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The frequency of parents' reading-related activities at home and children's reading skills during kindergarten and Grade 1 ☆

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ABSTRACT

This longitudinal study investigated the associations between the frequency of parents' reading-related activities at home and their children's reading-related skills during the transition from kindergarten to Grade 1. Longitudinal data were obtained for 1436 Finnish children (5- to 6-year-olds at baseline) and their mothers and fathers. 684 girls and 752 boys participating in the study represented four Finnish municipalities. The reading skills of the children were measured four times: at the beginning and at the end of their kindergarten year, and at the beginning and at the end of Grade 1. In kindergarten, decoding tests were administered individually. In Grade 1, group tests in reading fluency were performed. The children's mothers and fathers filled in questionnaires on the frequency of their teaching of reading and the frequency of shared reading with their children in the kindergarten year and in Grade 1. The results showed that the better word reading skills children showed in kindergarten, the more shared reading parents reported. Also, the better word reading skills boys evidenced in kindergarten, the more teaching of reading parents reported. However, in Grade 1, it was children's poor skills in reading that activated more frequent parents' teaching of reading and more frequent shared reading.

Previous research on the role of parents in the development of their children's reading skills have reported mixed findings. Some studies have shown that the frequency of parents' reading-related activities play an important role (Evans, Show, & Bell, 2000; Fan & Chen, 2001; Frijters, Barron, & Brunello, 2000; Hood, Conlon, & Andrews, 2008; Sénéchal, 2006; Sénéchal & LeFevre, 2002), whereas some other studies have not found any impact of the frequency of parents' reading-related activities on children reading skills (Chen & Stevenson, 1989; Cooper, Lindsay, & Nye, 2000; Hoglund, Jones, Aber, & Brown, 2009; Levin et al., 1997; Silinskas, Leppänen, Aunola, Parrila, & Nurmi, 2010). Some researchers have even suggested that children's academic skills may have an impact on their parents' academic involvement rather than vice versa (Hoover-Dempsey & Sandler, 1995). Along this notion of "evocative impact" (Rutter, 1997), many studies have shown that children's literacy skills predict how much time parents spend in reading-related activities with their children (Levin et al., 1997; Silinskas, Leppänen, et al., 2010; see Pomerantz, Moorman, & Litwack, 2007, for a review). To investigate parents' role in children's evolving academic skills and the evocative impact of children's academic skills on their parents academic involvement, the present study examined the longitudinal associations between the frequency of parents' reading-related activities (i.e., shared reading and teaching of reading) and children's skills (i.e., decoding in kindergarten and reading fluency in Grade 1) during the transition from kindergarten to Grade 1.

Parents' reading-related activities and children's reading skills

Parents' academic involvement is a multifaceted construct that includes both home-based and school-based involvement (Fan & Chen, 2001; Pomerantz et al., 2007). School-based involvement has been defined as parents' cooperating with kindergarten or school, whereas home-based involvement refers to parental activities with their children at home (Pomerantz et al., 2007). Parental home-based reading-related involvement with their children, in turn, can be broken down into informal and formal reading-related activities at home (Sénéchal & LeFevre, 2002). Informal activities include the home literacy environment, such as joint storybook reading or quantity of children's books at home, whereas formal reading-related activities refer to exposing a child to print per se, such as teaching letter names, sounds, or the teaching of reading. Even though informal

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and formal reading-related activities at home may occur simultaneously, they have been shown to be relatively independent (Hood et al., 2008; Manolitsis, Georgiou, Stephenson, & Parrila, 2009; Sénéchal, LeFevre, Thomas, & Daley, 1998). The present study focused on both informal (i.e., shared reading) and formal (i.e., teaching of reading) aspects of reading-related activities.

Previous research on the frequency of parental teaching of reading in the development of children's reading skills has shown conflicting results. The findings seem to differ before and after entry in formal schooling. In kindergarten, parental teaching, such as teaching letters (Evans et al., 2000; Manolitsis et al., 2009; Torppa, Poikkeus, Laakso, Eklund, & Lyytinen, 2006) and teaching to decode words (Hood et al., 2008; Sénéchal & LeFevre, 2002), have a positive impact on children's skills. For instance, Torppa et al. (2006) found that less frequent teaching of letter names at the age of 4.5 predicted delayed letter knowledge at the age of 6 among Finnish children. In Grade 1, in turn, parents' teaching of reading has been found to be negatively related to the development of children's reading skills both among U.S. and Finnish children (Chen & Stevenson, 1989; Silinskas, Leppänen, et al., 2010). Moreover, research on homework has shown that parents' help with homework during the first years of primary school does not contribute or contributes negatively to children's academic development (Chen & Stevenson, 1989; Cooper et al., 2000; Levin et al., 1997). One reason why the results before and after school entry are different is that before the school entry children are not typically exposed to the systematic teaching of reading skills, and, therefore, parents' teaching of reading plays a role. However, after school entry, children are exposed to systematic teaching of reading at school, and, consequently, parental teaching is not as important as in kindergarten.

