulties by an "assessment over time" principle. As a result of progress on kindergarten interventions, grade 1 teachers can be informed about the on-going literacy needs of the children still at-risk for reading difficulty. A great deal of extra support teaching may still be needed during grade 1 for many children. Children at-risk for reading difficulties benefit from both phonological awareness and phonics instruction, with specific linking of the one to the other (Torgesen, 1998; 1999; 2000).

Finally, in the past, educators have argued that early identification of reading difficulties would result in premature "labeling", which would cause needless anxiety

(Freppon & Dahl, 1991). However many precautions can be taken against this. If interventions are carried out within classrooms, on a small group basis, there is no need for any "special needs" connotations to be attached to the work. Without early identification, the children at-risk for reading difficulties do not just disappear. A "wait and see" approach may result in a growing state of anxiety for parents, denial for teachers and damage to the reading self-concepts of children.

#### Purpose

The present study took place within a context where early screening and intervention is systematically implemented, and the study's purpose at a general level is inseparable from the aims of early screening and intervention for children at-risk for reading difficulties: to give such effective compensatory instruction in reading that most of these children become successful enough readers to have full access to the school curriculum, and to enjoy reading before feelings of failure set in and cause additional problems. Since large research studies have identified what effective compensatory remediation consists of, but it is not generally available, the more specific central purpose of the present study was to examine whether parents could implement the same elements of effective remediation, by means of a program with the same instructional components as the research interventions, but also specifically based on what is known about parents working with their own children. A further purpose of the study was to explore motivational aspects such as child attitude change and change in parent perceptions as a result of using the home intervention, since the study's intervention program was specifically designed for parents and as such had both motivational and reading instruction components.

### CHAPTER II

### **Review of Literature**

### Introduction

The literature review has eight sections, including this introduction, which support the study, content of the study's intervention program, and the rationale for using a home intervention as an additional element of a comprehensive early intervention system (kindergarten to grade 2) for children at-risk for reading difficulties. The review is structured so that each section is followed by a description of how that particular literature supports the study's purpose, design and procedures. Sections two and three concern the three content areas of the program: phonological skills instruction, phonics teaching and a method for improving fluent text reading skills and reading engagement. They also support the study's whole broader intent and context: early intervention for children at- risk for reading disability. The fourth and fifth sections support the case for addressing motivational aspects of reading for children at risk-for reading difficulties as well as cognitive strategies. The study's intervention program attempts to do this by means of written suggestions in the activity book and demonstrations in the accompanying video. The sixth and seventh sections describe studies on children's reading conducted with parents, including Paired Reading studies, which suggest that parents can effectively learn to use and apply specific methods of reading with their children, and may benefit from guidance on making better plans to help their children become successful readers. Finally the concluding section draws together the main implications of the three literature reviews and describes an additional research question which emerged as a central issue and was addressed by the study

One more issue should precede the sections just described: namely a description of the transactional model of reading acquisition underlying the program used in this study. Rosenblatt (1994) observed that all human activities and relationships are transactions in which individual and social aspects combine with cultural and ecological aspects to become new complex wholes, which have a fluid, dynamic quality. Although the meaning of "transactional" is close to "interactive", Rosenblatt (1994) describes the term interactive as referring to more discrete and pre-defined entities which interact while maintaining their wholeness. However, transactions are much more fluid involving elements which are aspects of one process. The elements both change each other and produce a whole reconstituted situation. Hence language is both spoken and understood by individuals who are automatically engaged in transactions with their environment. Therefore the "sense" of a word may become changed in different contexts, and a conversation between two people is a transactional process where words may have slightly changed meanings between the beginning and end of the conversation.

When applying this model to reading, several elements of spoken language transactions are missing, such as physical presence, timing, actual setting, nonverbal behaviour and tone of voice. The reader transacts with the written script. In this transaction the reader constructs meaning by drawing on personal linguistic and life experiences. There are two aspects of a dynamic situation, which are the reader and the text and meaning comes into being for the reader during the transaction. Letters and words are visual symbols capable of interpretation as verbal expression, but the reader will select a meaning, infer syntax and enter into a reciprocal process where other factors in the total situation will influence meaning. For successful readers, preliminary meanings will be constructed and each new element of the text will be matched with what has been read so far. In the case of children with reading difficulties, the transactional process may be impeded by some different factors in the total situation, such as impaired phonological processing abilities. Hence it will become difficult for them to proceed with the organizing and synthesizing processes, which create their individual interpretations of the text.

Developmental theorists have frequently asked how early skills, such as phonics skills, might be taught and assimilated in a context that helps young readers with their transactional process of producing meaning from text. They express the fear that habits and attitudes towards the written word might be taught that interfere with the processes of organizing, synthesizing and inferring meaning, even from simple reading texts. However, the following literature reviews present support for an alternative question (still within the transactional model) for children at-risk for reading difficulties because of phonological deficits: namely what kind of extra support will be needed to *enable* them to proceed with organizing, synthesizing and inferring meaning.

Adams (1990) summarized research-based information about many of the factors affecting reader and text transactions (e.g. sound-symbol links) and described the central importance of the alphabetic code in learning to read. Freppon and Dahl (1991) argued that Adam's summary ignored at least three important points: firstly, not one but many cuing systems are involved in reading (e.g. information about the function and form of print), secondly, reading and writing behaviours are language based and thirdly the perspective of the individual learner is usually not adequately considered. These points are not negated by the conclusions (Adams, 1990) that reading is not a "psycho-linguistic guessing game" because readers process virtually every letter as they read, and also need knowledge of the meanings, spellings, pronunciations and contexts of words. Conclusions about phonological processing difficulties for children at-risk for phonological reading difficulties do not negate these points either. The real difference in perspectives appears to arise from a consideration of meaning-related exploration, as opposed to direct skill teaching. Recent research shows that the needs of successful and at-risk-readers may differ regarding some important factors in the reading process.

The aim of the program of the present study is to intervene sensitively e.g. with phonological processing interventions that are both language rich and developmentally appropriate for kindergarten and grade 1 children, and to provide additional support in learning the alphabetic code because without it progress in reading comprehension is compromised during grade 1. Effective direct skills teaching can run concurrently with transactional reading processes so as to make them more successful. It is undoubtedly important to give as much time as possible for the interpretation of text meaning to go on in a transactional way for children who also need the direct teaching of some component reading skills. Finally, the program is true to the transactional model of reading in three particular ways: its guidance to parents about considering the perspective of the young reader within the social setting of home through the use of language of principles of mediation; its demonstration of expansionist strategies (Tracey & Young, 2002) in both activity and reading sessions and thirdly its emphasis on a supported reading process which allows the child to follow the transactional path of successful readers as closely as possible.

### Phonological Processing Skills and Reading

There is a large number of studies that have examined the link between phonological processing skills and reading. Recently a meta-analysis of 52 of these studies (National Reading Panel of the NICHD, 2000) was conducted, using strict inclusion criteria regarding research design. The meta-analysis drew the following main conclusions: spelling benefits as much as reading from phonemic awareness (PA) training; reading and spelling benefit in English and non-English languages and in all SES groups; normally progressing younger children can benefit, as well as younger children at risk for reading difficulties and older disabled readers; the effects of training are not short-lived, but last beyond the immediate training period: "In sum, these findings led the Panel to conclude with much confidence that phonemic awareness training is more effective than alternative forms of training, or no training, in helping children acquire phonemic awareness, and in facilitating the transfer of these skills to reading and spelling. Phonemic awareness training improves children's reading performance in various types of tasks, including word reading, pseudoword reading and reading comprehension" (National Reading Panel, NICHD, 2000, p. 2-19.)

It has taken a long time for this knowledge to be generally accepted by educators, and the implementation of these conclusions in real school situations seems to be slow. It is possible that the new terminology is confusing. Although the National Reading Panel report mainly uses the term "phonemic awareness," and distinguishes phonological skills instruction (derived from the noun **phonology**) from **phonics teaching**, the prefix "phon" may still cause confusion among parents and teachers.

Definitions used in this study now follow:

- **phonology** the aspect of language concerned with sound, whether overt or internal, including everything from sub-phonemic distinctive features, to intonation and inner speech (Brooks, 1999).
- **phonemes** the smallest meaningful sound units in words.
- **Phonological awareness-** recognizing the different speech sounds in words and being able to consciously reflect on them, and manipulate them.
- **phonological processing skills-** reading related phonological processes, which are a set of mental activities or skills required in reading and learning to read, and which involve accessing, storing or manipulating phonological information.
- **phonological memory** the ability to represent phonological information in short term (and working) memory.
- **rate of access/speed of retrieval** the speed of accessing linguistic information which is coded in long term memory.
- **phonics teaching** work on letter-sound correspondences within the print domain.
- **phonemic awareness** –the ability to focus on, and manipulate phonemes in spoken words.

Many other factors are involved in the complex process of learning to read, such as print awareness, vocabulary knowledge and the value placed on literacy within the child's family and culture (Heath, 1983). Print awareness and wide vocabulary knowledge are two examples of important early concepts, which are often taught in homes where the value placed on literacy is high. Children from such homes have an advantaged educational history (Clay, 1985; Vellutino et al.,1996). Educational history is an important consideration for teaching children at-risk for reading difficulties, but early intensive remediation will be of benefit whether it is the main problem or, something that exists as well as a constitutional deficit (Vellutino et al.,1996). Most children come to school with existing links between spoken language and meaning. However, for children at-risk for reading difficulties the links between meaning and written language are not easily formed (Vandervelden & Siegel, 1995). The whole language philosophy and method of teaching reading made the assumption that links would be as easily established between meaning and written language, as they are between meaning and spoken language for all children (Goodman, 1986; Smith, 1978). These educators questioned whether it was really necessary to understand the alphabetic principle, and master its use in learning to read :

"Learning to read involves no learning ability that children have not already exercised in order to understand the language spoken at home, or to make sense of the visual world around them. In fact, learning to read should be very much simpler, given the complexity of these earlier language and visual accomplishments...a child who can see, and who can comprehend speech, cannot be a failure at reading because of a 'specific learning disability' or minimal brain dysfunction, or dyslexia, or any of the other terms that are used to conceal ignorance about why some children fail to learn to read" (Smith, 1978, p.7). Later in the same chapter, Smith again states: "Reading requires no linguistic ability that is not demonstrated in the understanding of speech" (Smith, 1978, p. 10).

Smith's statements about linguistic ability and reading have been shown to be incorrect (Bryant & Bradley, 1983; Cunningham, 1990; Ball & Blachman, 1991; Hatcher, Hulme & Ellis, 1994; Torgesen, Wagner & Rashotte, 1994; Blachman, 1994; Byrne & Fielding-Barnsley,1995; National Reading Panel, 2000). Phonological linguistic abilities are very related to reading, and may be very weak in bright children who have excellent verbal comprehension. Even as early as 1963, the linguist, Zhurova described a detailed

analysis of the way in which infants go through stages of getting acoustic pictures of words, through rhythm and melody to the eventual mastery of the phoneme in oral speech. After studying the performance of 4 to 6 year old children on initial sound identification tasks, he concluded that the ability to isolate a specific sound in a word in oral language does not happen spontaneously in preschoolers, but needs to be taught. A short time later (from the early 1970s onwards), such observations about oral language began to be linked with differences in children's ability to learn to read. Reading researchers began to observe firstly, that a child's ability to understand speech did not reveal how well he, or she, could analyze language into its component parts (for example having the understanding that "cat" has three phonemes, which are "k", "ae" and "t"). Secondly, they observed that the awareness that language could be split up into words, syllables and phonemes was very important for the beginning reader. The young child in school is confronted by a highly abstract, alphabetic system. Even when there is a very direct correspondence between sounds and symbols in languages like German, Spanish, Hebrew or Finnish, having conscious access to sounds is necessary for working towards mastery of the way the language is represented visually (orthography) (Goswami, 1997).

Different tasks were developed to measure the development of phonological awareness skills. Probably the most widely used kinds of tasks were tapping tasks, oddity tasks and same-different judgments. For example, children were asked by investigators to tap out the number of sounds in a word (Liberman, 1973) or to listen to a group of spoken words and select one that was different, or to listen to pairs of words, and then decide whether or not they shared the same sound (Bryant & Bradley, 1983).

Also, knowledge about a developmental hierarchy of acquiring phonological awareness became recognized. Half of a sample of children aged 4 could segment words into syllables, but not into phonemes. Most (90%) children aged 6, at the end of Grade 1, could segment words into syllables, but only 70% could also segment words into phonemes (Liberman, Shankweiler, Fischer & Carter, 1974). The children aged 6 who had difficulty with phoneme segmentation were also having difficulty with reading. In fact Isabelle Liberman and colleagues are now credited with developing the most complete early theories on which phonological awareness research could be based. By the end of the 1980's they said: "It has become an established fact that the central cause of variability in children's rates of learning to read is variation in the phonological component of their natural capacity for language" (Liberman, Shankweiler & Liberman, 1989. p.5). Those investigators whose research questions concerned the possible causes of why it might be difficult for some children to learn to read, produced conclusions about reading for all children that are now proving more useful to educators than unsubstantiated assumptions about links between meaning and spoken language, and meaning and written language.

Several longitudinal training (intervention) studies were conducted from the mid 1970s onwards, which strengthened conclusions about the link between phonological processing skills and reading (Bradley & Bryant, 1983; Byrne & Fielding-Barnsley, 1990; Fox & Routh, 1976; Gough & Tunmer,1986). Bryant (1985) described training in which alternative explanatory factors were equated across experimental and control groups as the only way to prove causation. He was describing his previous study (Bradley & Bryant, 1983). Two experimental groups received phonological skills training, using (1) rhyming and analogy activities and (2) rhyming and analogy activities, plus direct teaching of letter-sound correspondences with plastic letters. The control groups received (1) training with nouns that could be shown in pictures and put into meaning categories, or (2) no extra training. Many investigators had found correlations between reading and phonological awareness, but correlation only shows a relationship of some sort between the factors involved. But Bradley and Bryant's (1983) study was longitudinal and provided training. They identified "at risk" children of between four and five years of age (65 out of 400 screened originally), and then trained two groups twice a week for two years. These two experimental groups showed significant gains over the control groups, and the gains were still evident in the experimental groups at later follow-up when the children were twelve. Note that the regular teaching of reading had started for all groups during the two-year training period.

Lundberg, Frost & Petersen (1988) used their particular situation in Denmark (where children are not formally taught reading until the age of seven) to conduct auditory phonological skills instruction only (without "linkage" to phonics) with 235 children in 12 kindergarten classes. The children had daily sessions of 15 to 20 minutes, over an 8 to 9 month period, and were followed from kindergarten to grade 2. Class teachers who had received training implemented the program, which was carefully sequenced from easy listening games, to awareness of sentences and words, to syllables and then to phonemes. There was a comparison group of 155 children. No later significant effects were found on "functional linguistic skills", such as vocabulary, or comprehension of oral instructions. However significant effects were found for meta-linguistic skills relating to sounds. For example, the experimental group's ability to segment words into phonemes (phonemic awareness) had increased dramatically, whereas the control group made little gain. More importantly, evidence of permanence of the training effects was found. Only 6% of the experimental group still had very low scores on phonemic segmentation in grade 1, whereas 37% of the comparison group had low scores. In grade 2 significant differences persisted between experimental group and comparison group children on tests of reading and spelling. Group by grade interaction effects demonstrated that the impact of training was stronger by grade 2 than it had been in grade 1. One hypothesis suggested for this result is that by giving the experimental group a more conscious access to sounds in words in kindergarten, their training might have enabled them to generalize word attack skills to more complex words more successfully than the children who had not received training. The intervention program used in this research is now published, and offers an excellent compendium of class-wide, or small group phonological awareness training activities for teachers (Adams, Lundberg, Foorman & Beeler, 1997)

Ball & Blachman (1991) suggested that the combination of phonological awareness training, plus letter-sound correspondences, which had been important in Bryant & Bradley's most successful study group, was superior to phonological awareness training only. Children performed significantly better in reading, spelling and phoneme awareness. Blachman, Ball, Black & Tangel, (1994) demonstrated that teachers could also deliver such training within classrooms, and obtain very significant results.

By this time, in the mid 1990's, it was becoming accepted that a **bi-directional causality** might exist. In other words, phonological awareness improved as letter sounds and names were taught in the regular beginning reading curriculum, and if letter sounds

and names were included in phonological awareness training, there was a more powerful positive effect on reading and spelling levels.

Hatcher, Hulme & Ellis (1994) also suggested that a bi-directional causality effect might operate during remedial instruction. They were working with children who were already at least seven years old, and were confirmed as poor readers rather than being at risk for reading difficulties. This is likely to be a very different situation, requiring a very explicit revisiting of a child's knowledge of phonics, from the most basic level of soundsymbol correspondence. Hatcher et al. used the term "linkage" for a very direct and explicit letter-sound instructional component at the end of their intervention program which otherwise contained highly sequenced, auditory phonological training stages. Since their 4 study groups had already received regular formal reading instruction for at least two years, and were all by the time of the study receiving extra "remedial" reading support at school, but no phonological skills teaching, the investigators made strong claims for a teaching unit which explicitly linked new improved phonological skills with letters (phonics principles) at the end of the program. This teaching unit was called linkage. Hatcher et al.'s 4 groups were: reading alone; reading with phonology; phonology alone and a control group who received no extra intervention from the investigators. The reading with phonology group improved significantly more than the other groups. Their "phonological linkage hypothesis" stated that if phonological instruction interventions also work on the direct application of phonological skills to reading, they will be more powerful. Their program was later published as "Sound Linkage: An Integrated Phonological Awareness Training Programme" (Hatcher, Hulme & Ellis, 1994). The carefully designed hierarchy of phonological skills in Hatcher et al.'s
intervention program began to interest specialist support teachers of reading in England and in North America. The idea of bi-directional causality remained, and has been extended in the most recent intervention studies.

These training study conclusions guide the intervention program of the present study, which provides phonological awareness training graded in complexity in separate units. The value of phonological instruction itself is supported by the results of empirical studies (Lundberg et al,1988; Hatcher et al.,1994). The combination of phonological instruction with phonics teaching is supported by Bryant & Bradley (1983), Ball & Blachman (1991) and Hatcher et al., (1994). Phonological skills instruction may not have been given at all in the past educational history of the child, or not given intensively enough for the child's individual needs. The program of the present study provides units (zones) of phonological skills instruction followed by units of basic phonics teaching. They can be taught separately, or phonological units can be taught in a more integrated way to improve phonics skills.

#### Intensive Intervention Studies

Intensive intervention studies during the last decade continued to expand and support the strong link between phonological skills and reading. Torgesen, Wagner and Rashotte (1994) attempted to demonstrate causal links using a longitudinal design and correlations between latent rather than observable measures. This study was designed to overcome some of the problems perceived by the authors to exist in previous longitudinal studies. These problems were of three kinds: omitting other possible causes of individual progress in reading, failure to allow for bi-directional causality between phonological processing skills and reading and imperfect reliability of measurement of relationships between variables (i.e. the results contained true score and error variance). Although it is not possible to have "perfect" measurement of relationships between variables, the authors devised a way of using the common variance of results from clusters of tasks, which attempt to measure the same construct, and these are called latent variables. A process of testing the experimental model had to be undertaken first, in order to ensure that tasks had sufficient validity for measuring each construct (e.g. phonological awareness), and sufficient reliability to detect individual differences throughout the whole age range of the proposed study. A central tenet of the research was that the three kinds of phonological processing abilities that exist: phonological awareness, phonological memory and retrieval of phonological information from long-term memory, would be relatively stable characteristics over time. Most research previously had only studied one of these abilities at a time and there was uncertainty about the relationships between them (Wagner & Torgesen, 1987).

The study involved 288 children randomly selected from kindergarten classrooms. The testing was designed to assess five phonological abilities: serial naming; isolated naming; phonological synthesis; phonological analysis and memory. Phonological analysis and memory tasks seemed to be measuring the same construct in younger children, but as they became older the two aspects became more differentiated. The findings indicated that phonological skills (especially the three main ones) could be regarded as fairly stable, individual characteristics over time, and supported the core phonological variable theory (Stanovich, 1988). Each phonological variable was very significantly correlated with reading in kindergarten and grade 1, in a way that was described as: "uncontaminated by possible effects of prior reading skills, and general verbal ability" (Torgesen et al., 1994, p.282.).

The Torgesen et al. (1994) study demonstrated relative stability of the phonological deficits, which argues for the providing of instruction at an early stage, because the deficits will not disappear through maturity. These findings could also provide some explanation of the survey data (U.S. Office of Assessment, 1994), which revealed widespread underachievement when early intervention was not undertaken for children at risk for reading difficulties. Specifically, Torgesen et al's findings suggest that the children at-risk for reading difficulties who received no intervention continued to have their phonological processing deficits over time, causing word decoding problems (and therefore reading fluency and comprehension problems) through to grade 4 and beyond.

Vellutino et al., in a series of studies (1991, 1994, 1995 as cited in Vellutino et al., 1996) addressed a wide range of variables that could affect reading: phonological processing deficits, visual processing deficits, semantic deficits and syntactic deficits. Their studies found no empirical evidence to support visual deficit explanations, and only mixed evidence for semantic and syntactic deficit explanations: "In brief, the results of a large number of studies, when taken together, permit the inference that reading disability in many cases, is caused by phonological coding deficits that impair the acquisition of phonological skills such as phoneme segmentation, letter and word naming, letter-sound mapping, name retrieval and verbal memory" (Vellutino et al., 1996. p.602.).

The research literature concerning phonological processing skills and specific reading disability began to show a transition to large scale intervention studies, aiming to

examine the frequency, quantity and intensity of extra instruction which would be needed to keep most children at-risk for reading disability at grade level, especially in view of the finding that phonological processing deficits were relatively stable over time.

Torgesen, Wagner, Rashotte, Lindamood, Rose, Conway and Garvan (1999) proceeded with their stated next logical step of conducting intensive intervention studies. Intensive intervention consisted of training in phonological awareness, with systematic phonics instruction at the word level. The study identified at- risk children by a two-level screening approach. The first level was simply performance on letter naming. The bottom 30% of 1436 kindergarten children from 13 elementary schools was selected (413), and then they were given a phonological awareness task, a serial naming of numbers task and a vocabulary task. Finally, 180 children were randomly assigned to either a no-treatment control group, a treatment group which supported regular classroom activities, or two treatment groups which differed in the explicitness with which phonological awareness and phonemic decoding instruction were delivered. One group received an "embedded phonics" approach, which consisted of phonemic reading skills integrated into the context of real reading. The other received a direct emphasis on phonemic decoding skills at the word level, combined with explicit transfer to text instruction. The research team examined the effects of directness and intensity of instruction on children who were most at-risk for reading difficulties according to their weak phonological processing skills. The interventions began in mid-kindergarten, and ran to the end of grade 2. About 80 hours of individual help were provided in 20-minute sessions four times each week, and a combination of trained teachers and teaching assistants were employed. The results showed a significant difference in the numbers of children retained in either kindergarten,

or grade 1, in favour of the direct word level treatment group. This group avoided being retained in their kindergarten class for an extra year the most successfully (because they were judged as not able to cope with grade 1 work), and significantly more successfully than the embedded phonics group. In addition the direct word level treatment group had significantly stronger skills on tasks of phonological awareness, phonemic decoding and un-timed, context-free word reading, than the "embedded phonics" group.

Foorman, Fletcher, Francis, Schatschneider and Mehta (1998) studied children from low socio-economic backgrounds, mainly in urban areas, where the majority of children were judged to have either little home preparation for reading (such as familiarity with books and stories), or inadequate instruction in the classroom, or both. The investigators identified a sample of first and second grade children (N =285) and provided 4 x 20 minute sessions weekly of individual instruction over the course of 2.5 years. They were interested in how **explicit** decoding instruction should be to obtain the best results on reading tests. Their premise was that decoding accuracy is the best single predictor of reading comprehension (Stanovich, 1990; Vellutino, 1991). Three kinds of instruction were used: direct instruction in letter-sound correspondences, less direct instruction in systematic sound to spelling patterns embedded in connected text, and, implicit code instruction within connected text.

Foorman et al.(1998) found that the direct code instruction condition was significantly better at improving word reading speed, and word recognition, than either implicit code method. This was especially true for the children who had the poorest phonological processing skills at the beginning. They found that the effects of group instruction were moderated by the children's initial levels of phonological awareness.

Group differences between children in the three instructional groups in end of year achievement tests (end of grade 1) were found for decoding and passage comprehension tests. In both kinds of test, the direct code (DC) group performed best, and approached national averages. The group mean percentile results were 43 and 45 respectively. The other two groups had mean percentile results of 29 and 35 (IC - implicit code), and 27 and 33 (EC-embedded code). On the measure of comprehension used (Passage Comprehension) mean differences and effect sizes were large, and in favour of the group receiving direct code instruction. Therefore both word decoding, and reading comprehension were shown to increase at the relatively early time of end of grade 1. The Effects of Explicit Phonological and Phonics Instruction on Reading Comprehension The Foorman et al. (1998) study included three study groups reflecting the continuum of emphasis on teaching coding that might be expected to occur in real school situations. Many teachers strongly believe in preserving the child's understanding and enjoyment of meaning within stories (Freppon & Dahl, 1991). Who would disagree? It surely expresses the central aim of teaching reading. However, the means to that end is still unclear for many educators, if they have insufficient knowledge about learning differences in children. Some teachers also believe that to indicate letter-sound patterns very informally, in "naturally occurring ways" (i.e. as they occur within a story) will be sufficient for a growing understanding of phonics within the English language and will produce better reading comprehension results. Over many years no evidence for the validity of this belief has been found (McKenna, Stahl & Reinking, 1994).

