OVERCOMING POVERTY:

PROMOTING LITERACY IN CHILDREN

FROM LOW-INCOME FAMILIES

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EXECUTIVE SUMMARY

Most children who have problems learning to read come from low-income families. Reading problems put these children at high risk for school failure, dropping out, low literacy and chronic unemployment in adulthood, and consequently, for perpetuating the cycle of poverty and low literacy in the next generation. To prevent and decrease these problems, effective reading interventions for children from low-income families must be developed. Nowhere is this more urgent than in Newfoundland and Labrador where the incidence of low-income families is much higher than the national average, where youth from low-income families have lower literacy rates that their counterparts in Quebec and the Prairie provinces, and where school-age children from low-income families are among the least proficient readers in the country. To design effective interventions for children from low-income families, we need to know why some of these children become excellent readers while most do not. An earlier report conducted in Newfoundland and funded by the National Literacy Secretariat (O'Sullivan, 1992) showed that 1) children from low-income families who become excellent readers have extremely positive beliefs about their competence in reading as do their parents; 2) by the time children are 9 years old, children's beliefs, parents' beliefs, and children's reading proficiency levels are firmly established and resistant to change; 3) efforts to promote positive beliefs about reading and higher reading achievement for children from low-income families must begin before children reach the age of 9 years.

This project was designed to answer specific questions about reading beliefs and reading proficiency in very young children from low-income families. Answering these questions is essential for the development of effective early intervention programs. The project involved 439 children age 4 to 8 years all living in poverty (defined here as the low-income cutoff established by Statistics Canada) in Newfoundland. The objectives were to 1) examine what young children (ages 4 to 8 years) living in poverty believe about their reading and determine how those beliefs come to influence the children's reading proficiency; 2) determine the role that parents in low-income families play in influencing their children's beliefs about reading. In particular, we examined what parents believe about their children's reading, the type of literacy environments they create in their homes, and how those factors influence children's reading beliefs and competence; and 3) develop recommendations for the design of early intervention programs aimed at increasing reading proficiency for children living in poverty.

We measured the children's beliefs about their competence as readers and about the value of reading for them; their reading proficiency and the sophistication of their reading-relevant knowledge and processing (i.e., their knowledge of book and print conventions, phonological awareness, and receptive oral language); parents' beliefs about their children's competence as readers and about the value of reading for their children; and parents' reports

about the literacy environment in their homes. We found that as a group, these children had pre-reading and reading skills well below national and Newfoundland averages and the sophistication of their reading-relevant knowledge and processing was also well below these standards. Furthermore, boys and girls, rural and urban children, children who did versus did not attend preschool, all demonstrated the same pattern. Importantly, from Kindergarten through to Grade 2 the children's performance relative to the national average did not change. That is they neither gained nor lost ground. Although these children had insufficiently developed reading and related cognitive and linguistic competencies, they believed themselves to be competent readers, and believed that reading was very interesting and useful for them. In other words they had the motivational will but lacked sufficient cognitive and linguistic skill for proficient reading. Parents, like their children, believed their children were very competent and reported positive literacy environments in their homes.

Although most of the children were not proficient readers our sample included children who were among the most outstanding readers in Canada for their age. What distinguished these children and their parents? We found that before Grade 2, there were two relatively independent paths to excellence in reading, one driven by "skill" and one by "will". Children on the skill path were distinguished by their extremely sophisticated knowledge of book and print conventions (e.g., knowing that English is read from left to right), knowledge that comes from interaction with books. Small differences in children's knowledge of print conventions went hand-in-hand with increases in their reading proficiency. What distinguished the parents of these children was their belief that their children were outstanding. These parents probably formed that belief based on their evaluations of their children's interaction with books. Children on the will path to excellence were distinguished not by sophisticated development in reading-relevant knowledge but by their remarkable confidence in their reading ability. These children may have had relatively little access to books and relied more on labels, signs, and catalogues for their independent reading. Interestingly, we could not identify any characteristic that distinguished the parents of children on the will path to reading excellence. In particular, they did not view their children as outstanding readers. In Grade 2, these two paths converged to a great extent so that most excellent readers had sophisticated reading-relevant knowledge and believed, as did their parents, that they were truly remarkable readers. The design of this project did not allow us to determine what path or paths (i.e., will or skill) these particular children had taken prior to Grade 2. We need longitudinal research where young children on the skill and will paths to excellence are followed for several years. That will tell us how resilient each path to reading excellence actually is and what happens to children on the different paths as they advance through school.

Our recommendations for designing reading intervention programs for children in poverty include the following:

1) The window of opportunity for successful intervention extends at least until Grade 2.
2) All children who live, and attend school, in communities with a high incidence of poverty should be considered at-risk for reading problems. Interventions should be designed for these children as a group.
3) Effective interventions for Prekindergartners (i.e., children due to begin school within 12 months) should be center-based, coordinated by professional educators, involve parents, and operate from a well articulated developmentally appropriate reading program. Programs should be focussed on providing children with the resources (e.g., time, guidance, materials) to interact with written language.
4) Communities should utilize existing expertise to develop and implement reading interventions for Prekindergartners and utilize existing school buildings as centers for program delivery.
5) Communities need to facilitate new and innovative partnerships between government departments, other organizations, and the professions to design and deliver effective reading interventions for Prekindergarten children in poverty. This approach is consistent with Newfoundland and Labrador's Strategic Social Plan.
6) Programs prior to school entry cannot inoculate children against later potential effects of poverty on their reading and school success. Exemplary programs will be required by these students for many years throughout their school careers.
7) In schools where there is a high incidence of poverty and where reading achievement is low, intervention efforts should be focussed on clearly articulated, well implemented, school-wide efforts that build from coherent classroom reading instruction. It is only when exemplary reading instruction programs are in place that additional resources should be targeted to identify and intervene with individual children at-risk.
8) Each school should develop a well articulated reading program that recognizes, respects, and incorporates the characteristics of the community that it serves.
9) These reading programs should be designed to help children acquire both the *skill* and the *will* that are essential for proficient reading.
10) Individual schools should be supported in their efforts to build school-based teams of expertise in reading, expertise that constitutes a permanent resource for each school. School teams should draw on community-based expertise (e.g., university, literacy groups) to help design, implement, and evaluate their reading programs.
11) The critical role of the classroom teacher should be acknowledged and teachers should be fully supported, especially through ongoing professional development, in their work in reading instruction. Each school should have adequate access to a reading specialist who will coordinate ongoing professional development for teachers.
12) Resources should be allocated to schools based on need so that schools with large numbers of children in poverty have the resources to develop exemplary reading programs.

13) Parents play an important role in their children's reading and should be included in all programs for Prekindergarten and school-age children. Professional development for parents should include in-depth exploration of their beliefs about competent reading, how to recognize it, and promote it in their children.

14) The children and parents in this project lived in Newfoundland but the issues identified here are matters of urgent national importance. Canada has the expertise and the resources to ensure that all children in poverty can read well by age 9. What is needed is a commitment to use existing resources in different ways to achieve that goal. A national Head Start in Reading for children in poverty is called for.

BACKGROUND

Reading Problems Among Children Living in Poverty

Between 15% and 30% of all school children have significant problems learning to read and most of these children come from low-income families (Ellis & Large, 1987). Compared to children from middle- and upper-income homes, children from low-income families begin school at risk for reading problems and they fall farther behind in reading as they get older and advance through school (Ginsburg & Bronstein, 1993; Stanovich, 1986; Walker, Greenwood, Hart, & Carta, 1994; Wigfield & Asher, 1983). Children living in poverty [defined in this project as the dollar value associated with the low-income cutoff (Statistics Canada, 1996)] who have reading problems are at high risk for school failure, dropping out of school early, and for low literacy and chronic unemployment in adulthood (Wigfield & Asher, 1983). This cycle, that begins with reading problems in childhood, virtually guarantees that most of these children will live close to or in poverty when they reach adulthood, as in time will their own children. Because of the enormous social and economic consequences of this cycle of poverty and low literacy, it is clearly in Canada's interest to prevent and decrease reading problems among children in low-income families before they become established and resistant to change.

Preventing reading problems for children in poverty is particularly critical in Newfoundland and Labrador. This is because in Newfoundland and Labrador, the incidence of children living in low-income families is 26%, considerably higher than the national average (Statistics Canada, 1996); youth from low-income families in Newfoundland and Labrador have lower literacy levels than their counterparts in Quebec and the Prairie provinces (Willms, 1997); and the rate of illiteracy among adults is the highest in Canada (Southam Newspaper Group, 1987; Statistics Canada, 1991). School-age children from low-income families in Newfoundland are among the nation's worst readers, with *average reading scores at the 25th. percentile* on nationally standardized tests (O'Sullivan, 1992). Furthermore, boys are significantly worse readers than girls. Importantly, these patterns are well established by the time children are 9 years old (O'Sullivan, 1992, 1995) and are extremely unlikely to change as the children advance through school. In fact, a child's reading level is a good indicator of what his/her income will be in adulthood (Willms, 1997). What this means is that most third grade children who live in poverty and have reading problems are already on a developmental trajectory to low-income in adulthood. It is clear that meaningful efforts to prevent and decrease reading problems for children in poverty must begin with much younger children, before the cycle of underachievement in reading becomes firmly established.

What type of interventions will prevent or decrease reading problems in children from

low-income homes? To answer that question, we need to understand why some children living in poverty become excellent readers while most have chronic problems with reading. If we can determine what fosters reading excellence for these children, then we can use that knowledge to design interventions that will promote reading proficiency for this population. Interventions that are based on scientific knowledge have a high probability of success. In contrast, interventions based on folk belief or common sense **B** however well intentioned **B** are extremely unlikely to be effective. Designing social and educational interventions on the basis of available scientific knowledge was also recommended in the recent review of Federal Science and Technology Policy (Report of the National Advisory Board on Science and Technology, 1995).

Why Do Some Children Living in Poverty Become Excellent Readers?

Researchers have spent many years describing the effects of low-income on children's reading achievement but only recently have we begun to analyse the processes by which such effects come about (Huston, McLoyd, & Garcia Coll, 1994). The language and literacy environments in low-income homes (e.g., availability of reading material, parents reading to children) influence children's reading, such that richer language environments help promote children's reading competence, at least to a certain extent (Walker et al., 1994). However, good reading requires more than language skill, it also requires motivation or will (Ginsburg & Bronstein, 1993; Stevenson & Lee, 1990). Even children raised in language rich homes need the motivation to learn to read, to take control of their reading, and to set and achieve high standards in reading and literacy (Snow, Burns, & Griffin, 1998). It is children's beliefs about reading that provide the motivation to succeed (Borkowski, Johnston, & Reid, 1987; Stipek & MacIver, 1989). For example, children who believe they are good readers and who expect to do well, persist when they encounter reading problems and try to figure out strategies for overcoming those problems. This persistence results in increasingly sophisticated reading skills which enhance children's reading proficiency and reinforce their positive reading beliefs. In contrast, children with negative reading beliefs give up easily when they experience problems, believing that there is nothing they can do to overcome them. Consequently, they do not use their experiences to develop their reading skills but instead, interpret those experiences as further evidence for their negative beliefs about themselves as readers (Snow et al., 1998).