Previous studies have also reported mixed findings concerning the effect of the frequency of shared reading on children's reading skills (Bus, van IJzendoorn, & Pellegrini, 1995; Evans et al., 2000; Foy & Mann, 2003; Scarborough & Dobrich, 1994). For instance, the meta-analysis by Bus et al. (1995) and the literature review by Scarborough and Dobrich (1994) showed a positive association between shared reading and children's reading skills. However, the authors interpret their findings differently: Bus et al. (1995) concluded that shared reading has a middle-level contribution to children's reading, whereas Scarborough and Dobrich (1994) conclude that the contribution is weak. Other studies among both kindergarten children and first graders have shown that shared reading promotes children's vocabulary (Evans et al., 2000; Foy & Mann, 2003; Frijters et al., 2000; Sénéchal & LeFevre, 2002; Torppa et al., 2006).

In addition to parental influence on the development of their offspring's academic skills, children's academic skills may also impact how and to what extent parents engage in reading-related activities with their children. In other words, children may have an "evocative impact" on their parents' behavior (Rutter, 1997). According to Hoover-Dempsey and Sandler (1995), perceived invitations for involvement from children play a role in parental home-based academic involvement. For instance, Green, Walker, Hoover-Dempsey, and Sandler (2007) found that the strongest predictor of parents' academic involvement at home is their perceptions of requests by their children.

Research on children's literacy skills and parents' home-based involvement has shown associations but these tend again to vary by school grade. In kindergarten, parents teach those children who master basics of reading more often than other children (Fan & Chen, 2001; Silinskas, Leppänen, et al., 2010). In contrast, parents react to their school-aged children's poor performance by increasing involvement in school-related activities at home (Cooper et al., 2000; Hoglund et al., 2009; Levin et al., 1997; Silinskas, Leppänen, et al., 2010). For instance, Chen and Stevenson (1989) concluded that children who are doing less well at school receive a greater amount of help from their parents in completing homework.

Previous studies on parents' involvement and the development of children's literacy have several limitations. First, parents' reading-related activities with their children at home have been measured typically only once, before school entrance (Evans et al., 2000; Frijters et al., 2000; Sénéchal et al., 1998). Such cross-sectional data do not provide a basis on which to investigate the direction of influence between parents' reading-related activities and children's reading skills. Hence, in the present study, we examined the longitudinal cross-lagged associations between parental reading-related activities at home and children's reading skills.

Second, the majority of the previous studies have relied on relatively small sample sizes (Evans et al., 2000; Foy & Mann, 2003; Sénéchal & LeFevre, 2002; Stephenson, Parrila, Georgiou, & Kirby, 2008), which has decreased the power of statistical testing and the potential to obtain significant results. To fill this gap, we used a large-scale longitudinal study to capture existing effects.

Third, most of the previous studies have used reports by the parent who considers himself/herself as the one more involved in children's schooling (Chen & Stevenson, 1989; Evans et al., 2000; Foy & Mann, 2003; Sénéchal & LeFevre, 2002; Stephenson et al., 2008), which may not provide a full picture of parents' reading-related activities. We considered both parents as important contributors in the development of their children's reading skills, and, therefore, reports from both mothers and fathers were combined in the present study.

Fourth, only a few studies have included children from different school grades, allowing the possibility to investigate whether school grade moderates the association between parents' teaching and children's skills (Green et al., 2007; Hood et al., 2008; Levin et al., 1997; Silinskas, Leppänen, et al., 2010). None of these studies investigated the associations between the frequency of parental reading-related activities and children's reading skills during the transition from kindergarten to Grade 1. We assumed that parental teaching may have different impacts on children's reading skills before and after school entry.

Fifth, most of the previous research has been conducted in orthographically opaque languages, such as English (Evans et al., 2000; Frijters et al., 2000; Hood et al., 2008; Sénéchal et al., 1998), and only a few studies have examined children learning to read in orthographically transparent language, such as Finnish (Silinskas, Leppänen, et al., 2010; Torppa et al., 2006). As acquiring reading skills in orthographically transparent languages is easier than acquiring reading in orthographically opaque languages (Seymour, Aro, & Erskine, 2003), the cross-lagged associations between parental reading-related activities and children's reading skills can manifest differently in different language environments. For instance, Canadian parents (whose children were acquiring reading in English, i.e., language of opaque orthography) were shown to be reading to their kindergarten-aged children and teaching them to identify letters more frequently than Greek parents (whose children were acquiring Greek, i.e., language of consistent orthography) (Manolitsis et al., 2009).

Research has shown that girls outperform boys in most of reading and pre-reading tasks (Halpern, 1997; Halpern & LaMay, 2000; Logan & Johnson, 2009; Lynch, 2002; Phillips, Norris, Osmond, & Maynard, 2002). Moreover, parents help their sons more than they help daughters in completing homework assignments (Cooper et al., 2000). Previous research has also shown that parents of primary school boys are more involved in homework than parents of girls (Cooper et al., 2000). In our study, we also examined whether the longitudinal associations between parents' reading-related activities and children's reading skills would be different for boys and for girls.

In the present study, we focused on investigating reading skills with measures that had a strong emphasis on decoding (kindergarten) and reading fluency (Grade 1). The reason for this was that such skills can be assumed to be associated with the frequency of parents' reading-related activities (Hood et al., 2008; Manolitsis et al., 2009; Sénéchal & LeFevre, 2002; Silinskas, Leppänen, et al., 2010; Torppa et al., 2006). Namely, decoding and reading fluency are important initial skills for later literacy development, and is also easily detected by the parents.