Stahl and Miller (1989) reviewed studies conducted in 1988 and earlier of whole language approaches in kindergarten and grade 1 classes where direct code instruction

was not given. They found no evidence of better results in reading comprehension by whole language approaches compared to traditional methods, which included code instruction, but actually found lower reading comprehension results in the classes most closely aligned with whole-language philosophy. In contrast, McKenna et al. (1994) cited some eclectic programs which did involve direct code teaching as being more effective (e.g. Brown & Pressley, 1993; Cunningham, Hall & Defee, 1991). Research on reading comprehension in young children is not as advanced as research on children's word processing, but studies that contrast children with poor reading comprehension and good reading comprehension have shown that those with good comprehension are better at word decoding (Perfetti, 1985). There is a danger that even updated balanced literacy approaches will not include enough help with decoding for reading at-risk children to achieve good comprehension and motivation with reading (McKenna et al., 1994). Enjoyment of meaning usually results in children having enough practice in connected text to gain fluent reading skills (Stanovich, 1986).

The Torgesen et al.(1999) study found results at the end of grade 1 which were compatible with the Foorman et al.(1998) study. However, by the end of grade 2, there were no reliable differences between their groups on tests of passage comprehension. Torgesen et al. had explored the balance between giving children an 80% word level emphasis ("Direct" group) and 20% text help, versus 43% word level emphasis and 53% text help ("Embedded" group). At the end of Grade 2 many other scores were higher for the "Direct" group: phonological awareness, phonemic decoding and un-timed contextfree word reading. However, reading comprehension was not higher. This is a problematic finding for those who would like to hypothesize a logical progression from

good word reading and reading comprehension skills in grade 1, to equivalent, or even better reading comprehension gains by the end of grade 2. A plausible hypothesis would state that the effects of the intensive grade 1 work on the fundamentals of fluent word decoding should result in better reading comprehension scores not only at the end of grade 1, but also during grade 2. Therefore an important research question becomes: "What additional factors may affect reading comprehension?"

The socio-economic area from which the children in the Torgesen et al. study came (middle class) was different from that of the children in the Foorman et al. study (relatively disadvantaged). Therefore pre-school reading factors ("educational history" – Vellutino et al.,1996) might have put the children in a stronger position at pre-testing in the Torgesen et al. study. For example, it has been found that children coming from homes in higher socio-economic areas are likely to have stronger linguistic abilities to use meaning in more advanced texts (such as wider vocabulary, and more familiarity with difficult syntax). In the Torgesen et al. study, the embedded plionics approach, which is favoured by some educators as likely to improve reading comprehension, was equal to the direct phonics group, but was no more effective than the no-treatment control.

In summary, the Foorman et al. study demonstrated that it is possible to improve both reading comprehension and word decoding by the end of Grade 1 using direct code instruction methods. The Torgesen et al. study supported this finding. Torgesen et al. also indicated that the way(s) to achieve major gains in *all* aspects of successful reading, specifically comprehension and fluency, by the end of grade 2 are still not evident. However, direct code instruction does not inhibit gains in reading comprehension. It is thought more likely that something else is missing, for example proven techniques for

improving reading fluency. One important direction for future research is to examine the effects of extending instruction programs with new reading fluency elements, which may lead to better comprehension during grade 2 (Stahl & Kuhn, 2002).

Defining Specific Reading Disability: Educational History versus Constitutional Deficits The conventional definition of Specific Reading Disability (Dyslexia) has three key elements. One is average intelligence, another is severe difficulty in learning to identify printed letters and words, and the third is that the difficulty exists in the absence of exclusionary criteria such as sensory deficits, emotional disorder, low general intelligence, socioeconomic impoverishment and motivational problems other than as a result of poor reading. The implicit assumption underlying this definition is that the causes of reading problems are constitutional deficits in specific cognitive factors that enable an individual to become a competent reader (Vellutino et al., 1996).

Clay (1987) persuasively argued that the logic of both the conventional definition of Specific Reading Disability and the research supporting the claim that specific reading disabilities are caused by constitutional deficits (i.e. cognitive factors) is flawed, because it does not control for the effects of educational history. Clay (1987) argued that educational history (i.e. lack of exposure to pre-reading experience, or inadequate early reading instruction) provides a logical, consistent and empirically supported conceptualization of specific reading disability (Clay, 1985; Pinell, 1987; Wasik & Slavin, 1993), and also an alternative explanation of the research claiming that specific reading disability is caused by constitutional deficits.

The logic of Clay's argument exposed a second problem for the conventional definition of specific reading disability, in that a dichotomy was created between specific

reading disability and educational history factors as an explanation of poor reading performance. Vellutino et al. (1996) strongly argued that the dichotomy between constitutional and experiential causes of reading disability lacks ecological validity. They argued that reading achievement is a by-product of a complex interaction between one's genetic endowment and the quality of one's literacy experience and instruction (p. 602). Vellutino's conceptualization of reading achievement was congruent with the assumption that both constitutional and educational history factors should be viewed operationally as continuous variables. Hence children with constitutionally-based reading impairment should have relatively low scores on reading related cognitive measures, whereas children with experientially-based reading impairment should have relatively high scores on reading related cognitive measures after a certain amount of intervention. Vellutino et al. (1996) reasoned that, given that phonological coding tasks are measuring a continuous underlying cognitive ability, and that those tasks distinguish poor readers from good readers, they also should distinguish between poor readers who are difficult to remediate and poor readers who are easy to remediate. In addition, children who respond poorly to intensive evidence-based early reading intervention programs should correspondingly have poorer scores on post intervention measures of phonological coding ability.

To test their hypothesis Vellutino et al. (1996) conducted a study involving 1,407 children from 17 schools initially divided into two cohorts, one of which entered kindergarten a year before the other. The target participants of children at risk for reading failure were classified by a five point teacher rating scale, which was then followed by testing on the Word Identification and Word Attack subtests of the Woodcock Reading Mastery Tests Revised (WRMT-R, Woodcock, 1987). Children who scored at, or below

the 15<sup>th</sup> percentile on these tests and had an IQ at or above 90 on either the Verbal or the Performance Scale of the WISC-R (Wechsler Intelligence Scale for Children-Revised) were included. The selection process resulted in a poor reader group of 118 (9% of the divided sample), and a normal reader control group of 65. Two groups of poor readers, were formed. One group received individual tutoring and the other regular school teaching only. The tutoring was intensive. It was daily, given by trained staff and in sessions of about 30 minutes over fifteen weeks. A comparison of the reading outcomes between tutored and non-tutored poor readers provided a source of empirical evidence of the effectiveness of the intervention program.

This study differed from the previous studies (Foorman et al., 1998; Torgesen et al., 1999) in that comparisons were also made between normal readers and the two groups of poor readers. The frequency, duration and nature of the intervention program was designed to bring all children who might have missed important pre-school experiences, which are relevant to reading success, up to age appropriate reading levels. The results showed that some at-risk children were very effectively remediated, and hence may have had more "educational history" problems than constitutional deficits. Other at-risk children were not effectively remediated, and hence likely had a more serious constitutional deficit rather than a limited educational history.

Vellutino et al. (1996) conducted a linear regression analysis for each child to determine the child's rate of growth in reading performance from Autumn of kindergarten to Autumn of second grade.<sup>1</sup> The regression slopes which were the measures

<sup>&</sup>lt;sup>1</sup> Reading ability was measured at four points: Autumn of kindergarten; Winter of grade 1; Spring of grade 1; Autumn of grade 2. Time served as the independent measure in the regression analysis.

indicating rate of growth were rank ordered. The Rasch-based W score on the Basic Skill cluster of the Woodcock Reading Mastery Test-Revised was used as the measure of reading performance. Four subgroups were partitioned out on the basis of the rank ordered rates of growth: Very Limited Growth (VLG), Limited Growth (LG); Good Growth (GG): Very Good Growth (VLG).

The results of the Vellutino et al. study provided evidence both for the constitutional deficits of poor readers and the effects of poor educational history. Children who had the most severe constitutional deficits were difficult to help even when phonological, and phonics skills training were given in an intensive one to one situation. Individual growth curves plotted for children in a group called "Very Limited Growth" (VLG) did not show the same initial response to remediation as at risk children in three other groups ("Limited Growth –LG, Good Growth - GG, Very Good Growth –VGG) who also received extra instruction. Other children who had milder constitutional deficits were effectively remediated giving evidence for the role of educational history, a combination of poor educational history factors, and milder constitutional factors.

The results of the study add further support to earlier research that validated a causal link between phonological coding deficits and depressed reading achievement. In addition the study controlled educational history as a confounding variable. Two important implications of the study are firstly, that response to early reading intervention should be part of the diagnostic process of identifying students with specific reading disability. Secondly, that analysis of the effects of early reading intervention programs will be clearer and more informative if a student's rate of growth is used in a disaggregated analysis.

The results of the studies reviewed here provided converging evidence regarding the most successful content of early extra instruction for children at risk for reading difficulty, and regarding the pattern of delivering instruction. Individual tutorial sessions were given daily (as far as possible), and the most effective form of instruction was the direct and explicit teaching of alphabetic code knowledge. In the details of training instructors in the study by Vellutino et al. (1996), it was clear that trainers could make their own judgments at some stages about the time given to different instructional components according to individual child progress, for example the amount of particular sessions to be devoted to phonological skills teaching as opposed to phonics teaching. Teachers did not alter the teaching program, but they responded to individual needs in terms of the time spent on each element. The authors suggested that the relationship between child and tutor became a personal one, which enabled a sharing of goals, and the communication of positive feedback. The program used in the present study intended to make such a collaborative approach central to the home teaching sessions.

# How the Study and Intervention Program are based on the Phonological Processing Skills and Reading Literature

The three content areas of the program (which included graded tests of phonological and early phonics skills plus teaching activities which correspond to each of the tests, and specific guidance about Paired Reading) were based on the content of the interventions used in recent studies just reviewed (Foorman et al., 1998; Torgesen et al., 1999; Vellutino et al., 1996) and the successful results shown by projects using Paired Reading (Topping & Wolfendale, 1985). (A separate review of the literature on Paired Reading will follow.) These three elements are the three elements that were used in all the recent studies where phonological and phonics skills improved most when directly taught in one to one tutoring situations for approximately 30 minutes daily. The study's intervention program (Sound Track for Reading) provided 5 phonological and 5 phonics steps, which were also directly taught in a one to one situation (at home). The recommended time for direct teaching of these skills was only 10 minutes daily, which differed from the block of 30 minutes typically used in the research training studies. However the program of the present study required a further 10 minutes for Paired Reading at another time in the day, making the basic daily suggested length of intervention 20 minutes per day. Therefore it differed from the research training interventions slightly in session length, and also in that text reading was separated from direct teaching of phonological and phonics skills. During the development of the program, participating parents (of children with reading difficulties in grades 2 and 3) reported that consistently working for only 10 minutes on the activities and asking their children to notice the timing was very helpful. Soon the children trusted this arrangement and began to remind their parents about doing the reading activities, rather than parents having to prompt their children. Therefore these differences between the tutoring model of large research studies and the implementation of the intervention in the present study were adapted for the home setting.

Phonological skills alone can be effectively taught, as demonstrated by Lundberg et al. in 1988. This study's intervention provided lessons for the separate teaching of auditory phonological skills, if diagnostic testing (at the beginning of the program) indicated a need for it. The phonological skills steps follow a hierarchical structure, and the steps are listed in Appendix J. Hatcher et al. (1994) first demonstrated that a

comprehensive hierarchical range of phonological skills could be very successfully taught to 7 year old children who were considered to be reading disabled. It was demonstrated in their study that teaching auditory phonological skills to children who had phonological coding deficits and letter and word decoding problems improved both their letter and word decoding (phonics skills) and their reading achievement. Hatcher's Phonology and Reading group made the best progress. Children in the present study were children at-risk for reading disability, and unlike the children in the Hatcher et al. study had already had a first phonological skills intervention in kindergarten. However the study's intervention program enabled the phonological skills of grade 1 children in the present study to be informally re-evaluated, and then re-taught as necessary by their parents, since several of these children were predictably slower to acquire the skills than others (Vellutino et al., 1996). If other children were found to have good phonological skills according to the 10 tests of the program's intervention (used by parents - not the test battery of the study) at the beginning of the intervention (October of grade 1), they received a lesser amount of phonological instruction, and a greater amount of phonics instruction. All children had the benefit of daily text reading as well as phonological skills instruction, as in the most successful group of the Hatcher et al. study. All children also had the benefit of receiving phonological and phonics instruction in a complementary way, since all families identified both phonological and phonics steps as target teaching areas. The program asked parents to teach these steps directly but alongside each other so that new learning within each area would be mutually helpful to the child. This central aspect of the study's intervention program is based on the research conclusions about bi-directional causality

(Ball & Blachman, 1991; Hatcher et al., 1996; Torgesen et al., 1992) where phonological skills instruction is enhanced by concurrent phonics teaching and vice versa.

In addition to the tests and the directly taught lessons, the program of the present study also provided a suggested process for how parents could interact with their children during the lessons. It aimed to provide a means of creating a climate between parent and child, which enabled the teaching of skills like self-monitoring and self-regulation in order to make attributions more positive, improve feelings of self-efficacy and therefore encourage the development of an internal rather than external locus of control within the child. These terms will be defined in the next section: Motivation and Reading.

### Motivation and Reading

The intervention program of the present study (Sound Track for Reading) used an adapted set of the mediation principles of L.S. Vygotsky (Cole, John-Steiner, Scribner, & Souberman,1978) as a process vehicle, or positive teaching approach for parents. The strategies associated with these mediation principles parallel findings in the motivation literature, especially regarding how to make attributions more positive, how to improve feelings of self-efficacy and how to promote the development of an internal, rather than an external locus of control.

Children at-risk for reading difficulties are also at-risk for poor self-efficacy feelings within the central academic domain of reading, which could lead to self-blaming attributions and the formation of an external locus of control. Chapman & Tunmer (1995) found that within the first school year feelings of self-efficacy develop that relate to actual and later reading achievement. Therefore early intervention programs should attempt to improve motivation directly, as well as providing early remediation before

motivation problems increase. It was part of the purpose of the present study to provide an intervention program that included a process for improving aspects of motivation and to examine it's effects. Hence another literature, concerning motivation and reading, also provided a basis for the present study.

### Strategies of Mediation

Strategies of mediation are derived from the translation of the work of the Russian psychologist L.S. Vygotsky (Cole et al., 1978), which described the importance of the social context of learning, and the development of particular forms of language for use in a teaching and learning context where an apprenticeship would be created. The apprenticeship idea in Vygotskian theory implies more than just the teaching of new skills to a novice. It means the relating of the skills being taught to the whole culture and world of the learner, by using specific language interactions. These interactions are called mediated learning experiences. A mediated learning experience is created by using questions and statements which will elicit reflection and links, between already known ideas and new ideas for the learner. For example: "When have you done something like this before?" This question helps to set the present learning task in a new context, where past and present are compared. It is based on the mediation principle known as Transcendence, and it brings about more objectivity to the learning of the present skill, and more relevance to the world of the learner. The language is instrumental in developing meta-cognitive thinking (Feuerstein, Hoffman, Jensen & Rand, 1985). Jensen & Jensen (1994) define six principles of mediation: Intentionality and Reciprocity; Sharing; Meaning; Transcendence; Regulation of Behaviour; and Feelings of Competence. The definitions of each principle follow:

Intentionality and Reciprocity means that the parent must intend to act in a meaningful way with the child, and seek the child's response of connecting with the parent (e.g., "Look at how this works. I can see you're watching closely now."). The reciprocity is essential for the interaction to have been mediation.

2) Sharing is a component to be used closely with Intentionality and Reciprocity. Sharing language will establish in the child a feeling that the interaction is a shared experience (e.g., "We will work together to understand this").

3) Meaning states that the child will know why each new step is significant. Each new way of thinking and functioning will then become relevant to the child. (e.g., "If you don't hear the difference between the vowel sounds "e" and "i" you may confuse them in the words you read and write", or "It's important to learn this sound because it happens many times in different words")

4) Regulation of Behaviour. The language of this principle shows the child when and where to use a particular function. It explains all the steps of collecting, transforming and expressing information systematically. It reinforces a careful and deliberate manner of thinking (e.g., "Well Done! You took you time, and see you have excellent results.")
5) Transcendence means that the aim of the interaction is to go beyond the present task. It describes a past state, which is real to the child, and then encourages a projection of thinking forward into a new state, which will become real because the present task is a tool to achieve that reality (e.g., "When have you done something like this before?" "Can you remember when you couldn't do that ? Now you can do it very well")
6) Feelings of Competence are the result of specific reinforcement as the child demonstrates that learning has taken place, and new skills are mastered. This principle

implies more than routine praise (e.g., "Good job!"). It involves creating the opportunities for success, and then drawing particular attention to what was successful (e.g., "You can say those two sounds very clearly now."). In fact, it involves boosting the child's confidence about being successful on similar and future tasks in this area of reading (self-efficacy).

Implicit in the dynamic test-teach-re-test model is the principle that a collaborative examination of errors will help parent and child examine difficulties in a new "systemic" way, where blame is not a useful construct. The actual learning process is the product, rather than an immediate right or wrong answer.

Since the questions typical of each mediation principle may elicit the expression of feelings, such as fear of failure, it is not surprising that their use has been successful in identifying feelings which can block learning (Das & Conway, 1992; Tzuriel, Samuels & Feuerstein, 1988). Observer rating scales for teachers and parents have been effectively produced using these mediation principles (Lidz, 1991), and a successful training program for the parents of children with severe intellectual difficulties (Jensen & Jensen, 1994) has been developed. The study's intervention program video models the use of these strategies as simply and explicitly as possible, and describes them simply in the activity book (Ottley, 2001, pp. 286-192).

## Training Attributions and Self Efficacy

Attributions are people's ideas about the causes of their experiences (Dohrn & Bryan, 1994) and self-efficacy beliefs are personal beliefs about knowing how to organize and implement all aspects of a task (Schunk, 1989). The construct of attributions is closely linked to the construct of locus of control. For example, children or adults will develop an

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internal locus of control if they tend to attribute their successes and failures to the results of their own behaviour. Children and adults with an internal locus of control are more likely to take credit for successes and feel that they can avoid railures in future (e.g., by working harder). Dohrn and Bryan (1994) cite research by Borkowski, Wehring and Carr (1988), Bryan, Bryan and Dohrn (1993) and Schunk (1983), which demonstrated that people with an internal locus of control are generally more confident, more persevering in the face of difficulty and less daunted by challenging tasks. On the other hand people with an external locus of control believe they have little control over the consequences of their actions, and therefore they may experience increasing feelings of learned helplessness over time, plus low levels of confidence. They may often avoid tasks perceived to be challenging. Bandura (1982) cited by Schunk (1989), and Dohrn and Bryan (1994), found that perceptions of self-efficacy influenced the range of choices which individuals gave themselves, and the kinds of activities chosen by individuals, and how much time was devoted to them. Even when perceptions of self-efficacy were inaccurate, they were still powerful determinants of behaviour. Interventions which have aimed to make attributions more positive, and self-efficacy beliefs stronger, have been much more successful than programs to improve the broader area of self-concept (Prout & DeMartino, 1986). Attribution training studies seek to engage students on tasks and to give new feedback about the reasons why mistakes might have occurred. This process starts to take the emphasis away from an external locus of control (Schunk, 1984, 1988; Dohrn & Bryan, 1994).

Schunk (1989) reviewed a series of studies conducted with children who had reading comprehension and mathematics difficulties in which verbalization of a given strategy,

ability and effort feedback, coping versus mastery models of teaching, goal setting and rewards were all used as intervention variables. The findings of these studies provided evidence that specific performance goals improved self-efficacy beliefs and achievement; that positive ability feedback for early success improved self-efficacy beliefs; that feedback linking prior achievements with ability and effort improved outcome patterns. If young children can be helped to gain successes and then attribute the successes to their ability and effort, these attributions will influence perceived self-efficacy positively. The program of the present study enabled the setting of specific goals throughout. It suggested language that enabled both effort and ability feedback (e.g., " How have you learned so much already?"). It also suggested that parents summarize previous achievement, linking it with past and present successes so as to make attributions about the causes of these successes consistent with an internal locus of control. If using the program enabled parents to work successfully on these important aspects of motivation, as they used extra reading and phonological skills instruction, there could be both immediate and long-term positive effects on reading achievement for their children.

## Motivation and Measuring Aspects of Reading Self-Concept

Wigfield (1997) observed that within the literature on motivation in general, several constructs of motivation have been related to academic achievement. For example, studies have shown that ability beliefs (inner beliefs about general academic ability), and expectancy beliefs (a personal sense of whether one will do well, or not well, on a given task, such as reading) predict, and are connected to actual achievement (Eccles, 1993). Wigfield (1997) also observed that there is a relative shortage of research that relates general motivation constructs to reading. He suggests that the central questions of

motivation itself are : "Can I succeed?" and "Do I want to succeed, and why?" Then he suggests that central questions for <u>reading</u> motivation are : "Can I be a good reader?" and "Do I want to be a good reader and why?" (Wigfield, 1997, p.16)

In relation to the first question ("Can I be a good reader?"), beliefs about ability, beliefs about expected performance on specific tasks and feelings of self-efficacy are relevant. The beliefs about ability of children at risk for reading difficulties are likely to suffer at some point, but their specific beliefs about expected performance (expectancy beliefs) and feelings of self-efficacy might be expected to suffer at a very early time. This seems a reasonable supposition, since in most cases, the first school problems of *reading* at-risk children are with reading itself, and may be only with reading.

For some time, motivation theorists did not think that the self-systems of very young children would be negatively affected by early academic failure (Harter, 1986; Harter & Pike, 1984, Stipek, 1981), but later work indicates that they are (Eccles, 1993; Marsh, Craven & Debus, 1991). The earlier assumptions claimed that very young children did not differentiate between their achievements in different domains of self-concept (e.g. physical, social, academic), while children older than 8 years did. The later studies indicated that young children (Kindergarten and Grade 1) do form self perceptions (e.g. feelings of self-efficacy), which are differentiated, both across and within domains (Marsh et al., 1991; Eccles et al., 1993). A child's developing self-system is now known to be very important to actual reading progress (Borkowkowski, Day, Saenz, Dietmayer, Estrada & Groteluschen, 1992). Children may not link specific task difficulty and general ability until the later time of about 8 years (Nicholls & Miller, 1984), but it has been shown that children as young as 5 years can recognize when they have performed

something poorly (Butler, 1990). Chapman & Tunmer (1995b) found that children atrisk for reading difficulties perceived many tasks involving phonological skills as difficult as early as kindergarten and grade 1. Consequently, it was expected that grade 1 children in the present study would have perceptions of difficulty with reading, and high perceptions of ability at the same time.

Within the academic, social or physical domains, researchers in the last decade began to consider the existence of sub-components in perceptions (Wigfield & Karpathian, 1991). For example a section of the academic domain is reading, and within reading, there can be sub-components like perceptions of reading competence, perceptions of reading difficulty, and attitudes towards reading. "Attitude" refers to feelings about reading, and this concept entails a much more emotional, or affective subcomponent than the first two. Perceptions of difficulty are beliefs that reading activities are difficult or problematic.

Chapman & Tunmer (1995) were aware that Marsh (1986) had found a response bias in young children, whereby negatively phrased questionnaire items produced answers that were inconsistent with positively phrased items (e.g., "I am poor at making friends" tended to be agreed with by children younger than grade 3, at the same time as another positively phrased opposite statement: "I am good at making friends" was also agreed with). Marsh (1986) had therefore suggested that negatively phrased items should be omitted altogether, or omitted from scoring procedures, in scales for young children. Marsh (1986) had used a general self-concept scale, rather than a reading specific scale. He had suggested that the bias happened for cognitive-developmental reasons with younger children. Chapman and Tunmer (1995) intended to examine whether this was

evident when reading self-concept was being specifically surveyed. They worked with 520 children, of whom 193 were 5 years old. They used the Reading Self-Concept Scale (RSCS : Chapman & Tunmer, 1993), administered individually, with 50 items designed to assess reading-related self-perceptions. Half of the items were negatively phrased, and half were positively phrased (e.g. "Reading aloud is hard for me; "I am good at reading long words"). They constructed a 3 (year), X 2 (item type) design. ANOVA analysis indicated the same negative item bias that Marsh (1986) had previously found in younger children (below 8 years). The children tended to agree with the negatively phrased items, and also agreed with positively phrased items that were in conflict with the negative statements.

However, Chapman and Tunmer (1995) then conducted a second study using a revised reading self-concept scale (RSCS-Q) with a different sample of age 5, 6 and 7 children. This time, when negative items were worded interrogatively, and with simple language the response bias was effectively avoided with younger children. This important difference was discovered after further testing of (verbally given) negative and positive statements with young children. They found that when children have to verify a statement like "I am dumb at reading", they are required to process disembedded language, because the referential pronoun "I" does not refer to the person who is making the statement. In a second experiment, Chapman and Tunmer (1995) used questions such as "Do you make lots of mistakes with reading?" rather than asking children to agree or disagree with the statement: "I make lots of mistakes with reading". They found that children responded with more consistency to positive and negative items on the revised scale. They concluded that negatively worded question items which use the pronoun "you" can be

used with validity and are needed to explore perceptions of difficulty. They also concluded that some of Marsh's conclusions might have been premature. In particular Marsh's conclusions had dismissed the important issue of whether grade 1 children can make differentiations within sub-components of reading self-concept.

