

Parental Involvement in the Development of Children's Reading Skill: A Five-Year Longitudinal Study

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This article presents the findings of the final phase of a 5-year longitudinal study with 168 middle- and upper middle-class children in which the complex relations among early home literacy experiences, subsequent receptive language and emergent literacy skills, and reading achievement were examined. Results showed that children's exposure to books was related to the development of vocabulary and listening comprehension skills, and that these language skills were directly related to children's reading in grade 3. In contrast, parent involvement in teaching children about reading and writing words was related to the development of early literacy skills. Early literacy skills directly predicted word reading at the end of grade 1 and indirectly predicted reading in grade 3. Word reading at the end of grade 1 predicted reading comprehension in grade 3. Thus, the various pathways that lead to fluent reading have their roots in different aspects of children's early experiences.

INTRODUCTION

Learning to read is a complex process that involves a variety of skills and abilities. Children must bring their existing knowledge and experiences to bear on the task of learning to read which, for most children, begins in earnest with the introduction of formal instruction in grade 1. Learning to read is related to children's phonological awareness (Lonigan, Burgess, & Anthony, 2000; Wagner et al., 1997), to their knowledge of letters (Ehri, 1998; Evans, Shaw, & Bell, 2000; Wagner et al., 1997), to their knowledge about the functions of print (Purcell-Gates, 1996), and to their language skills (Share, Jorm, Maclean, & Mathews, 1984; Wagner et al., 1997). It is of particular interest to document how and where children acquire these early skills, because existing evidence suggests that early individual differences in these skills are relatively stable from kindergarten onward (Bryant, Maclean, Bradley, & Crossland, 1990; Butler, Marsh, Sheppard, & Sheppard, 1985; Lonigan et al., 2000; Scarborough, Dobrich, & Hager, 1991; Tunmer, Herriman, & Nesdale, 1988; Wagner et al., 1997; see also the review by Scarborough, 1998). Presumably, some of these skills are acquired through specific experiences at home or in kindergarten. The goal of the present longitudinal study was to examine the pathways from children's early knowledge and experiences through to fluent reading, with a focus on how parental involvement is related to the development of reading skills. The findings for the first year of the study were reported in Sénéchal, LeFevre, Thomas, and Daley (1998); the results for the following 4 years are presented in this article.

The importance of parental involvement in children's learning has never been in doubt. Recently, however, the issue has received increased attention in

the research literature (Christian, Morrison, & Bryant, 1998; Fantuzzo, Tighe, & Childs, 2000; Leseman & de Jong, 1998; Saracho, 1997a, 1997b). The notion that including parents in children's academic development can critically enhance their performance has been supported in a variety of research contexts. For example, Lonigan and Whitehurst (1998) conducted an intervention study designed to increase the vocabulary skills of 3- and 4-year-old children. Teachers and parents were trained to read to the children using dialogic reading in which they were encouraged to pose questions to the children. Lonigan and Whitehurst found that the intervention was most effective when parents as well as teachers were trained (see also Whitehurst et al., 1994). Similarly, Leslie and Allen (1999) found that the degree of parental involvement in a reading intervention for children in grades 1 through 4 who were nonreaders or were behind by one or two grade levels predicted children's reading growth. Thus, understanding how different aspects of parental involvement might influence children's acquisition of reading is of potentially great importance.

Home Literacy Activities

Sénéchal et al. (1998) argued that children are exposed to two types of literacy experiences at home; namely, informal and formal literacy activities. Informal literacy activities are those for which the primary goal is the message contained in the print, not the print per se. Consider a parent reading a bedtime story to his or her child. The attention of the parent

and child is surely on the story contained in the print and illustrations (Baker, Fernandez-Fein, Scher, & Williams, 1998). While reading, the parent may expand on the meaning of the story and/or the child may ask questions about the meaning of certain words (e.g., Sénéchal, Cornell, & Broda, 1995). In these types of interactions the child is exposed to printed material, but the exposure is informal. On the other hand, formal literacy activities are those for which parent and child focus on the print per se. Consider the same parent reading an alphabet book to the same child. In this instance the parent may focus on the print in the book by talking about letters or by providing the name and the sound of specific letters (Smolkin & Yalden, 1992). In the present study, exposure to storybooks was the measure of informal literacy activities; parental reports of how frequently they taught their child about reading and writing words was the measure of formal literacy activities.

The influence of storybook exposure on children's early acquisition of language and literacy has been thoroughly documented (e.g., Bus, van IJzendoorn, & Pellegrini, 1995; Scarborough & Dobrich, 1994; Sénéchal & LeFevre, 2001; Sénéchal, LeFevre, Hudson, & Lawson, 1996). Much less is known, however, about the influence of more formal literacy experiences that occur at home. There is some evidence that parents differ in whether they believe that they should teach reading skills to their preschool child (DeBaryshe, 1995; Fitzgerald, Spiegel, & Cunningham, 1991; Stipek, Milburn, Clements, & Daniels, 1992). Anderson (1995) found that children whose parents believed in the importance of providing more structured literacy experiences tended to have stronger emergent literacy skills than children whose parents believed in providing less structured experiences. Anderson's results, however, were not statistically significant, presumably due to the small sample surveyed ($N = 25$). To our knowledge, Sénéchal et al. (1998) was the first published study to examine the role of informal and formal home literacy experiences on the development of language and emergent literacy in a large sample of children (for comparisons among informal and formal teacher-led activities in kindergarten, see Meyer, Wardrop, Stahl, & Linn, 1994; Whitehurst et al., 1994).

Sénéchal et al. (1998) found that the middle- and upper middle-class English-speaking parents who participated in the current study reported a high frequency of home literacy experiences. On average, parents reported having started reading storybooks when their child was 9 months of age, that storybook reading occurred frequently in the home, that children had between 61 and 80 children's books in the home, and that children sometimes visited the library.

Parents also reported that joint-book reading was often initiated by their child, suggesting that children were interested in book reading. Finally, parents reported, on average, that they often taught their children how to read and print words. Sénéchal et al. (1996) found similar patterns of behavior, as did a variety of other researchers who asked parents similar questions (Baker et al., 1998; Evans et al., 2000; Frijters, Barron, & Brunello, 2000; Sonnenschein, Brody, & Munsterman, 1996). Thus, the home literacy experiences of the sample of children in the current study were likely to be representative of middle-class children.

Sénéchal et al. (1998) used parents' familiarity with children's literature as the measure of children's storybook exposure. Sénéchal et al. (1996) developed this measure of storybook exposure in response to the unreliability of the measure that had been used by most researchers; namely, asking parents to indicate how frequently they read to their children. Sénéchal et al. (1996) argued that storybook reading is a highly valued activity, and thus that parents' responses to a question about the frequency of that activity could be biased. They also showed that the correlations between parents' reports of reading frequency and children's vocabulary scores were unstable across samples.

To assess storybook exposure in a way that avoided the problems associated with parents' reports of how frequently they read to their children, an alternative approach was used that was developed by Sénéchal et al. (1996). They created lists of children's book titles and children's authors (with foils) and asked parents to indicate the titles and authors that they recognized (see also Stainthorp, 1997). For the present study, checklists were constructed in a similar way (see details in Sénéchal et al., 1998). The book exposure checklist consisted of 40 titles of children's books that are available in the local library, at bookstores, or at other locations that carry children's books (such as grocery stores). Twenty plausible foils were also constructed. Parents were given the list of 60 book titles and were instructed to indicate which ones they recognized. Guessing was discouraged. Similarly, the book author checklist consisted of 40 authors of popular children's books and 20 other names (i.e., editorial board members from volume 17 of *Developmental Psychology*).

This checklist methodology has been used successfully by Stanovich and colleagues with adults and older children and has been shown to be a valid and reliable measure of book exposure for those groups (Cunningham & Stanovich, 1991, 1993, 1998; Stanovich & Cunningham, 1992). Similarly, Sénéchal et al. (1996) showed that the checklist measure of

storybook exposure is a reliable predictor of vocabulary performance for young children. Thus, the checklist measure was used to index informal literacy experiences for the children in the present longitudinal study. Sénéchal et al. (1996) also developed a related measure of children's book exposure that can be used with prereaders. Children were shown pictures from storybooks and asked to give the title, author, and a brief description of the book. Sénéchal et al. (1996) found that this measure of book exposure predicted children's receptive and expressive language skills. This measure was used with one of the cohorts of children who participated in the present study.