Finnish literacy education in kindergarten and Grade 1

Finnish children start kindergarten in the year of their sixth birthday. Kindergarten education is voluntary and free of charge, and almost all children (96%) participate in it (National Board of Education, 2008). The kindergarten curriculum emphasizes personal and social development, and children are not trained systematically in academic skills, such as literacy skills. However, children are read to and encouraged to play with letters and words. On the year of their seventh birthday, children enter Grade 1. At Grade 1 children are formally and systematically taught to read using phonics-based instruction. Finnish kindergartens differ in two important ways from U.S. kindergartens. First, in Finland, children start kindergarten one year later than children in U.S. do. Second, in Finnish kindergartens children are not exposed to formal teaching of reading as it is the case in U.S. Consequently, our study addressed the transition from kindergarten to Grade 1, that is, entry into a grade level in which formal literacy training is introduced.

Unlike English, the orthography of the Finnish language is highly consistent in terms of the relationship between sounds and letters: Each phoneme corresponds to one grapheme and vice versa. Therefore, every word can be read in accordance with this highly bi-directionally consistent phonological strategy. Because of this nature of Finnish, children are first encouraged to learn to recognize single letters and letter-sound correspondences, then to read syllables, and then to unite syllables to form entire words (Lerkkanen, 2007). Due to these features of the language, 25% of Finnish children learn to read spontaneously already during the kindergarten year (e.g., Holopainen, Ahonen, & Lyytinen, 2001; Lerkkanen et al., 2010; Silinskas, Parrila, et al., 2010). Moreover, the majority of Finnish-speaking children learn to read during the first semester of Grade 1 (Leppänen, Niemi, Aunola, & Nurmi, 2004; Lerkkanen, Rasku-Puttonen, Aunola, & Nurmi, 2004).

Research questions

The following research questions were examined:

(1) Do children's reading skills predict the frequency of their parents' reading-related activities at home, that is, teaching of reading and shared reading ("evocative impact")? We expected, first, that higher levels of children's word reading skills would predict higher amounts of parental teaching of reading and shared reading during the kindergarten year, as parents are active in reading-related activities when they perceive that their children have mastered the basics of written language. In contrast, during Grade 1, we expected that children's low level of reading skills would increase parents' teaching of reading and shared reading, because parents become concerned about their children's poor reading skills, and therefore try to facilitate their children's acquisition of those skills (Chen & Stevenson, 1989; Cooper et al., 2000; Levin et al., 1997; Silinskas, Leppänen, et al., 2010).

(2) Do parents' reading-related activities, that is, teaching of reading and shared reading, predict the development of their children's reading skills? We expected that, in the kindergarten year, higher amounts of teaching of reading at home would positively contribute to the development of children's word reading skills (Hood et al., 2008; Sénéchal et al., 1998). We further assumed that shared reading would not predict children's word reading skills, because shared reading is related to children's vocabulary rather than to written language skills (Hood et al., 2008; Sénéchal et al., 1998). In contrast, in Grade 1, we expected that neither parents' teaching of reading nor shared reading would contribute to children's reading skills (Chen & Stevenson, 1989; Cooper et al., 2000; Levin et al., 1997; Silinskas, Leppänen, et al., 2010).

(3) Does children's gender moderate the longitudinal associations between parents' reading-related involvement and children's reading skills? As girls develop their reading skills earlier than boys (Halpern, 1997; Halpern & LaMay, 2000; Logan & Johnson, 2009; Lynch, 2002; Phillips et al., 2002), and as parents engage more in helping sons with their homework than with their daughters (Cooper et al., 2000), we expected that the relationship between the amount of parental reading-related activities and children's reading skills would be stronger for boys than for girls.

As in many previous studies (Hood et al., 2008; Manolitsis et al., 2009; Merlo, Bowman, & Barnett, 2007), we also controlled for children's non-verbal intelligence and parental level of education.

Method

Participants and procedure

The data were collected in the ongoing longitudinal First Steps study, which aims to assess children's academic development and motivation in the family and school context (Lerkkanen et al., 2006). We analyzed longitudinal data of 1436 children and their mothers and fathers (684 girls, 752 boys). Parents were asked for their written consent for their child's participation in the study.

Children ($M = 73.58$ months old, $SD = 3.40$ months) were examined at two measurement points in kindergarten: at the beginning (September, Tc1; $N = 1867$) and at the end (April, Tc2; $N = 1826$) of the kindergarten year. In Grade 1, group tests in reading were performed at the beginning (September, Tc3; $N = 2022$) and at the end (April, Tc4; $N = 2048$) of Grade 1 in the children's classrooms. The reasons for the increase in the number of participants in Grade 1 were the facts that not all the children attended kindergarten, new families had moved to these locations when school started, and some children who were one year older than the others had dropped out of second grade and were repeating first grade. Our analyses did not show any differences with respect to the major study variables between the children who dropped out of the study and those who did not. Trained investigators administered the individual pre-reading and reading tests in suitable rooms in each kindergarten or school.