In two further experiments, Chapman and Tunmer (1995) studied yet another sample of 771 children, between 5 and 10 years of age (143 were 5 years old), and administered the revised questionnaire (now called RSCS-30). When both a reading self-concept scale (RSCS-30), and reading measures were administered to Grade 1 children, perceptions of difficulty in reading could be found using interrogative items with the pronoun "you". This form of question also reduced linguistic complexity. Perceptions of difficulty, like perceptions of competence, were regarded as an integral part of making self-appraisals. The question: "Can you work out sounds in words?" requires a self- appraisal, and would be a measure of feelings of self-efficacy regarding an aspect of reading. Young children could judge this task to be difficult, but still have perceptions of ability so as to answer the question: "Are you becoming a good reader?" in the affirmative. The investigators found evidence for the distinctness of three factors within their scale: competence perceptions, difficulty perceptions and attitude. Furthermore, these sub-components of reading self-concept, especially perceptions of difficulty and attitude, showed a positive relationship with reading and reading-related tasks during the early months of a child's first year in school.

In summarizing their conclusions, Chapman and Tunmer considered that reading self-concept begins to develop in association with young children's pre-reading experiences and during the first months of school. Furthermore, they noted that Stanovich

(1986), provided evidence that initial specific difficulties in learning to read often eventually have much wider motivational, behavioural, and cognitive implications over time. Those children with early, specific reading difficulties may gradually do less and less reading, as opposed to those who have no difficulties, and tend to be well motivated, because they read with fluency and enjoyment. This trend has also been recently supported by an examination of how parents read with their own children (Tracey, 1999). By grade 3, successful readers are usually reading often, silently and independently, as opposed to children with reading difficulties who still tend to be reading aloud to their parents.

Chapman and Tunmer's series of studies suggest that children at-risk for reading difficulties need help in the area of reading self-concept at an early time. The present study provided a positive interaction process as one possible way of addressing that need. The video part of Sound Track for Reading (study program) aims to train parents to help children make more positive attributions about why aspects of early reading are difficult, at the same time as improving their feelings of self-efficacy. When success is achieved on small goals, parents are prompted to acknowledge the child's success by describing the action that the child took e.g., "you see that you took your time (on naming high frequency words), by noticing the first sound in the words, and you have excellent results" (Sound Track for Reading Video, 2001).

The "Elementary Reading Attitude Survey" (McKenna & Kear, 1990) was used in the present study for four reasons: The question were constructed to avoid the negative response bias described by Marsh (1986) with grade 1 children; empirical support for attitude towards reading as a valid sub-component of reading self-concept exists; the intervention program of the present study aimed to change attitudes by making children's attributions more positive, and by giving a form of self-efficacy training; the visual depiction of four kinds of feelings are especially clear and appealing to young children in a repeated cartoon character format.

The survey contains 20 questions, which are answered by choosing one of four Garfield cartoon picture items. The possible answers are on a four-point scale (e.g. "happiest; slightly smiling; mildly upset; very upset"). The picture cartoon format makes this instrument very appealing and comprehensible for the youngest children. The authors suggest that the use of a four point scale avoids two difficulties: no neutral central category exists, which has been shown to have a "non-committal" response effect (Nunnally, 1967); the load on working memory is decreased with four rather than five items (Case & Khanna, 1981). This instrument was eventually offered to teachers after being administered to more than 18,000 children across the USA in grades 1 to 6 (McKenna, Kear & Ellsworth, 1995). Estimates of reliability, and evidence of validity appear to be better than for previous instruments, many of which do not allow normative scoring for Grade 1 children (e.g. Gambrell, Palmer, Codling & Mazzoni, 1996).

In summary, "attitude" to reading has been defined as a subset of affective variables which are part of the construct of reading self-concept and hence are related to motivation with reading (Athey, 1985; Chapman &. Tunmer, 1995; McKenna & Kear, 1990 & 1995). Poor motivation with reading could be both a consequence of early phonological and phonics difficulties, and a cause of future reading underachievement. It is plausible that reading at-risk children might have their beliefs about their specific ability in reading undermined quite quickly in grade 1, particularly when peers without phonological deficits usually make rapid progress with reading. Therefore knowing more about when, and how to protect the self-perceptions of reading at-risk children is important, and the present study used the administration of a child attitude survey for that reason.

## How the Study and Intervention Program are based on the Reading and Motivation Literature

The process of the present study (Sound Track for Reading) attempted to help parents directly improve children's reading expectancy beliefs, feelings of reading self-efficacy and positive attributions about experiences of difficulty with reading while they worked through the activities. It could be claimed that both the content and the structure of the program alone should improve these aspects of motivation to some extent. For example in supplying phonological skills instruction to a child who still required it, the program created opportunities for missing skills to be identified and re-taught, possibly providing an alternative explanation (or new attribution) for the child about a cause of previous failure. Also, the structure of the program was dynamic (pre-test, model and re-teach, retest), with the aim that a child would always succeed on selected activities within his or her own time frame, so as to have improved perceptions of self-efficacy, and a shift towards an internal locus of control. However if parents also used explicit language to emphasize success and progress, they might work even more directly on key aspects of reading motivation itself.

The explicit language modeled for parents in the video of the study's intervention program and suggested in print, consists of statements and questions which are

instrumental according to Vygotsky's social learning theory (Cole et al,1978). They are designed to expand the thinking in a meta-cognitive way. The six principles of mediation described earlier were used in the program: Intentionality and Reciprocity; Sharing; Meaning; Transcendence; Regulation of Behaviour; Feelings of Competence.

The sensitive use of the language of mediation strategies results in a listening process, which enables an exploration of worries and other barriers to learning by teacher and student together. The listening process means that there is no expected time for achieving success, and no simplistic product of a "right answer". The learning process is the focus of attention. The real goal is the student's confidence with new learning, based on understanding, flexibility and finally transferability of new skills.

This process in the study's intervention program meant that the children had repeated chances to have individual instruction tailored to their own needs. The program required a specific amount of time each day, but there were no requirements about the amount of the program to be achieved in each time period. Therefore an individual pace was established to suit each child's rate of progress, which enabled children with mild, moderate or more severe reading difficulties to be accomodated.

In particular the last three mediation principles allowed parents to work directly on the motivational constructs of attributions, self-efficacy and locus of control. Regulation of Behaviour allowed the child's use of self- regulation (possibly after parent modeling) to be described and praised, which is one way to offer the child new attributions about steps that were once difficult, and to improve feelings of self-efficacy (e.g., "That's how you did so well. You stopped and thought for a moment.") Transcendence allowed parents to provide a view of success beyond the immediate situation, which emphasized an internal locus of control (e.g., "Can you remember when you couldn't do this? Now you can do it very well.") Feelings of Competence stressed that parents should take frequent opportunities to offer praise and encouragement (e.g., "You see you have excellent results on reading the words in this word wall." It has been demonstrated that this kind of task specific encouragement, and reinforcement, is much more effective than "urging on" (e.g., "You can do better!"), with the implication that more effort will result in success (Dohrn & Bryan, 1994). The mediation principles are consistent with the principles that have been successfully used in training schemes for teachers, parents and even older students working with younger children (Dohrn & Bryan, 1994; Yasutake, Bryan & Dohrn, 1995).

They are also consistent with the use of "expansive" rather than "restricted" language, which has been associated with the methods of parents of successful readers, which will be discussed in the third literature review.

### Parents and Children Reading Together

The introduction to this chapter stated that when children at-risk for reading difficulties need the direct teaching of component reading skills in grade 1, it is important for adequate quantities of text reading experience to be given in order that they make better progress with text interpretation in a successful transactional way. Since component skills are in the process of remediation, some impediments to their own unique transactional path must be assumed to remain and children are likely to need a supported process which allows them to learn to interpret text to themselves at least as frequently as successful readers, and without frustration. Recent research will be reviewed indicating that the parents of children at-risk for reading difficulties may tend to be restricted in their range of helping strategies in comparison to the parents of successful readers. They may tend to emphasize and correct errors during text reading in a way that hinders rather than helps improved transactional processes between reader and text. The supported text reading session is a chance for children to move towards the achievement of their own new product of enjoyable text interpretation. Furthermore if parents also use the expansive approaches apparently used more by the parents of successful readers than by the parents of children with reading difficulties (Tracey & Young, 1994; 2002), they may promote their child's reading comprehension, and motivation to read even more powerfully. The importance of increasing quantities of reading done by children at-risk for reading difficulties has been underlined (Adams, 1990; Stanovitch, 1986), but recent research into the *quality* of supported reading experiences lend support to the premise that parents are uniquely important as effective helpers.

### Text Type

The case for direct teaching to most effectively improve children's phonological representations of sounds and their command of the alphabetic principle, so that word decoding improves, has been described previously. It is also known that if phonics instruction is done only in isolation from texts, children are not helped to apply phonics strategies in recognizing words. The use of phonetically regular texts may help readers become more fluent. Juel and Roper-Schneider (1985) studied two groups of Grade 1 children, who received the same phonics instruction, but read different kinds of texts. One set of texts contained high-frequency words, and the other contained phonetically regular words became better than the other group at using letter sound information more extensively than for

only the initial letter sound of a word. They also continued to use these skills for at least 6 months beyond Grade 1, and on less phonetically regular texts.

Does this mean that highly decodable texts are the best thing for reading at-risk children? The conclusions of Foorman et al. (1998) suggest that there are advantages, since they found better word recognition results for children who learned with a phonicsbased series of books. Other researchers also advocate phonetically regular texts for at risk readers. Beck (1997) suggested that the proportion of decodable words in early texts should be about 70-80% since: "70 to 80 percent decodable would be reliable enough for children to refine their knowledge of the spelling-to-speech mapping system, while 30 to 50 percent is not enough" (Beck, 1997, p.17). Since it is known that children need to learn about common and consistent letter sound patterns in order to read well, it is also logical that they need opportunities to apply in text what they are learning about these letter-sound patterns. However, Hiebert (1998) presents a strong case against decodable text: "...simplifying the text to the lowest denominator of high frequency words did not facilitate the task of learning to read in the manner that the generation of educational psychologists who advocated this type of text believed. While phonetically regular text is presumed to facilitate acquisition of word recognition skills better than high-frequency text, numerous questions remain about the kind and amount of phonics information that beginning readers need." (Hiebert, 1998, p. 7).

Csikszentmihalyi (1991) described the best, or fundamental intrinsic motivation for reading as "flow", defined as the mental state where readers are so completely involved in the enjoyment of the meaning of the text that they strongly desire to continue. Abundant studies involving older children with learning disabilities indicate that attaining

the state of "flow" frequently does not happen. If decoding difficulties continue to take up energy and effort, which would otherwise be used for processing meaning, comprehension is poor (Lyon, 1996). Without the enjoyment of meaning, "flow" will not be gained. The concept of "flow" also implies that decoding has become automatic and effortless (Adams, 1990). Educators have experimented with the best ways of training reading fluency, which is at least an interim stage before "flow" with slightly older readers (Stahl & Kuhn, 2002). They have found that support from peers who have fluent reading skills, repetition of reading selected texts and large increases in amounts of regular "frustration-free" text reading are effective. "Frustration-free" means that there is no place for mechanistic decoding in these training sessions, because the thread of meaning of the story will be lost. If grade 1 reading at-risk children experience regular fluent reading, understanding and enjoyment of text, through the use of careful adult scaffolding, from the outset of learning to read, they experience regular modeling of fluent reading. They are also drawing on several cognitive linguistic areas of prior learning (e.g. verbal language comprehension) to address the new challenge of printed words.

Brennan, Bridge & Winograd (1986) demonstrated that revised texts using "high content" words could be easier to read. A high content word is very meaningful in the particular context of the story, e.g. "skate", with illustrations of children skating, instead of "go", as in "I can go" ("go" and "I can go" are typical "high-frequency" words of previous primer reading books). Hiebert (1998) commented however that such studies had worked with children in grade 2 and older. They did not examine the effects of revised texts on beginning readers in grade 1.

The texts we currently have tend to be of two genres: little books, and literaturebased (predictable) textbook programs. Both genres provide meaningful reading while acquiring basic word recognition strategies for grade 1 children. Little books are short as the name suggests, being 8 to 24 pages long, and appear in a series of levels. At the earliest level, each phrase begins with "A", followed by a word or words of something shown in a picture. Throughout the levels, high frequency words (Dolch, 1965) are few in number, but repeated often. Illustrations enable the reading of many different high content words, which appear infrequently, but are critical to understanding the meaning of the text (Clay, 1985). Literature-based textbook programs cannot be read only by naming illustrations. They usually adopt a rhyming pattern in the early levels, which enables some predictability to help with unfamiliar words e.g. "hen" and "wren". These programs have fewer words (701 words in 6 books of the first anthology for first grade (as opposed to 1,225 words in 40 little book first stage texts.) Only 5 % of the words are high frequency, as opposed to 31% in little books.

Children in the present study will be using books for Paired Reading which have natural language and a close picture-text match, or predictability of text structure and a close picture-text match. Such books offer grade 1 readers contact with many words in many different texts, which is important for getting experience with word recognition strategies and sustaining interest. The "high frequency" words (Dolch, 1965) that they use may be a small number of high frequency words repeated frequently (e.g., "a" and "the" will be used many times over). The pictures and predictability act as support for young children to do meaningful reading while still learning about whole word recognition and the application of the alphabetic principle for decoding. It is now widely

accepted that young children need to gain practice with three aspects of reading texts: "applying the alphabetic principle, recognizing high-frequency words and using the structures of sentences and texts to validate meaning." (Hiebert, 1998, p. 13).

## How to Teach

Advice to parents about children's reading usually stresses the importance of reading to children. A recent finding suggests that reading books to children benefits oral language skills (Senechal, 1997), and a further, longitudinal study of 140 children followed from Kindergarten to Grade 3 examined whether parents reading to children influenced written language (Senechal, Lefevre, Thomas & Daley, 1998; Lefevre & Senechal, 1999). Two kinds of home literacy experiences were compared. These were storybook reading and parent teaching. Children were tested at the end of grade1, and again at the end of grade 3. It was found that only parent teaching was directly related to the improvement of children's written language skills, like knowing letter names for letter sounds. Storybook reading was related to oral language skills. However, the findings do not mean that parents reading stories to children is of little value, but they do suggest that advice to parents about how they help with reading should be more specific. Taverne and Sheridan (1993) provided individual consultations to train parents on how to "read with" their children. Frequency, quality and duration of reading done at home all improved. Unfortunately, they did not assess reading gains, but receptive language improved when measured on the Peabody Picture Vocabulary Test-Revised. In structured interviews both children and parents reported that the time spent was highly satisfying, and the language ability finding seems to be consistent with Lefevre & Senechal (1999).

There are conflicting findings about the relationship between how often children read to their parents and children's reading achievement. Hewison & Tizard (1980) found a stronger link between achievement and children reading aloud to parents, than achievement and parents reading to their children. On the other hand, a strong and positive relationship was reported between the frequency with which parents read to children and children's reading achievement by Anderson, Hiebert, Scott and Wilkinson (1985). Lefevre (2000) asserts that there is an overall shortage of evidence to show a direct link between reading achievement and parents reading stories to their children.

When it comes to parents hearing children read, Tracey (1998) reported that very few studies have examined the practice of children reading aloud to their parents at home (Durkin, 1966; Hannon, Jackson & Weinburger, 1986; Lancy, Draper & Boyce, 1989; Tracey & Young, 1994), especially in view of how often the practice is recommended. Durkin (1966) studied precocious readers who read to their parents and whose parents read to them frequently, but these parents also taught their children about reading itself. Hence, there were several literacy practices occurring. Tracey (1998) found that in fact the existing literature indicates that older, poor readers (in grade 3) read aloud more often to their parents than skilled grade 3 readers. She suggested that this is mainly because the good readers can read independently by grade 3. Her conclusions after reviewing the studies were that in grade 1, at-risk readers seem to read aloud at home as often as non atrisk readers, but important differences were found between the ways in which parents of at risk readers helped their children, and the ways in which the parents of succeeding readers helped (Lancy et al., 1989; Tracey & Young, 1994). The parents of succeeding (or non-at risk readers) asked more questions, and made more comments while their
children were reading. They were found to adopt helpful scaffolding strategies, to be sensitive about frustration levels of text and to often ask useful meta-cognitive questions. Scaffolding means to give as much help as needed for the student to complete a task successfully followed by a gradual removal of some of the support until eventually the student can complete the task independently. The parents of at-risk readers tended not to be expansive in such ways. In contrast, they became very limited in the range of cues given, mainly giving decoding cues, and sometimes even going so far as to cover pictures to avoid "cheating". Tracey and Young (1994) concluded that important qualitative differences often exist in the home reading experiences of at-risk, versus succeeding readers. Very recently Tracey and Young, 2002 have conducted a more detailed and extensive study where the conversations of 76 grade 3 students reading to their mothers were audiotaped, transcribed and coded. There were equal numbers of above-average and below-average readers in each group. Tracey and Young's theoretical framework was one of social constructivism, emphasizing the child's construction of knowledge through interactions in the world around them, and especially the importance of the ways parents interact with their children during literacy events. They found a significant and consistent trend for the mothers of below-average readers to correct their children more than the mothers of above-average readers : "In short the reading sessions were punctuated by frustration and failure for the children, and most likely, for the mothers as well" (Tracey & Young, 2002, p. 733.) The qualitative differences in the conversations of these two groups were highlighted. It was thought unlikely that the extensive error correction practices of the mothers of below-average readers would lead to either increased reading ability or to children's increased motivation to read. It was concluded that educators

should forewarn parents about minimizing error corrections by intervening only when necessary.

Paired Reading is a very successful way for parents and children to read together, which inherently uses the process of scaffolding. Paired Reading allows children to read age appropriate text with full enjoyment and understanding. They do so with an approach that is at first fully supported by the parent. At first, child and parent read simultaneously. Then, when the child feels confident enough to go on alone, the child signals to the parent, and immediately receives praise for doing so. Any errors are corrected quickly and clearly by the parent, so that the meaning of a sentence remains intact. Both parent and child must track the text carefully (Fitton & Gredler, 1996; Topping 1986)

Topping (1986) reported that if children are expected to gain one year on standardized reading tests during one calendar year, children in a Paired Reading project typically showed increases which are between 1.5 and 7 times greater in reading accuracy, and between 1 and 12 times greater in reading comprehension. This was a general statement without details of study durations, but some examples follow. Morgan and Gavin (1985) conducted one of the early Paired Reading studies, with a small sample of 7 mid-primary age children (8 and 9 years of age) in an experimental group and 8 control children. The Neale Analysis of Reading (Neale,1958, 1989) which gives measures of reading accuracy and comprehension, and where children read text passages, was used for pre- and post-testing. Over a period of 3 months, there were average reading accuracy gains of 6.29 months for the experimental group, and 2.0 months for the control group. In reading comprehension, there were gains of 9.29 months for the experimental group, and a measured loss of .4 months for the control group. Heath (1981) studied a

younger sample (average age 7.11) of 19 Paired Reading group children and 16 control group children for a three month time period. He found very similar results. The average reading accuracy gains for the children doing paired reading were twice those of the control children, and reading comprehension gains were greater for the Paired Reading group, being about twice those of the controls. Some projects included follow-up testing one year after the post-testing and gains were maintained, although growth was at a much slower rate (Carrick-Smith, 1982; Topping 1990). Carrick-Smith (1982) describes an extension of the Derbyshire study (Bushell, Miller & Robson, 1982) which involved 28 pairs of children who were matched on reading accuracy and reading age to form experimental and control groups. Over the two-month period of the study, gains in reading accuracy and reading comprehension for the experimental group students on the Neale Analysis of Reading had been found to be at least twice those of the control group children. A follow-up study one year later showed that the very rapid rate of improvement of the study period (an average 10 month gain for reading comprehension, and an average 5.5 month gain in reading accuracy) for the experimental group did not continue when the project ended. The rate of change became approximately one month over one month of time again, as it had been for the control students. However, the increases made by the experimental students over the control students were still maintained one year later, which is an important finding. The study involved students of secondary school age, but they were selected because they were at least three years behind their chronological ages on the reading tests, and of average general cognitive ability. Therefore, it is plausible that they were a fairly heterogeneous group in terms of reading difficulty, as in the Vellutino et al. (1996) study with younger children. The very

strong gains in reading comprehension which were obtained in these studies make them of interest to programs designed for young children at risk for reading difficulties, since we currently need to know more about how to improve reading comprehension during and beyond grade 1 (Torgesen, 1997; Torgesen et al., 1999).

### Parent Training

Despite the empirical support for the effectiveness of the Paired Reading method, resources for the initial training and on-going support of parents have not been available to turn this work into general policy. Topping and Lindsay (1992) drew attention to the fact that widespread (community) interventions would have to be simple, decentralized and inexpensive to become lasting practices. Fitton and Gredler (1996) concluded more recently that there are three key conclusions for parents and educators: "First, reading at home has benefits for the child's school performance. Second, parents are invaluable components in children's learning. Finally, parents are more helpful tutors if they have specific guidelines to follow when reading with their children." (Fitton & Gredler,1996, p. 328).

Leach and Siddall (1990) compared four different parent and child reading programs in a controlled study: Hearing Reading; Pause, Prompt and Praise; Paired Reading; and Direct Instruction (a program designed for parents, not to be confused with the methodology for teachers). Paired Reading and Direct Instruction were the most effective. Direct instruction was found to need very intensive and time consuming training procedures, and to involve expensive materials. Paired Reading was considered to be a more realistic option, with a very good cost-benefit factor. All of the parent programs examined by Leach and Siddall (1990) required at least 90 minutes of individual training, which was given in one session. However, Direct Instruction required 3 sessions of 90 minutes.

Some studies have focused on the responsiveness of parents to learn and implement new methods as they hear their children read (e.g. Henderson & Glynn, 1986). Parents were trained to praise more often, and to pause before giving the words. Parents applied the guidance well, and their children's reading behaviour changed as a result.

Fitton and Gredler (1996) suggested that some parents may initially fear involvement in teaching reading at home because they fear conflicting with school programs, thus disrupting more than helping. They describe a study by Thurston and Dasta (1990) who worked with low-income African-American parents whose prior confidence to help was very low. The parents were trained to praise, model correct words and ask comprehension questions. They implemented their new skills well, and children's oral reading scores improved significantly more than those of a control group. Topping and Wolfendale (1985) reviewed many Paired Reading programs demonstrating that parents can use new strategies very effectively when shown how. Children's reading improved as a result of interventions spanning the age range of 5 to 14 years, and in both large and small projects. Hewison (1988) described a transition from giving parents advice based not so much on a clear theory, but rather on an analysis of what effective parents seemed to do, to the highly specific method of Paired Reading, which is based on behavioural principles. For example, in the Haringey reading project (Tizard, Schofield & Hewison, 1982), an experimental group of children who were of Grade 1 age (Year 2 in the UK) read to their parents several times a week on selected texts provided by the schools. A control group of children did not take part in the project but may have read

with their parents. Two schools from disadvantaged areas were used, each having experimental and control children. It was found that on a standardized reading test, only 6 % of the parent involvement children were performing at the weakest level (of below standard score 84), while in the control group 17% were in this low range. A follow-up evaluation conducted one year after the end of the project revealed that only 9 % were in the weak range, in comparison to an estimated national average at the time of 15%. It was concluded that the project had been the most successful with at-risk readers. The Haringey project showed success for providing texts without parent training but did not show such great gains as those reported for Paired Reading.

Do parents become more anxious and restrictive in the way they assist *because* their child has difficulty with reading? Or are they actually *causing* more difficulty for their children by interacting with them in an unhelpful way? It seems reasonable to encourage parents to use the expansive approaches, which have been observed to accompany more successful reading. The conclusions of these two studies particularly supported the detailed advice which the study program gave both for the text reading session component and in the use of mediation language and ideas during activity sessions.

In the version of Paired Reading for grade 1 children in the intervention program of the present study, there are three stages: first the parent reads clearly and expressively, while the child tracks each word visually; second, parent and child read simultaneously; third, the child reads alone but the parent supplies words when the child hesitates. It is essential that the child tracks carefully, and the use of a line guide is sometimes helpful. While the child tracks and sees the word at the same time as hearing it, a real reading

experience of processing the component parts of the word goes on (Adams, 1990). The method is frustration-free, because it is fully supported by the parent. The child is not required to stop and decode words, because that would disrupt the flow of meaning. The same applies in the second and third stages of paired reading also, where parent and child read simultaneously (second), and where the child may read alone (third), but always with the parent supplying any word that causes hesitation.