The seminal research to date on relations between reading beliefs and reading achievement for children in poverty was carried out in Newfoundland and Labrador and was funded by the National Literacy Secretariat (O'Sullivan, 1992, 1996; O'Sullivan & Howe, 1996). In that research, clear cut findings were produced about relations between motivational beliefs and reading achievement for children from low-income families in Grades 3, 6, and 9. First, children' beliefs about their reading competence were reliably related to their reading achievement levels. For example, children who believed that they were *excellent* readers set and

expected to achieve very high standards in reading and were in fact much better readers (performing up to the 99th. percentile on standardized tests) than children who saw themselves as *good* readers. Second, girls were better readers than boys and girls had much more positive beliefs about their reading and more ambitious career goals than boys. For example, most girls had aspirations for professional careers while boys aspired to blue-collar careers especially in the fishery. Third, these patterns in reading beliefs and reading achievement were clearly established by the time the children were 9 years old.

Why did some of these children have extremely positive reading beliefs and others did not? The children's beliefs about themselves as readers were heavily influenced by parents' beliefs about their children's reading. Low-income parents who believed that their children could succeed in reading and that their children could improve if they tried harder, had children who held the same beliefs about themselves and who ranked among the best readers in Canada on nationally standardized tests (O'Sullivan, 1992; O'Sullivan & Howe, 1996). These results are similar to findings reported by researchers around the world that show how differences in parents' beliefs influence their children's beliefs and proficiency in mathematics and account, in part, for differences in mathematics achievement between students in Asian and North American schools (Ginsburg & Bronstein, 1993; Okagaki & Sternberg, 1993; Stevenson & Lee, 1990).

To summarize, children living in poverty become proficient readers when they hold very positive beliefs about reading, beliefs that motivate them to succeed. The children's beliefs are heavily influenced by their parents' beliefs. What this means is that intervention programs to promote reading competence in children from low-income families should include a focus on the beliefs held by both parents and children about the children's reading. Furthermore, because children's beliefs and their reading levels are well established by the time children reach their ninth birthday, they are highly resistant to change at that point. To be successful, must interventions must be targeted at much younger children and their parents. To design effective interventions for younger children, at least four additional questions must first be answered.

What Questions must be Answered to Develop Effective Interventions?

We know that 9 years-olds living in poverty have well established beliefs about their reading and that those beliefs influence their reading proficiency. We do not know how old children are when they initially establish their reading beliefs. Nor do we know how old they are when their beliefs become linked to their reading proficiency. The answers to these questions are important because they will tell us at what age children's beliefs can be easily influenced to effect their reading proficiency, that is, the best age group for intervention programs. Second, we know that children's beliefs are strongly related to their reading achievement but we do not know if beliefs influence reading directly or indirectly via the basic knowledge and processes

that underlie children's reading (Siegel, 1993; Stanovich, 1986). For example, children's beliefs may influence their understanding of print concepts (e.g., knowing that English is read from left to right), their phonological processing ability (i.e., ability to process sounds in words) or their oral language, all basic knowledge and processes demonstrated to be important in reading (Snow et al., 1998). We need to answer that question so that intervention programs can target those reading-related knowledge and processes that are most heavily influenced by beliefs. Third, we know that some parents have more positive beliefs about their children's reading (especially parents with daughters) than others (especially parents with sons) and that children's beliefs about themselves are highly similar to their parents' beliefs about them. However, we do not know how parents' beliefs come to influence children's beliefs. For example, do parents with more positive beliefs create richer literacy environments in their homes? We need to know the answer to that question so that, in interventions, we can help parents develop, communicate, and socialize positive beliefs in their children.

Overall, the answers to these three questions will provide clear direction for the design of early intervention programs. They will tell us the age at which children's beliefs and their reading proficiency are most amenable to appropriate interventions; what reading-related knowledge and processes should be targeted in interventions; and how to help parents develop positive beliefs about their child's reading and socialize those beliefs in their children. The project described below was designed to provide these answers and to establish clear guidelines for the design of early intervention programs in reading for children in poverty.

OBJECTIVES AND SIGNIFICANCE

There were three objectives in this project. The first was to examine what young children (ages 4 to 8 years) in low-income families believe about their reading and determine how those beliefs come to influence the children's reading proficiency. The second objective was to determine the role that parents in low-income families play in influencing their children's beliefs about reading. In particular, we examined what parents believe about their children's reading, the type of literacy environments they create in their homes, and how those factors influence children's reading beliefs and competence. The third objective was to develop recommendations for the design of early intervention programs aimed at increasing reading proficiency for children living in poverty. The importance of achieving these objectives cannot be overestimated. The result will be a set of specifications that can be used to design interventions with a sound scientific base and, therefore, a high probability of success. The social and economic benefits of such interventions for children from low-income families and for the country as a whole would be immense.

METHOD

The Sample

Recruitment

The participants were Prekindergarten (i.e., children due to enter Kindergarten in the next school year), Kindergarten, Grade 1 and Grade 2 children from low-income families and one parent or guardian of each child. Participating families were recruited in three stages. First, a sample of communities was selected. To be selected communities had to have a) an average family income less than the Provincial average (Statistics Canada, 1994), b) an incidence of low-income families higher than the provincial average (Statistics Canada, 1994), and c) a primary school. Fifty six communities in Newfoundland met these criteria. To achieve a sample that was representative of children living in poverty in urban (defined as a population > 7,000) versus rural (defined as a population < 7,000) communities and in eastern, central, and western Newfoundland, 9 communities were selected from the pool of 56 (Statistics Canada, 1997). Seven of these communities were rural and contained only one school. To recruit schools in the two urban communities, the Directors of Education for those districts nominated schools in their jurisdictions that served a high incidence of low-income families. This produced two schools from urban communities. In all, our sample included 9 schools from four school districts across the island of Newfoundland.

Second, to recruit families with young children, schools produced class lists for Prekindergarten (i.e., children registered to enter Kindergarten the following year), Kindergarten, Grade one and Grade two. The parents/guardians (hereafter referred to as the parents) of the 987 children on the lists were contacted and 724 or 74% agreed to take part. Telephone interviews were conducted with 702 of those parents, the remaining 22 could not be reached (e.g., they had moved). Following the 702 interviews with parents, the children were tested. Of the 702 children, 28 were unavailable at the time of testing (most were out of school due to illness) leaving 674 in the tested sample. This represents 93.6% of the children whose parents consented to participate, 69% of all the potential participants. All participating parent-child dyads were offered an honorarium of $20 for taking part.

Third, the sample of 674 students was reduced to 439 students from very low-income families. This was accomplished on the basis of employment information supplied by parents. Families were eliminated if family income was estimated to be greater than the low-income cutoffs defined by Statistics Canada (1996). That is, an income greater than $22,500 a year for families in urban communities of 100,000 or more people and greater than $18,129 a year for rural families. For example, families were eliminated if at least one parent worked for more than 6 weeks in a professional capacity or for more than 15 weeks in a skilled trade. Families were retained if one or both parents was employed full-time in manual labour.

Description

Statistics describing the children's age, sex and community are shown in Table 1. There were roughly equivalent numbers of female and male children from each grade. The sample is predominantly rural (65%) and representative of the urban-rural distribution of children living in poverty in Newfoundland (i.e., urban = 66%, rural = 34%) (Statistics Canada, 1997). Among Prekindergartners, 39% attended preschool for an average of 14 hours a week and 35% attended Prekindergarten programs (i.e., operated by the school where the child was registered to attend Kindergarten the next year) for an average of 3 hours a month. Only 8% of the children attended both.

Table 1

Number of Children, Age, Sex, and Type of Community by Grade

	Prekindergarten	**Kindergarten**	**Grade 1**	**Grade 2**
Number of Students	**77**	**133**	**102**	**127**
Mean Age	**4 yrs 11 mos**	**5 yrs 10 mos**	**6 yrs 11 mos**	**7 yrs 11 mos**
% Female	**53%**	**54%**	**41%**	**55%**
% Male	**47%**	**46%**	**59%**	**45%**
% Rural	**71%**	**62%**	**59%**	**68%**
% Urban	**29%**	**38%**	**41%**	**32%**

Most of the respondents on the parent questionnaire were mothers of the children sampled (see Table 2) and most reported that they were married or living in common-law relationships (61.2%). That 38.8% of the parents were unmarried is atypical of the population in Newfoundland as a whole where 80% of adults report being married (Statistics Canada, 1993). However, it is typical of populations living in poverty where there is a high incidence of single parent families that are led mainly by women (National Council of Welfare, 1997). Concerning the parents' education, 35%of the responding parents and 46% of the other parents had not completed high school (see Table 2). Interestingly, 7% of the parents had attended university.

The employment information provided by parents is summarized in Table 3. Over 72%of respondents reported that they had not worked at all during the previous 12 months. Of those reporting employment, the majority were manual laborers (e.g., seasonal fish plant

workers) or worked in clerical/sales positions (e.g., waiter or waitress). For 75% of the students in the project, a second parent/guardian lived in the home. Of this group, 38% were unemployed during the previous year and among those who were employed most were manual labourers (e.g., unskilled construction work).

Table 2

Marital Status and Years of Education For Responding and other Parents/Guardians

Respondent's Relationship to Student	Respondent's Marital Status	Highest Level of Education		
		Schooling Level Reported	Respondent	Other Parent or Guardian
Mother 90.4%	Married 56.6%	Less than High School	34.9%	45.9%
Father 7.1%	Divorced 7.6%	High School	22.3%	26.7%
Other 2.5%	Never Married 15.2%	College/Trade School	37.8%	23.6%
	Separated 6.0%	GED	0.9%	1.0%
	Common-law 4.6%	Some University	2.1%	1.0%
	Other 9.9%	University Degree	1.1%	1.4%
		Graduate Degree	0.9%	0.3%

Table 3

Type and Amount of Employment for Responding and Other Parents/Guardians

	Parent employment in past year	**Average # of weeks worked in past year**	**Other parent employment in past year**	**Average # of weeks worked in past year**
Unemployed	**72%**		**38%**	
Employed	**28%**		**62%**	
Of Those Employed:				
Professional	**5%**	**6**	**0%**	**0**
Technical	**0%**	**0**	**1%**	**7**
Trade	**0%**	**0**	**4%**	**6**

Clerical/Sales	**39%**	**42**	**10%**	**45**
Manual Labor	**56%**	**25**	**85%**	**27**

Tests and Measures

A number of different tests and measures were used in this project. These are described below. Note that the questionnaire used for the parent interview included questions concerning demographic information on family size, income, employment, and parents' education (Hauser, 1994).

Children's reading. The children's reading achievement was measured on the letter-word identification subtest of the Woodcock-Johnson Psychoeducational Battery (Woodcock & Johnson, 1989-1990). On this test, children are shown individual, decontextualized letters and words and asked to identify them.

Children's reading related knowledge and processing. Three aspects of children's reading related knowledge and processing that are critical for reading development were measured. These were a) children's knowledge of print conventions measured on the Concepts About Print Test (Clay, 1979). On this test, children are given a little book and asked to show the front of the book, the back of the book, what is read (e.g., text vs. picture), direction of reading (e.g., left-to-right, top-to-bottom), and so on; b) phonological awareness measured on a modified version of the syllable (Prekindergartners) and phoneme (Kindergarten, Grades 1 and 2) segmentation tests (Liberman, Shankweiler, Fischer, & Carter, 1974). This test requires children to tap out the sounds (i.e., syllables or phonemes) in words that they hear (e.g., "cat"); and c) children's receptive oral vocabulary measured on the Peabody Picture Vocabulary Test (PPVT) (Dunn & Dunn, 1981). Here, children hear a word and must indicate which of 4 pictures the word represents. The PPVT is a standardized, commercial test. Both the Concepts About Print and Syllable/Phoneme Segmentation Tests were normed using a representative sample of Newfoundland children, specifically for this project.