The mothers and fathers of the children were also asked to fill in questionnaires during the spring term of kindergarten (March, Tp1) and Grade 1 (March, Tp2). Parents completed the questionnaires at home independently; that is, they were asked not to consult with each other when filling in the questionnaires. In kindergarten, a total of 1571 mothers and 1121 fathers filled in the questionnaires. In Grade 1, the questionnaires were received from 1484 mothers and 1029 fathers. In Grade 1, parents also reported their children's native language. For the subsequent analyses, we only selected data provided by native Finnish speaking families. Moreover, we omitted the data obtained from single parents. These changes resulted in a final data set of 1436 families.

The mothers' or stepmothers' ages ranged from 25 to 56 ($M = 38.41$, $SD = 5.27$), and the fathers' or stepfathers' ages ranged from 27 to 69 ($M = 41.05$, $SD = 5.76$). A total of 77.6% of families consisted of married spouses and their biological children; 13.2% of families consisted of unmarried spouses and their biological children; and 9.2% of families consisted of spouses and children from their previous relationships. The number of children in the families ranged from 1 to 8 ($M = 2.45$, $SD = 1.04$). A total of 23.9% of mothers and 6.4% of fathers were unemployed at the time of their children's kindergarten year. A total of 4.8% of mothers and 5.7% of fathers had no vocational education; 2.9% of mothers and 3.9% of fathers had attended short vocational courses; 31.3% of mothers and 34.7% of fathers had a vocational school qualification; 23% of mothers and 22.2% of fathers had vocational college qualification; 10.3% of mothers

and 11.1% of fathers had polytechnic degree or bachelor's degree; 22.9% of mothers and 17.3% of fathers had a master's degree; and 4.5% of mothers and 5.2% of fathers had licentiate or doctoral degree.

Measures

Parents' questionnaire

To measure the frequency of mothers' and fathers' home-based reading-related activities with their children, we employed questions based on these used previously by Sénéchal et al. (1998). Other studies have also used similar items (e.g., Foy & Mann, 2003; Haney & Hill, 2004; Hood et al., 2008; Leppänen et al., 2004; Silinskas, Leppänen, et al., 2010).

Shared reading. In kindergarten (Tp1), parents were asked to rate the frequency of shared reading by a single question: "How often do you read to your child/read books together with your child?" On a 5-point scale (1 = *less than once a week,* 2 = *1–3 times a week,* 3 = *4–6 times a week,* 4 = *once a day*, and 5 = *more than once a day*). In Grade 1 (Tp2), parents were asked to rate the frequency of shared reading by a single question: "How often do you read books or magazines with your child?" On a 5-point scale (1 = *not at all or rarely*, 2 = *once or twice a week (1–2 days),* 3 = *several days a week (3–6 days),* 4 = *once a day/daily,* and 5 = *several times a day*).

Teaching of reading. In kindergarten (Tp1), parents were asked to rate the frequency of teaching of reading by two questions: "How often do you teach/have previously taught letters to your child?" and *"How often do you teach/have previously taught your child to read?"* on a 5-point scale (1 = *not at all/very rarely* to 5 = *very often/daily*). Cronbach's alpha was .74 and .78 for mothers and fathers, respectively. In Grade 1 (Tp2), parents were asked to rate the frequency of teaching of reading by one question: "How often do you teach your child to read?" on a 5-point scale (1 = *not at all*, 2 = *rarely,* 3 = *once or twice a week*, 4 = *several days a week*, and 5 = *once a day/daily*).

Children's measures

The reading skill measures focused heavily on decoding and reading fluency.

Word reading in kindergarten

In kindergarten, reading of words (i.e., decoding) was assessed using an individually administered wordlist (subtest of ARMI; Lerkkanen, Poikkeus, & Ketonen, 2006). The list contained 6 words at Time 1 (Fall) and 10 words at Time 3 (Spring). At the first measurement point (Tc1), the words were two-syllabic (4 words), three-syllabic (1 word), and five-syllabic (1 word) words. At the second measurement point (Tc2), the words were two-syllabic (7 words), three-syllabic (2 words) and five-syllabic (1 word) words. Children read the words aloud one by one at a time. No time limit for completing the task was given. The raw sum score of correct answers was used. At Tc1, 11.0% of children scored at the ceiling, and Cronbach's alpha was .96. At Tc2, 27.6% of the children scored at the ceiling, and Cronbach's alpha was .91.

Reading in Grade 1

Progress in word reading (i.e., reading fluency) was tested in a group situation at Grade 1 Fall (Tc3) and Spring (Tc4). The test used belongs to a standardized national reading achievement test battery (ALLU; Lindeman, 1998). Form B with capital letters was used in Fall and form A with small letters was used in Spring. In the word reading test the child was asked to select the correct word from four phonologically similar alternatives and link this to a picture by drawing a line between the two. In the task, a maximum of 80 trials can be attempted within the test duration. The score is the number of correct responses marked within the time limit. In the First Steps design, a two-minute time limit was used. According to the test manual (Lindeman, 1998), the Kuder–Richardson reliability, a measure of internal consistency for dichotomous variables, was .97 for form B and .97 for form A. The alternate-form reliability between forms A and B was .84.