The guidance given in the study's intervention program includes three of the six elements which are advised by Topping (1986) as important in parent training: verbal instruction, modeling (video) and prompted practice (if parents can assist each other). Topping (1986) lists three additional elements of training parents effectively as: feedback and reinforcement, independent practice and reinforcement plus monitoring. In the feedback and reinforcement stage, ideally a coordinator working for the research team would observe each parent as they implemented paired reading with their child. Immediate feedback on strengths and weaknesses of the implementation would be given, followed by a few days to practice independently. There would then be a follow-up visit by the coordinator to observe again, and to discuss the progress of the whole procedure. Usually by this time, the coordinator would be able to see and praise increased parental confidence with the method, and to help solve any problems. In the present study, the feedback, monitoring and further discussion with an outside coordinator were not directly available. It was recommended that parents watch the video demonstration carefully, and that one parent took the role of observing and giving supportive feedback on the first few sessions.

# How the Study and Intervention Program are based on the Parents and Children Reading Together Literature

The third section of the intervention program asked parents to spend a second period of time (approximately 10 minutes) every day on Paired Reading. The importance of *text reading* time is reflected by the fact that half the daily, recommended intervention time was allocated to it. The guidance given to parents for this important session was contained in the last 7 minutes of the video, and in the activity book (Ottley, 2001 p. 173-184).

Text reading was an important element in the intervention programs used in the large research training programs described previously. It was included in their intervention programs because the phonological and phonic skills, which were directly taught in one part of the lesson could then be applied in real reading situations by the child. Findings about bi-directional causality support its inclusion (e.g., Hatcher et al., 1994). Text reading is included in the present study's intervention for the same reason, but followed a Paired Reading model as described in the previous review of the Paired Reading literature.

Accordingly, the text reading experience required by the intervention of the present study (Sound Track for Reading) was designed to be free of any frustration and failure, because children heard any unknown words as soon as they were needed, and did not have to lose track of the meaning of any given sentence by stopping to decode an unknown word in the sentence. Parents were asked *not* to give decoding cues at this time, but to support the child's enjoyment and comprehension by supplying unknown words.

Children also received very positive feedback from parents for their successful reading of text, especially on the third reading.

The inclusion of text reading by means of Paired Reading in the present study's program is supported by the clear empirical support for Paired Reading (e.g. Fitton & Gredler 1996; Hewison, 1988; Topping & Wolfendale, 1985). It is also supported by the suggestion of Stanovich (1986) that Matthew<sup>2</sup> effects operate over time for children with reading disabilities, compounding their failure because they are likely to read increasingly smaller quantities of text.

Section 3 of the intervention program also aimed to introduce supported access to a wide range of texts to children at-risk for reading difficulties, so that parents and children might realize that quantities of reading need not be limited. Parents were asked to use a regular supply of books from their children's schools, or go to libraries. Schools were asked to cooperate with possible extra requests for books, and were usually very glad of such requests from parents, especially for their reading at-risk children. Systematic Paired Reading projects, which provide training sessions for parents and special arrangements for schools to organize and monitor a steady flow of appropriate books for parents, have become scarce. Despite its effectiveness, Paired Reading seems now to be a method that some educators recommend to parents on some occasions. This may be because of time and cost implications, but its value for increasing quantity of text reading, and access to age-appropriate text reading for children at- risk for reading difficulties may offer possibilities for improving the reading comprehension of grade 2 children who continue to be at-risk for reading difficulties. In the video demonstration of Paired Reading, a

<sup>&</sup>lt;sup>2</sup> "Matthew effects" mean that the rich get richer and the poor get poorer. In reading the term means that those who can read well do more reading than those who cannot read well, and therefore do less reading. Consequently the good readers improve, while poor readers have much less reading practice over time.

grade 2 child reads who had previously been reluctant to read with his parents for more than a year previously. His parents had constantly asked him to decode words which detracted from his enjoyment of the meaning in stories. He regained confidence and motivation by means of Paired Reading, and began to read much greater quantities of text, which resulted in improved reading achievement.

The books used by the families in the present study (and most commonly available in schools now) have been influenced by a mixture of text features such as: the need to give children experience of the diversity of patterns within written English; the need to give children opportunities to link common features of oral and written language as they meet up with printed words, since semantic and syntactic knowledge of spoken language helps all children who are learning to read; the recognition that children also bring verbal understanding to their reading and expect (cognitively) to find words that they associate meaningfully with known topics (Anderson & Pearson, 1984).

Section 3 of the program of the present study also gave guidance on how to introduce the reading session. Attention was drawn to the importance of a relaxed setting, a special interruption-free time, discussion about the appearance of the book and pictures, invitations to speculate about possible events in the story before reading and comparisons of these predictions with what actually happens, after reading. This detailed advice, and the specificity of the Paired Reading model itself, was based on the evidence that parents have widely differing views about the importance of supporting their child's reading and how to do it (Edwards, 1995) and on suggestions that some parents may not be aware of the differences between reading to their children, and supporting their child's own first experiences of reading (Lefevre & Senechal, 1999).

In summary, Section 3 of the study's intervention program intended to provide a clear plan for parents regarding text reading, in order to increase the quantities of reading done by children in the study (which should itself improve reading achievement), and in order to improve the quality of parent- child interactions so as to increase children's understanding and enjoyment of text reading (which should improve children's attitude to reading) and provide an opportunity for independent rapid implementation of phonological and phonic skills (Adams, 1990) being directly taught in the other part of the program.

### Literature Review Conclusions

The three literature reviews were described as bases for both the purpose of the whole study and the purpose of its integral intervention program. The first review (Phonological Processing Skills and Reading) provided the research justification for conducting early screening and intervention procedures, for making them comprehensive enough to include a grade 1 tutoring program and for the content of the intervention program of the present study. Without important intensive grade 1 tutoring components, early screening and intervention procedures are not comprehensive enough for most children at-risk for reading difficulties to achieve the very successful results that are possible. The at-risk children themselves and the whole school community can be richer or poorer according to this factor of comprehensiveness (i.e. providing enough one to one tutoring in grade 1).

Parents could be the ideal partners in comprehensive early intervention schemes, not only for financial reasons, but because they might be the *best* people to undertake a tutoring role, *when given appropriate information or effective training* as described in the second review (Motivation and Reading). The third review (Parents and Children Reading Together) suggests that parents as a group need and deserve to be much more informed about the early reading process for all children. They are their children's first literacy tutors, and are potentially effective on-going tutors *when given appropriate information or effective training*. Children at-risk for reading difficulties (a substantial proportion of the whole group), need effective predictive rather than reactive systems which start in the whole kindergarten context, and are the concern of the whole school. If this responsibility is recognized and addressed, most of the children can become successful and the whole school community benefits. The whole school community includes parents. Hence the reviews have produced two important issues about parent involvement. One is the desirability of involving parents. The other is the costeffectiveness of involving parents.

Hannon (1998) supports both issues. He strongly suggests that in order to foster children's early literacy development in general, parents must be involved. Educators should consider four levels of parental involvement (1) avoiding unnecessary parent exclusion; (2) linking home and school literacy systems; (3) developing home-focused programs for school-age children; (4) developing home-focused pre-school programs. Furthermore he suggests that there are unique home situation factors, which make instruction given by parents at home to their own children potentially very effective indeed. For example, parents can provide one to one help, are not bound by a general curriculum and timetable, and can choose optimal or spontaneous times to teach.

Although Hannon was referring to good literacy practice for all children, an intervention program like that of the present study could be seen as an example of his third way of involving parents: developing home-focused programs for school-aged

children. However schools vary in how much they have developed systems similar to those suggested by Hannon. For example, schools often encourage parent volunteers to give time in kindergarten and grade 1 classrooms, and these parents may develop a strong sense of partnership with the school and more confidence to help their own children at home, but they are a minority of the whole parent population. Schools may advise parents about helpful books on reading and distribute leaflets on: "How to help your child with reading" (e.g., Hall & Moats, 1999; Mavrogenes, 1990; Wilken, 1996), but we do not know how effective these recommendations are for children's reading in general or for children at-risk for reading difficulties. These two ideas are widespread in schools and are of no cost, or minimal cost to schools. In fact parent volunteers are giving valuable time resources *to* the schools.

If parents had reading difficulties themselves, their own confidence to help their own children may be low. There is a high probability that at least one parent of children at-risk for reading difficulties also had reading problems themselves (DeFries & Alarcon, 1996). Family literacy projects have been designed and conducted in response to the needs of some families, meaning literacy programs where early education for children is combined with basic education for parents. They represent the other end of the cost continuum of parent involvement. Family literacy programs have been successfully conducted across the world, and often in areas of socio-economic need. There is no generic family literacy program. They are as diverse as the needs of the participating families, and they are expensive because they have extensive staffing requirements for training and teaching (Brooks, Gorman, Harman, Hutchison, Kinder, Moor & Wilkin, 1997; Cairney & Munsie, 1995). Hannon (1998) suggests that family literacy programs are of great value

but only for some families. They are not a universal solution because most families would not want or need the level of support offered. There are organizations, which can be reached via the internet, offering advice to parents about reading especially at the preschool age e.g. Parents as Teachers. Parents can receive information from newsletters and publications, which may be more accessible than consulting a book only (e.g.Hall & Moats, 1999). The program of the present study attempts to provide research-based, specific information which teachers of grade 1 children might loan to parents, or which school districts could use in coordinator-led initiatives, as well as being available for individual parent use.

The phrase "appropriate information and effective training" has been repeated in drawing the strands of the literature reviews together. It became a central issue for the study to examine how far a video demonstration and a book can replace costly parent training which involves the employment of people as trainers. On a broad scale, there is a clear implication from the relationships between parent involvement programs, which have substantial training requirements and cost, and parent involvement programs, which do not have training requirements, and cost. It is that the greater the cost, the less widespread the programs tend to be, and vice versa. Some of the least costly and most widespread initiatives, like leaflets for parents, are assumed to be helpful, but to what extent and in what ways is unknown. The work of Senechal and Lefevre and colleagues has illustrated that popular assumptions about good advice on reading can be incorrect. The lack of widespread use of Paired Reading (demonstrated to be highly effective by Topping and Wolfendale (1995) and others) may not have become a widespread practice because of the cost of employing coordinators to train parents. Low cost programs may

not be the most effective, but they will tend to become widespread if they are of low cost. grade 1 interventions for children at-risk for reading difficulties, with one to one tutoring and specific instructional components need to become widespread, but are potentially very costly. An additional and important question for this research project became clear, and the study addressed it. It is the issue of whether potentially high cost tutoring of grade 1 children at-risk for reading difficulties can be effectively conducted by parents, when they have a specific program containing the same instructional components as the research tutoring programs and a process which might directly improve reading motivation.

### CHAPTER III

### Purpose and Hypotheses

### *Purpose of the Study*

The purpose of the study was threefold. Firstly it aimed to examine any significant positive gains in reading achievement (additional to the passing of time in grade 1) for an experimental group of grade 1 children at-risk for reading difficulties who used a home intervention program with their parents for a suggested time of 20 minutes daily for 10 weeks, as opposed to a control group of children also at-risk for reading difficulties, but not using the home program over the same period of time. There was also another more specific aspect, that is: to examine the reading outcomes of children of predicted low growth and predicted high growth (Vellutino et al., 1996) within each study group.

Secondly, the study was designed to examine whether there were any significant changes in the attitude to reading of the experimental group children, and the perspectives of the experimental group parents, which could be attributed to using the program, rather than only the effects of the passage of time in grade 1.

Thirdly the study was designed to explore the extent to which a specifically designed program for parents, consisting of an activity book and a video, could replicate the successful results of intensive research study interventions which required costly one to one tutoring to give phonological and phonics skills and text reading instruction.

# Hypotheses

The four study hypotheses were:

Firstly, that significant Time X Group interaction effects would be found in a 2 X 2 analysis (where the Experimental and Control Groups and the 2 Times of testing, pre-and

post, are the independent variables) on a range of reading and reading related measures (dependent variables), when comparing an experimental group of grade 1 children at-risk for reading difficulties who used the study's home intervention program with their parents to a "waiting list" control group of grade 1 children, also at-risk for reading difficulties and, attending the same schools at the same time, but who had not yet used the study's home intervention program.

Secondly, there would be a significant positive change in experimental group child attitude scores on a child attitude survey between pre- and post-testing (i.e. before using the intervention for a period of 10 weeks, and after using the home intervention). There would also be a significant difference between experimental group child attitude scores at post-test, and control group scores at the same point in grade 1, but before working on the study's intervention program.

Thirdly, there would be a significant positive change in experimental group parent perspectives between pre-and post-testing (i.e. before using the home intervention for a period of 10 weeks, and after using the home intervention) according to their responses on a questionnaire for parents. There would also be a significant difference between experimental parent group scores, after using the intervention, and control group parent scores before using the intervention, on the same parent questionnaire.

Fourthly, there would be significant correlations between high change scores on the parent perceptions questionnaire and the measure of treatment integrity, and between high treatment integrity and change scores on reading and phonological measures (i.e., rank ordered difference scores between pre-and post-test results). This would indicate

that the study's intervention program had contributed to motivation and academic gains over and above the combined effects of regular school and additional school programs.

Overall, the intention of the study is to provide some indication that parents can be effective and cost-effective tutors of their own grade 1 children, using a home program in place of the high cost individual tutoring options used in research studies.

### CHAPTER IV

### Method

### Design.

The present study was a longitudinal training study, involving pre-and post-testing of a group of children (n = 46) on a reading achievement test battery in October and February of grade 1. Children and their families were randomly assigned to two groups (experimental and "waiting list" control). The study provided an intervention program for the experimental group parents to use at home with their own grade 1 children between pre-and post-testing, and for the control group parents to use later in grade 1 (immediately after post-testing of all the children).

The study had a two by two factor design for the quantitative analysis, using factorial ANOVA. There were two levels of the between subjects factor, which were groupings according to intervention (experimental group), or no intervention ("waiting list" control group). There were two levels of the within subjects factor, which were the two times of measuring outcomes on the battery of tests. The parents in the study were those who chose to participate out of a larger group of 100 parents whose children had been identified as at risk for reading difficulties in the previous school year while in the kindergarten classes at 14 schools in the North Vancouver School District. Therefore, the study design assumed that there were equal levels of enthusiasm in both groups of parents to work at home on early reading. Parents were not able to choose the group assignment, since the children were randomly allocated to one of the two groups. This meant that families allocated to the experimental group used the program during 10 weeks in the first part of grade 1, and families allocated to the "waiting list" control group used the

program during 10 weeks in the second part of grade 1. Using a "waiting list" control group meant that all children had the chance to gain from the program at a time during the important grade 1 year. Ten of the fourteen schools were predominantly middle class schools with incomes above the national average for British Columbia (Statistics Canada, 1996). Two schools were considered to be schools of somewhat lower socio-economic status, but with average incomes, and two other schools were considered to be relatively disadvantaged schools, with below average incomes.

Randomized allocation to groups within schools was a feature of the design which intended to make socio-economic factors and school environment factors as equal as possible. All schools provided extra reading programs to all the children in the study, except one child in the experimental group, whose turn for individual tutoring did not come until after the study period. Extra reading support within the schools was regarded as being at two different levels: one of these was intensive and consisted of 3 or 4 individual tutoring sessions each week, and the other was a less intensive level where the children received two or three sessions of extra reading instruction within a small group of about 5 children. Three schools used the intensive individual tutoring model, and eleven schools used the small group model in general. Altogether 9 children in the experimental group, and 11 children in the control group received the more intensive individual tutoring level of help in school during the study period; 14 experimental group children and 12 control group children received the less intensive, small group level of help.

Based on the method used by Vellutino et al. (1996), an examination of the pre and post-test results of a subset of 5 children in the experimental group and 4 children in the

control group was possible. These children were of predicted low growth according to three criteria: one, very low scores (below the 5<sup>th</sup> percentile) on the original kindergarten screening (Torgesen & Wagner,1994), two, a low profile of scores on the pre-tests of the present study and three, subjective teacher judgments of slow progress on the school kindergarten phonological skills instruction program. Similarly it was also possible to conduct an examination of the pre and post-test results of another subset of 3 children in the experimental group, and 5 children in the control group who were of predicted high growth according to the three criteria: one, scores above the 10<sup>th</sup> percentile on the original kindergarten screening, two, a higher profile of results on the pre-tests of the present study and three, rapid progress on the kindergarten intervention.

Children in the study sample sometimes came from different classes within the same school. Some information was therefore sought from the Learning Assistance Teachers about any perceived differences of teaching style and emphasis for children in different classes and different study groups who attended the same school. Attendance at the same school meant exposure to the same whole school ethos and policies. However, informal descriptions of teacher style and emphasis were noted, since the sample size was not large enough in itself for random allocation to study groups to control entirely for such differences. Potentially, teaching differences could contribute substantially to the variability of scores, since the combined effects of the program and regular school teaching were being measured.

# Treatment Integrity

Treatment integrity, or how an intervention is implemented as planned (Gresham & Cohen, 1993) was an important aspect of the study design. Integrity data were analyzed

by obtaining an estimate of the quantity of components completed over the days of treatment. The components for this study were firstly the number of activity sessions completed over 10 weeks, and secondly the number of Paired Reading sessions conducted over the same period of time. A treatment integrity ratio was obtained by summing the actual number of components over the sum of the total possible number of treatment components. This allowed comparisons between individuals of high and low treatment integrity from the experimental group with their measured progress between pre and post-testing and with their questionnaire responses. The calculation of treatment integrity was also important in view of the fact that the program was the only means of training parents (i.e. a coordinator to give outside feedback and help was not provided).

Treatment integrity was monitored in this study by the use of forms within the program activity book. Appendix B shows the main summary form used for measuring treatment integrity. It took the form of a calendar with the weeks of the study (1 to 10) listed down the right hand side, and the days of the week at the top. Each daily space was divided into two, so that both instructional and Paired Reading sessions could be ticked if both were completed, or just one of the two, or neither. Parents were asked to fill these in as diligently as possible since all the treatment integrity scoring could be done from this form. Appendix C shows a form to record the teaching zones, which were used during the 10 weeks. The left hand column of this form asked for the date of beginning work in the new area, the middle column shows which teaching area, and the right hand column asked parents to indicate the next step, which could be a teaching target within the same teaching zone. Completion of this form provided information about how much time was being spent in particular areas of the program, and it was only completed when an area of

the program was completed, unless parents wished to use it in a more detailed way for targets within teaching areas. Parents were asked to complete Appendix D every day to record which book they were using for Paired Reading, and how long they were spending on Paired Reading at each session. Appendix E shows the form which parents used to summarize results of the initial tests in Section 1 of the program, which enabled the parents to know where to start teaching. It was usually completed within the first two or three days of the study, after which time the form shown in Appendix F would be used to record progress. There are many hazards in trying to maintain high levels of treatment integrity in naturalistic settings like schools, and even more within homes (Hargett & Webster, 1997).

# Child Attitudes and Parent Perceptions

In order to examine the second and third study hypotheses relating to possible motivational changes for parents and children, and therefore possible correlations between motivational changes and treatment integrity scores, and between motivational changes and reading outcome measures, attitude questionnaires were administered to the children and parents before and after using the program. The children's questionnaire was the Elementary Reading Attitude Survey (McKenna & Kear, 1990), which is provided in Appendix F, and the parent questionnaire (devised by the investigator and adapted from Perry & Nordby, 2000) is provided in Appendix G.

The parent questionnaire was numerically scored only, and it was used for pre and post-test examination of changes in experimental group parental perceptions. A comparison of the post intervention responses for experimental group parents was also made with the pre-intervention responses of "waiting list" control group parents. The

questionnaire was administered to parents at the time of meeting with the investigator to receive the intervention materials (pre-test), or to return the intervention materials (post-test). The parent questionnaire did not have any psychometric properties, and was simply used as an exploratory way of asking about perceived changes.

The empirical basis of the Elementary Reading Attitude Survey (ERAS) has been described in Chapter II, and it was used to measure attitude change in the experimental group children between pre and post-testing on the reading achievement test battery (before and after working on the home intervention program). It was administered to the experimental group children just after they had completed the pre-test battery. At posttest it was administered in school, after completion of the post-test reading measures battery by the graduate students who conducted the testing. The survey was also administered to the control group children in the same way and at the same time as the experimental children who were then completing the questionnaire as a post-test.

### Demographic Questionnaire

4

The demographic questionnaire (Perry & Nordby, 2000) is shown in Appendix D, as well as the information obtained from administering it to parents in both the experimental and control groups. Families of both groups completed the questionnaire, which allowed socio-economic factors to be numerically scored. These were: number of parents in the home; number of children in the family; whether English was the first language spoken at home; whether the child in the study had attended pre-school; number of parents working full-time or part-time; highest educational level of parents. Data from Statistics Canada 1996 Census enabled the comparison of estimated income by occupations across the two groups.

### Sample Selection

The study took place within a school district (North Vancouver School District, B.C., Canada), which operates a systematic scheme of early intervention for children at risk for reading difficulties. The scheme begins with routine screening of all kindergarten children on the basis of their phonological and reading related skills in order to find those at risk for reading difficulty. The scheme is well understood across the whole school district and kindergarten teaching staff have been given training on using kindergarten screening tests and on the implementation of intervention programs to follow for the children at risk for reading difficulties. The test used by all the schools in the present study was the TOPA (Test of Phonological Awareness, Kindergarten Version – Torgesen & Bryant, 1994). This test is simple and quick to administer. It consists of 20 items that involve comparison of the first sounds in words.

For the purposes of the present study, a list of children at risk for reading difficulties was available from Learning Assistance teachers in the schools. A list of at least 100 families whose children were identified as at-risk for reading difficulties was made. Then, a letter containing information about the purpose and structure of the study and an invitation to participate was sent to the parents. Parents had already received information from schools regarding their children being at risk for reading difficulties, according to the policy of the school district. The invitation to participate in the study was received as part of discussions with their child's school regarding future intervention and planning. The most important two pieces of information that parents received about the study, before deciding whether or not to participate, concerned the daily time commitment, and the fact that it was not possible to choose which group to be in

(experimental group or "waiting list" control group). Approximately 50% of the invited group completed and returned the reply slips, indicating their wish to participate. The whole study sample was formed from the positive replies.

All families received more information about the study and about the program by letter. All parents were also invited to attend an information evening. They could seek more information by telephone, and by meeting with the investigator. About 30% of experimental group families attended the information evening, but only one or two of the "waiting list " control parents. Schools knew which families were involved and when the two times of conducting the intervention began. Schools did not know to which study group the families belonged.

### Procedures

The families were randomly allocated to either the experimental group or the "waiting list" control group, and notified about their times of commencing the intervention during grade 1 (October or February). Experimental group families received the intervention program immediately after all the children in the whole sample had been pre-tested, using the battery of 10 tests of reading and phonological processing skills listed in Appendix A. The test battery, which is described in detail in the *Measures* section of this chapter, included two word reading tests and one pseudoword reading test. These were the Wide Range Achievement Test (WRAT) of Reading (Jastak,1993), and the Woodcock Reading Mastery (WRMT) Word Identification and Word Attack tests (Woodcock, 1987). The Wide Range Test of Spelling (Jastak,1993) was included, and three measures of phonological processing skills: Phoneme Deletion (Initial Sound), Phoneme Deletion (Final Sound) and Phoneme Deletion and Substitution. The other three tests were of

identifying words in a meaningful story context (Mystery Word), rapid naming of pictures (Denckla, 1972) and semantic and syntactic understanding (Oral Cloze Test).

Experimental group parents and children completed the questionnaires before commencing the intervention at the introductory meeting with the investigator. The parents received a verbal description of how to get started with the program. They were able to ask any questions that arose about using the program by telephone. Few parents contacted the investigator to ask for more information after the initial meeting when parents received the intervention program. When the investigator contacted parents, the information in the activity book supplemented by the video appeared to have been clearly understood in most cases. Each parent was asked to read the introduction to the program in the activity book (Ottley, 2001, pp. 2-9), and to watch the video several times. Pretesting was conducted in the schools during the school day. In February, post-testing of all the children in the whole study sample took place, again in school, but not by the investigator since the investigator knew which groups the children belonged to. The second testing and second administration of the children's questionnaire were conducted by two graduate students who were familiar with the administration rules of the tests, but did not know which group the children belonged to. "Waiting list" control group families then received the intervention program. "Waiting list" control group parents also completed the parent and demographic questionnaires in February of grade 1. The arrangements for introducing "waiting list" control group parents to the program were the same as for experimental group parents.

The maximum estimated number of instructional sessions which could take place for the experimental group was 70 activity sessions (7 days per week for 10 weeks) and 70

reading sessions. This was a very optimistic estimate and no families conducted more than 6 sessions per week of activities and 6 sessions of reading. Thus the maximum total amount of time for activities was estimated to be 6 hours, and in addition a further 6 hours were assumed for Paired Reading, making a possible total of 12 hours. The number of hours across the day of the study provides a measure of treatment intensity. Experimental group parents indicated the number of activity sessions, and Paired Reading sessions, which were completed during the 10 weeks on the record forms (Appendices B, C, D, and E ) as described previously. Information on instructional starting points in the program was provided in the program (Ottley, 2001, p. 56) and is important for the decisions which parents made about where to start teaching after conducting the diagnostic tests. Diagnostic test information is included in the description of the program to follow and in Appendix J. "Waiting list" control group families received the intervention program after post-testing, and were able to continue using the program during Grade 1, and beyond, if they wished to.