Children's beliefs. Children's reading beliefs were measured on an 11-item questionnaire with a 7-point Likert response scale used for each item (O'Sullivan, 1992). This questionnaire measures two types of belief. The child's a) beliefs about his/her reading competence, and b) beliefs about the value of reading where value includes both intrinsic (e.g., interest, enjoyment) and utility (e.g., usefulness) components. Because the original questionnaire was designed for school-age children, a modified version employing 8 items was developed and used for the Prekindergarten children in this project (see Table 4 for the items used to measure these beliefs).

Parents' beliefs. Parents' beliefs about their child's reading were measured on a parallel form of the children's questionnaire. Parents' beliefs about a) their child's reading competence, and b) the value of reading for their child were measured on 10 items with a 7-point Likert response scale used for each item (see Table 5 for the items used to measure these beliefs).

Literacy environment in the home. Eight items designed to measure reports of the literacy environment in the home were included in the parent questionnaire. Items tapped the availability of reading material in the home, the child's age when parents began reading with him/her, the frequency of parents' own reading, and of their reading with their children. These items were modelled after items reported to have the greatest predictive validity for children's reading (e.g., Stevenson & Lee, 1990).

Procedure

Six trained interviewers conducted the telephone interviews with parents. Following those interviews, children whose parents gave written permission for their participation were tested. Six trained research assistants (not involved in the parent interviews) travelled to the child's school (and in the case of some Prekindergartners to the child's home) to administer the tests and the children's questionnaire. Children were tested individually. Each child completed the reading beliefs questionnaire before the standardized tests. This was done to eliminate possible temporary effects of the children's reading test performance on their measured beliefs about reading. The interviewer read each item on the questionnaire aloud. The children responded using a concrete visual representation of the Likert response scale that they had been pretrained to use (i.e., a row of coloured bars arranged in stacks from 1 to 7). Then the standardized language and reading tests were administered in random order. Data collection for this project took 4 months to complete. It began in March and ended in June, 1998.

Table 4

Questions used to Measure Children's Beliefs about Their Reading

Prekindergarten Questions
Items Measuring Perceived Competence
How good are you at letters and books?
How easy are letters and books?
Suppose you had to learn something new about letters and books, how good would you be at that?
When you go to Kindergarten how good will you be at reading?
Items Measuring Perceived Value
How much do you like letters and books?
Do you think it's important to be good at letters and books?
Would you like people to read to you more?
When you grow up will you have to be good at reading to get a job?
Kindergarten, Grade 1, and Grade 2 Questions
Items Measuring Perceived Competence
How good are you at reading?
How easy is reading for you?
Are you better or worse at reading than the other children in your class?
Are you better or worse at reading than the other things you learn in school?
How well are you doing in reading at school this year?
Items Measuring Perceived Value
How much do you like reading?
How much fun is the reading you do in school?
Would you do more reading in school even if you did not have to?
When you grow up will you have to be good at reading to get a job?
How important is it to be good at reading?
Some things you learn in school help you to do things better away from school. Learning about plants in school might help you grow a better garden at home. What about reading? Does it help you do things better away from school?

Table 5

Questions used to Measure Parents' Beliefs about Their Children's Reading

Items Measuring Perceived Competence
In general, how good is your child at reading?
Compared to most other children your child's age, how good is your child at reading?
How easy is reading for your child?
How well is your child doing in reading now?
Compared to most things your child does, how good is your child at reading?
Items Measuring Perceived Value
How interesting does your child find reading?
In general, how much does your child like reading?
Would your child do more with reading even if he or she did not have to?
In general, how useful is what your child learns in reading?
How useful will reading be for your child's career in adulthood?

FINDINGS

We set out to answer two main questions. First, what do young children (ages 4 to 8 years) in low-income families believe about their reading and how do those beliefs influence their reading proficiency? In particular, do children's beliefs influence their reading achievement directly or indirectly through their knowledge of print conventions, phonological awareness, and language? Second, what role do parents in low-income families play in influencing their children's beliefs about reading? In particular, what do parents believe about their children's reading, what types of literacy environments do they create in their homes, and how do those factors influence their children's reading beliefs and proficiency?

Children's Reading Proficiency and Reading Beliefs

Our first question was what do young children (ages 4 to 8 years) in low-income families believe about their reading and how do those beliefs influence their reading proficiency? Answering this question involved several steps **B** 1) determining the children's reading proficiency levels, 2) determining the sophistication of children's reading-related knowledge and processes, 3) determining what they believed about themselves as readers, and 4) examining the relationships between the children's reading, their reading-related knowledge and processes, and their beliefs.

1. Children's Reading Proficiency

The children's scores on the standardized reading test (i.e., Woodcock-Johnson letter-word identification subtest) are displayed in Table 6. Although these scores are within the average range (i.e., 85-115) on this standardized test, it is clear that the majority of children at each grade are reading below the 50th percentile. We assigned each child's score on the Woodcock-Johnson reading test to one of three groups: low reading proficiency (standard scores < 88), moderate reading proficiency (standard scores 88-100), and high reading proficiency (standard scores > 100) with 33% of the children assigned to each group. Note that our use of the terms low, moderate, and high reading proficiency is relative (see Table 7). For example, children who were moderately proficient were reading on average at the 34th percentile rank and, although moderate in this sample, they would be among the poorest readers in Canada.

We wanted to see if some groups of children were better readers than other groups. To do this we compared differences in performance on the Woodcock-Johnson reading test as a function of grade, sex, community, and reading proficiency (low, medium, high) using analyses of variance.[1] The only group-based difference we found confirmed that the children we had assigned to our low reading proficiency group were in fact significantly worse readers on the standardized test than those in the moderate group who in turn were significantly worse than those in the high proficiency group. No other group-based differences in reading ability were found. What this means is that for these young children living in poverty, boys and girls read equivalently well as did urban and rural children. Furthermore, standardized test performance neither improved nor deteriorated significantly with grade. In other words, relative to the national average, the children's reading proficiency did not change significantly with years of formal schooling. Among Prekindergartners, neither preschool nor prekindergarten attendance influenced performance on the Woodcock-Johnson reading test (primarily a measure of letter identification for that age group).

2. Children's Reading Related Knowledge and Processing

Children's standardized scores on the tests of reading-related knowledge and processing (i.e., knowledge of print convention measured on the Concepts About Print Test, phonological awareness measured on the Syllable/Phoneme Segmentation Test, and oral language measured on the PPVT-R) are displayed by grade in Table 6 and by reading proficiency group in Table 7. From these tables it is clear that these children's scores were well below the Newfoundland and national averages (i.e., average score = 100, average range of scores = 85-115 on all tests). We wanted to see if some groups of children had more sophisticated reading-related knowledge and processing than other groups. To do that, we compared differences on each of these measures as a function of grade, sex, community, and reading proficiency group using analyses of variance. We found that children's reading proficiency level affected performance on all the measures. That is children in our low reading proficiency group had poorer

Table 6

[1]Because of the large number of comparisons involved in these analyses, a criterion of $p < .01$ was set for determining significant effects.

Children's Mean Score (Percentile Rank in Parentheses) on the Standardized Measures by Grade

Measure	Prekindergarten	Kindergarten	Grade 1	Grade 2
Woodcock-Johnson	**96.0 (PR 39)***	**92.7 (PR 32)**	**95.3 (PR 37)**	**95.2 (PR 37)**
Concepts About Print	**87.2 (PR 19)**	**75.8 (PR 05)**	**95.5 (PR 37)**	**85.3 (PR 16)**
Syllable/Phoneme	**88.7 (PR 23)**	**79.0 (PR 08)**	**89.3 (PR 23)**	**89.0 (PR 23)**
PPVT-R	**81.2 (PR 10)**	**87.4 (PR 19)**	**95.0 (PR 37)**	**93.4 (PR 32)**

*Prekindergarten Woodcock-Johnson scores are age-based. All other Woodcock-Johnson scores are grade-based.

Table 7

Children's Mean Scores (Percentile Rank in Parentheses) on the Standardized Measures by Reading Proficiency Level

Measure	Low	Moderate	High
Woodcock-Johnson	**80.03 (PR 9)**	**93.6 (PR 34)**	**110.8 (PR 77)**
Concepts About Print	**75.5 (PR 5)**	**83.8 (PR 14)**	**98.6 (PR 47)**
Syllable/Phoneme	**81.36 (PR 10)**	**85.7 (PR 18)**	**92.4 (PR 30)**
PPVT-R	**81.0 (PR 10)**	**88.0 (PR 21)**	**99.0 (PR 47)**

knowledge of print conventions, phonological awareness, and oral language than children in our moderate proficiency group who in turn performed more poorly than children in our high proficiency group (see Table 7). Children's grade also affected their performance on these measures. In general, performance was better for Grade 1 and 2 children than for Prekindergarten and Kindergarten children (see Table 6). Nevertheless, even in Grades 1 and 2, average performance on all of the measures was well below the 50th percentile. Boys and girls performed equivalently on all measures and while rural children demonstrated better oral language than urban children, knowledge of print conventions and phonological awareness were not influenced by where children lived. Among Prekindergartners, there were no differences between children who attended preschool or prekindergarten versus those who did not.

3. Children's Beliefs About Their Reading

We wanted to see if children held two separate beliefs, one about their competence as a reader and the other about the value of reading for them. Factor analyses of the children's scores on the questionnaires measuring reading beliefs confirmed that even Prekindergarten children distinguished in their own minds between their competence as readers and the value of reading for them (see Appendix A for factor loadings). What this means is that a child's belief about

his/her competence as a reader was relatively independent of his/her belief about the value of reading. For example, children who believed themselves to be extremely competent readers did not necessarily place a really high value on reading. Interestingly, Prekindergartner's held a single belief about the value of reading, one that included both intrinsic (e.g., interest) and utility (e.g., usefulness) components. But Kindergarten, first, and second graders had two separate beliefs about value, one intrinsic and one utility. For all of the children, then, their perceptions of their competence and the value of reading were separate. From Kindergarten on, beliefs about the intrinsic and utility value of reading were separate as well.

We wanted to see if different groups of children held more positive beliefs about their competence and about the value of reading than others. That is, were there group-based differences (i.e., grade, sex, community, and reading proficiency level) in children's beliefs about reading? To answer this question, we used scores derived from the factor analyses in analyses of variance. We found that beliefs were fairly uniform across groups. The exceptions occurred for children in school. These were that 1) younger children saw reading as less useful than did older children and 2) as a group, better readers held more positive beliefs about their competence than did poorer readers. Boys and girls, urban and rural children held equivalent beliefs about their competence in reading and about its value for them. It is important to point out that almost all of the children in this project saw themselves as competent readers and believed that reading was valuable. The differences reflected in these analyses should be interpreted in terms of degrees of competence and degrees of value, not competence versus incompetence, or valued versus not valued (see Appendix B for ANOVA output).