Visuo-spatial thinking

The non-verbal ability of the children was measured at the end of kindergarten by the individually administered Spatial Relations sub-test from the Woodcock-Johnson Psycho-Educational Battery, Part One: Tests of Cognitive Ability (Woodcock & Johnson, 1977). The Spatial Relations test measures the ability to use visualization (the ability to apprehend spatial forms or shapes, often by rotating or manipulating them in the imagination). Children were presented with 3 practice items and 31 tasks. Each task consisted of one target shape and 6 pieces. The aim in each task was to identify the subset of pieces needed to form a complete shape. The children had 3 min to go as far as they could. The raw sum score of correct answers was used. Cronbach's alpha was .91.

Results

Descriptive statistics

The means, standard deviations, and *t*-test between the samples of boys and girls are presented in Table 1. The results of the independent-samples *t*-test showed, first, that, in kindergarten, mothers teach their daughters significantly more than their sons. In Grade 1, both mothers and fathers teach their sons significantly more often than their daughters. Moreover, girls' scored significantly higher on word reading and reading skills than boys across all measurement points. Second, Levene's test for equality of variances showed significant differences in the variance of mothers' teaching in kindergarten ($p < .05$), mothers' teaching in Grade 1 ($p < .05$), and children's word reading skills in the beginning of kindergarten ($p < .001$). For all three variables the variances for girls were significantly greater than those for boys.

All predictive analyses were performed using the M*plus* 6.11 statistical program (Muthén & Muthén, 1998–2010). Since we assumed missingness-at-random in our data, we used full information maximum likelihood parameter estimation with robust standard errors (*MRL*). This missing-data method of M*plus* enables all the observations in the data set to be used in estimating the parameters of the models. Model fit precision was examined using a combination of the comparative fit index (CFI), Tucker-Lewis index (TLI), root mean square error of approximation (*RMSEA*), and standardized root mean square residual (SRMR). The CFI and TLI values above .95, a *RMSEA* value below .06 and a SRMR value below .08 indicate a good model fit (Hu & Bentler, 1999; Muthén, 1998–2004). Moreover, only the CFI and TLI values below .90 and RMSEA and SRMR values above .10 are indications of a poor model fit (Kline, 2005). The correlations between the variables are presented in Table 2 and Table 3, separately for girls and for boys.

Measurement models

We started our analysis by constructing a measurement model for the frequency of reading-related activities at home for kindergarten and Grade 1. This was done in the following steps. First, the frequency of mothers' and the frequency of fathers' shared reading were used as the items forming the latent constructs for the frequency of shared reading in the family. Similarly, the frequency of mothers' and the frequency of fathers' teaching of reading were used as items to form the latent construct of the frequency of the teaching of reading. In the measurement model, all the latent constructs were allowed to correlate.

Table 1
Means, standard deviations, and contrast of girls and boys in all study variables.

	Girls		Boys				95% CI	
Variable	*M*	*SD*	*M*	*SD*	*t*(*df*)	*p*	*LL*	*UL*
Shared reading (mother, Tp1)	2.57	1.03	2.56	1.01	.80 (1202)	ns	−.07	.18
Shared reading (father, Tp1)	2.06	.92	2.11	.97	−1.12 (837)	ns	−.24	.06
Teaching of reading (mother, Tp1)	2.68	.90	2.48	.84	4.02 (1210)	<.001	.10	.30
Teaching of reading (father, Tp1)	2.45	.82	2.47	.79	−.34 (848)	ns	−.12	.09
Shared reading (mother, Tp2)	2.96	1.15	2.90	1.13	.06 (1429)	ns	−.10	.10
Shared reading (father, Tp2)	2.32	1.11	2.41	1.15	−.90 (959)	ns	−.17	.06
Teaching of reading (mother, Tp2)	2.86	.94	3.02	.88	−3.20 (1430)	<.001	−.24	−.06
Teaching of reading (father, Tp2)	2.58	.81	2.77	.76	−3.73 (959)	<.001	−.29	−.09
Word reading (Tc1)	1.41	2.25	.086	1.88	4.65 (1250)	<.001	.31	.77
Word reading (Tc2)	5.12	4.27	3.70	4.22	5.89 (1245)	<.001	.94	1.89
Reading (Tc3)	9.70	6.60	8.07	6.60	4.59 (1389)	<.001	.93	2.32
Reading (Tc4)	19.26	8.89	17.92	9.09	2.81 (1433)	<.05	.40	2.27
Mothers' education (Tp1)	4.20	1.48	4.28	1.47	−1.82 (1192)	ns	−.32	.01
Fathers' education (Tp1)	4.01	1.52	4.12	1.42	−1.55 (842)	ns	−.35	.04
Non-verbal ability (Tc1)	14.33	2.22	14.27	4.02	.55 (1249)	ns	−.18	.33

Note. CI = confidence interval; *LL* = lower limit; *UL* = upper limit.
ns = nonsignificant.