One of the important findings in the Sénéchal et al. (1998) study was that storybook exposure, as indexed by parents' familiarity with children's literature, was unrelated to parents' reports of teaching: Parents who frequently read books to their child did not necessarily report teaching their child to read and print words (see also Evans et al., 2000; Fitzgerald et al., 1991; Sonnenschein et al., 1996; Stipek et al., 1992). The apparent independence between storybook exposure and parents' reports of teaching is interesting because it raised the possibility that informal and formal literacy activities might have different relations to the development of children's literacy. As noted by Baker et al. (1998), few researchers have specifically explored how home experiences are related to the development of children's word reading skills such as decoding.

The study described in this article had three objectives. The first objective was to assess the relative importance of two distinct parent-child activities—storybook reading and parents' reports of teaching—to the development of aspects of children's receptive language and emergent literacy. The second objective was to assess the relation between early literacy experiences and subsequent reading acquisition. The third objective was to assess the relation between early literacy experiences and fluent reading. Three cohorts of children participated in the study, two cohorts of kindergarten children and one cohort of grade 1 children. All three cohorts of children were followed until grade 3.

Predicting Children's Oral Language, Emergent Literacy, and Phonological Awareness

One objective of the present study was to assess the relative importance of parent storybook reading and parents' reports of teaching to children's language and emergent literacy (labeled written-language skills in Sénéchal et al., 1998). Importantly, Sénéchal et al. (1998) found different patterns of relations among the two types of literacy experiences and child outcomes. Storybook exposure predicted only oral lan-

guage skills (i.e., a composite of vocabulary, listening comprehension, and phonological awareness), whereas teaching predicted only emergent literacy skills after controlling for relevant variables such as parent print exposure and child analytic intelligence. Thus, activities that included informal interactions with print, such as book reading, were related to the development of receptive language, and activities that included more formal interactions with print, such as teaching about reading, were related to the development of emergent literacy. This pattern of results held for children in kindergarten and in grade 1. Evans et al. (2000) also found that parents' reports about teaching predicted early literacy skills. In their sample, however, storybook exposure did not predict vocabulary development. Frijters et al. (2000) found that a composite measure of home literacy experiences that included storybook exposure predicted kindergarten children's vocabulary only, and that children's interest in literacy predicted early literacy skills. Thus, recent research is consistent with at least some aspects of Sénéchal et al.'s findings.

Sénéchal et al. (1998) measured two aspects of children's language, namely, vocabulary and listening comprehension, as well as one metalinguistic skill, phonological awareness. The results of factor analyses confirmed that the three measures formed a single factor and, consequently, they used the factor scores as a measure of oral language. Recent evidence, however, suggests that phonological awareness may not be influenced by storybook exposure (Evans et al., 2000; Whitehurst & Lonigan, 1998; but see Murray, Stahl, & Ivey, 1996). To test the relation between home literacy experiences and phonological awareness, the measure of language used in the analyses presented here included only vocabulary and listening comprehension and is referred to as the receptive language factor. Phonological awareness was analyzed separately. In the present report, the pattern of relations among early literacy experiences and receptive language versus phonological awareness was tested with data obtained when the kindergarten-cohort children entered grade 1. These analyses provided an extension of those in Sénéchal et al. (1998).

Predicting Reading at the End of Grade 1

The second objective of this study was to assess the relation between early literacy experiences and reading acquisition. Sénéchal et al. (1998) showed that aspects of children's language and emergent literacy skills mediated the relation between home activities and reading acquisition. Specifically, parent storybook reading and parents' reports of teaching did not

account for additional variance in children's word reading skills at the end of grade 1 after controlling for relevant variables such as receptive language, phonological awareness, and emergent literacy skills. Thus, the links between home literacy experiences and reading at the end of grade 1 were indirect. Sénéchal et al. (1998) measured word reading, however, not reading comprehension, at the end of grade 1. There is some evidence that home literacy experiences make a direct contribution to children's reading comprehension (Leseman & de Jong, 1998). To test this possibility, the kindergarten-cohort children in this study were administered a test of reading comprehension in addition to a test of word reading at the end of grade 1.

Predicting Reading at the End of Grade 3

The third objective of the study was to assess the long-term influence of early home literacy experiences on reading achievement, as measured by children's performance at the end of grade 3. It is possible that a direct relation exists among early home literacy experiences and fluent reading. Specifically, if early shared book reading experiences develop a child's orientation toward literature, then the influence of these early experiences might be stronger once children master decoding skills and become fluent readers. On the other hand, parents' reports of teaching might still have an indirect link to fluent reading because the influence of these reports is closely linked to the development of emergent literacy skills and it is those early skills that will facilitate the acquisition of reading. In the present study, children's fluent reading skills were measured with tests of reading vocabulary and comprehension administered at the end of grade 3 (Barker, Torgesen, & Wagner, 1992).

Overview of the Present Study

Two kindergarten cohorts ($N = 110$) and one grade 1 cohort ($N = 58$) of middle- and upper middle-class children from English-speaking families participated in the initial phase of the study. Home literacy activities were assessed once at the beginning of the study. Children's receptive language and emergent literacy skills were assessed in kindergarten for the kindergarten children and at the beginning of grade 1 for all children. Reading skills were assessed at the end of grades 1 and 3. Sénéchal et al. (1998) reported the kindergarten findings for the kindergarten cohorts and the grade 1 findings for the grade 1 cohort. The grade 1 findings for the kindergarten cohorts (extensions of earlier results) and the grade 3 findings for

all the children (long-term outcomes) are presented in this article.

METHOD

Participants

Children and their parents were recruited from three schools in Ottawa, Ontario, Canada. All three schools were single-track (English language) schools that shared a common mandate emphasizing self-directed learning, integrated curricula, parent and community involvement, and innovative approaches to teaching and learning. These schools also used multiage groupings of children and thus many of the children had the same teachers in grades 1, 2, and 3. These school characteristics are in contrast to the majority of schools in the region, which are more likely to have multiple tracks (i.e., English, French Immersion, gifted) and to espouse more traditional educational approaches.

Children in Ontario can start kindergarten at age 4 and attend for 2 years. In the schools that participated in this study, 4- and 5-year-old kindergarten children are integrated into the same classrooms. Thus, both 4- and 5-year-old kindergarten children were recruited, but their data were analyzed jointly because the two groups of children shared teachers, classes, and similar curricula that emphasized the development of social skills. Nonetheless, year of kindergarten was included as a predictor when it was associated with outcomes. Because reading instruction begins in grade 1, interviews were conducted with the grade 1 teachers to determine the reading curricula. The reading curriculum was described as a balanced literacy approach, in which literacy-rich activities were used. Phonics teaching was included within the context of these literacy activities.

Of the 110 kindergarten children who were tested initially, 93 (41 girls, 52 boys) were followed until the end of grade 1, and 66 (30 girls, 36 boys) were followed until the end of grade 3. For ease of comprehension, these children were labeled the K-cohort children. Of the 58 grade 1 children initially tested in grade 1, 45 (22 girls, 23 boys) were followed until the end of grade 3. These children were labeled the Gr1-cohort children. All children came from English-speaking homes, and most were White.

Of the children who did not complete the entire study, 4 were not included because their inattentiveness invalidated their grade 3 reading scores (2% of sample); 9 children were not followed because they transferred to special or enriched education programs (5% of sample); and the remainder were not followed because they moved out of the school district (28% of

sample). These loss rates are comparable with other longitudinal studies (e.g., Lonigan et al., 2000, reported a loss rate of 29% over 1.5 years; Leseman & de Jong, 1998, reported a loss rate of 27% over 3 years). In this sample, loss rates increased with the length of time such that the greatest loss occurred for the children who were youngest at the original test. Comparisons of performance indicated that the children who completed the study performed better, on average, than the children who did not complete the study on measures of language, emergent literacy, and grade 1 reading (excluding those children lost for reasons other than moving). Importantly, however, analyses of the data for the subsample of children who completed the study showed that the findings reported in Sénéchal et al. (1998) were replicated, suggesting that the constrained range of performance in the remaining sample should not compromise the ability to test the hypotheses under study.

The education level of the sample in the present study was superior to the national level for Canada. As reported in Sénéchal et al. (1998), 91% of parents had pursued studies after high school. That percentage is higher than the Canadian national percentage (56% for adults between the ages of 25 and 45), but closer to the percentage for the city of Ottawa (70% for adults between the ages of 25 and 45; Ottawa-Carleton Economic Development Corporation, 1996; Statistics Canada, 1993). Parent education (i.e., the average of mother and father education level) was used as a control variable when it was related to child outcomes.

Measures

A complete description of the measures used to assess literacy experiences, language, and emergent literacy was reported in Sénéchal et al. (1998). A brief overview of the measures is presented below.