4. Influence of Reading Beliefs on Reading Proficiency

Up to this point, our focus has been on group-based differences. However, because individual children's scores on the standardized reading test ranged from the 1st to the 99th percentile, we wanted to see if small changes in reading proficiency went hand-in-hand with similar changes in reading beliefs or with changes in reading-related knowledge and processes. In other words, what are the more fine-grained determinants of reading excellence among children living in poverty? To answer this question a series of stepwise multiple regression analyses was carried out. With these analyses we wanted to determine the relations between reading beliefs, knowledge of print concepts, phonological awareness, oral language, and reading proficiency (see Figure 1). These analyses were conducted separately for each grade.

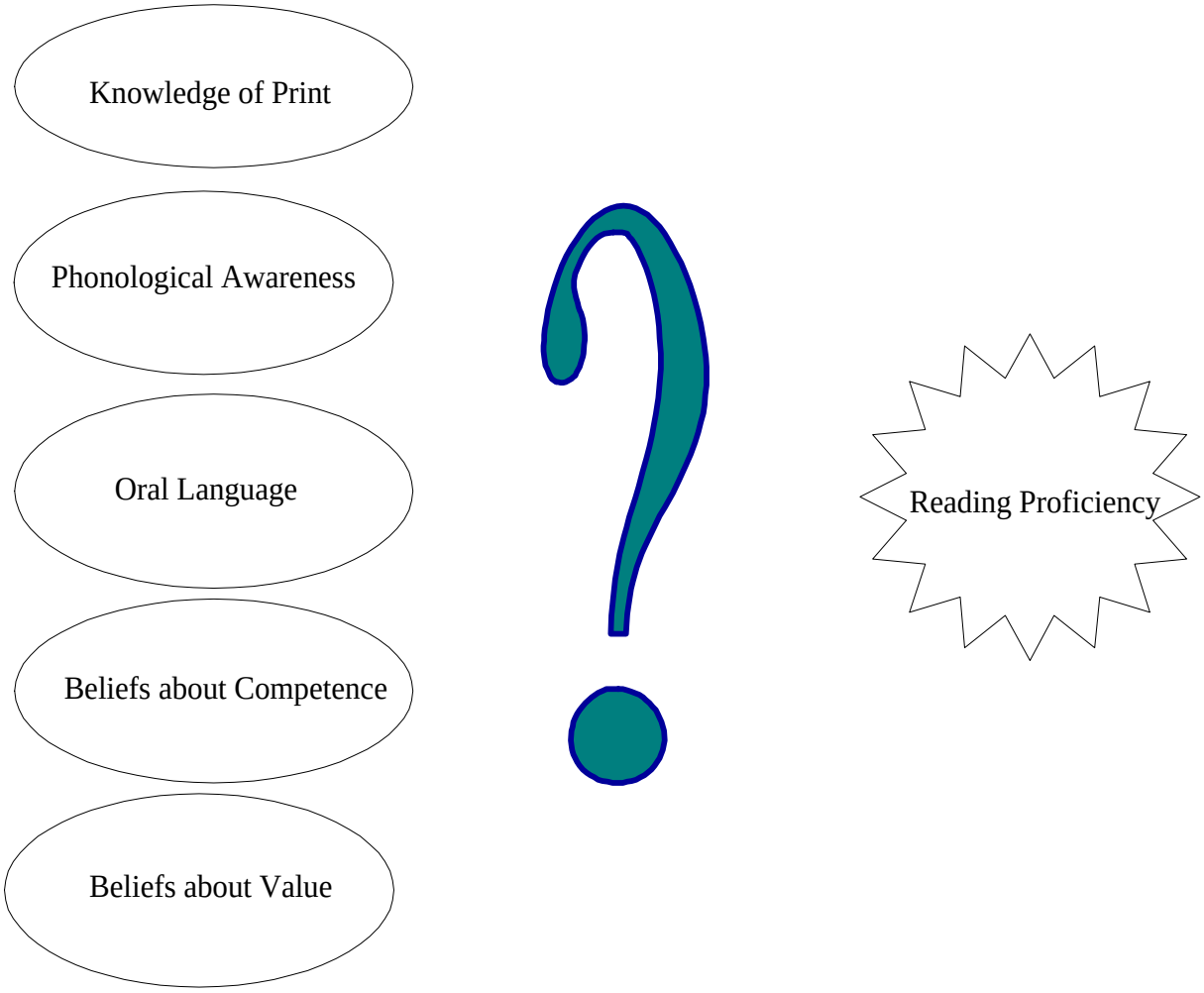

Figure 2. Hypothetical links between children's beliefs and knowledge and their reading proficiencies.

The findings are clear (see Figure 2). First, only one of the children's reading beliefs, their beliefs about their competence, influenced their reading. This influence was evident for children in school but not for Prekindergarteners. In contrast to their beliefs about competence, the children's beliefs about their interest in or the usefulness of reading were not related to individual differences in their reading proficiency. What this means then is that small positive increases in perceptions of reading competence went hand-in-hand with small increases in actual reading proficiency for children attending school. Second, beliefs about their competence had a direct influence on the children's reading and did not influence reading indirectly through reading-related knowledge and processes. The direct influence of competence beliefs on reading proficiency was modest but increased across the grades, ranging from none in Prekindergarten, to some in Kindergarten and Grade 1 (accounting for 3% and 4% of the variance in reading, respectively), to a more substantial contribution in Grade 2 (11%). This increasing influence of competence beliefs with grade is consistence with previous reports that the impact of beliefs increases as children get older reaching maximum strength in the late elementary early-junior

high school years (Oka & Paris, 1987; O'Sullivan, 1992). Third, besides their beliefs about their competence, individual differences in children's reading proficiency were directly related to differences in their knowledge of print conventions. This influence was evident at all grade levels, including Prekindergarteners. Knowledge of print conventions (scores on the Concepts About Print Test) accounted for most of the variance in the reading scores (ranging from 28% to 40% across the grades). Consequently, small increases in children's awareness about the conventions of reading went hand-in-hand with small increases in reading proficiency.

Summary

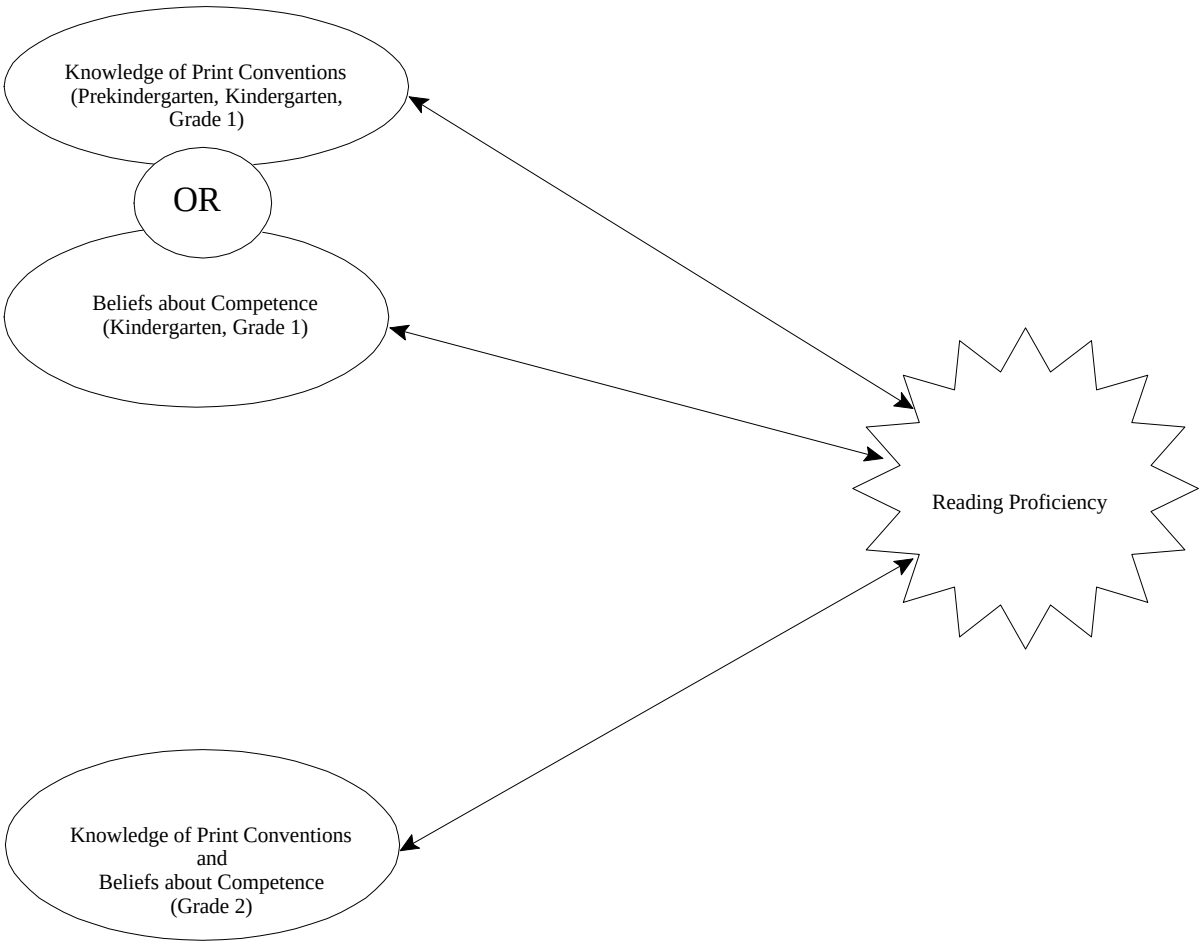

Figure 3. Confirmed links between children's beliefs and knowledge and their reading proficiencies.

What can be said about the reading proficiency, reading beliefs, and reading-related knowledge and processing skills of young children in poverty? Our findings indicate that, as a group, these children have pre-reading and reading proficiencies that are well below the national average. As well, their competencies in reading related knowledge and processing are below provincial and national averages. What this means is that prior to school entry these children as a group demonstrate insufficient development of the important cognitive and linguistic skills involved in reading. Furthermore, attendance in preschool or prekindergarten programs does not

alter this pattern. Throughout the years spent in primary school, these children do not close the gap in performance between themselves and the population as a whole. Despite the fact that they have insufficiently developed reading skills and knowledge, they have established motivational beliefs about their reading, beliefs where they see themselves as good readers and see reading as an interesting and useful activity. In sum, children living in poverty enter school with sufficient motivational will, but insufficient cognitive and linguistic skill, to develop reading proficiency equivalent to the national average, let alone to levels achieved by children raised in more affluent homes.

Within this group, however, there were some excellent readers. What distinguished these excellent readers? First, prior to school entry and throughout Kindergarten, Grades 1 and 2, they were distinguished by their sophisticated knowledge of book and print conventions. Second, once children had begun reading instruction at school, excellent readers were distinguished by their beliefs about their competence as readers. Third, before Grade 2 excellent readers were distinguished by *either* their knowledge of print conventions *or* their beliefs about competence but not both. It was not until Grade 2 that better readers knew more about print conventions *and* saw themselves as excellent readers. One implication is that there may be two relatively independent paths to good reading in the early years **B** one driven by knowledge of print conventions and the other driven by the belief that one is an excellent reader. Interestingly, like readers in other socioeconomic circumstances, believing that you are an outstanding reader can help some children achieve well beyond what would be expected based solely on cognitive and linguistic competencies (Oka & Paris, 1987).