Second, the modification indices suggested that estimating the association between the two indicators, that is, the frequency of mothers' shared reading in kindergarten and the frequency of mothers' shared reading in Grade 1, would improve the fit of the model. Consequently, this association was estimated. Next, we fixed nonsignificant associations to zero. After these modifications, the model showed a relatively good fit (χ^2 (14) = 81.69, $p < .001$; CFI = .96; TLI = .91; RMSEA = .05; SRMR = .03).

Third, to test if the results of the measurement model fitted to both boys and girls, we continued with multiple-group analyses. The unrestricted model fitted the data relatively well (χ^2 (36, N_{girls} = 684, N_{boys} = 752) = 129.42, $p < .001$; *CFI* = .94; *TLI* = .90; *RMSEA* = .06; *SRMR* = .04). Consequently, we restricted all factor loadings and correlations to be equal for boys and girls. The results showed that the fully restricted model fitted the data relatively well (χ^2 (41, N_{girls} = 684, N_{boys} = 752) = 134.95, $p < .001$; *CFI* = .94; *TLI* = .91; *RMSEA* = .06; *SRMR* = .04). The chi-square likelihood ratio test between the non-restricted and restricted models did not yield any significant difference. The standardized loadings of the constructs of the restricted model are presented in Table 4. All indicators loaded at least moderately (i.e., loadings of .30 or more) on the latent constructs. The correlation between latent shared reading (family level) and teaching of reading (family level) was .28 and .37 ($p < .05$) in kindergarten and .29 and .27 ($p < .001$) in Grade 1 for boys and girls, respectively.

Longitudinal associations between the frequency of parents' reading-related activities and children's reading skills

The analyses on the longitudinal associations between the frequency of parents' reading-related activities and children's reading skills were conducted in three steps. The first model included paths between the frequency of parents' reading-related activities and children's reading skills, the stabilities of the constructs across time, and the association between the frequency of the shared reading and the frequency of teaching of reading in kindergarten and the association between their error terms in Grade 1. In the model for the whole sample, all the non-significant paths were fixed to zero. This resulted in a relatively good model fit (χ^2 (40) = 243.621, $p < .001$; CFI = .95; TLI = .92; RMSEA = .06; SRMR = .04).

Second, to examine whether the associations were the same for both girls and boys, we carried out multiple-group analyses. The chi-square likelihood ratio test between the unrestricted model and fully restricted model yielded a marginal significant difference ($\Delta\chi^2 = 24.06$, $\Delta df = 16$, $p < .08$). Consequently, we continued to examine differences between the boys' and girls' models. This was done by comparing the restricted model and non-restricted model. In the restricted model, we constrained all factor loadings, cross-sectional correlations, and paths to be equal for boys and girls. In the non-restricted model, one factor loading or path of the model at a time was estimated separately for boys and girls, one by one, whereas

Table 2
Correlations in girls' sample (n = 684).

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
1.	Shared reading (mother, Tp1)														
2.	Shared reading (father, Tp1)	.39***													
3.	Teaching of reading (mother, Tp1)	.14**	.01												
4.	Teaching of reading (father, Tp1)	.16**	.28***	.20***											
5.	Shared reading (mother, Tp2)	.61***	.26***	.12**	.06										
6.	Shared reading (father, Tp2)	.28***	.61***	.05	.20***	.35***									
7.	Teaching of reading (mother, Tp2)	.06	−.07	.21***	.09	.18***	.08								
8.	Teaching of reading (father, Tp2)	.03	.12**	−.01	.22***	.06	.23***	.42***							
9.	Word reading (Tc1)	.08	.13**	.06	.02	−.01	.08	−.32***	−.27***						
10.	Word reading (Tc2)	.08	.13**	.07	.02	−.03	.02	−.48***	−.25***	.63***					
11.	Reading (Tc3)	.07	.08	.04	.04	−.04	−.01	−.37***	−.30***	.70***	.64***				
12.	Reading (Tc4)	−.01	.03	.04	.01	−.08	.03	−.30***	−.27***	.50***	.66***	.48***			
13.	Mothers' education (Tp1)	.18**	.25***	−.02	−.01	.12**	.16**	−.13**	−.12**	.18***	.16**	.18**	.14**		
14.	Fathers' education (Tp1)	.10**	.21***	−.06	−.05	.04	.09	−.13**	−.06	.14**	.15**	.17**	.11**	.67***	
15.	Non-verbal ability (Tc1)	.01	.08	.01	−.04	−.01	.01	−.13**	−.10**	.21***	.23***	.23***	.17**	.14**	.13**

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 3
Correlations in boys' sample ($n = 752$).