Literacy experiences. Two parent measures of home literacy experiences were of interest: parent reports of how frequently they taught their child to read and print words and parents' storybook exposure. Parents reported the frequency with which they taught their child to read and print words on two 5-point scales (1 = never, and 5 = very often). The average of the responses to the two questions was used to index the frequency of parents' reports of teaching at home. Storybook exposure was measured by giving lists of titles and authors of children's books to parents and asking them to indicate which they recognized. Guessing was minimized by informing parents that the lists included foils. Presumably, performance on the two checklists reflected parents' relative exposure

to children's literacy as a result of reading to their child (Sénéchal et al., 1996; Stainthorpe, 1997). The Spearman-Brown reliability coefficients for the children's titles and authors checklists were .88 and .90, respectively (Sénéchal et al., 1998).

Parents completed an extensive questionnaire about home literacy experiences at the beginning of the study. The questionnaire included questions about the frequency of storybook reading, the number of children's books in the home, the age at which they started reading to their child, the frequency of library visits, and the frequency with which children initiated shared reading, among others. Preliminary analyses revealed that these questions alone, in combination, or added to the storybook exposure measure did not predict or improve the prediction of child outcomes. Consequently, only the storybook exposure measure was used as the index of storybook reading at home.

It was also of interest to measure children's exposure to print once they entered school, and, thus, a measure of children's print exposure was completed by children at the end of grade 1. The typical checklist task to measure print exposure was not used because it requires that children read the titles (e.g., Cunningham & Stanovich, 1993), which may introduce a confound with reading skill. Consequently, a task developed by Sénéchal et al. (1996) was used. In this task, children were shown key illustrations from 37 popular children's books and were asked to recall the title of the book. Presumably, their performance on the task reflected their exposure to children's literature both from reading themselves and from listening to books read to them. Sénéchal et al. (1996) showed that this task was reliable, Spearman-Brown coefficient = .88, and that it had good criterion validity because it predicted children's vocabulary after controlling for relevant variables. The Gr1-cohort children completed this recall task. To decrease testing time, a recognition version of this task was administered to the K-cohort children in which they had to select, from among three pictures, the picture that represented a named title. Unfortunately, the latter recognition task proved unreliable and, therefore, is not discussed further.

Finally, parents' own exposure to popular adult literature was used as an indicator of their literacy level. Parents completed a Canadian version (Sénéchal et al., 1996) of the Author Recognition Test (Stanovich & Cunningham, 1992). Parents indicated the authors they recognized from a list of popular authors. Guessing was minimized by informing them that the checklist included foils. The Spearman-Brown reliability coefficient was .94 (Sénéchal et al., 1998). Parent print exposure was used as a control variable when it was associated with child outcomes.

Receptive language, phonological awareness, emergent literacy, and analytic intelligence. Child measures at the beginning of grade 1 included two measures of receptive language. First, vocabulary was measured with the Peabody Picture Vocabulary Test–Revised (Dunn & Dunn, 1981). Second, listening comprehension was assessed with 15 randomly selected stories from the listening to stories subtest of the Stanford Early School Achievement Test (SESAT; Psychological Corporation, 1989). A single measure of phonological awareness was used and consisted of the sound categorization task of the SESAT. In this task, children were asked to match words based on onsets or rhymes. There were four measures of emergent literacy skills. First, Items 1 through 9 and 11 from the Concepts About Print Test (Clay, 1979) were administered. The items selected were those that children could answer without knowing how to read (e.g., point to the location where the experimenter should start to read). Second, alphabet knowledge was assessed by asking children to name 15 letters. Third, decoding was tested by asking children to read simple consonant–vowel–consonant words (e.g., sun). Children who could not read the words were asked to sound out each letter and blend the sounds. Words read correctly with or without help were scored as correct. Fourth, invented spelling was measured by asking children to spell words or as many of the sounds in the words as possible. Words were scored on a 4-point scale to reflect the level with which children captured the phonology of the words (1 to 3 points) or their conventional spelling (4 points; Mann, Tobin, & Wilson, 1987). Finally, analytic intelligence was measured with the animal

house subtest of the Weschler Preschool and Primary Scale of Intelligence–Revised (Weschler, 1989). A summary of these measures, their maximum score, and interitem reliability are presented in Table 1.

Reading at the end of grade 1. The Gr1-cohort children were tested on word reading with the reading vocabulary subtest of the Gates-MacGinitie Reading Tests (Level A, Form 3; MacGinitie & MacGinitie, 1992). The publisher-reported reliability for this test is .93 (Kuder-Richardson coefficient). The K-cohort children were tested on both word reading and reading comprehension with the letter-word identification and passage comprehension subtests of the Woodcock-Johnson Psycho-Educational Battery–Revised (1989). The publisher-reported reliability coefficients are .96 and .95 for the letter-word identification and passage comprehension subtests, respectively.

Reading at the end of grade 3. Reading was assessed with the vocabulary and comprehension subtests of the Gates-MacGinitie Reading Tests (Level C, Form 3; MacGinitie & MacGinitie, 1992). The publisher-reported reliability is .93 (Kuder-Richardson coefficient) for both the vocabulary and the comprehension subtests. This test was used because the school board for the schools from which children were recruited administered this test to all grade 3 children when the research project was initiated.

Procedure

Parents completed the checklists and questionnaire at home at the beginning of the study. Children were tested individually in their schools. Assessment of language and emergent literacy for both the kin-

Table 1 Description of the Measures Used to Assess Literacy Experiences, Receptive Language, Phonological Awareness, Emergent Literacy, and Analytic Intelligence

Variable (Maximum Score)	Description of Task/Name of Test	Reliability ^a
Receptive language		
Vocabulary (160) ^b	PPVT-R	.77
Listening comprehension (15)	Listening to stories subtest; SESAT	.80
Phonological awareness (16)	Sound categorization task; SESAT	.84
Emergent literacy		
Print concepts (10)	10 selected questions; CAP	.85
Alphabet knowledge (15)	Label 10 uppercase and 5 lowercase letters	.95
Invented spelling (10)	Print 10 words	.97
Decoding (5)	Read 5 consonant–vowel–consonant words	.95
Analytic intelligence (19) ^b	Animal house subtest; WPPSI-R	.66

Note: PPVT-R = Peabody Picture Vocabulary Test–Revised; SESAT = Stanford Early School Achievement Test; CAP = Concepts About Print Test; WPPSI-R = Weschler Preschool and Primary Scale of Intelligence–Revised.

^aInteritem reliability as reported in Sénéchal et al. (1996), Sénéchal et al. (1998), or in publishers' manuals.

^bStandardized scores.

dergarten and the grade 1 children was conducted during the first half of the school year and consisted of two sessions. The measures administered during the first session included concepts about print, alphabet knowledge, decoding, vocabulary, and analytic intelligence. In the second session, children completed the listening to stories, invented spelling, and phonological awareness tests. The same tests were administered in the same order when the two kindergarten cohorts entered grade 1. Assessment of reading skills in grades 1 and 3 was conducted near the end of the school year, during the months of May and June.

RESULTS

Preliminary Analyses

The descriptive statistics for the K-cohort children on measures of receptive language and emergent literacy tested at the beginning of grade 1 and reading tested at the end of grades 1 and 3 are reported in Table 2. The correlations among home literacy variables and child variables are presented in Table 3. The equivalent information for the Gr1-cohort children

Table 2 Descriptive Statistics for the Child Measures for the K-Cohort Children and for the Book Exposure and Reading Measures for the Gr1-Cohort Children

	M	SD
K-cohort		
Receptive language		
Vocabulary ^a	118.5	13.3
Listening comprehension (15)	10.8	2.0
Phonological awareness (16)	12.9	2.7
Emergent literacy		
Print concepts (10)	8.7	1.0
Alphabet knowledge (15)	14.0	2.0
Invented spelling (40)	23.0	9.3
Decoding (5)	2.5	1.8
Analytic intelligence ^a	11.5	2.0
Reading at the end of grade 1 ^a	115.1	13.9
Reading at the end of grade 3 ^a	59.8	8.1
Gr1-cohort		
Child book exposure in grade 1 (37)	5.8	3.1
Reading at the end of grade 3 ^a	58.4	8.0

Note: Maximum scores are in parentheses unless otherwise noted. See text for descriptions of cohorts.

^aStandardized scores.