The Role of Parents in Children's Reading Beliefs and Proficiency

The second main question in this project was, what role do parents in low-income families play in influencing their children's beliefs about reading? Answering this question involved several steps - 1) determining what parents believe about their children's reading, 2) determining the literacy environments parents have in their homes, and 3) determining the influence of parents' beliefs and the literacy environment in their homes on children's beliefs about their competence and children's knowledge of book and print conventions (the variables that distinguish excellent from less proficient readers).

Parents' Beliefs About Their Children's Reading

We wanted to see if parents held two separate beliefs about their children's reading, one about the children's competence as readers and the other about the value of reading for their children. Factor analyses of the parents' scores on the questionnaire measuring their beliefs confirmed that they distinguish conceptually between their children's competence and the value of reading for them. Also, like children from Kindergarten on, parents distinguished between the intrinsic and utility value of reading for their children (see Appendix A for factor loadings). In other words, parents held three separate beliefs about their children's reading.

We wanted to determine if different groups of parents held more positive beliefs about their children's reading than others. That is, were there group-based differences (i.e., child's grade, child's sex, community, and child's reading proficiency) in parents' beliefs about their children's reading? To answer this question, we used scores derived from the factor analyses in analyses of variance. First, parents' beliefs about their children as readers were related to their children's grade. Parents of older children (Grades 1 and 2) perceived them to be more competent and less interested in reading than did parents of younger children (Prekindergarten and Kindergarten). Second, the children's reading proficiency levels influenced their parents' beliefs such that parents of better readers considered their children more competent than did parents of less proficient readers. Third, rural parents attributed greater competence to their children than did urban parents and parents of daughters perceived them to be more interested in reading than did parents of sons. It is important to note that, like their children, almost all the parents perceived their children to be quite competent and believed that reading was valuable for them (see Appendix B for ANOVA output).

Literacy Environment in the Home

Parents responded to 8 items on their questionnaire designed to measure the literacy environment in the child's home. These items are displayed in Table 8 together with the average score for each item. It is clear that the average score on most items is high and it should be pointed out that items such as these are highly susceptible to "socially acceptable" patterns of responding. To determine if there were group-based differences in parents' reports of the literacy environment in their home a series of analyses of variance was conducted. These analyses revealed that first, children were on average 15 months old when parents first started to read to them. Second, parents of Kindergarten and Grade 1 children reported reading to them more often than did parents of Prekindergartners or Grade 2 children. Third, parents of children in the low reading proficiency group reported that their children asked them to read less frequently than did children of moderate and high reading proficiency. Fourth, daughters were reported to read at home more often than sons. Fifth, parents of younger children reported reciting poetry, rhymes, and jingles more often than parents of older children. Sixth, urban parents reported that their children see them reading more often and that they enjoy reading more than did rural parents.

Table 8

Questions Measuring the Literacy Environment in the Home

Questions	Mean	Standard Error
How old was your child when you first started to read to him or her? (in months)	15.05	0.839
How often do you read to your child? (1 = never, 7 = once a day)	6.763	0.032
How often does your child ask you to read to him or her? (1 = never, 7 = very often)	5.961	0.084
How many children's books does your child have? (in books)	111.430	13.397
How often does your child look through books by himself or herself? (1 = never, 7 = very often)	6.402	0.066
How often do you and your child say nursery rhymes, poems, and jingles together? (1 = never, 7 = very often)	5.584	0.098
How often does your child see you reading? (1 = never, 7 = very often)	5.547	0.109
How much do you enjoy reading? (1 = a little, 7 = a lot)	5.806	0.118

Relationships Between Parents' Beliefs, Literacy Environment in the Home, and Children's Competence Beliefs and Knowledge of Print Conventions

To this point we have focussed on group-based differences in parents' beliefs. The last question we addressed here was, what distinguishes the parents of excellent readers? In other words, how do small changes in parents' beliefs and in the literacy environment in their homes effect children's knowledge of print conventions (all grades) and children's beliefs about their competence (Kindergarten to Grade 2), the only child variables that distinguished excellent from less proficient readers (see Figure 3). Answering this question required two steps. First, we needed to establish whether parents' beliefs about their children's reading were related to the literacy environment in their home. For example, do parents with more positive beliefs report more optimal literacy environments? A series of regression analyses showed that, with one exception, there was no relationship between parents' beliefs and the literacy environment in the home. The exception was that in homes where children read more frequently on their own and in homes where increasing numbers of books were available for children to read, parents tended to see their children as increasingly competent. What this means is that parents' beliefs about their

children's competence are linked to their children's reading behaviour in the home rather than the parents' own involvement in reading activities, alone or in conjunction with their children.

Second, having shown that parents' beliefs are relatively independent of the literacy environment they report for their home, we examined the relationship between these variables

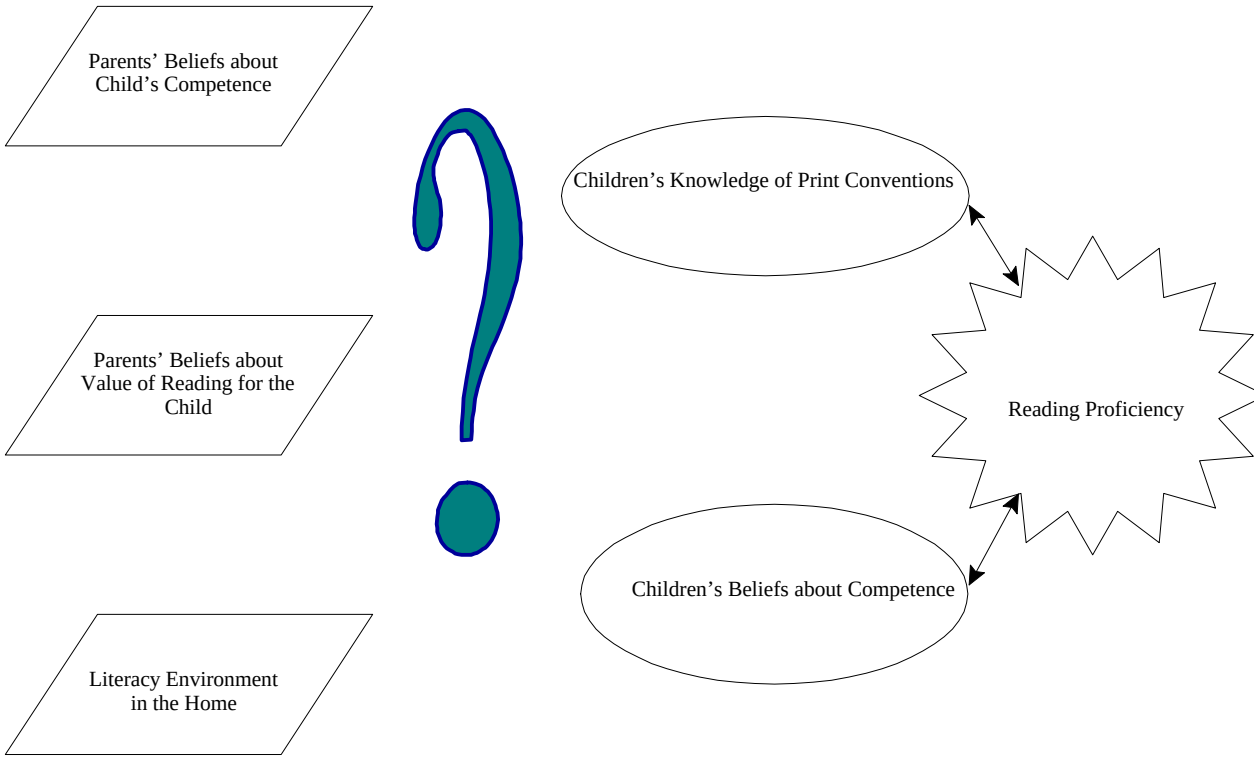

Figure 4. Hypothetical links between parents' beliefs, literacy environment in the home, children's knowledge and beliefs, and children's reading proficiency.

and children's knowledge of print conventions and children's beliefs about their reading competence. Regression analyses showed that first, small positive changes in parents' beliefs about their child's competence went hand-in-hand with small increases in children's knowledge of print convention (accounting for 18% of the variance for Prekindergarten, Grade 1, and Grade 2 children's scores on the Concepts About Print Test). In contrast, differences in parents' reports about the literacy environment in their home had little influence on children's understanding about print. The exception was found in Grade 2 where reported differences in the age of their child when parents first read to them accounted for 2% of the variance in children's knowledge of print convention (the younger the child when reading began, the more sophisticated the child's knowledge). Second, small positive changes in parents' beliefs about their child's competence influenced the children's perceptions of their own competence, but only in Grade 2 (accounting for 40% of the variance). Parent reports of the literacy environment in the home were not related to their children's beliefs about their competence.

Summary

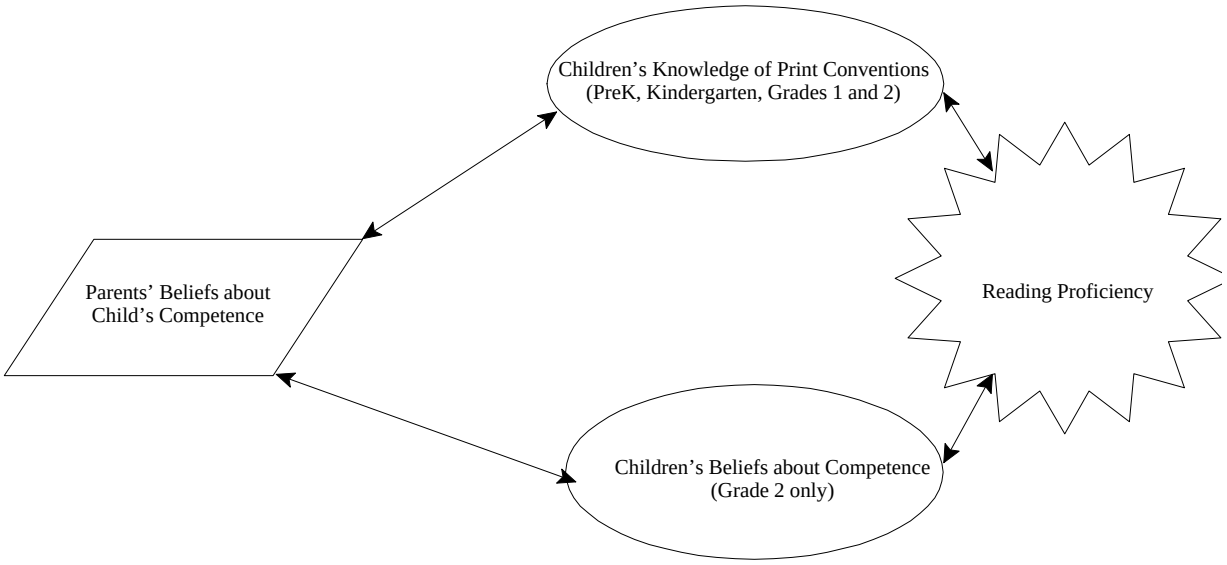

Figure 5. Confirmed links between parents' beliefs, literacy environment in the home, children's knowledge and beliefs, and children's reading proficiency.