		1	2	3	4	5	6	7	8	9	10	11	12	13	14
1.	Shared reading (mother, Tp1)														
2.	Shared reading (father, Tp1)	.53***													
3.	Teaching of reading (mother, Tp1)	.12**	.08												
4.	Teaching of reading (father, Tp1)	.07	.18***	.30***											
5.	Shared reading (mother, Tp2)	.59***	.29***	.08	.03										
6.	Shared reading (father, Tp2)	.39***	.61***	.07	.17***	.35***									
7.	Teaching of reading (mother, Tp2)	.11*	.01	.15***	.05	.22***	.07								
8.	Teaching of reading (father, Tp2)	.06	.10*	.10*	.27***	.12**	.28	.37***							
9.	Word reading (Tc1)	.12**	.08	.11**	.09	−.03	−.02	−.29***	−.24***						
10.	Word reading (Tc2)	.13**	.14**	.19***	.10*	−.04	.01	−.34***	−.30***	.61***					
11.	Reading (Tc3)	.05	.06	.13**	.10	−.13**	−.07	−.35***	−.27***	.72***	.53***				
12.	Reading (Tc4)	−.03	−.01	.05	.07	−.19***	−.12**	−.36***	−.30***	.54***	.66***	.42***			
13.	Mothers' education (Tp1)	.23***	.22***	−.06	−.04	.18**	.14**	−.08	.01	.16**	.15**	.13**	.07		
14.	Fathers' education (Tp1)	.17**	.20***	−.07	−.01	.12**	.15**	−.07	.01	.13	.11**	.08	.06	.67***	
15.	Non-verbal ability (Tc1)	−.01	−.03	.07	−.02	−.06	−.04	−.24***	−.15**	.24***	.28***	.31***	.35***	.10**	.12**

* $p < .05$. ** $p < .01$. *** $p < .001$.

all the other estimates were constrained. The chi-square likelihood ratio test was used to assess the fit statistics of two nested models. The results showed, first, that the model fit improved after estimating the path from word reading in the beginning of kindergarten (Tc1) to the frequency of teaching of reading during kindergarten (Tp1) ($\Delta\chi^2 = 6.09$, $\Delta df = 1$, $p < .05$) separately for boys and girls. Second, the model fit also improved after estimating the path from the frequency of teaching of reading (Tp1) to word reading (Tc2) separately for boys and girls ($\Delta\chi^2 = 4.10$, $\Delta df = 1$, $p < .05$). Finally, the model fit improved after estimating the path from the teaching of reading (Tp2) to reading skills in Grade 1 (Tc4) ($\Delta\chi^2 = 5.51$, $\Delta df = 1$, $p < .05$) separately for boys and girls.

The results for the final model are presented in Fig. 1, which reports the unstandardized estimates and error terms (χ^2 (105, $N_{girls} = 684$, $N_{boys} = 752$) = 313.544, $p < .001$; CFI = .95; TLI = .94; RMSEA = .05; SRMR = .05).

We expected, first, that higher levels of children's word reading skills would predict higher amounts of parental teaching of reading and shared reading during the kindergarten year. As expected, the results showed that word reading at the beginning of kindergarten positively predicted both the frequency of parents' shared reading and the frequency of teaching of reading: The better the children's word reading skills were at the beginning of kindergarten, the more shared reading and teaching of reading parents reported.

We also assumed that children's low level of reading skills would increase parents' teaching of reading and shared reading during Grade1. As assumed, the results showed that children's reading skills in kindergarten and at the beginning of Grade 1 negatively contributed to the frequency of parents' reading-related activities while their children were in Grade 1: The worse children performed in reading tasks, the more parental teaching of reading they received. Similarly, the worse the children read at the beginning of Grade 1, the more shared reading parents reported.

Our next hypothesis was that, in the kindergarten year, higher amounts of teaching of reading but not shared reading at home would positively contribute to the development of children's word reading skills This hypothesis was confirmed among boys but not among girls: Among boys the frequency of teaching of reading was positively associated with their word reading skills at the end of kindergarten. This was not the case among girls.

Our next hypothesis was that, in Grade 1, neither parents' teaching of reading nor shared reading would contribute to children's reading skills. The results showed, however, that the frequency of teaching of reading was negatively related to children's word reading at the end of Grade 1: The more parents engaged in the teaching of reading during Grade 1, the worse the children's performance was. The frequency of shared reading did not predict children reading skills at the end of Grade 1.

The results showed further that children's gender moderated three associations. The results showed that the word reading skills of girls (vs. boys) were more stable across kindergarten, only among boys (vs. girls) the frequency of teaching of reading was positively associated with their word reading skills at the end of kindergarten, and the negative relationship between the frequency of parental teaching and children's reading was stronger for boys (vs. girls) in Grade 1.

As the last step in our analyses, we included measures of children's non-verbal ability and parental education as control variables. Parental education consisted of two items: mothers' level of education and fathers' level of education. The results showed that parental education predicted shared reading for both girls ($\beta = .33$, $p < .01$) and boys ($\beta = .30$, $p < .01$). Parental education also predicted word reading skills for both girls ($\beta = .15$, $p < .01$) and boys ($\beta = .17$, $p < .01$). Also, non-verbal ability predicted children's word reading skills for girls ($\beta = .17$, $p < .01$) and for boys ($\beta = .22$, $p < .01$). The significant relationships reported for previous models did not change with the inclusion of the controls.

Table 4
Parameter estimates for latent variable indicators (standardized solution).