Table 3 Correlations among Variables for the K-Cohort and the Gr1-Cohort

Variable	BEx	Tch	Voc	List	PA	PC	Alph	Spell	Decd	Intl	PEx	Edu	RG1	RG3
K-cohort														
Literacy experiences														
Storybook exposure (BEx)														
Parents' reports of teaching (Tch)	.07													
Language measures														
Vocabulary (Voc)	.38*	.15												
Listening comprehension (List)	.31*	.22*	.42*											
Phonological awareness (PA)	.10	.36*	.30*	.08										
Emergent literacy measures														
Print concepts (PC)	.17	.08	.16	-.01	.19									
Alphabet knowledge (Alph)	.08	.21*	.06	-.03	.40*	.09								
Invented spelling (Spell)	.27*	.37*	.24*	.14	.54*	.27*	.53*							
Decoding (Decd)	.27*	.39*	.13	.09	.50*	.35*	.49*	.76*						
Control variables														
Child analytic intelligence (Intl)	-.06	.11	-.10	-.08	.23*	.23*	-.00	.08	.13					
Parent print exposure (PEx)	.62*	.06	.20	.13	.04	.12	.05	.20	.28*	-.03				
Parent education (Edu)	.28*	-.08	.19	.24*	-.02	.02	.02	.20	.12	-.08	.31*			
Reading in grade 1 (RG1)	.22*	.31*	.14	.16	.50*	.18	.44*	.72*	.71*	.19	.20	.26*		
Reading in grade 3 (RG3) ^a	.32*	.21 ⁺	.53*	.38*	.73*	.19	.39*	.52*	.51*	-.05	.16	.21	.57*	
Gr-1 cohort														
Child book exposure in grade 1	.17	.41*	.52*	.40*	.29*	.28	.20	.38*	.54*	.27	.27	.04	.50*	.69*
Reading in grade 3 (RG3)	.40*	.32*	.58*	.50*	.36*	.24	.24	.29*	.48*	.23	.35*	.12	.52*	

Note: N = 93 for K-cohort; N = 45 for Gr1-cohort. See text for descriptions of cohorts.

^aN = 66 K-cohort at the end of grade 3.

*p = .05; ⁺p = .09.

was reported in Sénéchal et al. (1998). The grade 3 reading performance for the Gr1-cohort is also reported in Tables 2 and 3. The 10 missing data points out of 1,895 were replaced with the mean for the appropriate grade (Tabachnick & Fidell, 1989).

Data reduction was obtained by conducting two factor analyses on each of the two cohorts. The first analysis included the vocabulary and listening comprehension measures. The principal component analysis with varimax rotation yielded a single factor and, thus, the factor scores were used as the measure of language comprehension. The phonological awareness task was excluded from this analysis because we wanted to test the argument presented by Whitehurst and Lonigan (1998) that phonological awareness was not enhanced by storybook reading. The second analysis included the four emergent literacy tasks; specifically, print concepts, alphabet knowledge, early reading, and emergent printing. This principal component analysis with varimax rotation yielded a single factor, but the factor loading for print concepts was very weak, that is, .22, compared with the loadings for alphabet knowledge, .72, invented spelling, .89, and decoding, .90. This finding is consistent with Sénéchal, LeFevre, Smith-Chant, and Colton's (2001) contention that conceptual aspects of emergent literacy are distinct from procedural aspects of emergent literacy. As a consequence, a second factor analysis was conducted that included only the latter three measures. This revised analysis resulted in a better structure for the obtained factor, and those factor scores were used as the measure of emergent literacy. The print concepts measure was not analyzed further because its distribution was highly skewed, with 72% of the sample obtaining scores of 9 or 10.

Because parents' reports of teaching and storybook exposure were uncorrelated in this study, it becomes of interest to assess whether the two types of home literacy experiences have differential relations with child outcomes. Fixed-order hierarchical regressions were conducted to test whether reading storybooks and parents' reports of teaching to read and print words have different patterns of association with children's receptive language, phonological awareness, emergent literacy, and reading. The five potential control variables for the regressions included child age at the time of testing a particular outcome, year of kindergarten at the beginning of the study (i.e., first for 4-year-olds versus second for 5-year-olds), child analytic intelligence, parent print exposure, and parent education level. Only those control variables that were significantly correlated with that particular outcome measure were entered in each equation.

Predicting Receptive Language, Emergent Literacy, and Phonological Awareness

The first series of fixed-order hierarchical regressions (see Table 4) tested whether literacy experiences that occurred at home during the kindergarten years explained variance in children's receptive language, emergent literacy, and phonological awareness measured at the beginning of grade 1. Consistent with Sénéchal et al. (1998), it was expected that storybook exposure would predict receptive language only and that parents' reports of teaching would predict emergent literacy only. The first regression showed that storybook exposure explained a significant 9% of unique variance in children's receptive language after controlling for children's initial kindergarten level, parent education, phonological awareness, and emergent literacy. In contrast, parents' reports of teaching did not explain a significant amount of variance in receptive language. In this equation, children's phonological awareness explained a significant 5% of variance, whereas children's emergent literacy skills did not predict their receptive language skills.

The regression for emergent literacy showed a different pattern. As expected, parents' reports of teaching, and not storybook exposure, explained a statistically significant 4% of unique variance after controlling for children's analytic intelligence, parent print exposure, phonological awareness, and receptive lan-

Table 4 Hierarchical Regression Analyses for Receptive Language, Emergent Literacy, and Phonological Awareness at the Beginning of Grade 1 for the K-Cohort

Criterion	R ²	ΔR ²	F
Receptive language			
Grade level	.06	.06	5.37*
Parent education	.12	.06	6.46**
Child phonological awareness	.17	.05	5.29*
Child emergent literacy	.17	.00	<1.00
Parents' reports of teaching	.19	.02	1.94
Storybook exposure	.28	.09	10.91***
Emergent literacy			
Parent print exposure	.05	.05	4.35*
Child phonological awareness	.35	.30	42.90***
Child receptive language	.35	.00	<1.00
Storybook exposure	.37	.01	1.67
Parents' reports of teaching	.41	.04	5.76*
Phonological Awareness			
Child analytic intelligence	.05	.05	5.11*
Child receptive language	.12	.06	6.38**
Child emergent literacy	.38	.26	37.37***
Parents' reports of teaching	.39	.01	1.59
Storybook exposure	.40	.01	1.13

Note: N = 93 for K-cohort.

p* = .05; *p* = .01; ****p* = .001.

guage. In this equation, children's phonological awareness explained a powerful 30% of variance, whereas receptive language skills did not predict additional variance in emergent literacy skills. Taken together, the first two analyses replicated the findings in Sénéchal et al. (1998) by showing that different types of literacy activities are related to different outcomes: storybook exposure predicted receptive language and parents' reports of teaching predicted emergent literacy. The analyses also extended the findings of Sénéchal et al. by clarifying the links between receptive language and emergent literacy. The exclusion of phonological awareness from the receptive language factor indicated that receptive language was not directly related to emergent literacy (and vice versa). Phonological awareness, however, predicted both receptive language and emergent literacy.

The regression for phonological awareness is interesting because it revealed yet a different pattern of relations. In this case, neither storybook exposure or parents' reports of teaching predicted a significant amount of variance in phonological awareness. Both receptive language and emergent literacy were significant predictors of phonological awareness, however, suggesting that the impact of home literacy experiences on phonological awareness may be indirectly mediated through children's receptive language and literacy skills.

Predicting Reading at the End of Grade 1

The next series of regressions examined whether literacy experiences that occurred at home during the kindergarten years were related to the children's reading skills at the end of grade 1. Children were administered a measure of word reading and a measure of reading comprehension from the Woodcock-Johnson Psycho-Educational Battery-Revised (Woodcock & Johnson, 1989). The test yields standardized scores for each measure as well as standardized scores for both measures combined. Preliminary analyses revealed that the pattern of results was identical when each measure was analyzed separately or jointly. As a consequence, the results presented in Table 5 are those for the combined reading measure. The first regression model tested whether storybook exposure and parents' reports of teaching accounted for significant amounts of variance in grade 1 reading. Parents' reports of teaching were entered into the equation last because of their previous association with emergent literacy. The results of Model 1 revealed that parents' reports of teaching accounted for a significant 12% of the variance in reading skills, whereas storybook exposure did not account for significant variance.

Table 5 Hierarchical Regression Analyses for Reading at the End of Grade 1 for the K-Cohort

Model	R^2	ΔR^2	F
Model 1			
1. Child age	.09	.09	9.02**
2. Parent education	.14	.05	5.52*
3. Storybook exposure	.15	.01	<1.00
4. Parents' reports of teaching	.28	.12	14.94***
Model 2			
3. Emergent literacy	.64	.50	121.75***
4. Parents' reports of teaching	.65	.01	1.63
Model 3			
3. Receptive language	.16	.02	1.99
4. Emergent literacy	.64	.48	117.24***
5. Phonological awareness	.67	.03	8.06**

Note: $N = 93$ for K-cohort.

* $p = .05$; ** $p = .01$; *** $p = .001$.