# Sound Track for Reading

# Program Components

The present study provided a new program called Sound Track for Reading (Ottley, 2001), which is designed for parents to use with their own children during grades 1 or 2. The program contains instructions and all materials for phonological and phonics skills tests<sup>3</sup> and corresponding activities which are to be used in a daily teaching session of 10 minutes. Figure 1 provides a synopsis of the phonological and phonics components. Paired Reading takes place in a further 10 - minute session at another time in the day, and

<sup>&</sup>lt;sup>3</sup> The tests referred to are diagnostic tests for parents to use at the beginning of Sound Track for Reading so as to find weak phonological and phonics skill areas which can be improved by using the activities related to each test. They are not part of the study's test battery of reading measures.

specific guidance is provided on introducing and conducting the session. These suggested times for work on activities and reading were adapted for the home situation, based on feedback from parents. Appendix J summarizes the Sound Track for Reading Program.

Phonological Test	<b>Teaching Activity</b>	Materials
1 – Whole words as units of sound.	Whole words as units of sounds	Word lists to tap beats with plate and stick; moving cubes into a grid.
2 – Rhyming	Rhyming	Sets of rhyming word pictures for games.
3 – Onset-rime splitting	Onset-rime splitting	Sets of one-syllable words, two- part grid and cubes.
4 –Beginning and ending sounds	Beginning and ending sounds	Sets of word pictures for 12 initial & 9 final consonant sounds
5 – Phoneme splitting & blending	Phoneme splitting and blending	Grid, cubes, sets of 2, 3 & 4 phoneme word pictures for games
Phonics Test	Teaching Activity	Materials
6 – Letter-sound linking	Letter-sound linking	Large & small lower case letters with arrows; success sheets
7 – Consonant – vowel-consonant	Consonant-vowel- consonant words	Vowel family pictures, vowel – consonant stories & games
8 – High frequency words	High frequency words	Word walls & 22 words; "look,say cover,write,say,check" game
9 – Consonant blends etc.	Consonant blends & two syllable words	Envelope matching game & syllable matching game
10 – More high frequency words	More high frequency words	Word walls & 28 more words.

Figure 1. The Structure of Parts 1 & 2 of Sound Track for Reading.

Sound Track for Reading consists of an activity book and a video. The activity book contains the three instructional components: tests of phonological and phonics skills, activities to teach the same phonological and phonics skills and Paired Reading guidance. The video shows parents using parts of the program with their own children, while positively modeling the strategies of mediation and the collaborative teaching and learning process described in Chapter II (pp.41-43)

The activity book explains phonological skills as auditory language processing skills and phonics skills as the understanding of letter-sound correspondences in printed words and sentences. It describes the known effectiveness of giving phonological skills instruction (Ottley, 2001, pp. 4-5) and of directly teaching phonics principles especially in a way where each component reinforces the other (Torgesen, 1997). It provides a glossary of the terms relevant to giving phonological instruction (pp. 6-7). It lists the five graded phonological tests: (1) Whole words as units of sounds; (2) Rhyming; (3) Onsetrime splitting; (4) Discrimination of beginning and ending sounds; (5) Phoneme splitting and blending. These are followed by the five graded phonics tests: (6) Letter-sound linking; (7) Consonant-vowel-consonant (c-v-c) reading and writing; (8) Reading and writing high frequency words; (9) Reading and writing words with consonant blends and two syllables; (10) More high frequency words.

All the tests are conducted at the beginning, usually taking between two and three sessions. Work then continues on the activities corresponding to the tests as needed.

Each test includes parent recording sheets, child response sheets and stimulus sheets. The child response sheets are all provided in duplicate, so that one set can be removed from the book for the child to use. A summary chart enables the recording of results after each test has been given, and a guide to scores (with cut-off points) is also provided to indicate which teaching activities (corresponding to the tests) should be used.

The method of moving from testing to teaching in directly related activity areas is clearly described in the program. Testing allows parents to discover gaps in a sequence of

skills which their children need to learn to become confident and fluent readers. The tests also enable the program process to be a dynamic one according to the learning theory of Vygotsky (Cole et al., 1978). They reveal detailed information about the first teaching targets in any of the 10 activity areas.

### Program Contents

As described in Chapter II, the three instructional components of the program (graded tests and activities of phonological skills, phonics skills and specific guidance about Paired Reading) are based on the content of the interventions successfully used in recent studies (Foorman et al., 1998; Torgesen et al., 1999; Vellutino et al., 1996) and the successful results of Paired Reading projects (e.g., Topping & Wolfendale, 1985).

Most phonological skills intervention programs use a hierarchical structure, first demonstrated by Hatcher et al. (1994). The five phonological areas will now be described in more detail: (1) Identifying words as whole units of sound is a basic level, which proves to be surprisingly hard for some children. Sometimes it is taught using word strings of increasing length (between 1 and 5 words), to which children respond by moving a corresponding number of cubes into a grid. At other times it is taught by tapping (e.g. tapping a spoon on a paper plate,) (Bennett & Ottley, 1996), so that only beats of sound are heard, without the addition of meaningful language. In the program of the present study, tapping is suggested as a scaffolding idea that can be used to help the child achieve success in a supported way, while learning the skill of recognizing single words as large sound units. (2) Rhyming is an early phonological ability. Many kindergarten teachers and parents have traditionally recognized rhyming activities as helpful games, which would reinforce awareness of sounds in words. Rhyming songs are fun to sing and to hear. Saying many different rhyming words with picture word prompts enables rhyming games of "odd one out" (Bradley & Bryant, 1983) and also encourages children to produce rhyming words of their own, which is a harder level of rhyming. (3) Onset-rime activities serve as an introduction to the more difficult skill of phoneme splitting and have also been shown to help spelling achievement (Goswami & Bryant, 1990). A special two-part grid is provided, and the use of interlocking cubes to represent the segments of the words makes an enjoyable game. An onset is the first phoneme in a word and the rime is the remainder of the word. For example in the word "cat", "k" is the onset, and "" t " is the rime. (4) Discrimination of beginning middle and final sounds in words is an important skill that can be improved by auditory games involving sets of word pictures and playing: "Which is the odd one out?" or "Happy Families". (5) The fifth phonological activity area concerns phonemes. Practice is provided with two, three and four phoneme words shown as pictures and pronounced as "robot talk" or responded to by moving blocks into a grid. "Robot talk" involves saying the phonemes of a word separately, in a staccato way with no change in voice expression. Children practice both counting phonemes when listening, and pronouncing phonemes themselves in this part of the program. The Sound Track for Reading video shows a grade 3 girl who had not received this training in kindergarten or in grade 1 and who benefited by learning how to manipulate phonemes in level 5 of the program, which in turn helped her to read and write difficult consonant blends like "b-r" in the word "bread" in level 9 of the program.

The phonics tests and activity areas contain both reading and writing aspects at each level. They involve printed letters and words. The first phonics area (6) involves checking that sound-symbol links are known and that letters can be correctly formed.

Well-known progressions in teaching correct letter formations are used, from writing in sand, to tracing letter shapes from a dot, to writing over dotted letters and finally to writing single letters independently. Multi-sensory methods are introduced to help visualmotor integration, memory for sounds and memory for letter symbols. Many children atrisk for reading difficulties need extra time and practice in grade 1 at this stage. The second phonics level (7) involves identifying, pronouncing and writing short vowel sounds correctly and fluently. Children create characters with names that contain the short vowel sound and one consonant (e.g. "Ab", "Ed" and "Ig") and are able to draw the characters and their whole families, while repeating the names and writing the names many times in a meaningful context. The third phonics level (8) introduces 22 high frequency words (Dolch, 1965) set in "word walls", one of which can be cut up into word cards, like small flash cards, so that matching games can be played. The emphasis is on whole word recognition since these are not words which can be represented directly in a picture, or even indirectly like high content words (Hiebert, 1998). The method of "Look, Say, Cover, Say, Write, Check" is introduced for spelling. The fourth phonics level (9) involves reading and writing two syllable words and words with consonant blends, using several picture and game suggestions for working in these areas. The fifth phonics level (10) involves a further 28 high-frequency words (Dolch, 1965), more word wall games and also using "Look, Say, Cover, Say, Write, Check" for spelling.

The third part of the program (Supported Reading) gives guidance about choosing a suitable time and place to conduct the second daily session which involves parent and child reading together. It draws attention to the fact that there are many distractions in most family homes (e.g., television or the activities of siblings) which need to be avoided

for this short time in the day. Wilken (1995) claims that preserving such a time every day for children is emotionally nurturing as well as beneficial for reading. Paired Reading instructions are clearly provided in the activity book (Ottley, 2001, p.180.), and a demonstration of Paired Reading is shown for 7 of the 22 minutes of the program's video.

# **Program Process**

Two aspects of the learning theories of Vygotsky (Cole et al., 1978) are of central importance to the Sound Track for Reading process. Firstly, the program follows a dynamic test-teach-retest model, hence the 10 tests form the first part of the program's content. According to this model each teaching area is known as a zone of proximal development (ZPD), which is a new level of learning close to what the student can already do, but providing additional challenge. The new level of learning is also the next step towards mastery of a given content area. Vygotsky believed that static testing (pretesting) was only the beginning of a process of discovering what the student can achieve with help that involves careful scaffolding. For example in the program (Ottley, 2001, p.71), if the child finds it difficult to hear whole words as separate units of sound, it is suggested that parents introduce tapping a spoon on a plate to respond to patterns of beats only, before returning to word strings. When the ZPD has been located by the teacher (in this case the parent) by conducting the preliminary tests, goal setting is automatically involved so that the new level of learning (new skill to be taught) is modeled for the student. Then the collaborative process begins so that the student plays a part in deciding how much scaffolding will be needed until eventually, the skili is fully learned and can be performed independently (Feuerstein et al., 1985; Litz, 1991; 1995; 1997).

The second aspect of Vygotsky's theories to be central to Sound Track for Reading's process is the use of the 6 strategies of mediation and the specific language that accompanies them. The strategies (Intentionality and Reciprocity, Sharing, Meaning, Transcendence, Regulation of Behaviour and Feelings of Competence) were fully defined in Chapter II (pp. 50-53) and examples of their use in the program video are given. The strategies and many examples of accompanying language are also described in the program's activity book (pp.185-192). The aim of the language of mediation strategies is to work directly on aspects of motivation by providing a form of attribution and selfefficacy training and encouraging an internal locus of control. Chapter II (pp.50-53) also explains how the language of the 6 strategies is consistent with methods to improve motivation for reading. For example, parents combining the principles of Transcendence and Feeling of Competence might compare newly learned skills with a time in the past when they were unknown and worrying by saying: "Can you remember when you couldn't do that? Now you can do it very well." Parents can also use encouraging projections into the future "Because you know this now, you will be able to use it in other words". All of these statements also encourage new attributions (e.g. by implying "if you thought you couldn't learn this before because you weren't smart enough, now you know you can learn it when you have a different method of teaching", and an internal locus of control : "You can learn this by finding a new method", and new feelings of selfefficacy: "Now you can do it very well".

The incorporation of the language of Vygotskian strategies of mediation into the program is a deliberate means of guiding parents towards expansive questions, and away from approaches typified by a tense and narrow focus on decoding prompts, fears about

using scaffolding, and a lack of sensitivity to the child's frustration levels. This was considered to be important in view of the possible uncertainty which many parents have in working with their own children on reading (Edwards, 1995), and the value of expansive discussion and questioning. Tracey (1998) made the point that studies of the techniques employed by the parents of successful readers are at least as important as what parents might be taught to do in programs of "remedial" instruction. The parents of successful readers asked a wide range of questions which sometimes prompted children to recall associations (with present reading content) from their own experience, and sometimes asked children to imagine or predict ideas related to the reading content. These approaches encourage thinking about the skills being learned or the meaning of text, and are likely to stimulate greater comprehension and interest in the child.

### Measures

### Achievement Test Battery

The same test battery of reading and phonological processing skills was used for pre- and post-testing. There are alternative, parallel forms of one of the word reading tests and the spelling test. The battery contained 10 tests, shown in full in Appendix A. The full list of tests and their purposes contained in the battery used for pre-and post-testing is described in this section.

 Wide Range Achievement Test –3 (WRAT) of Reading - Blue and Tan forms. These are tests of letter and word reading in a list of increasing difficulty. At pretest, the Blue form required children to name the sounds or names of 15 letters (A, B, O, S, E, R, T, H, U, P, I, V, Z, J, Q), and the words: "in, cat, book, tree,
how, animal, even, spell". At post-test the Tan form required children to name the same 15 letters, and different words: "see, red, milk, was, then, jar, letter, city".

2. The Wide Range Achievement Test –3 (WRAT) of Spelling - Blue and Tan forms. These are tests of letter writing and word spelling to dictation. At pretest using the Blue form, children were asked to write their names and 13 letters in either upper or lower case (A, C, F, O, W, N, G, L, D, J, K, Y, X), and the words: "and, in, him, make, cook, must, enter, light, reach, circle". At post-test, using the Tan form, children wrote their names and the same letters followed by different words: "go, cat, boy, run, will, cut, arm, dress, train, shout".

# The Wide Range Achievement Tests (Wilkinson, 1993)

The Wide Range Achievement Tests (WRAT) have two forms, entitled Blue and Tan. The Blue Form was used in the pre-test, and the Tan form in the post-test. The WRAT examined both reading and spelling.

It was expected that the letter naming, and letter writing, would be completed by most of the children at pre-test. They were not expected to read many of the words at pretest. At post-test grade1 children would be expected to read and write the letters easily, and possibly read several words. The tests enable the conversion of raw scores into standard scores, percentiles and grade equivalent scores. The tests enable a wide range of skill development to be measured, making them very suitable for the purpose of the present study.

- 3. Phoneme Deletion Initial Sounds a test of listening to a word (with picture), and saying it without its initial phoneme (e.g. "Here is a picture of a bus. The first sound in bus is 'b'. Say 'bus' without the 'b' sound").
- 4. Phoneme Deletion Final Sounds a test of listening to a word (with picture), and saying it without its final phoneme (e.g. "Here is a picture of a foot. The last sound in foot is 't'. Say 'foot' without the 't' sound.")
- 5. Phoneme Deletion and Substitution a test of listening to words (without pictures), saying some without initial or final phonemes, and saying some with the substitution of a different phoneme (e.g. "fill (change /f/ to /b/)"; "cup (change /p/ to /t/)"; "crest (change /s/ to /p/)").

(The full tests are given in Appendix A.)

# Phoneme Deletion Tests, and the Phoneme Deletion and Substitution Test.

The phoneme deletion tests of initial and final sounds were selected from Muter, Hulme & Snowling (1997) and all items are shown in Appendix A. The items of the first two phoneme deletion tests hadd pictures, which gave some support to short term memory, as the children were asked to delete phonemes in well - known words that can be shown as pictures (e.g. "Here is a picture of a bus. The first sound in bus is 'b'. Say 'bus' without the 'b' sound."). If these items were correct children were asked to attempt more complex phoneme deletion and substitution items, which did not have accompanying pictures.

Since different levels of phonological awareness can be assessed, and the ability to delete initial and final phonemes is a more advanced skill than the ability to segment words into syllables or to be successful on rhyming tests (Muter et al.1997), two tests of

phoneme deletion were included in the battery, which allowed for a range of skills to be tested, since all children had already had phonological skills instruction in kindergarten. If children can manipulate phonemes in words so as to be successful on phoneme substitution tests, their phonological awareness is even more advanced and they are also using phonological memory skills (Torgesen et al.,1994). The range of phonological awareness skills that could be tested by the three tests of phoneme deletion and substitution (with and without pictures which offer some support to phonological memory) was therefore wide enough to measure both initial status and progress in at-risk readers who were going to receive more phonological skills training and phonics instruction (which would also enhance phonological skills according to bi-directional causality theory)

6. Mystery Word Test. This is a specially devised test of reading short passages in order to identify a particular target word (the "mystery word") by using context information. Children read short sentences containing the target word, and giving meaningful clues to help them identify it.

# The Mystery Word Test

The Mystery Word test was devised as a test of text reading, which enabled children to use semantic information, when they were asked to read short passages of text with many repetitions of a target word. The Mystery Word test was devised for the larger North Vancouver study for use with grade 1 children. First children were asked to read the mystery words one at a time. If they could read the word they did not read the passage which contained it. If they could not read the word, they started to read the passage to figure out the word by using a combination of context cues, decoding and known sight words. The testers could help children with all other words in the passage except the mystery word. However, if the text reading was so difficult that no words could be attempted, the test was discontinued. Therefore, not all children read the text passages. Since the "mystery word" occurred eleven times in each passage, scoring was done according to how quickly they could solve the mystery and read the word (e.g., if children read the word in the first sentence, their score was 11/11.) The passages (printed in full in Appendix A) contained the following mystery words: "turtles", "flowers", "kangaroo" and "chocolate". No children could read any of the four mystery words at pre-test. By post –test the Paired Reading element of the study intervention might have prepared the experimental group children for more success on this test. However it was also possible that control group children might receive as much story reading at home, as a normal part of what the parents of grade 1 children would do in the home situation.

- 7 Woodcock Reading Mastery Test (WRMT) of Word Identification. This is a word reading list of increasing difficulty (e.g. " is, you, and, up, cat, stop, come, jump, help, book.").
- 8 Woodcock Reading Mastery Test (WRMT) of Word Attack is a pseudoword reading list to measure decoding skills (e.g. "dee, ift, raff, bim, nan, un, fay, gat, roo, oss".)

#### Woodcock Reading Mastery Word Tests (WRMT)

The Woodcock Reading Mastery Test (WRMT) of Word Identification contains a higher proportion of "high frequency" words than the WRAT of Word Reading. Most of

the words early in the test are also easily decodable. The WRMT Word Attack Test consists of words without meaning (pseudowords), and is a means of testing phonological decoding. Children at-risk for reading difficulties without extra direct instruction may continue to find word decoding difficult, despite the regular teaching of grade 1. Children with good phonological skills, usually make considerable progress with word recognition and word decoding during Grade 1 (Juel, 1988). The use of all three standardized reading tests enabled a comparison of percentile scores from two different word lists, and a measure of the progress of phonological decoding skills of the children in the two study groups.

9 Rapid Automatized Picture Naming (RAN) – rapid naming of 40 pictures of 5 common objects (ball, chair, bed, tree and bat) which appear in 8 rows.

#### RAN- Rapid Automatic Naming.

RAN -Rapid Automatized Naming (Denckla, 1972) was included in view of the claims made for the possible importance of this deficit, as described previously (Wolf, 1997). It contains 8 rows of 5 pictures, which grade 1 children can name easily: pear, bird, tree, chair, house. Each picture appears in a different place in every row. Administration of this test involves checking that the child can name the pictures. Then instructions are given about naming the pictures across the rows from left to right, and consecutively row by row as quickly as possible but without making mistakes. The time taken to name all 40 pictures is recorded in seconds. The number of uncorrected errors is also counted. 10 Oral Cloze – a test of supplying a missing word in a sentence. The test measures the child's semantic understanding and grammar.

# Oral Cloze Test.

The Oral Cloze test is a specially devised collection of 14 sentences which are read aloud to the child. Each sentence has a missing word which can be guessed mainly on the basis of the child's understanding of grammar (e.g., "Sally has a party dress and a school dress. She has two\_\_\_\_\_\_".) Also, understanding the semantic information in the rest of the sentence is important (e.g., "Yesterday, Joe\_\_\_\_\_\_ the ball.") Sometimes there are several correct answers (e.g., "kicked", or "hit", or "threw" in the last example). Administration of this test involves explaining how the missing part of the sentence will be indicated (e.g., "I will say 'blank'" or "I will make a beeping sound, like '\_\_\_\_"). Then the child is given two practice items, so that they understand exactly how to respond. Semantic and syntactic understanding are important for reading (Hiebert, 1998) and the Oral Cloze test gave a measure of these aspects.

### Parent Questionnaire

The parent questionnaire had 10 questions, each having four response options. The options were on a Likert-type scale (never, sometimes, quite often, often). The four point options were sometimes listed from positive to negative, and sometimes in reverse order, to encourage careful reading of the possible responses by adults. The parent questionnaire had three questions asking the parent to judge the child's reading progress (Question 1, 3, & 7), and two questions designed to examine the kind of prompts given while hearing the child read (Questions 4 & 6). Three further questions asked for parental perceptions of the child's enjoyment of reading (Questions 2, 5, & 9), one question directly asked about

the parent's own confidence to help the child with reading (Question 10) and one question asked how important it was to the parent that the child became a good reader (Question 8). The questionnaire was devised by the investigator and used a larger questionnaire as a partial source (Perry & Nordby, 2000). The three questions about reading progress and reading enjoyment respectively were intended to parallel the child attitude survey which had an equal number of questions about attitude to academic reading (progress) and leisure reading (enjoyment). The two questions about prompts given by parents were intended to provide a way of examining whether or not use of the adapted Paired Reading method within the home program had changed how parents gave prompts while reading with their children. The single question asking about change in confidence levels to help was related to both program effectiveness, and the idea that parents may be generally unsure about how to help with reading. This questionnaire was numerically scored, and did not have subscales.

## Child Attitude Survey

The questionnaire used for children was the Elementary Reading Attitude Survey (McKenna & Kear, 1990) devised for children in Grades 1 to 6. The ERAS was normed on 18,183 children, from 95 school districts in 38 U.S.A. states. There were an equal number of boys and girls and the sample was considered to be representative of the population of the USA.(McKenna, Kear & Ellsworth, 1995).The internal consistency of the scale was alpha, .80 (Cronbach, 1951). The scale was derived from earlier published surveys (e.g., Estes, 1971; Heatherington, 1979), but all the items were put into a format which used the interrogative and "You" (e.g., "How do you feel...?" ). This format was shown to be preferable for use with younger children, and one that enabled differentiated

responses between attitudes, perceptions of difficulty and perceptions of competence (Chapman & Tunmer, 1995). In addition, 4 pictures of the cartoon character (Garfield) were used to provide assistance for young children to understand the 4 point scale. The calculations for Grade 1 children normally result in one general attitude percentile score. The reliability coefficients for reading attitudes of the younger children in Grades 1 and 2, while still acceptable (between .74 and .80), were slightly lower than those for the older children (all above .80). The raw scores are easily converted into percentiles by using the accompanying tables.

#### Statistical analysis

ANOVA group comparisons for repeated measures to examine Time x Group interactions for all the measures of the battery were conducted using a significance level of p < .05. The same ANOVA group comparisons were also conducted a second time, omitting the three children whose scores on Word Attack at pre-testing were above the  $30^{\text{th}}$  percentile, since this was the criterion for regarding children as no longer at-risk for reading difficulties by the beginning of grade 1.

The Early Reading Attitude Survey results were calculated as percentiles to enable comparisons between pre- and post-testing, and between the two study groups. The parent questionnaires were numerically scored only, since this questionnaire had no psychometric properties and was used only in an exploratory way. Pearson correlations, either two-tailed, p < .05 or one-tailed, p < .10 were calculated between difference measures of most dependent variables including treatment integrity. These results are now presented in Chapter V.

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#### CHAPTER V

#### Results

In order to make a group comparison between the experimental and control children on the 12 measures administered at pre and post-test, a 2 x 2 group by time analysis of variance (ANOVA) was conducted on each measure. The ANOVA in this study has both between subject and repeated measures factors. The ANOVA's examined within-subjects factors (measures administered at pre and post-test), and between-subjects factors (group membership: experimental or control). Therefore, the main effects of group, and interactions between group and measures administered at pre and post-test will be reported. Percentile ranks were chosen as the unit of measurement for analyses since the data are normally distributed, and statistical power can be gained (Zimmerman & Zumbo, 1993). Although all participants in this study had been identified as at-risk during kindergarten, three participants scored above the 30<sup>th</sup> percentile on Word Attack. by the beginning of this study. Hence, these group comparisons were also conducted without 3 children (2 experimental group, and 1 control group).

Questionnaire analysis was conducted by independent samples t-tests for both child attitudes and parent perceptions. The t-tests compared experimental group questionnaire scores at pre- and post-test, and also compared experimental post-test questionnaire scores with control group pre-intervention scores.

Individual treatment integrity scores were obtained for the experimental group families by calculating a ratio comprising a summation of the teaching and reading sessions conducted over the maximum number of sessions possible. A group treatment integrity percentage score was obtained from the ratio of total group sessions conducted over the total of possible group sessions. Treatment integrity ratios were also calculated for teaching activity and Paired Reading sessions separately.