What can be said about the influence of parents on their children's reading beliefs and proficiencies? Our findings indicate that parents, like their children, have well established beliefs about their children's reading, beliefs where they view their children as good readers who are interested in reading and for whom reading is a useful activity. Also parents report positive literacy environments in the home, although the children are relatively old when parents first start to read to them. It is important to note that parent reports about the literacy environment in the home were not generally related to parents' beliefs about their children's reading. What distinguished the parents of excellent readers? The answer to this question is very clear - at every grade level the parents of outstanding readers were distinguished by their extremely positive beliefs about their child's competence. Importantly, the "path" from parents' beliefs about their child's competence to the child's excellence in reading depended on the grade level of the child. That is, for Prekindergarten, Kindergarten, and Grade 1 children, small increases in parents beliefs about their children's competence went hand-in-hand with increases in the

children's knowledge of print conventions and, in turn, with increases in children's reading proficiency. For Grade 2 children only, positive changes in parents' beliefs about their child's competence went hand-in-hand with increases in the children's own competence beliefs, as well as their knowledge of print conventions, with both in turn related to excellence in reading. Before Grade 2, parents' beliefs about competence had no influence on their children's beliefs. Earlier in this report we found that, before Grade 2, children travel down one of two paths to excellent reading, a path driven by skill (knowledge of print conventions) or a path driven by will (believing one is excellent). Now we can add that for children on the skill path, the influence of parents is evident. In contrast, the parental influence for children on the will path is far less clear (see Figure 5).

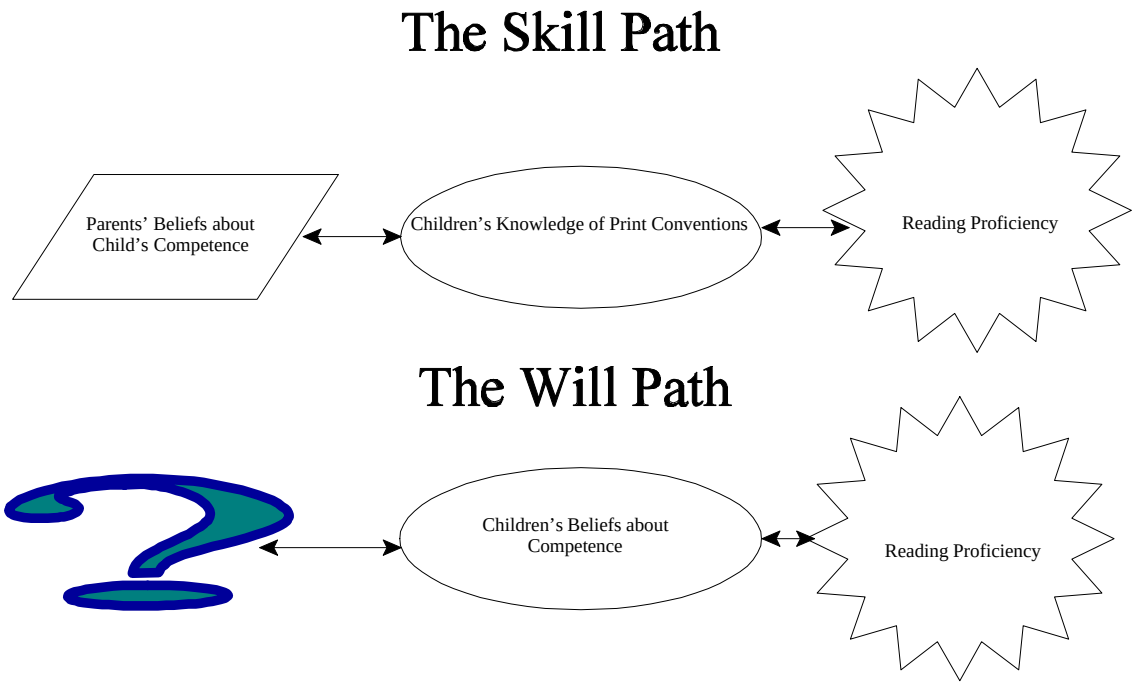

Figure 6. Two paths to reading excellence before Grade 2.

DISCUSSION AND CONCLUSIONS

There were three objectives in this project. The first was to examine what young children (ages 4 to 8 years) in low-income families believe about their reading and determine how those beliefs come to influence the children's reading proficiency. The second objective was to determine the role that parents in low-income families play in influencing their children's beliefs about reading. The third objective was to develop recommendations for early intervention programs aimed at increasing reading proficiency for children living in poverty.

Reading Proficiency

There was great variability in the pre-reading and reading proficiencies of the children in this project with individual scores ranging from the 1st to the 99th percentile rank. On average, however, the children had pre-reading and reading proficiencies that were well below the national average. What is more, their competencies in reading related knowledge and processing were also well below the national average. This was true for children who had not yet entered the school system and for those who had attended school for several years. What this means is that by age 5 children living in poverty, in general, have insufficient development of the cognitive and linguistic skills that are the ingredients of good reading. Furthermore, attendance in preschool or prekindergarten programs did not alter this pattern. It is important to point out that we measured preschool and prekindergarten attendance and not the quality of these programs. There is abundant evidence that the effects of poverty on children's development, including reading development, can be mitigated substantially by attendance at high quality preschool programs (Ramey & Ramey, 1998). It is not true that any preschool program is better than none at all. What is needed are high quality centre-based programs with parental involvement and a dedicated curriculum in reading tailored to the specific needs of children in poverty.

In our project, children who were attending school did not close the gap in performance between themselves and the population as a whole from Kindergarten to Grade 2. On the other hand, the gap did not widen either. Unfortunately, there is overwhelming evidence that by elementary school (i.e., Grade 4) children in poverty begin to fall further behind in reading and the gap increases as they advance through the grades (Walker et al., 1994). This is largely because, by Grade 4, reading has become an important medium for learning across the curriculum. Children are expected to read well enough to use textbooks in learning with the result that low proficiency in reading becomes increasingly detrimental to academic success. One positive finding from our project is that there was no evidence of this decline by Grade 2. What this suggests is that the school system has great opportunity to intervene successfully with these students while they are still in the primary grades. It will be much more difficult to design successful interventions that are initiated in the later elementary grades where adequate reading proficiency is central to learning and achievement across the curriculum.

Beliefs About Reading

Despite the fact that they had poorly developed reading skills and knowledge, the children, and their parents, had well established beliefs about their reading, beliefs where they saw themselves (and parents saw them) as good readers and they saw reading as an interesting and useful activity. Neither the children's nor their parents' beliefs changed significantly across the primary school years. These findings are reminiscent of an earlier project (O'Sullivan, 1992) with Grade 3, 6, and 9 students living in poverty. Those students were also considerably below the national average in terms of their reading ability but saw themselves (as did their parents) as competent and interested like the children here.

It seems obvious that school children are either not getting accurate feedback about their reading ability, or fail to incorporate it into their beliefs about themselves (Stipek & MacIver, 1989). The students in O'Sullivan (1992) had very high reading marks in school, as did the children in this project. For example, the average teacher-assigned reading mark was 70% in Grades 1 and 2 even though the vast majority of the children were reading below the national average. Although teachers use marks to motivate students, reward effort, as well as communicate about achievement, the end result is that these children and their parents received reports about the children's reading that did not present a realistic picture of their children's achievement relative to the national average. Given these high marks in school, it is not surprising that most children (and their parents) believed that they were much better readers than they actually were. Furthermore, although there was no difference on our standardized reading test between urban and rural children, the rural children brought home much higher (at least 10%) teacher-assigned reading marks than urban children and rural parents (not surprisingly) believed that their children were more competent than did parents in urban communities. North American students and parents in general tend to overestimate the students' reading ability but the gap between competence and perceptions of competence is much wider for families living in poverty(Okagaki & Sternberg, 1993; Stevenson & Lee, 1990). Province-wide standardized testing of students' reading is routine in Newfoundland as it is in other provinces. With the increasing emphasis on standards, accountability, and measurement embodied in "school reform" efforts, little has been said about the role of the teacher-assigned mark. It is time that these influential teacher-based measures be considered in that larger context.

We did not find significant sex or urban-rural differences in this project. For older children in Newfoundland, including children living in poverty, sex and urban-rural differences in reading ability and in children's and parents' beliefs about reading have frequently been reported. Females and urban students read better, see themselves as better readers, and express more interest in reading than males and rural students (Department of Education of Newfoundland and Labrador, 1997). The absence of these sex and urban-rural differences among a large sample of younger 4- to 8-year-olds is very positive. It suggests that the success of appropriate reading programs is not constrained by pre-existing gender-based or community-based differences in low-income families. Further, the absence of sex differences on our reading proficiency and reading-related knowledge and processing measures adds to the growing number of research studies where sex differences in reading are not found among very young children (Snow et al., 1998). Finally, the absence of an urban-rural difference here is consistent with other recent reports that failed to find such differences once income levels were controlled for (O'Sullivan, 1992, 1996; Willms, 1997).

Two Paths to Excellence in Reading

What distinguished the children and their parents who achieved excellence in reading? Our findings indicate that there are two relatively independent paths to excellence in reading in the early years **B** one driven by knowledge of print convention (skill) and the other by the belief that one is an excellent reader (will). Concerning the skill path (knowledge of print convention) there was huge variation in the children's knowledge of print convention, much more variation than is typical. Although this type of knowledge is important for all readers, it is not the most potent predictor of reading among children in general (Snow et al., 1998), phonological awareness (the ability to manipulate sounds below the level of the word **B** Siegel, 1993) is. The reason that knowledge of print convention was so important here was that differences between children on this measure were much larger than on any other measure we used and larger than that typically found among children. Knowledge of print convention comes from exposure to books. There was considerable variability in children's access to libraries in this study, especially in the rural areas. Further, there were considerable differences in parental reports concerning the number of children's books in the home and the age at which they first read to their children (prenatal to 5-years-old). One implication of these findings is that even small increases in exposure to print for children living in poverty could result in considerable benefits for their reading.

Parents' influence among children on the skill path to reading excellence was evident. Interestingly, it was the parents' beliefs about their child's competence that went hand-in-hand with children's increasing proficiency. Of course, the relationship is a reciprocal one **B** children's interest and ability in reading influences parents' beliefs about their child's competence which, in turn, influences what parents might do to promote their children's reading. Although this relationship is complex (Snow et al., 1998), our findings indicate that it is the parents' belief in their child's ability that is critical rather than the literacy environment they report in their home. Clearly, the exact role that parents and their beliefs play for children on the skill path to excellence needs to be better understood and can be with additional research.

Concerning the will path, excellent readers were distinguished by one type of belief, namely, their perceptions of their competence. Beliefs about interest or about the usefulness of reading were not related to how well children could actually read. One implication is that programs that aim to improve children's reading by increasing their interest in reading or stressing the importance of reading to future career opportunities are unlikely to make a difference. What characterizes excellent readers is their beliefs about what they bring to reading (e.g., ability, high expectations) rather that what reading brings to them (e.g., enjoyment, career prospects). There is abundant evidence that children who see themselves as good readers set high standards for themselves, expect to achieve them, and persist when they encounter problems (Snow et al., 1998). In other words, these beliefs are associated with positive reading behaviors and do not represent mere wishful thinking.

Interestingly, for children on the will path, excellence in reading and their belief in their excellence, was not accompanied by excellence in knowledge of print convention or by parents' beliefs that the child was outstanding. How can a child be a proficient reader and know it yet not have a great awareness about books? Obviously, all of our good readers had good word

identification skills but it is possible to develop those skills without a lot of interaction with books per se. For example, many of the parents reported to us that labels on food and toys as well as catalogues (e.g., Canadian Tire, Sears) were a widely available source of reading material in their homes. The implication here is that parents rely on their children's interactions with books when forming their beliefs about their young child's competence as a reader. Parents are less likely to appreciate the reading proficiency of children who develop good word identification skills primarily from interactions with labels and catalogues.