Model 2 clarified this finding by showing that the link between parents' reports of teaching and reading was indirectly mediated through children's emergent literacy. When children's emergent literacy skills, measured at the beginning of grade 1, were entered first, parents' reports of teaching did not account for significant variance. Hence, parents' reports of teaching accounted for variance in children's emergent literacy, and, in time, children's emergent literacy accounted for variance in reading skills at the end of grade 1. These findings extend those reported by Sénéchal et al. (1998) for the Gr1-cohort by showing that the indirect link between parents' reports of teaching and reading in grade 1 held when home literacy experiences were measured in kindergarten.

The results of Model 3 (see Table 5) revealed that receptive language was not related to grade 1 reading, whereas emergent literacy and phonological awareness were. Other research has shown that children must acquire sufficiently fluent decoding skills before receptive language skills can exert their full influence (Snow, 1991; Snow, Tabors, Nicholson, & Kurland, 1995; but see Wagner et al., 1997). Presumably, one should expect a relation between receptive language comprehension measured early and more fluent reading skills such as those measured in grade 3. This possibility was tested in the regressions below.

Predicting Reading at the End of Grade 3

The next series of analyses examined the long-term links between early home literacy experiences and reading achievement in grade 3. The reading measure was obtained by averaging standardized scores on the vocabulary and the comprehension subtests of the

Table 6 Hierarchical Regression Analyses for Reading at the End of Grade 3 for the K-Cohort

Model	R^2	ΔR^2	F
Model 1			
1. Child age	.05	.05	3.59 ⁺
2. Grade 1 reading	.44	.39	43.20 ^{***}
3. Storybook exposure	.48	.04	4.96 [*]
4. Parents' reports of teaching	.48	.00	<1.00
Model 2			
3. Receptive language	.61	.17	27.66 ^{***}
4. Storybook exposure	.61	.00	<1.00
Model 3			
3. Receptive language	.61	.17	27.66 ^{***}
4. Emergent literacy	.62	.01	1.55
5. Phonological awareness	.73	.11	23.59 ^{***}

Note: $N = 66$ for K-cohort.

* $p = .05$; *** $p = .001$; ⁺ $p = .06$.

Gates-MacGinitie Reading Tests. Table 6 presents the results of the regression analyses for the K-cohort. The results of Model 1 showed that early storybook exposure, and not parents' reports of teaching, explained significant variance in grade 3 reading skills. In this equation, storybook exposure, measured in kindergarten, predicted 4% of additional variance in reading skills after controlling for children's age and grade 1 reading. This finding suggests a powerful and lasting effect of early storybook exposure. Model 1, however, controlled for reading skills at the end of grade 1, but did not control for children's early receptive language skills. It is important to include receptive language as a control variable because of its previous relation with storybook exposure (see Table 4). The results of Model 2 showed that the relation between grade 3 reading and storybook exposure (measured in kindergarten) is mediated by children's receptive language skills (measured at the beginning of Grade 1). Once receptive language was entered into the equation, storybook exposure did not account for unique variance in grade 3 reading.

The results of Model 3 (see Table 6) yielded the classic findings that receptive language and phonological awareness predict significant portions of additional variance in grade 3 reading after controlling for reading skills at the end of grade 1. Emergent literacy skills, however, did not explain a significant amount of variance in grade 3 reading. This latter finding suggests that emergent literacy had an important effect on the acquisition of reading in grade 1, which, in turn, predicted more advanced reading skills in grade 3.

The regression analyses for reading in grade 3 for the Gr1-cohort are presented in Table 7. Recall that the measures of literacy experiences, receptive language, and emergent literacy for this cohort were obtained at

Table 7 Hierarchical Regression Analyses for Reading in Grade 3 with the Gr1-Cohort

Model	R^2	ΔR^2	F
Model 1			
1. Child age	.10	.10	4.78 [*]
2. Parent print exposure	.21	.11	5.75 [*]
3. Grade 1 reading	.43	.22	15.58 ^{***}
4. Storybook exposure	.48	.05	3.95 [*]
5. Parents' reports of teaching	.48	.00	<1.00
Model 2			
4. Receptive language	.56	.13	12.13 ^{***}
5. Storybook exposure	.58	.02	1.48
Model 3			
4. Receptive language	.56	.13	12.13 ^{***}
5. Emergent literacy	.57	.01	<1.00
6. Book exposure—end grade 1	.64	.07	6.80 ^{**}

Note: $N = 45$ for Gr1-cohort.

* $p = .05$; ** $p = .01$; *** $p = .001$.

the beginning of grade 1. Despite these differences, the results of Models 1 and 2 are strikingly similar to those obtained with the K-cohort. First, parents' reports of teaching were not related to grade 3 reading after controlling for children's age, parent print exposure, and grade 1 reading. Second, the relation between storybook exposure and reading skills in grade 3 was mediated by children's early receptive language skills. Hence, the results are consistent with the notion that reading storybooks during the preschool years will enhance children's vocabulary and listening comprehension, and, in time, these receptive language skills will facilitate fluent reading.

The findings presented thus far did not address the issue of whether the reading that children do themselves enhances eventual success in reading. This possibility could not be tested with the K-cohort children, but it could be tested with the Gr1-cohort children because they received a reliable measure of storybook knowledge at the end of grade 1. Presumably, their knowledge of book titles reflects their accumulated exposure to books read to them at home, school, and elsewhere (e.g., the library), as well as the exposure they received from reading books themselves during their first year of school. The results of Model 3 (see Table 7) are remarkable. Children's book exposure accounted for 7% of unique variance in children's reading skills after controlling for children's age, parent print exposure, and end of grade 1 reading, as well as receptive language and emergent literacy measured at the beginning of grade 1. Note that phonological awareness was not included in the equation because a preliminary analysis showed that it did not account for significant variance due to ceil-

ing effects (i.e., 27% of that sample obtained a perfect score of 16, and an additional 49% obtained a score of 14 or 15).

Given the findings of Model 3, it becomes of interest to explore the relation between children's book exposure and the remaining variables. Supplementary hierarchical regressions revealed that (1) children's book exposure explained a significant 5% of unique variance in grade 1 reading after controlling for children's age, analytic intelligence, receptive language, and emergent literacy; (2) grade 1 reading and receptive language explained a significant 7% and 8%, respectively, of unique variance in children's book exposure after controlling for each other as well as age, parent print exposure, receptive language, and emergent literacy; and (3) storybook exposure at home and parents' reports of teaching did not predict a significant amount of variance in children's book exposure after controlling for age, parent print exposure, and grade 1 reading.

DISCUSSION

In the present longitudinal study, the complex relations among early home literacy experiences, developing receptive language, emergent literacy skills, and reading achievement of children were examined in a middle- to upper middle-class sample. Two measures of parent involvement in literacy development—children's exposure to storybooks and parents' reports of how frequently they taught their children about reading and printing words—were uncorrelated. Evans et al. (2000) also found that storybook exposure was unrelated to the frequency with which parents reported teaching letter names and forms. More important, these different kinds of home literacy experiences were related to different kinds of skills. Experiences that included informal interactions with print, such as storybook reading, were associated with the development of children's receptive language, and experiences that included more formal interactions with print, such as teaching about reading, were associated with the development of emergent literacy.

The findings of this 5-year longitudinal study are captured in Figure 1 and suggest clear links from home experiences, through early literacy skills, to fluent reading. As shown in Figure 1, the two types of home literacy experiences that were assessed in the present study were differentially related to child outcomes: storybook reading was related to children's receptive language development, whereas parents' reports of teaching were related to children's early literacy skills. This pattern held for both cohorts (i.e., the K- and Gr1-cohorts) and over time (i.e., child out-

comes for the K-cohorts were measured in kindergarten and at the beginning of grade 1). Parent involvement, however, was not directly related to children's phonological awareness skills. Moreover, early parent involvement was not directly linked to subsequent reading performance; instead, there were indirect relations between parent involvement and reading outcomes. First, the relation between parents' reports of teaching and reading in grade 1 was mediated by children's emergent literacy. Second, the relation between storybook reading and reading in grade 3 was mediated by children's early receptive language skills. Again, these patterns of findings were replicated across cohorts.

The relations among child outcomes were also examined. As shown in Figure 1, receptive language and early literacy skills were both related to phonological awareness and vice versa. In contrast, receptive language skills and emergent literacy skills were not directly related. Instead, these two variables were linked through their separate relations with phonological awareness. These findings extend those found in Sénéchal et al. (1998). Importantly, the variables that were directly related to reading skill at the end of grade 1 were those most closely tied to the mechanics of reading; that is, phonological awareness and the child's emergent literacy skills. In contrast, the pathway was different for reading achievement in grade 3 in which receptive language skills and phonological awareness were directly related to reading performance, but children's emergent literacy skills were not. Instead, the relation between emergent literacy and grade 3 reading was mediated by children's grade 1 reading performance. Finally, children's exposure to books measured at the end of grade 1 was directly related to reading in grade 3. These findings are consistent with the view that continued exposure to print is an important component of the development of skilled reading (Cunningham & Stanovich, 1991, 1998).