Table 1. Means, Standard Deviations and Ranges on Measures of Reading for

Experimental and Control Groups at Pre- Test and Post-Test

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	Pre-Te	est	Post-Test		
Measure	Experimental	Control	Experimental	Control	
	Group	Group	Group	Group	
	(n=23)	(n=23)	(n=23)	(n=23)	
WRAT Reading					
Percentile					
Mean	32.52	29.83	54.52	50.26	
SD	18.91	19.73	25.53	32.23	
Range	1 - 75	1 - 68	14 - 95	1 - 94	
WRAT Spelling					
Mean	29 17	33.00	59.96	51.13	
SD	22.65	23.42	21.38	28.64	
Range	1 - 75	1 - 83	23 - 88	1 - 88	
Phoneme Deletion Initial*					
Mean	1.39	2.30	6.17	5.09	
SD	2.63	3.31	2.84	3.36	
Range	0 - 8	0 - 8	0 - 8	0 - 8	
Phoneme Deletion			n		
Mean	1.48	1.09	5.35	4.65	
SD	2.21	1.90	3.05	3.27	
Range	0 - 8	0 - 6	0 - 8	0 - 8	
Phoneme Deletion					
Mean	2.87	3.39	11.57	9.74	
SD	4.30	4 66	5.41	5.96	
Panga	۹.00 ۱ ـ 16	0 -13	0 -16	0 -16	
Nange	0-10	0 - 10	0 10	0.0	

Phoneme Deletion				
Mean	1.04	.78	7.00	5.13
SD	2.62	1.54	4.10	4.11
Range	0 -10	0 - 4	0 -14	0 -14

Table 1: Means, Standard Deviations and Ranges on Measures of Reading for								
Experimental and C	ontrol Groups a	at Pre-Test and P	ost-rest (Contin	<u>uea)</u>				
Nystery word Pro-tost /4								
Mean	.00	.00	.91	.74				
SD	.00	.00	1.41	1.18				
Range	0 - 0	0 - 0	0 - 4	0 - 4				
Mystery word Story /11								
Mean	.00	.00	., 2.29	2.05				
SD	.00	.00	4.16	3.42				
Range	0 - 0	0 - 0	0-11	0-10				
Word Identification Percentile								
Mean	12.35	12.83	57.09	46.87				
SD	19.55	16.96	23.96	28.42				
Range	1 - 84	1 - 63	4 - 96	3 - 90				
Word Attack* Percentile								
Mean	9.17	8.57	53.83	34.03				
SD	14.42	12.15	23.42	29.11				
Range	1 - 58	1 - 52	4 - 96	3 - 90				
RAN Time			~					
Mean	68.17	70.70	60.39	64.32				
SD	17.59	19.67	16.08	23.50				
Range	37 -100	40 -128	34 -116	32 -121				
Urai Cloze Moon	6.04	5 83	8 22	7,26				
SD	2 29	2.90	3.01	3.32				
Range	0 -10	0 -10	1 -12	1 -11				
		-						

\* Significant group-by time interaction found for this measure.

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Table 1 (above) shows the mean percentile or raw scores, standard deviations and range for each group, on each test at the pre- and post-test. Table 2 (following) shows the same information without the scores of 3 children (who could be described as no longer at-risk according to the criterion of being above the 30<sup>th</sup>. percentile on Word Attack at pre-test).

# Table 2. Means, Standard Deviations and Ranges on Measures of Reading for

	Pre-T	est	Post-Te	est
Measure	Experimental	Control	Experimental	Control
	Group	Group	Group	Group
	(n=21)	(n=22)	(n=21)	(n=22)
WRAT Reading Percentile				
Mean	32.10	28.77	51.19	48.64
SD	19.78	19.52	24.08	32.01
Range	1-75	1-68	14-87	1-94
WRAT Spelling Percentile	<b>60</b> / <b>0</b>	00.70		40.90
Mean	29.19	30.73	57.62	49.80
SD	23.63	21.21	20.89	28.65
Range	1 - 75	1 - 63	23 - 88	1 - 88
Phoneme Del. Initial* Mean SD Range	1.05 2.33 0 - 8	2.23 3.37 0 - 8	6.00 2.92 0 - 8	5.09 3.44 0 - 8
Phoneme Del. Final				
Mean	1.10	1.05	5:10	4.59
SD	1.76	1.94	3.08	3.33
Range	0 - 8	0 - 6	0 - 8	0 - 8
-				

Revised Experimental and Control Groups at Pre-Test and Post-Test.

Phoneme Del. Total Mean SD Range	2.14 3.31 0 -13	3 .27 4 .73 0 -13	11.10 5.49 0 -16	9.68 6.10 0 -16
Mystery Word Pre-test Mean SD Range	.00 .00 0 — 0	.00 .00 0 — 0	.76 1.19 0 – 4	.77 1.19 0 – 4
Mystery Word Story Mean SD Range	.00 .00 0 — 0	.00 .00 0 — 0	2.43 4.38 0 – 11	2.32 3.80 0 - 10
Word Ident. Percentile Mean SD Range	9.48 7.79 1 – 84	10.55 13.26 1 – 41	51.86 22.38 1 – 89	44.91 27.45 3 - 83
Word Attack* Percentile Mean SD Range	5.05 4.50 1 – 17	6.59 7.79 1 – 26	50.76 22.13 1 – 80	31.85 27.81 1 – 92
RAN Time Mean SD Range	68.82 18.35 37 - 100	72.09 18.94 47 – 128	61.19 16.58 34 116	65.59 22.40 36 – 121
Oral Cloze Mean SD Range	6.00 2.35 0 - 10	5.64 2.82 0 - 10	7.95 3.02 1 - 12	7.27 3.40 1 – 11

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\* Significant group-by-time interaction found for this measure.

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## Interactions of group and measures administered

At pre-test there were no significant group mean differences on any of the tests. The group-by-time interaction was statistically significant only for Word Attack F(1, 45)= 6.58, p < .05, and for Phoneme Deletion (Initial Sound), F(1, 45) = 4.58, p < .05. In both cases the experimental group improved significantly more than the control group. There were no significant group differences on WRAT reading F(1, 45) = .48, ns, WRAT Spelling F(1, 45) = 3.46, ns, Phoneme Deletion (Final Sound) F(1, 45) = 0.11, ns, Phoneme Deletion (Total) F(1, 45) = 2.24, ns, Phoneme Deletion and Substitution F(1, 45) = 1.90, ns, Mystery Word Pre-test F(1, 45) = 0.20, ns, Mystery Word Story F(1, 45)= .11, Mystery Word Post-test F(1, 45) = 0.11, ns, Word Identification F(1, 45) = 1.19, ns, Rapid Naming F(1, 45) = .05, ns and Oral Cloze F(1, 45) = 0.69, ns.

As expected, there was a main effect of time on all measures irrespective of group: WRAT Reading, F(1, 45) = 35.36, p < .001, WRAT Spelling, F(1, 45) = 51.68, p < .001, Phoneme Deletion (Initial Sound), F(1, 45) = 65.54, p < .001, Phoneme Deletion (Final Sound), F(1, 45) = 67.52, p < .001, Phoneme Deletion Total, F(1, 45) = 94.84, p < .001, Phoneme Deletion and Substitution, F(1, 45) = 78.07, p < .001, Mystery Word Pre-Test, F(I, 45) = 18.60, p < .001, Mystery Word Story, F(1, 45) = 241.52, p < .001, Mystery Word Post-Test F(1, 45) = 38.88, p < .001, Word Identification F(1, 45) = 92.44, p < .001, Word Attack F(1, 45) = 87.97, p < .001, RAN Time F(1, 45) = 7.94, p < .007, Oral Cloze F(1, 45) = 16.35, p < .001.

When a 2 x 2 group-by-time analysis of variance was conducted on the *revised* groups of experimental and control children, omitting 2 experimental group children and 1 control group child who scored above the  $30^{th}$  percentile on Word Attack at pre-test, the

group by time interaction was still significantly different only for Word Attack, F(1, 41) = 6.61, p < .05, and for Phoneme Deletion (Initial Sound), F(1, 41) = 4.65 p < .05.

# Questionnaires.

Percentile scores on the Elementary Reading Attitude Survey responses at pre and posttest for the experimental group are shown in Table 3 for each child separately. A paired samples t-test revealed a significant difference from pre- to post-test for the experimental group t(22) = 4.77, *p*<.001. However, 4 out of 23 experimental group children had a lower score at post-test than at pre-test (see Discussion) as follows: 46-40 (child 15), 20-5 (child 19), 80-46 (child 10), 66-3 (child 2). An independent samples t-test was also conducted in order to compare the experimental group post-test scores to the control group pre-intervention scores on the child attitude survey. The experimental group had higher scores at post-test than the control group pre-intervention, but no significant difference was found.

The total group treatment integrity result for the experimental group was 1710 / 2760 or 61.95 %. The mean treatment integrity score for individual families was 74.35 %, the median was 82 and the range was 0-109. The mean treatment integrity result for teaching activities alone was 576 / 1380, or 41.74%. The mean treatment integrity result for Paired Reading alone was 1066 / 1380 or 77.25%.

Table 3 also shows the experimental group child attitude survey percentile scores and rank order compared with treatment integrity rank order. There were no significant correlations between these measures (See Table 6).

Table 3. Experimental Group Elementary Reading Attitude Survey Percentile

Scores at Pre-test and Post-test and Treatment Integrity Rank Order.

Pre-test	Post-test	Difference	ERAS	T.I. Bank	Child #
Percentile	Percentile		Rank	<u>raiir</u>	Ħ
6	92	86	1	10	22
6	80	· 74	2	5	20
18	80	62	3	15	3
25	82	57	4	10	4
6	62	56	5	1	18
18	62	44	6	21	17
43	82	39	<b>7</b> ·	23	14
3	40	37	8	12	6
50	86	36	9	17	9
37	72	35	10	6	5
18	52	34	11	19	1
1	32	31	12	18	7
62	86	24	13	6	12
46	66	20	14	2	8
18	34	16	15	22	13
18	28	10	16	13	11
18	22	4	17	8	21
0	0	0	18	4	23
0	0	0	18	20	16
46	40	-6	20	9	15
20	5	-15	21	14	19
80	46	-34	22	16	10
66	3	-63	23	2	2

ERAS Experimental Group Percentiles and Treatment Integrity.

# ERAS = Elementary Reading Attitude Survey. T.I. = Treatment Integrity.

Individual results of the parent questionnaire for the experimental group at pre- and post- intervention are shown in Table 4. The post-test experimental group parent questionnaire scores were significantly higher than their pre-test scores, t(22) = 8.58, p < .001. Also, the experimental group parent questionnaire post-test scores were significantly higher than the control group pre-test scores, t(22) = 5.65 p < .001.

Post-test Diff. Rank Parent T.I. T.I. Pre-test Order **R**.O. Scores. 

Table 4. Experimental Group Parent Questionnaire Pre- and Post-test Scores

and Treatment Integrity .

**Diff. = Difference. R.O. = Rank Order. T.I. = Treatment Integrity.** Table 5 shows treatment integrity rank order and scores, compared with difference

scores for the measures on which the group-by-time interaction effect was significant (Word Attack and Phoneme Deletion - Initial Sound). There were no significant correlations between these difference measures and treatment integrity scores, or between treatment integrity and the experimental group pre-post percentile difference scores for WRAT Spelling, or Word Identification. However, there was a small but noteworthy correlation between treatment integrity and the total of all phoneme measures, r = .355,

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p <.1(one-tailed) as shown in Table 6. This meant that there were modest correlations between parent perceptions and treatment integrity, r = .389, p <.08 (two-tailed) and between treatment integrity and the total of all phoneme measures, r = .355, p <.06 (onetailed).

<u>Table 5. Experimental Group Rank Order and Scores for Treatment Integrity</u> <u>compared with Pre-Post Test Percentile Scores for Word Attack and Phoneme</u> <u>Deletion (Initial Sound).</u>

Rank	Treatment	Word	Word	Word	Phon.	Phon.	Phon.	Child
Order	Integrity	Attack	Attack	Attack	Del.(In.)	Del.	Del.	#
for	Score	Pre-Post	Diff.	R. O.	Pre-	(ln.)	(ln.)	
T.I					Post	Diff.	R.O.	
1	109	5 – 34	29	19	1 – 8	7	4	18
2	106	2 – 71	69	2	0 – 8	8	1	8
3	99	58 – 84	26	6	2 – 8	6	14	2
4	95	7 – 42	35	17	0 – 8	8	1	23
5	90	17 – 77	60	8	<b>8 – 8</b>	0	20	20
6	88	1 – 66	65	4	4 – 8	4	16	5
6	88	8 – 1	-7	23	0 – 6	6	14	12
8	87	5 – 47	42	14	0 – 7	7	4	21
9	83	2 – 67	65	4	1 – 8	7	4	15
10	82	7 – 67	60	8	0 – 2	2	18	4
10	82	1 – 80	79	1	1 – 8	7	4	22
12	79	2 – 58	56	10	0 – 7	7	4	6
13	78	47 – 88	41	15	8 – 8	0	20	11
14	76	2 – 50	48	13	0 – 7	7	4	19
15	75	5 – 58	53	11	0 – 8	8	1	3
16	68	2 – 71	69	2	0 – 7	7	4	10
17	67	3 – 23	20	20	0 — 0	0	20	9
18	65	8 – 70	62	7	0 – 4	4	16	7
19	63	3 – 37	34	18	0 – 7	7	4	1
20	55	7 – 47	40	16	7– 8	1	19	16
21	45	3 – 23	20	20	$0 - 7^{2}$	7	4	17
22	30	2 – 13	11	22	0 - 0	0	20	13
23	0	16 – 64	48	12	0 – 7	7	4	14

R.O.= Rank Order. Diff. = Difference. Phon. Del. (In.) = Phoneme Deletion Initial Sound.

<u>Table 6. Pearson Correlations between Experimental Group Pre-Post Test</u> <u>Difference Scores for Treatment Integrity, Elementary Reading Attitude Survey</u> <u>and Parent Questionnaire, and Word Attack, Phoneme Deletion (Initial), All</u>

Phoneme Measures, WRAT Spelling and Word Identification Difference Scores

Variable	T.1.	ERAS	PAR. QU.
Treatment Integrity		.00	.389
Child Attitude (ERAS)	.00		.016
Parent Questionnaire	.389	.016	
Word Attack	.206	088	.114
Phoneme Deletion (Initial)	.243	.130	.204
All Phoneme Measures	.355	.288	.167
WRAT Spelling	.168	.183	.361
Word Identification	.040	.056	297

# T.I = Treatment Integrity. ERAS = Elementary Reading Attitude Survey.

# PAR QU. = Parent Questionnaire.

# N = 43 . Significance p < .08 (one-tailed) and p < .06 (two-tailed).

Table 7 shows the rank order and percentile difference scores for the child attitude survey compared to the percentile difference scores and rank orders for Word Attack and Phoneme Deletion (Initial Sound). There were no significant correlations between the experimental group child attitude survey percentile difference scores and these measures, or with the percentile difference scores for Word Attack, all phoneme measures, WRAT Spelling and Word Identification.

Table 7. Experimental Group Elementary Reading Attitude Survey Difference

Scores and Rank Order, compared with Difference Scores and Rank Order for

ERAS Experimental Group Attitude Survey Percentiles and Rank Order with								
Word Attack and Phoneme Deletion (Initial Sound).								
	Att.	Att.	W.Att.	W.Att.	Ph.Del.	Ph.Del.	Child	
	Diff.	Diff.	Diff.	Diff.	(Initial)	(Initial)	#	
	R.O.	Score	<b>R</b> .O.	Scores	Diff.	Diff.		
					R.O.	Scores		
	1	86	1	79	4	7	22	
	2	74	7	60	20	0	20	
	3	62	11	83	1	8	3	
	4	57	8	60	18	2	4	
	5	56	19	29	4	7	18	
	6	44	20	20	4	7	17	
	7	39	12	48	4	7	14	
	8	37	10	56	4	7	6	
	9	36	20	20	20	0	9	
	10	35	4	65	16	4	5	
	11	34	18	34	20	0	1	
	12	31	7	62	16	4	7	
	13	24	23	-7	13	6	12	
	14	20	2	69	1	8	8	
	15	16	22	11	20	0	13	
	16	10	15	41	20	0	11	
	17	4	14	42	4	7	21	
•	18	0	17	35	1	8	23	
	18	0	16	40	19	1	16	
	20	-6	4	65	4	7	15	
	21	-15	13	48	4	7	19	
	22	-34	2	69	13	6	10	
	23	-63	6	53	13	6	2	

Word Attack, and Phoneme Deletion (Initial Sound).

Diff.= Difference. Att. = Elementary Reading Survey Attitude Scores.

R.O. = Rank Order. W. Att. = Word Attack.

Ph. Del. = Phoneme Deletion (Initial)

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## CHAPTER VI

## Discussion

The present study hypothesized that there would be a significantly greater improvement over time for the experimental group than for the control group on the reading and phonemic measures of the test battery. The outcomes of the study indicated that improvement over time was only significantly greater for the experimental group on the measures of Word Attack and Phoneme Deletion (Initial Sound). However, the experimental group had used the study's intervention program for only ten weeks. Given the duration of the intervention time, the increase in scores on Word Attack and Phoneme Deletion (Initial Sound) provide limited support for the main study hypothesis, as long as the effects of extra school support could be assumed to be similar for children in both study groups.

The largest of the two significant results was for Word Attack which was a satisfactory finding since the study's intervention program had provided direct teaching of phonological and phonics skills (Foorman et al., 1999; Torgesen et al., 1998; Vellutino et al., 1996), and had intended to allow parents to capitalize or, the bi-directional causality effect of combined instruction noted by Hatcher et al. (1994) and Torgesen (1997). Word Attack was the test most likely to reflect the direct teaching component of the intervention program. Improved scores on the Word Attack test indicate improved word decoding skills, which are necessary for improved reading comprehension for grade 1 children (Lyon, 1995). However a link with reading comprehension could not be demonstrated by the present study since a passage comprehension test was not conducted. February of grade 1 (time of post-testing) was considered too early to administer a formal

test of passage comprehension to children at-risk for reading difficulty, but the Mystery Word test was included in the test battery. The Mystery Word Test is a test of identifying words in text, on which no significant Time X Group interaction was found.

The significant Time by Group interaction effect on Phoneme Deletion (Initial Sound) also supported the first study hypothesis, since half of the teaching activities of the intervention program taught phonological skills. Every child in the experimental group had worked on Zone 5, which consisted of phoneme splitting and blending activities. Most children worked from Zone 3 through to Zone 5. Furthermore this suggests that some children at-risk for reading difficulties may benefit from more phonological instruction in Grade 1, even when they have previously received a kindergarten phonological instruction program. Although the study's home intervention program contained phonological and phonics activities which could be used throughout grade 1, the time frame of the intervention program in the study was only 10 weeks, therefore it is possible that significant gains might be shown on more of the measures if the program had been used for a longer time period.

Progress for both groups of children by the February of grade 1 showed *accelerated* improvement in percentile terms, rather than just maintaining percentile results over time. The results of both study groups were good indications that the N. Vancouver School District's early screening and intervention policy continues to be effective in bringing most children at risk for reading difficulties up to grade appropriate levels during grade 1. The results of the standardized tests used in the test battery (Wilkinson, 1993; Woodcock, 1987) showed that at the beginning of the study (October of grade 1), both group means were at approximately the 30<sup>th</sup> percentile on the WRAT –3 (Wide Range Achievement

Test-Third Edition) reading and spelling tests. By mid-grade 1 (February) the group means had risen to above the 50<sup>th</sup> percentile (59.96 for the experimental group on WRAT Spelling). On the Woodcock (WRMT) tests of Word Attack and Word Identification, both groups means were at approximately the 12<sup>th</sup> percentile at pre-test. The experimental group rose to above the 50<sup>th</sup> percentile on both tests, while the control group rose to 46<sup>th</sup> and 34<sup>th</sup> percentile respectively. These improvements during grade 1 are consistent with the findings of Lesaux & Siegel (1999) and Lesaux (2003) describing the longitudinal study in North Vancouver. The present study was conducted in this setting of intensive early intervention so that it was difficult to separate the effects of the study intervention from the additional support programs provided in the schools, however children in the control group of the study were receiving at least as much additional reading support in school as the experimental group children. In fact two more control group children received high level school support than in the experimental group.

Both groups of children were very closely matched on all measures at pre-test. Appendix I shows individual pre and post-test scores on standardized measures for the experimental and control groups, and it can be seen that two experimental group children, and one control group child scored above the 30<sup>th</sup> percentile on Word Attack at pre-test. They had clearly improved from the original "at-risk" identification screening score (of below 25<sup>th</sup> percentile on TOPA) in mid- kindergarten, and when using the criterion of scoring above the 30<sup>th</sup> percentile on Word Attack at pre-test, they could be described as no longer at-risk for reading difficulties. This was unsurprising for two reasons: firstly all the children had received a kindergarten intervention program, and secondly some children from originally identified, heterogeneous at-risk groups will become children of predicted good growth on the basis of their response to the first intervention (Vellutino et al., 1996). These are the children whose reading performance was likely to have been more impacted by educational history factors than constitutional deficit factors. Thus, to make sure the students in this study were all still at-risk for reading difficulties the ANOVA Group X Time analyses were conducted again without children (2) and (11) from the experimental group, and child (16) from the control group. As reported in Chapter V, interaction effects were very similar to those found in the first analysis. The revised means, standard deviations and ranges are reported in Table 2, showing a smaller range for the Word Attack measure. The significant findings remained equally significant when three children who had already responded very well to remediation were omitted from analyses.

Therefore Table 1, and Table 2 in Chapter V show that ranges were wide, and standard deviations on all the measures were mostly high, because some children in both groups had already made good progress in some, but not all areas since the initial kindergarten screening and ensuing intervention. Other children were children of predicted lower growth, and were likely to be children with more constitutional deficits than education history factors (Vellutino et al., 1996). Such children were only a 3 % group by grade 4 in the large N. Vancouver study (Lesaux, 2003).

#### Individual Child Analysis by Predicted Growth

In their 1996 study, Vellutino and colleagues formed groups with classifications of: Very Low Growth (VLG), Low Growth (LG), Good Growth (GG) and Very Good Growth (VGG). Two of these classifications were appropriate for further examinations of pre and post-test results of groups of individual children in the present study: predicted

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low growth and predicted high growth. These individual analyses resulted in some additional evidence in support of the effectiveness of the study's home intervention program especially for the predicted low growth children. Comparisons were made using the information about level of extra school support and treatment integrity.

As already mentioned, the level of extra reading support that children were receiving in school in addition to regular grade 1 teaching was important for inferences about the effectiveness of the study's intervention program. Three schools were generally providing a "high level' of support. This means that individual tutoring was conducted for either three or four (more often four) 20 to 30 minute sessions each week. Eleven schools were providing a "lower level" of support. This means that children received extra teaching within a small group of between 4 and 6 children for two or three sessions of approximately 30 minutes each week. It was difficult to be more specific about small variations in small group support across the eleven schools.

Teachers were aware of children who had extremely low scores (e.g. below the  $5^{th}$  percentile) and who might become children of very low growth with severe reading disabilities despite receiving early intervention programs. Both study groups contained some children who scored below the  $5^{th}$  percentile on initial screening, and were potentially children of very low growth at the beginning of grade 1. These children were (9), (13), (15), (18) and (23) in the experimental group, and (7), (12), (13) and (22) in the control group.

<u>Table 8</u>		
<b>Experimental Group</b>	Very Low Predicted Growth Children (Pre-Post Tes	st
Percentiles		

Child	Level of School Support	Phoneme Tests (Pre- Post)	WRAT Reading Percentiles (Pre-Post)	WRAT Spelling Percentiles (Pre-Post)	Word Att. Percentile (Pre-Post)	T.I. /120
9	High	0 - 2	32 - 23	45 - 32	3 - 23	67
13	Lower	1 - 0	31 - 34	50 - 37	2 - 13	30
15	Lower	7 - 15	32 - 77	1 - 68	2 - 67	83
18	High	3 - 13	3 - 23	2 - 27	5 - 34	109
23	Lower	0 - 27	1 - 25	1 - 30	7 - 42	95

WRAT = Wide Range Achievement Test. Word Id. = Woodcock Word Identification Test. Word Att. = Woodcock Word Attack Test.

On WRMT Word Attack and Word Identification, all Phoneme measures and the WRAT Spelling test, children (9) and (13) showed very low growth, and needed intensive support systems after grade 1. Child (9) failed to score on all items of the phoneme tests at pre-test, and at post-test only scored 2, which is a very small increase considering the amount of instruction given at school. She had a raw score of 0 (or 3<sup>rd</sup> percentile) on Word Attack at pre-test and a raw score of 3 (23<sup>rd</sup> percentile) at post-test. On the WRAT Spelling test, her percentile result actually went down by 13 percentile points. Child (9) had a moderate treatment integrity score. Child (13) had similar results on the phoneme tests, Word attack and WRAT Spelling, but showed a raw score gain of 10 words between pre and post-test on Word Identification (going from the 1<sup>st</sup> to the 42<sup>nd</sup>

percentile). Without gains in phonological and word attack skills longer-term progress in reading is likely to be slow. His treatment integrity score on the home intervention program was low, and the score presented was based on a verbal parental report about reading. Both child (9) and child (13) are now considered to have severe reading disabilities. Children (15) and (18) were regarded as having the most significant problems in their respective schools (H) and (K) at pre-test. Child (18) received a high level of instruction in school, and child (15) received lower level support at school. Child (18) had the highest level of treatment integrity (T.I. = 109) in the experimental group, and was perceived at school as having very significant phonological difficulties. She began to show steady improvement (with most skill levels at approximately the 30<sup>th</sup> percentile by mid-grade 1). Child (15) also had a high level of treatment integrity on the parent program (T.I. = 83) and might easily have had full scores for treatment integrity had the activities in the program not become too hard for him between weeks 5 and 6 of the intervention period. The parent used the program as planned very diligently as far as possible, and then continued with Paired Reading only. Child (15) made very high gains on all the standardized tests. He achieved above average percentile scores of 67th percentile (Word Attack), 78<sup>th</sup> percentile (Word Identification) and 68<sup>th</sup> percentile (WRAT Spelling) by post-testing, as opposed to percentile scores of 2, 1 and 1 respectively for the same three tests at pre-test (October of grade 1). Child (23) was also originally considered to have very severe phonological problems (the most severe in school L). Treatment integrity was high (T.I. = 95), and he had a lower level of school instruction. Child (23) made very good gains on the Phoneme Deletion, and Phoneme Deletion and Substitution measures (0 at pretest, 27 at post-test), and good gains on Word Attack (35 percentile points) and WRAT Spelling (29 percentile points). The fact that he achieved nearly average percentile scores by post-test (WRAT Spelling –  $30^{th}$  percentile, Word Attack –  $42^{nd}$  percentile) far exceeded initial school expectations. The progress of children (15) and (23) offer support for the effectiveness of the home intervention. Child (18) made good progress but was also receiving individual tutoring at school. Child (13) made poor progress, however his treatment integrity score was very low, with no activity sessions being conducted at home.