By Grade 2, the two paths to reading excellence had to a great extent merged. It is likely that children with good word identification skill and positive beliefs had during their first 3 years in school increased opportunity to interact with text and develop their knowledge of print conventions. Similarly, children who had a sophisticated knowledge of print probably came to see themselves over time as good readers. These findings clearly point to the importance of the early school years and raise the question about what happens in schools to bring these developments about. Equally important is this question: why do some children persist along one of the two paths and what happens to their reading and their achievement in school as they grow older? Because both skill and will are important in reading (Snow et al., 1998) children are unlikely to be successful in later years without both. There is obviously a critical need for longitudinal research on these developmental trajectories in reading especially is this population that is so vulnerable to chronic reading difficulties.

Designing Intervention Programs

Our findings have clear implications for the design of early intervention programs. The implications concern the age of the child at intervention, which children should be included in early interventions, and the type of intervention most likely to be effective.

At What Age are Interventions Most Likely to be Effective?

We do not disagree with previous recommendations that the earlier the intervention the more likely it is to be effective. However, we can elaborate on this general recommendation as follows. The window of opportunity for successful intervention extends at least until the end of Grade 2. This optimistic estimate is not limited by "normal" maturational changes that occur throughout the course of brain development. Indeed, there is no evidence from brain-behaviour research that the window of opportunity for successful reading intervention closes prior to this (or any other) age. Ideally, all children in poverty would come to school with the cognitive and linguistic skills that match their high motivation. That many do not does not mean that the opportunity has been lost. Although the type of intervention will vary with the age of the child, we found that the potential for successful intervention up to and including Grade 2 is not in question.

Which Children should be Included in Early Intervention Programs?

The children in this project lived in communities with a high incidence of low-income families. They attended schools where a large proportion of students were living in poverty and

where reading achievement was quite low. Under these circumstances all children should be considered at high-risk for reading problems. Although a small proportion of the children were outstanding readers, early interventions should include all children who live, and attend school, in communities with a high incidence of poverty.

What Types of Programs are Likely to be Effective?

Programs prior to school entry. Prior to school entry, children have uniformly positive beliefs about themselves as readers and these beliefs are not tied to their pre-reading proficiency. Consequently, the focus of programs for these children should be on reading related knowledge and processing as opposed to beliefs. Although language, phonological awareness, and knowledge of print convention are all important ingredients of reading, for children in poverty the vast differences in knowledge of print convention are critical for reading success. Consequently, programs where children have the resources (e.g., materials, time, guidance) to interact with written language promise considerable pay offs. There is no evidence that literacy programs that rely solely on the family to provide intervention for their young children work in the absence of centre-based programs (Abt Associates, 1995). On the other hand, there is clear evidence that high quality, centre-based preschool programs coordinated by professionals and that include parents are the most successful models for program delivery (Ramey & Ramey, 1998). Two points are critical. First, most low-income children in Newfoundland do not have access to preschool programs of any kind (Canning & Lyon, 1995). Second, even for those that do, most centre-based preschools do not have the level and intensity of reading programs required for children in poverty nor do most early childhood training programs include a background in reading and it's development sufficient for preparing children to learn to read (Neuman, 1996). However, what every community in this project did have was 1) a school and 2) access to individuals and groups with expertise in reading and its development. For these reasons, special reading programs for young children in poverty can be developed and coordinated by utilizing existing community-based expertise. Furthermore, these programs can be operated out of existing school buildings in the communities. Although this will require new partnerships between various organizations and different government departments, this approach to community capacity building is consistent with Newfoundland's Strategic Social Plan (Government of Newfoundland and Labrador, 1998).

School-based programs. Even the best reading programs for Prekindergarteners cannot "inoculate" them against later potential effects of poverty on their reading and school success. Prekindergarten programs must be linked with exemplary school-based programs. When a large percentage of children in a given school are from low-income families and when average reading achievement is low (as was the case in this project), consideration should be given to improving existing instructional programs in reading before deciding to implement a new intervention (Snow et al., 1998). That is, when the entire school is at risk it is wiser to begin an intervention that includes organizational issues as well as coherent classroom reading instruction than to spend resources on such things as importing an expert, purchasing commercial programs, or introducing a new tutoring technique. There is considerable evidence that school restructuring efforts that address pedagogy, curriculum, assessment, and professional development for teachers and parents have tremendous success (Stringfield, 1997). Individual schools with a high incidence of children in poverty must be supported in their efforts to improve their existing

programs in reading. *It is only when good programs already exist that screening techniques to identify individual children-at-risk followed by interventions for those children should be considered.*

Several factors are critical if schools are to improve their existing programs in reading. First, each school needs a well articulated reading program that recognizes, respects, and incorporates the characteristics of the community that it serves. Second, programs designed to teach children in poverty the "skills" (e.g., word identification, comprehension) in reading are not enough. Children must be encouraged to perceive themselves as outstanding readers, to set and achieve high standards, and to develop reading strategies to help them overcome difficulties. We have shown in this report that children in poverty enter school with uniformly positive beliefs about their competence. It is during the early school years that perceptions of competence become linked with achievement. Competence and the belief that you are competent are both essential for good reading in the long-term and must be developed before children proceed to elementary school. Third, schools in high poverty communities should develop school-based teams of expertise in reading, expertise that will exist in that school and community for years ahead. School teams should draw on community-based (e.g., university, literacy groups) expertise to help in the design, implementation, and evaluation of their reading instruction programs. There are examples of highly successful models like this in Newfoundland schools where considerable gains in young children's reading have been demonstrated in very short periods of time, in controlled studies (O'Sullivan, Dunn, & MacGuire, 1999).

Fourth, teachers are central to the success of reading instruction for children in poverty. It is imperative that they have the necessary expertise and support to teach reading well. In most pre-service teacher education programs preparation for the teaching of reading is quite basic. Furthermore, for practising teachers meaningful professional development opportunities in reading instruction are severely limited (Snow et al., 1998). Consequently, each school needs adequate access to a specialist in reading who will coordinate ongoing professional development in the teaching of reading. Finally, most of the schools in this project had insufficient financial resources to deliver high quality reading instruction programs. For example, most could not provide adequate reading material for the children to read in school, let alone to borrow and read at home. In Newfoundland and Labrador, as in most Canadian Provinces, funds are not allocated to schools on the basis of need, but on numbers of students. This is one area where policy should change. Special funding should be put in place so that schools with a high incidence of children in poverty are given the resources to design and deliver high quality reading instruction programs.

Should Parents be Involved in Reading Interventions?

It is extremely important that parents be involved in all programs. Children's reading achievement in school improves when parents are involved. We have shown in this report that parents beliefs about their children's competence as readers are intimately related to the children's competence. Programs need to pay more attention to parents' beliefs about their children's competence and less attention to their beliefs about the value of reading which bear little relation to children's reading proficiency. Programs should begin by finding out what parents believe about reading competence, including what constitutes good reading, how to

recognize it and how to promote it. Then, programs should build on those existing beliefs helping parents to develop well integrated perspectives on their child's reading and their own role in it. It does not make sense to expect parents to engage in literacy behaviours that are inconsistent with their beliefs. Whether in preschools or in the K-12 system, parental involvement is critical and low-income parents should be viewed as the valuable resources they are and not as " part of the problem" that needs to be fixed. Professional development opportunities for parents should be part of all reading intervention programs for young children in poverty.

Final Word

It is our view that every Canadian child has the right to be able to read well by the age of 9 years. This is achievable in Canada where the knowledge and resources already exist. Children living in poverty are extremely vulnerable to underachievement in reading and all of the associated consequences. As our report makes clear, this is not an inevitable outcome for children living in poverty. What is needed is a commitment to use existing resources in new ways to insure that excellence in reading is the rule, not the exception, for children in poverty. Although the children and parents in this project lived in Newfoundland, the issues identified here are matters of urgent national importance. No less than a national Head Start in Reading for young Canadian children in poverty is called for.

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APPENDIX A

Factor Loadings for Children's and Parents' Beliefs

In this Appendix, we present the factor analysis solutions for children's and parents' beliefs about reading. All solutions are based on Principal Component Analyses using a Varimax rotation with Kaiser Normalization. With the exception of Prekindergarten children, whose solution included only 2 factors (perceived competence and general value of reading), all solutions contained 3 factors, namely, perceived competence, intrinsic value of reading, and utility value of reading. Factor loadings that are in bold indicate questions relevant to that factor.

Table A1: Prekindergarten Children's Beliefs
Varimax Solution

Question	Factor 1: *Perceived Competence*	Factor 2: *General Value*
How good are you at letters and books?	**.693**	.165
How easy are letters and books?	**.568**	.352
Suppose you had to learn something new about letters and books, how good would you be at that?	**.854**	-.030
When you go to Kindergarten how good will you be at reading?	**.700**	.178
How much do you like letters and books?	.210	**.723**
Do you think it's important to be good at letters and books?	.012	**.765**
Would you like people to read to you more?	.230	**.614**
When you grow up will you have to be good at reading to get a job?	.094	**.571**

Table A2: Kindergarten Children's Beliefs
Varimax Solution

Question	Factor 1: *Perceived Competence*	Factor 2: *Intrinsic Value*	Factor 3: *Utility Value*
How good are you at reading?	**.772**	.192	.002
Are you better or worse at reading than the other children in your class?	**.798**	.064	-.031
Are you better or worse at reading than the other things you learn in school?	**.598**	-.151	.179
How well are you doing in reading at school this year?	**.668**	.120	-.010
How easy is reading for you?	**.639**	.278	.147
How much do you like reading?	.113	**.774**	-.037
How much fun is the reading you do in school?	.087	**.782**	-.067
Would you do more reading in school even if you did not have to?	.099	**.635**	.269
When you grow up will you have to be good at reading to get a job?	-.108	.010	**.732**
How important is it to be good at reading?	.174	-.078	**.583**
Some things you learn in school help you to do things better away from school. Learning about plants in school might help you grow a better garden at home. What about reading? Does it help you do things better away from school?	.108	.372	**.599**

Table A3: Grade 1 Children's Beliefs
Varimax Solution

Question	Factor 1: *Perceived Competence*	Factor 2: *Intrinsic Value*	Factor 3: *Utility Value*
How good are you at reading?	**.799**	.080	-.031
Are you better or worse at reading than the other children in your class?	**.823**	.158	-.072
Are you better or worse at reading than the other things you learn in school?	**.698**	.157	.054
How well are you doing in reading at school this year?	**.782**	.286	-.086
How easy is reading for you?	**.827**	.119	.050
How much do you like reading?	.229	**.779**	-.186
How much fun is the reading you do in school?	.120	**.810**	.114
Would you do more reading in school even if you did not have to?	.338	**.657**	-.218
When you grow up will you have to be good at reading to get a job?	.048	**.560**	.140
How important is it to be good at reading?	.019	.131	**.892**
Some things you learn in school help you to do things better away from school. Learning about plants in school might help you grow a better garden at home. What about reading? Does it help you do things better away from school?	.147	.429	**-.464**