The finding that storybook exposure at home predicts children's receptive language skills both concurrently and longitudinally contributes to the existing literature by showing that the relation holds after controlling for exogenous factors (e.g., parent education) and endogenous factors (e.g., phonological awareness and emergent literacy; Frijters et al., 2000; for reviews, see Bus et al., 1995; Scarborough & Dobrich, 1994; Whitehurst & Lonigan, 1998). In a recent study, however, Evans et al. (2000) did not find storybook exposure to predict the vocabulary of kindergarten children after controlling for parent education. The differences across studies may be attributable to the measures used. In the Evans et al. study, a single

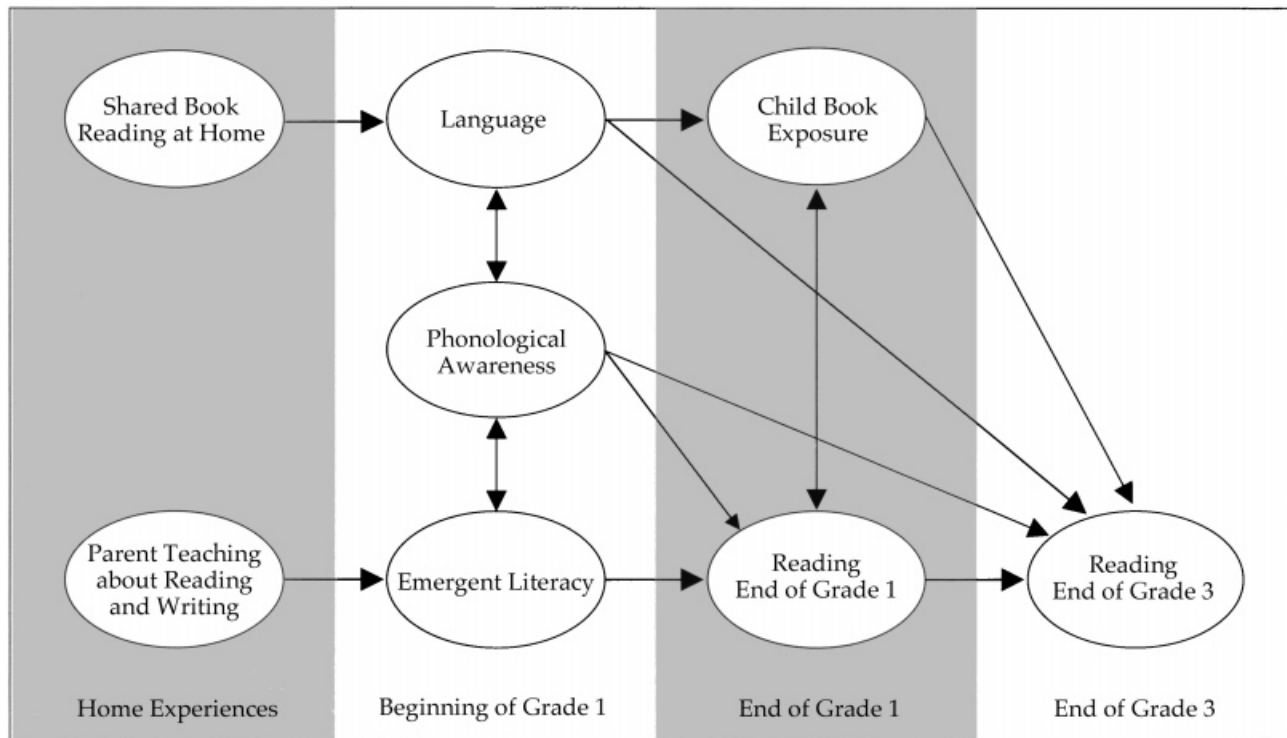


Figure 1 Model representing the relations among home literacy experiences and child outcomes. Arrows represent statistically significant relations, as tested with stringent hierarchical regressions that controlled for related variables such as nonverbal intelligence and age, as well as parent print exposure and education. Most of the pathways specified in the figure were tested with the kindergarten and grade 1 cohorts (either in the present article or in Sénéchal et al., 1998), but a few pathways could only be tested with one cohort (i.e., the relation between book exposure in grade 1 and reading in grades 1 and 3; the relations between receptive language, phonological awareness, and early literacy skills in kindergarten and grade 1).

checklist measure was used to assess storybook exposure (titles of children's books), whereas in the present study two checklist measures (titles and authors of children's books) were used. Use of multiple measures of the same construct typically increases the reliability of questionnaire variables (Oppenheim, 1992).

The finding that exposure to storybooks failed to predict children's emergent literacy skills suggests that informal literacy experiences may not be sufficient to foster children's specific emergent literacy skills such as alphabet knowledge or early decoding (Crain-Thoreson & Dale, 1992; Evans et al., 2000; Whitehurst et al., 1994). Instead, children's acquisition of specific literacy skills at home may require the guidance of a parent or older sibling. It is important to note, however, that the current study probably captured only some of the variability in children's informal experiences with literacy. Other research suggests, for example, that the quality of adult-child interactions during book reading may influence the acquisition of literacy skills (Reese & Cox, 1999). Our

checklist measures may not have captured the quality of interactions independently of quantity and diversity. Moreover, children's interest in books (measured independently of parent reports) may also be linked to early literacy skills (Fritjers et al., 2000; Scarborough et al., 1991), and parent checklist measures may capture children's interest only indirectly (Fritjers et al., 2000). Certainly, these aspects of informal literacy need to be investigated further.

The finding that parents' reports of teaching predicted concurrent and subsequent emergent literacy skills contributes to a small body of evidence on experiential factors, other than book exposure, that explain the development of early individual differences in literacy skills (e.g., Crain-Thoreson & Dale, 1992; Dale, Crain-Thoreson, & Robinson, 1995; Evans et al., 2000). These findings are important in light of the relative stability of these early individual differences once children commence formal instruction in reading (e.g., Wagner et al., 1997).

In the present study, early home literacy experiences were indirectly related to later reading perfor-

mance. The pattern of results identified in this longitudinal study suggests that children's exposure to books at home played an important indirect role in the development of reading skills. Shared book reading supported children's receptive language development, and receptive language development (in this study) began to show a strong link to reading performance once the mechanics of reading were under control and children were reading more fluently (also see Hinchley & Levy, 1988). In addition, children's continued exposure to books in situations beyond shared parent-child reading seem to have a role in the development of fluent reading. The finding that experiences with books in grade 1 made a unique contribution to reading in grade 3 after controlling for grade 1 reading skill and receptive language extends previous concurrent reports on the role of print exposure in grade 1 (Cunningham & Stanovich, 1993, 1998) and grade 3 (Barker et al., 1992). Book exposure, then, can be thought of as an enduring aspect of home experience that is likely to contribute to children's reading performance.

In contrast to storybook exposure, parents' reports of teaching appear to have a more limited (albeit important) influence on the process of learning to read. Children whose early literacy skills were relatively good at the beginning of kindergarten had better literacy skills early in grade 1 and were more likely to be decoding words at the end of grade 1 than their peers whose early literacy skills were weaker. The influence of parents' reports of teaching is presumably to enhance the basic skills that contribute to reading acquisition; in essence, to prepare the children to learn to read in school. Children whose word reading is good at the end of grade 1 are also more likely to be reading well in grade 3 (Wagner et al., 1997). Parent involvement in these early literacy skills, therefore, provides some of the basic groundwork for children's acquisition of the mechanics of reading.

As has been found in other studies (e.g., Lonigan et al., 2000; Wagner et al., 1997), children's emerging literacy skills were good predictors of their reading success in the early stages. In many ways, beginning reading can be viewed as the direct development of the early skills involved in linking letters to sounds (i.e., alphabet knowledge, invented spelling, and decoding). In contrast, receptive language skills were not related to word reading and reading comprehension at the end of grade 1. This latter finding is consistent with that of Evans et al. (2000), but differs from that of Wagner, Torgesen, and Rashotte (1994). One potentially important difference across the studies was the SES background of the children. In the present study and Evans et al., children were mostly from

middle-class homes, whereas the children in Wagner et al. (1994) were from more varied backgrounds. The vocabularies of middle-class children are usually adequate for learning to decode simple words, and thus are not believed to be a source of variability in early reading skill.