The control group also contained children who were recognized as having potentially severe reading disabilities according to the same criteria described for the experimental children: kindergarten screening test results of below the 10<sup>th</sup> percentile, slow progress on the phonological skills intervention and a subjective teacher assessment of "severe need" by the end of kindergarten. Children (10), (13), (17) and (22) made low gains during the first part of grade 1. Post-test scores are displayed in Table 9 :

#### Table 9

Child	Level of School Support	Phoneme Tests. (Pre/Post)	WRAT Reading Percentile (Pre/Post)	WRAT Spelling Percentile (Pre/Post)	Word Att. Percentile (Pre/Post)
10	Lower	0 - 0	27 - 16	37 - 18	3 - 5
13	Lower	0 - 0	1 - 1	1 - 1	1 - 7
17	High	0 - 0	45 - 47	61 - 79	26 - 1
22	High	0 - 2	1 - 1	3 - 5	0 - 2

Control Group Very Low Growth Children (Pre-Post-Test Percentiles).

Phoneme Tests = Total Phoneme Deletion and Phoneme Deletion and Substitution Scores. Word Id. = Woodcock Test of Word Identification. Word Att. = Woodcock Test of Word Attack.

Child (17) had an unusual pattern of results. She received a high level of school support, because she was perceived as having the most severe difficulties in school J. She seemed to have used visual memory for words to maintain high WRAT Spelling results at pre and post-tests, but her scores between pre and post test fell on Word Attack by 25 percentile points, and on Word Identification by 8 percentile points, and also remained 0 on all Phoneme measures. Child (17) may have been considered not at-risk for reading difficulties in a school system where kindergarten screening did not take place, because she was initially successful at spelling, and some sight word reading. However, because she was extremely at-risk according to tests of phonological skills, the school could identify her severe reading problem and did provide early intervention programs, which were and continue to be, very necessary. Such children are usually relying on visual memory strategies only. Child (10) showed a similar pattern. Children (22) and (13) appeared to be having little or no response to remediation, and to show many signs of severe reading disability. Although child (22) had a high level of school support, no greater improvement was evident. All these children were remaining at very low levels of reading achievement despite their school intervention programs.

Each group also contained some children whose phonological skills at pre-test were better than those of most other children who had a zero pre-test score. Scores of 10 or more on all the tests of Phoneme Deletion and Phoneme Deletion and Substitution were good indicators of very good growth during grade 1 since they usually progressed to total scores of above 20/34 by post-test. Children (5), (11), and (20) of the experimental group, and children (2), (4), (6), (8), (9) and (16) of the control group were in this category. Child (8) of the experimental group was also included, since his Phoneme Deletion scores and Word Attack scores were low at pre-test, but all other scores were very high. He was in School C, which provided high level extra support, but he was not due to receive this program until after the study period, and therefore became the only child in the study who received the home intervention program only, and with a high level of treatment integrity. All of these children had above average percentile scores on the standardized tests by post-test (February of grade 1) as follows:

## <u>Table 10</u>

Scores and Percentile Pre/ Post- Test Scores.									
Child	Level of	Phoneme Tests	WRAT	WRAT	Word Attack	Т.І.			
	Support	(Pre/Post)	(Pre/Post)	(Pre/Post)	(Pre/Post)	/120			
5	High	14 - 26	27 - 79	4 - 88	1 - 66	88			
11	Lower	22 - 23	37 - 84	21 - 86	47 - 88	78			
20	Lower	19 - 25	21 - 79	23 - 61	17 - 77	90			
8	None	2 - 23	75 - 87	63 - 77	2 - 71	106			

# Experimental Group Predicted High Growth Children: Total Phoneme Scores and Percentile Pre/ Post- Test Scores.

# Ident = Woodcock Test of Word Identification.

Child (11) had an average treatment integrity score (78/120) and was receiving lower level instruction in school, and child (20) had not received phonological skills intervention in kindergarten (school transfer) and also received lower level school support. Her treatment integrity score was high (90/120), and her ERAS (Elementary Reading Attitude Survey) result increased by 74 percentile points between pre and posttest. All these children scored at above average percentile levels on the standardized tests, and two of them had used the study's intervention program well, while having lower level support at school. Child (8) scored at an above average level on all measures at post-test with the study's intervention, while receiving no extra support in school.

Comparative scores for children (2), (4), (9), (11) and (23) in the control group are presented, as well as child (16) who scored below 10 on Phoneme Deletion at pretest but scored very highly on other measures, including Word Attack. He was of the three children considered to be no longer at-risk by the beginning of the study:

# <u>Table 11</u>

<b>Control Group Predicted</b>	High Growth Children:	Total Phoneme	Scores and
<b>Pre/Post-Test Percentile</b>	Scores.		

Child	Level of School Support	Phoneme Tests Pre/ Post	WRAT Reading (Pre/Post)	WRAT Spelling (Pre/Post)	Word Attack (Pre/Post)
2	High	17 – 30	68 - 94	63 - 88	2 - 92
4	High	15 - 26	47 - 92	50 - 83	1 - 87
9	Lower	13 - 24	37 - 79	50 - 75	22 - 68
11	Lower	14 - 19	47 - 89	39 - 37	1 - 45
23	Lower	12 - 22	55 - 61	25 - 37	7 - 48
16	Lower	6 - 17	53 - 86	83 - 79	52 - 82

# Word Ident. = Woodcock Test of Word Identification.

The children who were receiving high levels of extra instruction in school: children (2) and (4) achieved very highly indeed on Word Attack, and all measures by post-test. However all of these children are scoring at above average levels by post-test, except for children (11) and (23) on WRAT Spelling.

Analysis of individual results in the present study suggested some support for the value of an additional parent intervention program for children of predicted low growth, or at-risk for the most severe reading difficulties. In the comparisons of children of

predicted high growth, either school support or the study's home intervention program could be linked with above average achievement on standardized tests by the middle of grade 1. However the degree of home tutoring (integrity score) appeared to have an effect on the predicted low growth group.

Analysis of results for individual children also revealed that the two study groups were balanced in having an equal number of children of predicted low growth according to previous kindergarten screening results and this study's pre-test (October of grade 1). However, the experimental group low scoring group of children decreased from 4 out of 23 to 2 out of 23 by post-test. Child (15) became part of the high scoring group and child (18) moved up to "moderate" level. The control group children of low predicted growth remained the same, despite high level extra school support in some cases.

When comparing children of predicted high growth, the control group had more children of predicted high growth than the experimental group at pre-test. However, by post-test more children in the experimental group showed above average reading and spelling results than in the control group: by post-test 14out of 23 experimental group children had achieved reading and spelling percentile scores of at least 50 on most standardized measures (as opposed to 4 out of 23 at pre-test), whereas 9 out of 23 control group children had achieved reading and spelling percentile scores of at least 50 on most measures (as opposed to 6 out of 23 at pre-test).

There was also some change in children of medium growth or "moderate improvement" (post-test percentile scores of between 25 and 40). By post-test more control group children remained at somewhat below average levels than in the experimental group: 9 out of 23 (as opposed to 7 out of 23 experimental) remained at

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medium levels of achievement, and 5 out of 23 (as opposed to 2 out of 23 experimental group students) remained at very low percentile levels (below 20).

These are informal indications that the study intervention had positive effects, especially for the children of predicted lowest growth. The fact that amounts of extra school instruction varied is a complicating factor but the study design aimed to minimize the impact of school level support by having equal numbers of children with high level, and lower level extra support in each study group.

Nevertheless, to conclude that the parent intervention program itself contributed to most of the variance between the experimental group and the control group on the two tests where group differences were found (Phoneme Deletion - Initial sound and Word Attack), it was important to examine other possible influential variables across the two groups. These variables were amounts of extra instruction in school, amounts of previous phonological skills training, teaching emphases of the regular school curriculum and SES factors.

#### Amounts of Extra Reading Instruction in the Schools

The support given to children at school which was in addition to regular grade 1 teaching has been defined previously and classified as: high level and lower level. Three of the fourteen schools provided a high level of support (individual tutoring), and they were schools B, C and K. Two exceptions occurred when control group child (16) of school J, and control child (22) of school L were perceived as having very severe difficulties, and received high level support in a school that otherwise provided lower level support for its children at-risk for reading difficulties in grade 1. Also, one experimental group child of predicted good growth in school C was expected to receive high level support, but did not

receive any additional reading support in school during the time of the study, since school C was a large school and could not provide the high level of support to all children in the first term of grade 1. Experimental group children who received high level support during the time of the study were children (2), (3) and (4) of school B, children (5), (6), (7) and (9) of school C and children (18) and (19) of school K. Control group children who received high level extra reading support during the time of the study were children (2), (3) and (4) of school C, child (17) of school J, (3) and (4) of school B, children (5), (6), (7) and (8) of school C, child (17) of school J, child (22) of school L and children(18) and (19) of school K. This meant that 9 experimental group children and 11 control group children received high level support. Therefore as regards extra support teaching, the significant Time X Group interaction findings in favour of the experimental group appear not to have been compromised.

# Previous phonological skills training

All of the schools had used a system of testing phonological skills in kindergarten. All of the schools reported that they used the TOPA test. This test is probably most often used because it is quick to administer and can be done with a group of children rather than individually. The schools reported that they used a variety of intervention programs during kindergarten. On average these programs lasted for six to eight weeks. They involved 20 minutes each day for three or four days of the week. Only three of the schools sent written advice for parents about extra phonological training activities which could be implemented at home. Therefore, it seems likely that children who were only mildly at risk for reading difficulties were likely to have had a good starting experience in terms of improvement for phonological skills, and that severely affected children had insufficient training. Mildly affected children were those who had the highest original

scores on the TOPA test in kindergarten, who had made rapid progress when given phonological skills instruction in the kindergarten and who had been judged by teachers to be making good general progress by the end of kindergarten. Severely affected children conversely, tended to have low original TOPA scores, to be slow on the phonological intervention, and to be causing the most concern at the end of kindergarten. The findings of the present study support these two ideas. All schools reported that they would have liked more time to talk to parents about helpful phonological skills teaching activities that could be implemented in the home situation. As regards previous phonological skills teaching, the two study groups appear to have been evenly balanced. *Teaching emphases within the schools* 

Learning assistance teachers were interviewed and asked to compare teaching styles in those schools where children in different groups came from different classes. In school C (the largest school) children came from three different classes, which operated a team teaching system and the teaching styles of all three teachers were described as including very direct phonics instruction, combined with a vigorous home reading policy. The children were therefore considered to have received an experience which was as similar as possible from the school point of view. A control group child in school M was considered to be in a similar situation to school C, which also did Reading Recovery. In school A both children came from the same class. In school B the teaching styles of two teachers were again rated as very similar and as including direct phonics instruction. School F had one experimental group child. School N had two control group children in the same class. School H was a small school where the children came from the same class. Schools D, I, F and J each had 2 children in different classes where the teachers may have had different styles, but all described themselves as doing balanced literacy. No teachers were opposed to direct phonics teaching, and only one was not in favour of the home program. This was the teacher of child (10) in School D, and the issue caused some conflict for the parent, who did the initial tests and then concentrated only on Paired Reading. Child 10 made very good gains even though she was just receiving a lower level of extra reading support in school and direct phonics teaching in the regular classroom. In general, the emphasis of teachers within different schools seemed to be consistent with balanced literacy aims and often very much in favour of direct phonics instruction ( e.g., the teacher of child (10)). It was only possible to take note of these differences, and the study design itself (in allocating as equal a number of children as possible from each school to the experimental and control groups), was the only way in which this factor could be controlled.

## SES Factors

Appendix H shows the demographic questionnaire and its results for the experimental and control groups. There were 2 out of 23 families whose first language was not English in the control group as opposed to 1 out of 23 in the experimental group. One of the control group children was probably not at-risk for reading difficulties but had been identified at-risk in school kindergarten screening while at an early stage of learning English (See Appendix I – child (15)). There were 2 out of 23 single parent families in the experimental group and 1 out of 23 in the control group. More families in the experimental group had more than two children in the family (4 out of 23 as opposed to 3 out of 23 for the control group). Sixty percent of the experimental group parents listed university as their highest educational level. Sixty three percent of the control group

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parents listed university as their highest educational level. More than thirty percent of each group listed high school as their highest educational level. A small number (2 out of 23) parents also listed high school and job training as their highest educational level in the control group, and 1 out of 23 indicated job training and high school as the highest level attained in the experimental group. Five of the families of the experimental group, and 4 of the control group families reported that one parent worked part-time. There were 7 experimental group families where both parents worked full-time, and 9 control group families, which means that in some families 1 parent was at home full-time This applied to 8 experimental group families and 8 control group families. Three children in the experimental group and 2 children in the control group had not attended pre-school. Parents provided employment information and listed 29 different occupations, which fell into the categories of professional, small business, clerical, trade industry, vocational and service sector. Family income was estimated by matching occupations with average incomes listed in the 1996 census (Stats Canada). These estimates of total family income could only be very approximately made, but the two groups appeared to be quite evenly balanced with an experimental group range of \$15,000 to \$100,000 (median of \$53,000) compared to a control group range of \$16,000 - \$120,000 (median of \$47,000). The socio-economic areas of the schools show a wide range, although a higher number of the schools (9 out of 14) were described as high middle-class (A, B, C, E, I, K, L, M and N). Two of the twelve schools were considered to be at the lower end of the SES range (G and H) and 3 others would be considered to be moderately low (D, F and J). However the children from each school SES category were evenly distributed across the two study groups (3 children in each group - low SES; 3 children in each group - moderately low).

#### Treatment Integrity

Treatment integrity, or how an intervention is implemented as planned, was calculated for the whole group as 61.95%. However, more reading sessions than teaching activity sessions were conducted in the study. The reading treatment integrity percentage was 77.25%, and the teaching activity treatment integrity percentage was 41.74%.

All treatment integrity data were collected on the 4 forms shown as Appendices B, C, D, and E. The form presented in Appendix B gave basic information about both 10 minute sessions of conducting the program and involved a simple tick in the two sections of the 10 week calendar. The form shown as Appendix D was used to summarize the Paired Reading achieved. It was possible to get more information about both activity and reading components by consulting the forms shown as Appendix C and Appendix E.

In regard to Paired Reading (Section 3 of the program), it is likely that parents of grade 1 children (especially those who volunteered to do a home program) did hear their children read in accordance with the findings of Tracey (1998), and that treatment integrity figures in the present study reflected this. The exception was the parent of a French Immersion child who believed much more in the value of reading *to* her child. The post-test reading achievement scores of this child (16) in the experimental group were not high which seems to be consistent with the findings of Lefevre & Senechal (2000) regarding the impact of storybook reading on actual reading skills. The form in Appendix D asked parents to give the dates when each new book was started and the page numbers of reading done each day. A minority of parents completed these records very carefully (5), but most did not after the first week or two. Therefore it is impossible to be sure that the information from parents represented what actually happened.

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The form in Appendix C asked parents to list the activity areas they worked in, and also the dates of starting each new zone or area. Again, a minority of parents (4) summarized their progress through the teaching zones very conscientiously, but others did not. It was possible to see the test results on the summary shown in Appendix E. These forms revealed that most parents started teaching in Zone 3 of the program for phonological skills (Onset and Rime), and also (as expected) in Zone 6 (Letter-Sound Linking). The content of Zone 6 relates directly to the phonics teaching, which formally starts at the beginning of grade 1, therefore although phonological stages contained in Zones 1 to 5 may also require teaching, it would also be timely and relevant to use Zone 6 activities in order to boost confidence at school. This section of the program covers all sound-symbol links of the English alphabet, which many kindergarten children have encountered or even mastered before grade 1, but which many children at risk for reading difficulty are still unsure about. Zone 6 also suggests multi-sensory ways of learning letter-sound links, and using correct letter formation. Most of the experimental group children in the study started at this first phonics level of the program, as well as working in a phonological area. Phonological instruction continued on average for 5 or 6 weeks, alongside phonics instruction in Zones 6, 7 and 8. Only 2 parents went on to the last two teaching areas (Zones 9 and 10), which was also as expected during the first part of grade 1. Informal feedback from parents said that the Activity Book was clear and the video was helpful. Once parents had completed the testing phase of the program, they seemed to have very few further questions. The impact of treatment integrity in this study was considerable. Considering the short duration of the study, T.I. scores of above 100 out of 120 would have been desirable. Only 2 families achieved this level, and only 5 out of 23

families achieved a T.I. score of 90 or above. Where T.I. exceeded 50 out of 60 on the teaching activities, there is evidence of good progress (e.g., children (18), (15) and (23)), who were expected low growth children, and children (20) and (8) who were expected high growth children. Child (20) had lower level extra school support, and child (8) had none. Nine out of 23 children had T.I. scores of below 75, which is an indication that very few direct teaching sessions took place, so that the program was not implemented as planned.

#### Questionnaire Results

The second hypothesis of the study was that the interventions would result in an increase in child attitude scores on the Elementary Reading Attitude Survey.

#### Child Reading Attitude Survey

Comparison of the group mean percentile results at pre and post-tests on the Elementary Reading Attitude Survey (McKenna & Kear, 1990) showed that the experimental group children as a whole became more positive about their specific abilities in reading (self-efficacy) and showed signs of more enjoyment of reading by mid grade 1 when they had received both extra school help the regular school program and the study's home intervention. However, four individual children in the experimental group did not have higher scores at post-test. It is possible that they became more aware that aspects of reading were difficult for them, so that their post-test total scores were lowered. The authors of the ERAS had constructed the questionnaire according to findings that young grade 1 children can have perceptions of difficulty at the same time as high perceptions of general ability (Chapman & Tunmer, 1995), and this appeared to be true of these experimental group children, who also made among the greatest gains in the group on the tests of Phoneme Deletion and Substitution, Word Attack and Spelling. A possible interpretation of this is that these children became more realistic about the reading work that was necessary for them to make good progress in grade 1 as time went on. There was no apparent connection between high levels of treatment integrity and the most positive attitude changes on ERAS when individual scores were examined (Table 3). Therefore no support for part of the second study hypothesis (that there would be a positive change in children's measured attitudes to reading between pre and post-test as a result of using the home intervention program) was found. The significant positive experimental group change between pre and post-test could be due to time effects only, or to the effects of school programs. However, in a future study it would be useful to examine experimental group differences between pre and post- test after a longer intervention period. The addition of the parent program of this study to early interventions during 10 weeks in grade 1 did not positively affect group child attitude scores in a situation where both groups of children were receiving additional reading support programs at school.

## Parent Perspectives Questionnaire

The third hypothesis of the study was that the intervention would result in an increase in scores on the parent perceptions questionnaire, regarding their view of their child's progress in reading, and their ability to assist their child.

Consistent with this hypothesis, the experimental group parents all reflected positive change in their questionnaire results between pre and post-test. Of 10 parents who reported the most positive change in their perceptions, 8 had correspondingly high rank order positions for treatment integrity as shown in Table 3 (Chapter V). Hence a small

but significant correlation was calculated between group change in parent perspectives and treatment integrity (Chapter V - Table 7). In addition, the experimental group parents had significantly more positive perceptions in mid-grade 1 than the control group parents who had not yet used the intervention program. Furthermore, since all the parents who participated in the study generally had a great deal of confidence in the school support programs that their children were receiving, the parent questionnaire results could be said to support the second hypothesis (about positive qualitative changes as a result of using the intervention program) to some extent.

The analysis of individual responses to particular groups of questions in the parent questionnaire gives further specific information. The parent questionnaire contained three questions about parent perceptions of their child's improvement in reading (Questions 1, 3 and 7), three questions about parent perceptions of their child's enjoyment of reading (Questions 2, 5 and 9), two questions about the kind of prompts given during text reading sessions (Questions 4 and 6) and two questions concerning how important reading progress was for them as parents, and how confident they felt to help their own child with reading (Questions 8 and 10). In their responses to Question 10 (how confident parents felt to help their child with reading), most parents gave a 3 point answer (out of a possible 4) at pre-test ("quite confident"). At post-test 10 parents made the same response again, only 6 parents indicated that they felt more confident ("Very confident"), while 7 parents indicated that they felt not as confident. Possible inferences are that the program had been challenging to use in some way, or that it had revealed more about their child's needs than anticipated, or that it had revealed a much wider area of skills to address than they had expected. Most positive change in the questionnaire responses came from the

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questions that asked about how parents judged their child's progress in reading. This area of the questionnaire was mainly responsible for the significant group change between pre and post-test found for parent views. The whole experimental parent group reported a total increase of 95 points on Questions 1, 3 and 7. Again the largest changes were associated with high treatment integrity.

Ouestions 4 and 6 were designed to give information about change in approach to hearing children read after using the Paired Reading method. This question addressed the fourth hypothesis. Most parents at pre-test indicated that they asked their children to sound out the words at which they hesitated. The Paired Reading method was asking them not to do that, but instead to supply the whole word after a small pause. Parents who scored more points at post-test on Questions 4 and 6 reflected to some extent their adoption of the Paired Reading method. The responses were that 7 parents made the same response as at pre-test, 14 parents scored more highly at post-test, and 2 parents scored less. It may be difficult for parents to stop the practice of getting children to "sound out" during text reading, if they have a strong intuitive feeling that this is the most useful thing to do. Four parents at the beginning of the study were very unsure about how to hear their child read as suggested by Edwards (1995), and the majority view about asking for sounding out did not necessarily reflect confidence in the practice. In some cases parents indicated that teachers had told them to do this, or, that parents thought teachers would recommend it. There was confusion in this area. The change to the Paired Reading method could not be clearly traced, which may indicate that the method was not described clearly enough in the program, or that the way of communicating the method (video and written description) was not sufficient as training, or that Questions 4 and 6

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were not clear enough. But because parents did appear to understand Questions 4 and 6, it is more likely that training in the program was not sufficient for a full understanding of Paired Reading and full adoption of the method.

# Summary of Discussion

The experimental group improved significantly more than the control group on measures of Word Attack and of Phoneme Deletion (Initial Sound). Since in grade 1 it is a priority to establish strong word decoding for children at risk for reading difficulties (Bryant & Bradley, 1983; Ball & Blachman, 1991; Hatcher et al., 1994; Torgesen et al.,1994; Torgesen, 1997), and since the study's intervention program taught phonological skills and the alphabetic principle directly (Foorman et al., 1998; Torgesen et al., 1999; Vellutino et al., 1996), these findings support the first study hypothesis.

Although there was significant positive change in the reading attitudes of experimental group children at risk for reading difficulty between October and February of grade 1, it could not be shown that the parent program alone influenced children's attitude positively. There was support for the premise that grade 1 children do have differentiated perceptions of difficulty, and ability and attitudes to reading. Changes in child attitude were not related to treatment integrity of the study's intervention program.

Parent perceptions changed significantly in a positive direction after using the program, changes in parents' perceptions were related to treatment integrity for the program, and treatment integrity was related to increased scores on the total phonological measure. Most change in parents' perceptions resulted from their perceptions of their children's reading ability. However it was unclear whether most parents had fully adopted the specific method of Paired Reading, which was described in the program

activity book and demonstrated on the program video. However informal conversations with parents suggested that their awareness about preserving the meaning of whole sentences and the enjoyment of text reading had changed positively. Reported change in parent confidence levels to help with reading was small.

#### Limitations

Four main limitations were evident by the end of the present study. Firstly the omission of questionnaire administration to children and parents of the control group at the time of pre-testing all children prevented a full comparison of experimental and control groups after post-testing, particularly on the child attitude survey. It would have been interesting to learn whether any children in the control group, who had not been using the home intervention program, also had lower post-test than pre-test results, and whether their percentile difference results also showed an inverse relationship with achievement (like the 4 experimental group children). Shortage of resources precluded this additional testing, and also a post-test for the control group after their "waiting list" time of using the intervention in grade 1.

An unforeseen result was that at least one control group parent, not wishing to wait, obtained another home intervention. There was a feeling of disappointment among control group parents who did not receive the program first, because they were aware that other families did have the program. In a larger school district it might be possible to use different schools to avoid this awareness, although the advantage of controls for evenly balanced SES and school experience factors across the groups might then be reduced or lost.

The third limitation concerned the unclear response within the parent questionnaire about adopting the technique of Paired Reading. The procedures for training parents in the home intervention program were reliant on video presentation, and explanatory text in the activity book. As such they may have been much less effective than training schemes described in the Paired Reading literature (e.g. Topping & Wolfendale, 1985), which involved personal interaction and feedback from a coordinator. This was also an important consideration for treatment integrity, since the degree to which parents were prepared to examine, reflect on and discuss the video and the activity book, before working with their children was likely to influence the consistency of conducting both reading and activity sessions. It is possible that more direction needs to be given in a parent program which parents have to use without the support of a coordinator. The study intended to examine whether a book and a video (representing a cost-effective, therefore potentially more widespread method of training) could be effective even without the support of a coordinator in a home-based reading program. It is difficult to make conclusions about this issue since the program itself could be improved by the addition of more objective advice to parents not only about the method, but about how two people (usually the parents) could observe themselves conducting the Paired Reading method and then supply helpful feedback. The training on Paired Reading in the present study is limited to a written description in the activity book and a relatively short video sequence.