Table A4: Grade 2 Children's Beliefs
Varimax Solution

Question	Factor 1: *Perceived Competence*	Factor 2: *Intrinsic Value*	Factor 3: *Utility Value*
How good are you at reading?	**.784**	.393	-.002
Are you better or worse at reading than the other children in your class?	**.784**	.215	.105
How well are you doing in reading at school this year?	**.811**	.090	.183
How easy is reading for you?	**.755**	.165	-.028
How much do you like reading?	.218	**.805**	.097
How much fun is the reading you do in school?	.424	**.707**	.043
Are you better or worse at reading than the other things you learn in school?	.405	**.531**	.355
Would you do more reading in school even if you did not have to?	.193	**.768**	-.107
When you grow up will you have to be good at reading to get a job?	-.001	-.237	**.682**
How important is it to be good at reading?	-.032	.444	**.457**
Some things you learn in school help you to do things better away from school. Learning about plants in school might help you grow a better garden at home. What about reading? Does it help you do things better away from school?	.188	.226	**.631**

Table A5: Prekindergarten Children's Parents' Beliefs
Varimax Solution

Question	Factor 1: *Perceived Competence*	Factor 2: *Intrinsic Value*	Factor 3: *Utility Value*
In general, how good is your child at letters and books?	**.808**	.037	-.033
Compared to most other children your child's age, how good is your child at letters and books?	**.744**	-.003	.045
How easy are letters and books for your child?	**.701**	-.099	.034
How well is your child doing with letters and books now?	**.851**	.198	.013
Compared to most other things your child does, how good is your child at letters and books?	**.778**	.268	.143
How interesting does your child find letters and books?	.026	**.809**	.006
In general, how much does your child like letters and books?	.055	**.817**	.046
Would your child do more with letters and books even if he or she did not have to?	.078	**.519**	.177
In general, how useful is what your child learns in letters and books?	.216	.143	**.761**
How useful will reading be for your child's career in adulthood?	-.109	.073	**.843**

Table A6: Kindergarten Children's Parents' Beliefs
Varimax Solution

Question	Factor 1: *Perceived Competence*	Factor 2: *Intrinsic Value*	Factor 3: *Utility Value*
In general, how good is your child at reading?	**.852**	.150	.073
Compared to most other children your child's age, how good is your child at reading?	**.753**	.223	.259
How easy is reading for your child?	**.703**	.217	.090
How well is your child doing with reading now?	**.790**	.261	-.042
Compared to most things your child does, how good is your child at reading?	**.808**	.129	.126
How interesting does your child find reading?	.135	**.748**	.255
In general, how much does your child like reading?	.218	**.781**	.208
Would your child do more with reading even if he or she did not have to?	.364	**.695**	-.295
In general, how useful is what your child learns in reading?	.305	.286	**.482**
How useful will reading be for your child's career in adulthood?	.049	.049	**.911**

Table A7: Grade 1 Children's Parents' Beliefs
Varimax Solution

Question	Factor 1: *Perceived Competence*	Factor 2: *Intrinsic Value*	Factor 3: *Utility Value*
In general, how good is your child at reading?	**.868**	.233	.111
Compared to most other children your child's age, how good is your child at reading?	**.766**	.214	-.047
How easy is reading for your child?	**.750**	.334	.195
How well is your child doing with reading now?	**.825**	.288	.212
Compared to most things your child does, how good is your child at reading?	**.844**	-.068	.083
How interesting does your child find reading?	.231	**.800**	.101
In general, how much does your child like reading?	.096	**.875**	-.188
Would your child do more with reading even if he or she did not have to?	.237	**.776**	.276
In general, how useful is what your child learns in reading?	.395	.312	**.564**
How useful will reading be for your child's career in adulthood?	.023	-.058	**.894**

Table A8: Grade 2 Children's Parents' Beliefs
Varimax Solution

Question	Factor 1: *Perceived Competence*	Factor 2: *Intrinsic Value*	Factor 3: *Utility Value*
In general, how good is your child at reading?	**.791**	.412	.032
Compared to most other children your child's age, how good is your child at reading?	**.831**	-.019	.201
How easy is reading for your child?	**.835**	.217	.019
How well is your child doing with reading now?	**.764**	.383	.056
Compared to most things your child does, how good is your child at reading?	**.793**	.230	.050
How interesting does your child find reading?	.199	**.870**	.040
In general, how much does your child like reading?	.326	**.702**	.233
Would your child do more with reading even if he or she did not have to?	.396	**.508**	.321
In general, how useful is what your child learns in reading?	.251	.009	**.858**
How useful will reading be for your child's career in adulthood?	-.144	.370	**.618**

APPENDIX B

Analysis of Variance Tables for Children's and Parents' Belief Factor Scores

In this Appendix, we provide the analysis of variance results for the factors scores derived from the factor analyses (Appendix A) for the children's and parents' beliefs separately. Specifically, we analyzed the factors scores for: (1) Prekindergarten children's factors **B** perceived competence and general value; (2) Kindergarten, Grade 1, and Grade 2 children's factors **B** perceived competence, intrinsic value, and utility value; and (3) parents' factors **B** perceived competence, intrinsic value, and utility value. All significant effects (must achieve a value of $p < .01$) are printed in bold.

Table B1-a: Prekindergarten Children's Beliefs
Factor 1: Perceived Competence

Source	Degrees of Freedom	Mean Square	F Value	Significance *(p < .01)*
Rank (R)	2	.082	.076	ns
Sex (S)	1	1.579	1.474	ns
Urban/Rural (U)	1	.831	.776	ns
R x S	2	.415	.388	ns
R x U	2	.146	.137	ns
S x U	1	.084	.078	ns
R x S x U	1	.070	.065	ns
Error	57	1.070	**B**	**B**

Table B1-b: Prekindergarten Children's Beliefs
Factor 2: General (Intrinsic and Utility) Value

Source	Degrees of Freedom	Mean Square	F Value	Significance *(p < .01)*
Rank (R)	2	.206	.199	ns
Sex (S)	1	.221	.215	ns
Urban/Rural (U)	1	.0005	0.000	ns
R x S	2	.120	.117	ns
R x U	2	.595	.578	ns
S x U	1	.0005	.001	ns
R x S x U	1	3.613	3.506	ns
Error	57	1.030	**B**	**B**

Table B2-a: Kindergarten, Grade 1, and Grade 2 Children's Beliefs
Factor 1: Perceived Competence

Source	Degrees of Freedom	Mean Square	F Value	Significance *(p < .01)*
Grade (G)	2	2.156	2.373	ns
Rank (R)	**2**	**10.080**	**11.100**	**.001**
Sex (S)	1	.978	1.076	ns
Urban/Rural (U)	1	.330	.363	ns
G x R	4	1.638	1.802	ns
G x S	2	1.404	1.545	ns
R x S	2	.333	.366	ns
G x R x S	4	.813	.894	ns
G x U	2	.459	.505	ns
R x U	2	.465	.511	ns
G x R x U	4	1.068	1.175	ns
S x U	1	.068	.075	ns
G x S x U	2	.912	1.004	ns
R x S x U	2	.086	.094	ns
G x R x S x U	3	1.169	1.286	ns
Error	321	.909	**B**	**B**

Table B2-b: Kindergarten, Grade 1, and Grade 2 Children's Beliefs
Factor 2: Intrinsic Value

Source	Degrees of Freedom	Mean Square	F Value	Significance *(p < .01)*
Grade (G)	2	3.911	4.122	ns
Rank (R)	2	2.860	3.014	ns
Sex (S)	1	.153	.161	ns
Urban/Rural (U)	1	4.158	4.382	ns
G x R	4	2.721	2.868	ns
G x S	2	.348	.367	ns
R x S	2	.853	.899	ns
G x R x S	4	.266	.280	ns
G x U	2	1.930	2.035	ns
R x U	2	1.860	1.960	ns
G x R x U	**4**	**5.548**	**5.848**	**.001**
S x U	1	.012	.013	ns
G x S x U	2	.172	.181	ns
R x S x U	2	.413	.436	ns
G x R x S x U	3	.821	.866	ns
Error	321	.949	**B**	**B**

Table B2-c: Kindergarten, Grade 1, and Grade 2 Children's Beliefs
Factor 3: Utility Value

Source	Degrees of Freedom	Mean Square	F Value	Significance ($p < .01$)
Grade (G)	**2**	**7.228**	**7.397**	**.001**
Rank (R)	2	.691	.707	ns
Sex (S)	1	.026	.026	ns
Urban/Rural (U)	1	.167	.171	ns
G x R	4	.557	.570	ns
G x S	2	.345	.353	ns
R x S	2	.400	.409	ns
G x R x S	4	2.618	2.68	ns
G x U	2	.279	.285	ns
R x U	2	.607	.621	ns
G x R x U	4	1.000	1.025	ns
S x U	1	2.921	2.989	ns
G x S x U	2	.451	.461	ns
R x S x U	2	.049	.050	ns
G x R x S x U	3	.459	.470	ns
Error	321	.977	**B**	**B**

Table B3-a: Parents' Beliefs
Factor 1: Perceived Competence

Source	Degrees of Freedom	Mean Square	F Value	Significance *(p < .01)*
Grade (G)	**3**	**4.814**	**7.284**	**.001**
Rank (R)	**2**	**35.970**	**54.425**	**.001**
Sex (s)	1	.646	.977	ns
Urban/Rural (U)	**1**	**13.664**	**20.675**	**.001**
G x R	6	.836	1.266	ns
G x S	3	.690	1.044	ns
R x S	2	.349	.529	ns
G x R x S	6	.568	.859	ns
G x U	3	.421	.636	ns
R x U	2	1.278	1.934	ns
G x R x U	6	.855	1.294	ns
S x U	1	4.364	6.603	ns
G x S x U	3	.179	.271	ns
R x S x U	2	1.815	2.746	ns
G x R x S x U	6	1.313	1.987	ns
Error	287	.661	B	B

Table B3-b: Parents' Beliefs
Factor 2: Intrinsic Value

Source	Degrees of Freedom	Mean Square	F Value	Significance *(p < .01)*
Grade (G)	**3**	**3.859**	**4.392**	**.005**
Rank (R)	2	1.175	1.338	ns
Sex (S)	**1**	**11.195**	**12.739**	**.001**
Urban/Rural (U)	1	.113	.129	ns
G x R	6	1.500	1.706	ns
G x S	3	.183	.208	ns
R x S	2	2.099	2.389	ns
G x R x S	6	2.089	2.377	ns
G x U	3	.854	.972	ns
R x U	2	2.652	3.018	ns
G x R x U	6	1.736	1.975	ns
S x U	1	1.106	1.258	ns
G x S x U	3	.656	.747	ns
R x S x U	2	.806	.917	ns
G x R x S x U	6	2.425	2.760	ns
Error	287	.879	B	B

Table B3-c: Parents' Beliefs
Factor 3: Utility Value

Source	Degrees of Freedom	Mean Square	F Value	Significance *(p < .01)*
Grade (G)	3	.399	.439	ns
Rank (R)	2	1.262	1.391	ns
Sex (S)	1	1.300	1.433	ns
Urban/Rural (U)	1	1.079	1.189	ns
G x R	**6**	**2.955**	**3.257**	**.004**
G x S	3	.620	.684	ns
R x S	2	1.377	1.518	ns
G x R x S	6	.392	.432	ns
G x U	3	.980	1.080	ns
R x U	2	.402	.443	ns
G x R x U	6	1.075	1.185	ns
S x U	1	.977	1.077	ns
G x S x U	3	.489	.539	ns
R x S x U	2	.400	.441	ns
G x R x S x U	6	1.020	1.124	ns
Error	287	.907	B	B