Phonological awareness was analyzed separately from the other language measures in the present study. The exclusion of phonological awareness from the receptive language factor clarified the results presented in Sénéchal et al. (1998). They had included phonological awareness along with vocabulary and listening comprehension in an oral language factor. In doing so, Sénéchal et al. found that oral language and emergent literacy were interrelated: oral language was a significant predictor of emergent literacy and vice versa. The present analyses revealed that the pattern of interrelation was due to the inclusion of phonological awareness in the oral language factor. When phonological awareness was excluded, emergent literacy was not a significant predictor of receptive language and vice versa (see Figure 1). Fritjers et al. (2000) also found that the relation between storybook exposure and early literacy skills was indirect and mediated through phonological awareness.

The finding that receptive language and emergent literacy have bidirectional relations with phonological awareness is consistent with existing knowledge. Presumably, emergent literacy skills help children to understand that words are formed of individual phonemes. This increased phonological awareness subsequently may facilitate further learning about literacy, such as how to spell words phonetically (Burgess & Lonigan, 1998; Wagner et al., 1994). Second, a bidirectional relation was found between phonological awareness and vocabulary (see also Chaney, 1992, 1994; Lonigan, Burgess, Anthony, & Barker, 1998). Metsala and Walley (1998) argued that the relation between vocabulary and phonological awareness could be understood by considering the representation in memory of the phonological structure of words. Presumably, children's growing vocabulary during the preschool years plays a role in the development of accurate representations of the phonological structure of words. In turn, accurate phonological representations are necessary to the development of efficient phonological awareness as well as continued vocabulary growth (see also Thomas & Sénéchal, 1998).

What are the implications of this research for teachers and parents? First, the finding that vocabulary and listening comprehension skills are predicted by parents' knowledge of storybooks adds to the literature on the role of storybook reading in the development of these language skills (Sénéchal & LeFevre,

2001). Teachers can recommend that parents read to their children before and after their children begin to acquire decoding skills, because early progress in the development of receptive language is predictive over the long term for the acquisition of reading vocabulary and comprehension. Second, the relation between parents' reports of teaching and children's early literacy skills is consistent with a more general perspective that home experiences predict the acquisition of academic skills (e.g., Purcell-Gates, 1996; Reese & Cox, 1999; Scarborough et al., 1991; Sonnenschein et al., 1996; Stipek et al., 1992). Based on the present research, however, specific recommendations about whether parents should attempt to teach such skills is premature. In this study, little was known about the context within which parents taught their children about letters and words. Although it seems safe to suggest that middle-class parents spend some time teaching their young child to print and read words, statements about the extent or depth with which parents should pursue the teaching of reading with their young children cannot be made based on the results of the present research.

In addition to framing and organizing the results of the current study, Figure 1 also helps to define a set of questions that were not addressed. One such question is whether there are any home experiences that are related to the development of phonological awareness. Some researchers have suggested that exposure to rhymes through poems and stories may relate to the development of phonological awareness (Baker et al., 1998; Bryant, Bradley, Maclean, & Crossland, 1989). The present research indicates only that some of the more obvious home experiences do not appear to predict phonological awareness directly. A second question that was not addressed in the current research is whether the same or similar patterns would hold in samples with more variable levels of SES. Children in the present study were from middle- and upper middle-class homes. Despite this homogeneity, consistent patterns of relations were observed between home factors and acquisition of reading, suggesting that such factors may be even more important when children are at greater risk for reading failure because of social, economic, or cognitive difficulties. A third issue of interest is the role for continued exposure to books in the development of literacy. Cunningham and Stanovich (1993) found that children's book exposure in grade 1 was correlated with their reading skill, and the results from our Gr1-cohort indicate a relation between book exposure in grade 1 and reading achievement in grade 3. The relative contribution of continued parent-child reading versus the child's own independent reading to the development of reading skills is of considerable interest for future work.

In conclusion, many studies have shown that reading acquisition in the early grades is predictive of later reading performance. Still other studies have shown that children's early experiences are linked to their performance in kindergarten or grade 1. The contribution of the present study, however, is to show that the various pathways leading to fluent reading have their roots in different aspects of children's early experiences.

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REFERENCES

- Anderson, J. (1995). How parents' perceptions of literacy acquisition relate to their children's emergent literacy knowledge. *Reading Horizons, 35*, 209–228.
- Baker, L., Fernandez-Fein, S., Scher, D., & Williams, H. (1998). Home experiences related to the development of word recognition. In J. L. Metsala & L. C. Ehri (Eds.), *Word recognition in beginning literacy* (pp. 263–287). Mahwah, NJ: Erlbaum.
- Barker, T. A., Torgesen, J. K., & Wagner, R. K. (1992). The role of orthographic processing skills on five different reading tasks. *Reading Research Quarterly, 27*, 335–345.
- Bryant, P. E., Bradley, L. L., Maclean, M., & Crossland, J. (1989). Nursery rhymes, phonological skills, and reading. *Journal of Child Language, 16*, 407–428.
- Bryant, P. E., Maclean, M., Bradley, L. L., & Crossland, J. (1990). Rhyme and alliteration, phoneme detection, and learning to read. *Developmental Psychology, 26*, 429–438.
- Burgess, S. R., & Lonigan, C. J. (1998). Bidirectional relations of phonological sensitivity and prereading abilities: Evidence from a preschool sample. *Journal of Experimental Child Psychology, 70*, 117–141.
- Bus, A. G., van Ijzendoorn, M. H., & Pellegrini, A. D. (1995).

- Joint book reading makes for success in learning to read: A meta-analysis on intergenerational transmission of literacy. *Review of Educational Research*, 65, 1–21.
- Butler, S. R., Marsh, H. W., Sheppard, M. J., & Sheppard, J. L. (1985). Seven-year longitudinal study of the early prediction of reading achievement. *Journal of Educational Psychology*, 77, 349–361.
- Chaney, C. (1992). Language development, metalinguistic skills, and print awareness in 3-year-old children. *Applied Psycholinguistics*, 13, 485–514.
- Chaney, C. (1994). Language development, metalinguistic awareness, and emergent literacy skills of 3-year-old children in relation to social class. *Applied Psycholinguistics*, 15, 371–394.
- Christian, K., Morrison, F. J., & Bryant, F. B. (1998). Predicting kindergarten academic skills: Interactions among child care, maternal education, and family literacy environments. *Early Childhood Research Quarterly*, 13, 501–521.
- Clay, M. (1979). *The early detection of reading difficulties*. Portsmouth, NH: Heinemann.
- Crain-Thoreson, C., & Dale, P. S. (1992). Do early talkers become early readers? Linguistic precocity, preschool language, and early reading. *Developmental Psychology*, 28, 421–429.
- Cunningham, A. E., & Stanovich, K. E. (1991). Tracking the effects of print exposure in children: Associations with vocabulary, general knowledge, and spelling. *Journal of Educational Psychology*, 83, 264–274.
- Cunningham, A. E., & Stanovich, K. E. (1993). Children's literacy environments and early word recognition subskills. *Reading and Writing: An Interdisciplinary Journal*, 5, 193–204.
- Cunningham, A. E., & Stanovich, K. E. (1998). The impact of print exposure on word recognition. In J. L. Metsala & L. C. Ehri (Eds.), *Word recognition in beginning literacy* (pp. 235–261). Mahwah, NJ: Erlbaum.
- Dale, P. S., Crain-Thoreson, C., & Robinson, N. M. (1995). Linguistic precocity and the development of reading: The role of extralinguistic factors. *Applied Psycholinguistics*, 16, 173–187.
- DeBaryshe, B. (1995). Maternal belief systems: Linchpin in the home reading process. *Journal of Applied Developmental Psychology*, 16, 1–20.
- Dunn, L., & Dunn, L. (1981). *Peabody Picture Vocabulary Test—Revised*. Circle Pines, MN: American Guidance Services, Inc.
- Ehri, L. C. (1998). Grapheme-phoneme knowledge is essential for learning to read words in English. In J. L. Metsala & L. C. Ehri (Eds.), *Word recognition in beginning literacy* (pp. 3–40). Mahwah, NJ: Erlbaum.
- Evans, M. A., Shaw, D., & Bell, M. (2000). Home literacy activities and their influence on early literacy skills. *Canadian Journal of Experimental Psychology*, 54, 65–75.
- Fantuzzo, J., Tighe, E., & Childs, S. (2000). Family involvement questionnaire: A multivariate assessment of family participation in early childhood education. *Journal of Educational Psychology*, 92, 367–376.
- Fitzgerald, J., Spiegel, D. L., & Cunningham, J. W. (1991). The relationship between parental literacy level and perceptions of emergent literacy. *Journal of Reading Behavior*, 23, 191–213.
- Frijters, J. C., Barron, R. W., & Brunello, M. (2000). Direct and mediated influences of home literacy and literacy interest on pre-readers' oral vocabulary and early written language skill. *Journal of Educational Psychology*, 92, 466–477.
- Hinchley, J., & Levy, B. (1988). Developmental and individual differences in reading comprehension. *Cognition and Instruction*, 5, 3–47.
- Jorm, A. F., Share, D. L., Maclean, R., & Matthews, R. G. (1984). Phonological recoding skills and learning to read: A longitudinal study. *Applied Psycholinguistics*, 5, 201–207.
- Leseman, P. P. M., & de Jong, P. F. (1998). Home literacy: Opportunity, instruction, cooperation and social-emotional quality predicting early reading achievement. *Reading Research Quarterly*, 33, 294–318.
- Leslie, L., & Allen, L. (1999). Factors that predict success in an early literacy intervention program. *Reading Research Quarterly*, 34, 404–424.
- Lonigan, C. J., Burgess, S. R., & Anthony, J. L. (2000). Development of emergent literacy and early reading skills in preschool children: Evidence from a latent-variable longitudinal study. *Developmental Psychology*, 36, 596–613.
- Lonigan, C. J., Burgess, S. R., Anthony, J. L., & Barker, T. A. (1998). Development of phonological sensitivity in two- to five-year-old children. *Journal of Educational Psychology*, 90, 294–311.
- Lonigan, C. J., & Whitehurst, G. J. (1998). Relative efficacy of a parent and teacher involvement in a shared-reading intervention for preschool children from low-income backgrounds. *Early Childhood Research Quarterly*, 13, 262–290.
- MacGinitie, W. H., & MacGinitie, R. K. (1992). *Gates-MacGinitie reading tests* (2nd Canadian ed.). Toronto, Canada: Nelson Canada.
- Mann, V. A., Tobin, P., & Wilson, R. (1987). Measuring phoneme awareness through invented spellings of kindergarten children. *Merrill-Palmer Quarterly*, 33, 365–391.
- Metsala, J. L., & Walley, A. C. (1998). Spoken vocabulary growth and the segmental restructuring of lexical representations: Precursors to phonemic awareness and early reading ability. In J. L. Metsala & L. C. Ehri (Eds.), *Word recognition in beginning literacy* (pp. 89–120). Mahwah, NJ: Erlbaum.
- Meyer, L. A., Wardrop, J. L., Stahl, S. A., & Linn, R. L. (1994). Effects of reading storybooks aloud to children. *Journal of Educational Research*, 88, 69–85.
- Murray, B. A., Stahl, S. A., & Ivey, M. G. (1996). Developing phoneme awareness through alphabet books. *Reading and Writing: An Interdisciplinary Journal*, 8, 307–322.
- Oppenheim, A. N. (1992). *Questionnaire design, interviewing, and attitude measurement*. London: Pinter.
- Ottawa-Carleton Economic Development Corporation (OCEDC). (1996). *The Metro-Ottawa economic profile*. Ottawa, Canada: Author.
- Psychological Corporation. (1989). *Stanford early school achievement test* (3rd ed.). San Antonio, TX: Harcourt Brace Jovanovich.