The fourth limitation concerned the main confounding variable for the present study, which existed because of the particular setting of the study in the North Vancouver school district. Whereas early identification in kindergarten was very helpful for sample selection, it also meant that most children had already received some phonological instruction, however this applied to both groups. It also meant that on-going extra grade 1 instruction within school was underway for children in both groups, but it was difficult to quantify and hence to evaluate the relative effectiveness of different school reading support programs. Therefore it became very difficult to account for the relative effects of home intervention versus extra school teaching. If the program was given without school programs running concurrently, the impact of the home program might have been greater. Since the study's home program is intended to be used as part of a systematic early screening and intervention system, a larger study sample and a longer intervention period might be needed to obtain more significant group by time interaction effects.

#### Future Directions

There are several possible future directions for research and for further development of the intervention program itself.

Regarding future research, it would be very interesting to replicate this study first in a school district which did not have a clear, fully adopted policy for early screening and intervention. Initial sample selection might be done subjectively by kindergarten teachers, or by the introduction of an early screening test at kindergarten stage. If there was no intervention at grade 1 the effects of the home reading program would not be as mixed with the effects of extra school instruction. Also, if phonological instruction had not been conducted in kindergarten, greater change on the phoneme tests might be found after using the home program. A longer intervention period than in the present study would be helpful in view of the fact that most parents did not finish all the teaching activities, as the program contains enough activities to last for all of grade 1 for children at-risk for reading difficulties. The process of the intervention program which aims to improve reading motivation by teaching parents to use the language of mediation strategies may be more effective over a longer time period because of cumulative effects over time. A means of evaluating parental reactions to the use of the strategies and the language would also be necessary, and was not included in the present study.

If a "waiting list" control design feature is employed which is of ethical importance, it may be better for children in different but comparable schools to be allocated to the control group, so that parents are not so aware of using the program at different times in grade1.

Future directions for the study's intervention program (Sound Track for Reading), might be to produce a further video, which would summarize the order of giving tests and using activities, and would make direct suggestions about how two people (often both parents) can give each other valuable training feedback about conducting a Paired Reading session to improve their effectiveness. There was little evidence that both parents in a family (where applicable) became involved in the home intervention. All contact was with mothers, except for a single parent in the control group who was the father. Only one family reported that the father did the Paired Reading with the child. Otherwise, it seems to have been the responsibility of mothers in each family, and strong suggestions of joint parent working would be very important in amendments to the intervention program.

Most parents who used the tests and activities at the program development stage (not in the present study) did not have the video, and reported that the language associated with phonological skills instruction seemed daunting at first. However during the present study, when parents did have the video, they reported that they understood both the terminology and the method of test-model-teach. Parents did not need to ask many questions after receiving the activity book and the video. Parents also welcomed the use of pictures for most of the phonological tests and activities, because the children regarded them as games. However, they would have liked an even more basic step-by-step guide in the form of another shorter video.

An important question for this study became how far training by means of a video demonstration (which can be seen several times) and book can replace 90 minutes of structured personal training (as given in the past for Paired Reading). It was not possible to make specific conclusions about this issue, but the training on Paired Reading contained within the study's intervention program may have been inadequate to replace structured personal training on Paired Reading according to the results of the parent questionnaire. It is premature to conclude that book and video training will not effectively replace structured personal training. An effective procedure (Paired Reading), in the hands of potentially very effective people (parents) is not being widely implemented. Therefore, it would be useful to examine an expanded demonstration of training parents to use Paired Reading successfully, plus a step-by-step training guide to the whole program, preferably within a study that also had the different conditions as outlined.

#### Conclusion

Although only two significant results were obtained in the present study, the intervention period was short and the school district was providing a range of effective early school interventions. Significant Time x Group interactions for Phoneme Deletion (Initial Sound) and Word Attack give limited support to the idea that parents can make good use of specific information about phonological skills training. The idea of involving parents

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in phonological skills training was strongly suggested by the National Reading Panel (2000), because studies where parents conducted training were not found, and in view of the conclusions of the meta-analysis, that would appear to be an important area of research. Suggestions in the literature that the parents of children at-risk for reading difficulties are less confident when it comes to helping their own children with reading (Tracey & Young, 2002), might not make plans for helping (Edwards, 1995) and might not use "expansive" questions and language like the parents of successful readers (Tracey, 1998; Tracey and Young, 2002) provide strong encouragement for the further development of the program used in this study in the ways described in the last section.

Finally, the conclusions of Lefevre & Senechal (1999) and Lefevre (2000) about the different results of parents reading to their children and supporting their children's reading, and the importance of designing models of early intervention with effective parent contributions in mind, also support the further development and testing of specific home programs. Parents are a valuable potential resource because children at-risk for reading difficulties are a substantial group who do not yet receive important early instruction in all places and in sufficient quantities. Parents may be the best people to encourage the increased quantities of text reading needed by at-risk readers, who take atypical routes to comprehending and enjoying reading because of their phonological and phonics deficits. They need the chance to make good reading comprehension progress in a transactional way with improved underlying skills.

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NAME	ATE TESTED (yy.r	E TESTED (yy.mm.dd.)		
School	D. of B. (yy.mm.dd.)			
Language/s spoken at hom	ie			
Age when child began to s	oeak Englis	h		
Number of siblings	<i>µ</i>	Ages of siblings		
Name 3 books				
	TASKS ADI	MINISTERED.		
WRAT Reading. (Blue)	raw	%ile	St.	G.E.
WRAT Spelling. (Blue)	raw	%ile	St.	G.E.
Phoneme Deletion : Initial Final Total		/8 /8 16		<u>,</u>
Phoneme Deletion and Substitution/18* Note if this wasn't give			sn't given.	
Mystery Word : Pretest/4 Story 1/11 Post-test/4				
W. Word Identification	raw	%ile	St.	G.E.
W. Word Attack.	Raw	%ile	St.	G.E.
Picture Naming (RAN) time		uncorrec	cted errors_	
Oral Cloze		/14.		

1) WRAT Reading. Blue/Tan. (Jastak,1993. Wilmington. DE)

2) WRAT Spelling. Blue/Tan. (Jastak, 1993. Wilmington.DE)

# 3) & 4) Phoneme Deletion

Instructions for Initial Phoneme Deletion:

Examiner: "Here is a picture of a bus. If I say the word /bus/ without the /b/. we'll be left with /us/. Bus without the /b/ says /us/. Let's try some more." Give all four demonstration items, and explain fully, as for "bus."

Administer items 1-8 with the instruction, "Meat without /m/ says..." Do not give feedback for the test items.

If the child fails the demonstration items and the first four test items, you may discontinue the task.

Demonstration Items:

	bus	sad	pie	cow	
Test Ite	ms:				
1.	meat				
2.	bear				
3.	hat				
4.	sit				
5.	jam				
6.	tin				
7.	cake				
8.	cup			score:_	/8

# Instructions for Final Phoneme Deletion:

Examiner: "Now this time instead of taking off the first of words, let's try and take off the last sound. This will make things that are not real words. Here is a picture of a foot. Can you hear the last sound in foot? The last sound in foot is /t/. Now can you say foot without /t/? Foot without /t/ is foo."

Give all four demonstration items and explain fully as for foot.

Administer items I-8 with the instruction, "Meat without /t/ says...." Do not give feedback for the test items.

If the child fails the demonstration items and the first four items, you may discontinue the task.

#### Demonstration Items:

	foot	bag	bell	spoon	
Test Ite	ms:				
1.	meat				
2.	sad				
3.	hat				
4.	bus				
5.	jam				
6.	tin				
7.	cake				
8.	cup				
	-			score	/8
			Т	otal Score	/16

### 5) Phoneme Deletion and Substition.

\*\*\*Do not give this task to children who got 0 on the phoneme deletion tasks\*\*\*

<u>Pre-trials</u>: Say to the child, "Now we are going to change the way the words sound. I'm going to say a word, and I want you to say it back to me. After that, I'll tell you haw to change the word. "Say doll". After the child repeats it, say "Now say doll again, but don't say /d/." "Say doll." After the child repeats it, say "Now say doll again, but instead of /d/ say /w/."

Initial:

fill (remove /f/)	fill (change /f/ to /b/)
cup (remove /k/)	cup( change /c/ to /p/)
bat (remove /b/)	bat (change /b/ to /s/)

Final:

goat (remove /t/)	fill (change /l/ to /t/)_
make (remove /k/)	cup (change /p/ to /t/
seal (remove /l/)	bite (change /t/ to /k/)

Blends:

slip (remove /l/)	crest (change /s/ to /p/)
slip (change /l/ to /n/	stick (remove /t/)
nest (remove /s/)	stick (change /t/ to /l/)

<u>.</u>

Total Score:\_\_\_\_/18

# 6) Mystery Word.

...

**.** .

. .

# Pre-test

.

)

Stories administered?

turtles flowers kangaroo chocolate

# Post-test

Read ? P		Pronunciation.	if yes (or close to it) definition?
Turtles	Y	N	
Flowers	Y	N	
Kangaroo	Y	N	
Chocolate	Y	N	
Underline all the words the child reads accurately. Circle the first letter of words, on which the child requires help. Do NOT help the child with the mystery word.

\*\*Discontinue this task: if the child needs help with about 80% of the words of the first few sentences.

Story 1: Turtles

Turtles are animals that have shells. Most turtles have hard and bumpy

shells. The shell of turtles is hard to bite. Turtles hide in their shells to be safe.

On land, turtles move very slowly. But turtles are good swimmers. The feet

of turtles are webbed. The webbed feet help turtles to swim.

Baby turtles come out of eggs. Turtles lay their eggs in sand. The eggs of turtles have soft shells.

Story 2: Flowers

Flowers come in many colours and sizes, but the leaves of flowers are always green. Most flowers grow in gardens, but some flowers are grown in hothouses. Hothouse flowers are sold in stores.

In the garden, sun and water make flowers grow. In Canada, flowers start to grow in the spring, but die in winter. A garden with many flowers is beautiful.

We often send flowers to friends and family. Sometimes we send flowers to say "Hello." We can also send flowers to say, "I love you."

Story 3: Kangaroo.

The kangaroo lives in Australia. A mother kangaroo has a pouch. In the pouch, mother kangaroo carries her babies. A baby kangaroo is safe in its mother's pouch. A baby kangaroo is called a joey. A baby kangaroo likes to watch outside when it is in its mother's pouch.

The kangaroo does not walk, but hops on its back legs. The kangaroo can jump very far. The kangaroo uses its tail for balance. The front legs of a kangaroo are very strong. So be careful when you meet a kangaroo.

Story 4: Chocolate.

Jay loved to eat chocolate. After dinner, Jay's mother gave him two pieces of his favourite chocolate for dessert. The chocolate tasted very good. Jay's mother said, "Let's save the rest of the chocolate for tomorrow's treat."

But Jay wanted to eat more chocolate. That night when everyone was Asleep, Jay went to the kitchen to find more chocolate. But where was the Yummy chocolate? Jay looked everywhere, but he could not find any Chocolate. Jay was sad because he did not have any chocolate to eat. Jay went back to bed hungry.

The next day, Jay helped his father fix a squeaky door. He was So happy with Jay, he gave Jay a special treat! It was a yummy chocolate Bar! Jay ate the chocolate with a big smile.





Woodcock, R.W. (1987). *WRMT –R (Woodcock Reading Mastery Tests).* American Guidance Service Inc. Circle Pines.MN

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8) Word Identification. 9) Word Attack

#### 10) Oral Cloze.

Instructions: I will read something to you and there will be one word missing. Where the word is missing, I will say "blank." I want you to think of a word that would sound right in the blank. For example, I might say, "The moon shines bright in the \_\_\_\_\_," (pause and repeat) and I want you to say "sky." So it would be "The moon shines bright in the sky." OK. Let's try another one. "The puppy wags its \_\_\_\_\_," (pause and repeat). Good! Let's try some more.

Discontinue if the child fails the practice items, and the first four test items.

- 1. Sally has a party dress and a school dress. She has two\_\_\_\_\_.
- 2. We have done the work already. We\_\_\_\_\_ it yesterday.
- 3. John is a good player. Bill is a better player than John. But Tom is the \_\_\_\_\_ player of them all.

4. Bob is a child. Mary is a child, They are two \_\_\_\_\_.

5. The brown dog is small; the grey dog is smaller; but the white one is the

6. I have one mouse here, and one mouse there. I have two\_\_\_\_\_.

7. Yesterday, Tina and Marie\_\_\_\_\_walking down the street.

8. Yesterday, Joe \_\_\_\_\_the ball.

9. The hungry dogs have \_\_\_\_\_all the food.

10. Jane \_\_\_\_\_ her sister ran up the hill.

11. It was a sunny day with a \_\_\_\_\_sky.

12. Jim set the lamp on the table so he could\_\_\_\_\_.

13. Jeffrey wanted to go\_\_\_\_\_the roller coaster.

14. Dad \_\_\_\_\_Bobby a letter last week.

Master tick sheet to record all activity and reading sessions.



## APPENDIX C: TREATMENT INTEGRITY 2.

Progress record for activity sessions.



ZPD\* — Zone of proximal development.

ne - negla

## APPENDIX D: TREATMENT INTEGRITY 3.

<sub>P</sub>

Reading together record.

DATE	MINUTES	Воок	Signed
	-		
		· · · · · · · · · · · · · · · · · · ·	

# APPENDIX E: TREATMENT INTEGRITY 4.

Diagnostic test results.



## APPENDIX F: "ABOUT YOUR CHILD'S READING" PROFILE.

Name:			Date
	(Parent)		
Name:			Grade:
	(Child)		
1. Do	you think his/her progress wit	h reac	ling so far is:
			very good good OK poor
2. Do	es s/he like to read (alone)? with you?		never not very often sometimes often
3. Do	you think s/he reads as well a	s frien	ds?
			not at all not quite as well about the same better than most

4.	When s/he	comes to an	unknown	word,	does s/he?
----	-----------	-------------	---------	-------	------------

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say nothing
try to sound it out
wait for you to say
reread the sentence

5. Does s/he talk to you about the books, s/he has read?

		never
		sometimes
		usually
		always
6.	While reading together, what do you u	sually do when s/he comes to a new
	word?	sumply the whole word
		supply the whole word
		wait a moment
		ask your child to decode
		nothing
7.	When your child reads alone, does s/r	ne understand?
		almost everything
		some
		almost none
		none
8.	How important is it to you that your ch	ild reads well?
		not very
		sort of
		important
		very important
9.	Does you child think reading is?	
		boring '
		ОК
		interesting
		great
10	). How confident do you feel about helpi	ng your child with reading?
		not at all
		fair
		quite confident
		very confident

#### APPENDIX G: Elementary Reading Attitude Survey. (McKenna & Kear, 1990)

School Grade\_\_\_\_\_Name\_\_\_\_\_

1. How do you feel when you read a book on a rainy Saturday?

2. How do you feel when you read a book in school during free time?

3. How do you feel about reading for fun at home?

4. How do you feel about getting a book for a present?

5. How do you feel about spending free time reading?

6. How do you feel about starting a new book?

7. How do you feel about reading during the summer vacation?

8. How do you feel about reading instead of playing?

9. How do you feel about going to a bookstore?

10. How do you feel about reading different kinds of books?

11. How do you feel when the teacher asks you questions about what you read?

12. How do you feel about doing reading workbook pages and worksheets?

13. How do you feel about reading in school?

14. How do you feel about reading your school books?

15. How do you feel about learning from a book?

16. How do you feel when its time for reading in class?

17. How do you feel about the stories you read in reading class?

18. How do you feel when you read out loud in class?

19. How do you feel about using a dictionary?

20. How do you feel about taking a reading test?

## APPENDIX H: DEMOGRAPHIC QUESTIONNAIRE (Perry & Nordby, 2000)

Name
How many adults in your home?
How many children in your home?Ages?
What languages are spoken in your home? What is the language spoken most often?
What cultural backgrounds are represented in your home?

What kind of work do you do now, or most recently? If you work at home, caring for the children, please include that information.

What kind of work does your spouse/partner do now, or most recently? If he/she works at home, caring for the children, please include that information.

If you work outside of your home what type of childcare do you use?

Family Members (e.g.Grandparent, older siblings) Day Care After school care Care by a babysitter in your home Care by a babysitter in another home

Did your child attend preschool before Kindergarten?

Yes

No

Please check all the education or training you have had?

Elementary School.

High School.

Trade School.

Job Training Program.

College.

University.

Other.

Please check all the education/training your spouse or partner has had.

Elementary School.

High School.

Trade School.

Job Training Program.

College.

University.

Other.

Thank you for your time and participation in this study.

~

## APPENDIX H (Cont.)

Experi	mental					
School	Family	Number of Parents	Number of Children	First Language	Parents Employed	Highest Education Level
Α	1	2	1	E	1	Col/Uni
В	2	2	3	E	1	Col/Uni
В	3	2	2	Е	2	High/Uni
В	4	2	2	Е	2	Uni/Uni
С	5	2	2	Е	1.5	Uni/Uni
С	6	2	2	Е	1	High/J.Tr.
С	7	2	3	E,	1.5	Uni/Uni
С	8	2	2	Е	1.5	Col/Uni
С	9	2	3	Е	1	High/J.Tr.
D	10	1	3	Е	1	Col
Е	11	2	3	Е	1.5	High/High
F	12	2	2	E	1	High/High
G	13	2	2	Е	2	High/High
G	14	1	3	Е	1	High
н	15	1	1	Е	1	High
1	16	2	2	ESL	1	Col/High
J	17	2	2	Е	<u> </u>	Uni/Uni
к	18	2	2	E	1	Col/Uni
К	19	2	3	Е	1.5	Col/Col
L	20	2	2	E	1	Uni/Uni
L	21	2	2	Е	1	Uni/Uni
L	22	2	2	E	1	High/High
L	23	2	2	Е	1	Uni/Col

## Demographic Factors for the Experimental and Control Groups

Control						
School	Family	Number of Parents	Number of Children	First Language	Parents Employed	Highest Education Level
A	1	2	1	E	2	Uni/Uni
В	2	2	1	Е	1.5	Uni/Uni
В	3	2	2	Е	2	Uni/Col
В	4	2	1	Е	1.5	Uni/Col
С	5	2	2	Е	1	High/Col
С	6	2	2	E	1	Uni/Uni
С	7	2	3	E	1	Uni/Uni
С	8	2	2	Е	1.5	Uni/Uni
М	9	2	1	E	2	Col/Col
D	10	2	1	Е	2	High/Col
N	11	2	2	E	2	Uni/Col
N	12	1	3	Е	1	Col
G	13	1	4	Е	1	High
G	14	2	2	ESL	1	High/High
н	15	2	2	ESL	1	Col/Col
1	16	2	2	Е ·	1	Uni/Col
J	17	2	3	Е	1	High/High
к	18	2	2	E	2	Col/Col
к	19	2	2	E	2	Col/Col
L	20	2	1	E	1	Uni/Col
L	21	2	2	Е	2	High/High
L	22	2	2	Е	2	Uni/Uni
L	23	2	2	Е	1.5	Uni/Uni

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APPENDIX I: Experimental and Control Group Pre and Post Test Results for WRAT Reading, WRAT Spelling, all Phoneme Measures, Word Identification and Word Attack.

Experi	mental Group				
Child	WRAT Rdg.	WRAT Spell.	All Phoneme	Word	Word
	Pre-Post	Pre-Post	Pre-Post	ldent.	Attack
1	32 – 25	37 – 55	00	7 – 43	3 – 37
2	37 – 95	37 – 83	5 – 27	49 – 82	58 – 84
3	61 – 58	75 – 77	0 – 26	1 – 70	5 – 58
4	45 – 68	25 – 58	2 - 12	20 – 52	7 – 67
5	27 – 79	4 - 88	14 – 26	11 – 64	1 – 66
6	32 – 45	50 – 83	2 – 16	1 – 51	2 – 58
7	53 – 47	68 – 50	0 – 4	4 – 62	8 – 70
8	75 – 87	63 – 77	2 – 23	84 – 89	2 – 71
9	32 – 23	45 – 32	0 - 2	9 – 33	3 – 23
10	39 – 87	16 – 88	0 – 25	1 – 76	2 – 71
11	37 – 84	21 – 86	22 – 23	36 – 96	47 – 88
12	45 – 58	50 – 77	0 – 17	4 – 71	8 – 1
13	39 – 34	50 – 37	1 – 0	1 – 42	2 – 13
14	58 – 50	25 – 63	0 - 15	15 – 70	16 – 64
15	32 – 77	1 - 68	7 – 29	1 – 78	2 – 67
16	9 – 32	8 - 47	7 – 22	4 – 59	7 – 47
17	6 – 14	1 – 23	3 – 24	9 – 4	7 – 23
18	3 – 23	2 – 27	3 – 22	7 - 24	5 – 34
19	21 – 73	16 – 55	0 – 21	1 – 55	2 – 50
20	55 – 79	23 – 61	19 – 25	2 – 61	17 – 77
21	14 – 25	23 – 37	0 – 25	5 – 25	5 – 47
22	27 – 66	27 - 77	1 – 15	7 – 48	1 – 80
23	1 - 25	1 - 30	0 - 27	75 – 11	7 - 42

Experimental Group

.

Contro	l Group				
Child	WRAT Rdg.	WRAT Spell.	All Phoneme	Word Id.	Word Att.
	Pre-Post	Pre-Post		Pre-Post	Pre-Post
			Pre-Post		
1	2-8	3 – 21	0 – 1	3 – 18	<u>5 – 13</u>
2	68 – 94	63 – 88	14 – 25	41 – 83	2 – 92
3	58 – 87	43 – 88	0 – 22	1 – 79	8 – 67
4	47 – 92	50 – 83	13 – 26	7 – 83	1 – 9
5	27 – 34	30 – 37	1 – 11	3 – 44	1 - 30
6	32 – 73	37 – 55	10 – 22	3 – 59	1 – 60
7	25 – 39	32 – 63	0 – 10	41 – 10	26 – 10
8	27 – 88	50 – 75	4 – 26	3 – 82	1 – 64
9	37 – 79	50 – 75	10 – 24	23 – 68	22 – 68
10	27 – 16	37 – 18	1 – 0	9 – 3	3 – 5
11	47 – 23	39 – 37	12 – 19	3 – 44	1 – 15
12	3 – 21	2 – 14	1 – 2	1 – 36	4 – 10
13	1 – 1	1 – 1	0 - 0	3 – 5	1 – 7
14	32 – 16	6 – 27	0 – 23	9 – 20	3 – 18
15	3 – 83	8 – 77	0 – 17	4 – 68	8 – 19
16	53 – 86 <sup>.</sup>	83 – 79	6 – 17	63 – 90	52 – 82
17	45 – 79	61 – 47	0 - 0	41 – 33	26 – 1
18	18 – 32	13 – 50	0 – 12	9 – 31	7 – 15
19	16 – 32	2142	1 – 15	9 – 35	3 – 1
20	32 – 84	63 – 77	3 – 24	1 – 60	4 – 57
21	30 – 45	42 – 66	0 – 17	4 – 54	8 – 63
22	1 – 1	1 – 1	0 – 2	9 - 3	3 – 5
23	55 – 37	25 – 61	12 - 22	5 – 70	7 - 48
WRAT Rdg. = Wide Range Achievement Test of Word Reading					

#### APPENDIX I (Cont.)

WRAT Rdg.= Wide Range Achievement Test of Word ReadingWRAT Spell.= Wide Range Achievement Test of SpellingAll Phon.= Total of all Phoneme Deletion MeasuresWord Id.= Woodcock Reading Mastery Test of Word IdentificationWord Att.= Woodcock Reading Mastery Test of Word Attack

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#### APPENDIX J: SYNOPSIS OF SOUND TRACK FOR READING

The program has a description and a list of contents as follows:

What does Sound Track for Reading consist of? The program has two parts:

1. THE VIDEO explains how to use 6 mediation ideas to encourage positive thinking and learning skills. As the parent you will learn to recognize and praise new learning by planning small steps towards precise, achievable goals. You can only do that if you have discovered the weak links in a chain of reading skills, and then have clear activities to work on.

You will be shown how to use the six mediation principles (based on the work of the psychologist L.S. Vygotsky).

These principles are demonstrated in the video. They are:

- Intentionality and Reciprocity
- Sharing
- Transcendence
- Meaning
- Regulation of Behaviour
- Feelings of Competence (See Illustrations of language pp.186 191).
- 2. THE BOOK explains how to find weak links in the reading skills chain by using ten diagnostic tests (**Tests**, pp. 8 67). Each test leads to an area of new learning. Vygotsky called these zones of proximal development). There are ten of these areas full of activities in the middle section of the book (**Activities**, pp. 68- 167). The third section of the book (**Supported Reading**, pp. 173 176) tells you how to run a separate daily session of 10 minutes, which allows you and your child to enjoy stories and combine skills within real reading without frustration.

The Activity Book also contains recording forms to help you keep track of progress through the program and build a portfolio of your child's progress through these important early stages of reading and writing.

Please refer to the extra questions provided on page 192, and to the "Feelings Map" on page 193. These pages can help you develop communication and listening skills to help your child.

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