- Purcell-Gates, V. (1996). Stories, coupons, and the *TV Guide*: Relationships between home literacy experiences and emergent literacy knowledge. *Reading Research Quarterly, 31*, 406–428.
- Reese, E., & Cox, A. (1999). Quality of adult book reading affects children's emergent literacy. *Developmental Psychology, 35*, 20–28.
- Saracho, O. N. (1997a). Perspectives on family literacy. *Early Child Development and Care, 127–128*, 3–11.
- Saracho, O. N. (1997b). Using the home environment to support emergent literacy. *Early Child Development and Care, 127–128*, 201–216.
- Scarborough, H. S. (1998). Early identification of children at risk for reading disabilities: Phonological awareness and some promising predictors. In B. K. Shapiro, P. J. Pasquale, & A. J. Capute (Eds.), *Specific reading disability: A view of the spectrum* (pp. 75–119). Timonium, MD: York.
- Scarborough, H. S., & Dobrich, W. (1994). On the efficacy of reading to preschoolers. *Developmental Review, 14*, 245–302.
- Scarborough, H. S., Dobrich, W., & Hager, M. (1991). Preschool literacy experience and later reading achievement. *Journal of Learning Disabilities, 24*, 508–511.
- Sénéchal, M., Cornell, E. H., & Broda, L. S. (1995). Age-related changes in the organization of parent-infant interactions during picture-book reading. *Early Childhood Research Quarterly, 10*, 317–337.
- Sénéchal, M., & LeFevre, J. (2001). Storybook reading and parent teaching: Links to language and literacy development. In P. R. Britto & J. Brooks-Gunn (Eds.), *New directions in child development: No. 92. The role of family literacy environments in promoting young children's emerging literacy skills* (pp. 39–52). San Francisco: Jossey-Bass.
- Sénéchal, M., LeFevre, J., Hudson, E., & Lawson, P. (1996). Knowledge of storybooks as a predictor of young children's vocabulary. *Journal of Educational Psychology, 88*, 520–536.
- Sénéchal, M., LeFevre, J., Smith-Chant, B. L., & Colton, K. (2001). On refining theoretical models of emergent literacy: The role of empirical evidence. *Journal of School Psychology, 38*, 439–460.
- Sénéchal, M., LeFevre, J., Thomas, E., & Daley, K. (1998). Differential effects of home literacy experiences on the development of oral and written language. *Reading Research Quarterly, 32*, 96–116.
- Smolkin, L. B., & Yalden, D. B. (1992). "O" is for "Mouse": First encounters with the alphabet book. *Language Arts, 69*, 432–441.
- Snow, C. E. (1991). The theoretical basis for relationships between language and literacy in development. *Journal for Research in Childhood Education, 6*, 5–10.
- Snow, C. E., Tabors, P. O., Nicholson, P. A., & Kurland, B. F. (1995). SHELL: Oral language and early literacy skills in kindergarten and first-grade children. *Journal of Research in Childhood Education, 10*, 37–48.
- Sonnenschein, S., Brody, G., & Munsterman, K. (1996). The influence of family beliefs and practices on children's early reading development. In L. Baker & P. Afflerbach (Eds.), *Developing engaged readers in school and home communities* (pp. 3–20). Mahwah, NJ: Erlbaum.
- Stainthorp, R. (1997). A children's author recognition test: A useful tool in reading research. *Journal of Research in Reading, 20*, 148–158.
- Stanovich, K. E., & Cunningham, A. E. (1992). Studying the consequences of literacy within a literate society: The cognitive correlates of print exposure. *Memory and Cognition, 20*, 51–68.
- Statistics Canada. (1993). *Educational attainment and school attendance*. Ottawa, Canada: Supply and Services Canada.
- Stipek, D., Milburn, S., Clements, D., & Daniels, D. H. (1992). Parents' beliefs about appropriate education for young children. *Journal of Applied Developmental Psychology, 13*, 293–310.
- Tabachnick, B. G., & Fidell, L. S. (1989). *Using multivariate statistics* (2nd ed.). New York: Harper Collins.
- Thomas, E. M., & Sénéchal, M. (1998). Articulation and phoneme awareness of three-year-old children. *Applied Psycholinguistics, 19*, 363–391.
- Tunmer, W. E., Herriman, M. L., & Nesdale, A. R. (1988). Metalinguistic abilities and beginning reading. *Reading Research Quarterly, 23*, 134–158.
- Wagner, R. K., Torgesen, J. K., & Rashotte, C. A. (1994). Development of reading-related phonological processing abilities: New evidence of a bidirectional causality from a latent variable. *Developmental Psychology, 30*, 73–87.
- Wagner, R. K., Torgesen, J. K., Rashotte, C. A., Hecht, S. A., Barker, T. A., Burgess, S. R., Donahue, J., & Garon, T. (1997). Changing relations between phonological processing abilities and word-level reading as children develop from beginning to skilled readers: A 5-year longitudinal study. *Developmental Psychology, 33*, 468–479.
- Weschler, D. (1989). *Weschler Preschool and Primary Scale of Intelligence-Revised*. San Antonio, TX: The Psychological Corporation.
- Whitehurst, G. J., Epstein, J. N., Angell, A. L., Payne, A. C., Crone, D. A., & Fischel, J. E. (1994). Outcomes of an emergent literacy intervention in head start. *Journal of Educational Psychology, 86*, 542–555.
- Whitehurst, G. J., & Lonigan, C. J. (1998). Child development and emergent literacy. *Child Development, 69*, 848–872.
- Woodcock, R. W., & Johnson, M. B. (1989). *Woodcock-Johnson Psycho-Educational Battery-Revised*. Allen, TX: DLM Teaching Resources.