	Tp1				Tp2			
	Shared reading		Teaching of reading		Shared reading		Teaching of reading	
Measure	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys
Mothers' shared reading	.48	.55						
Fathers' shared reading	.87	.94						
Mothers' teaching of reading			.30	.35				
Fathers' teaching of reading			.73	.84				
Mothers' shared reading					.40	.41		
Fathers' shared reading					.82	.84		
Mothers' teaching of reading							.51	.51
Fathers' teaching of reading							.84	.84

Discussion

The present longitudinal study spanning from kindergarten to Grade 1 examined to what extent the frequency of parents' reading-related activities predicted children's subsequent reading performance, and the extent to which children's reading skills predicted the frequency of parents' reading-related activities later on. The results showed that, in kindergarten, the parents of children with good word reading skills reported more frequent shared reading and teaching of reading than the parents of children with poor

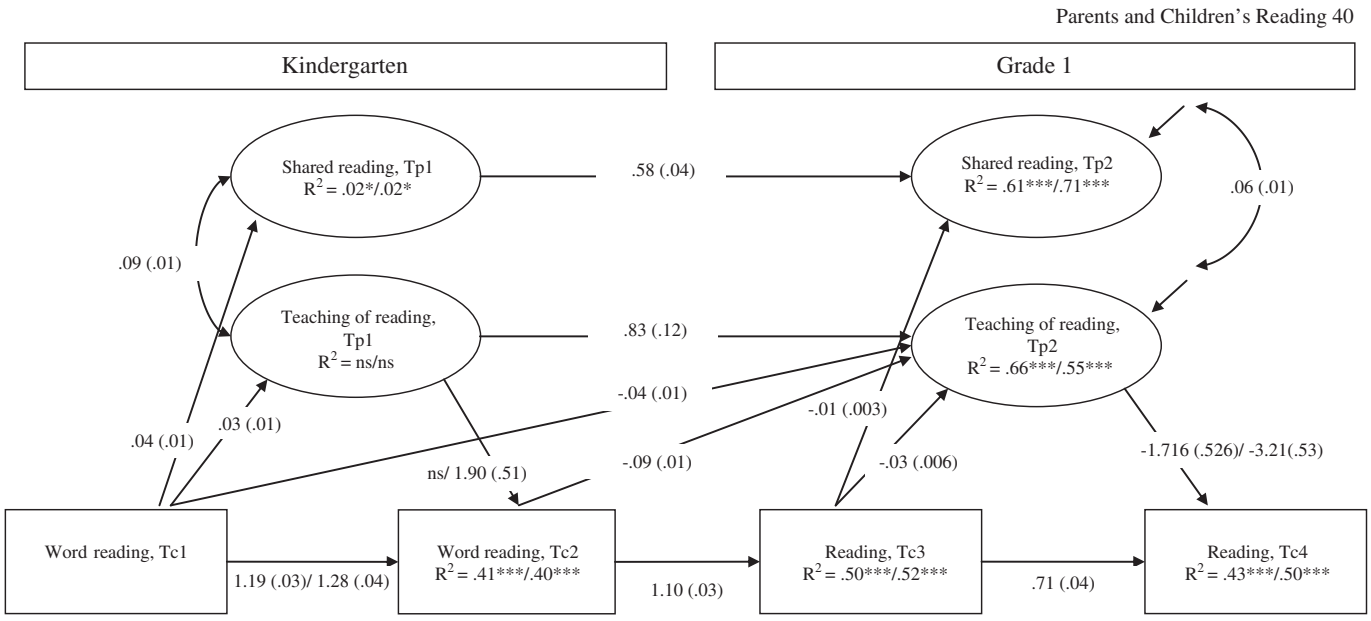

Fig. 1. Associations between parents' reading-related activities at home and children's reading skills. In some cases multi-sample modeling suggested that the estimates were different for boys and girls. In these cases, separate estimates are also reported. The first estimates in the model are for girls, and the second estimates are for boys. ^{ns} p > .05. * $p < .05$. ** $p < .01$. *** $p < .001$.

reading skills. In contrast, in Grade 1, the parents of children with poor reading skills engaged more frequently in shared reading and teaching of reading than the parents of children with good reading skills.

The results of the present study revealed that children's reading performance was related to the frequency of parents' reading-related activities differently in kindergarten and Grade 1. In kindergarten, as expected, better word reading skills of the children predicted higher frequency of teaching of reading by parents. Word reading skills also positively contributed to the frequency of parental shared reading: The better word reading skills a child had, the more parents read to their children. There are several possible explanations for these results. First, children with good word reading skills are likely to be more interested in reading–related activities during kindergarten year. It has been shown, for instance, that young children's letter knowledge was positively related to their interest in shared reading (Deckner, Adamson, & Bakeman, 2006). Consequently, children may trigger their parents' engagement in joint reading-related activities (Green et al., 2007). Our findings during the kindergarten year are in accordance with Hoover-Dempsey and Sandler's (1995) suggestion that perceived invitations for involvement from children play a role in home-based involvement. Second, parents may engage more frequently in reading-related activities during kindergarten year, if they consider their children to be ready for more demanding reading-related tasks. By engaging more with children with better word reading skills, parents foster widening of individual differences in early reading skills (the "Matthew effect"; Stanovich, 1986). Third, parents of poor readers may be poor readers themselves (Torppa et al., 2006). Therefore, it is possible that these parents provide fewer opportunities for reading-related activities at home. Fourth, it is also possible that parents of children with better reading skills at the start of kindergarten had already been and/or were teaching reading to their children and continued to do so throughout kindergarten (Silinskas, Leppänen, et al., 2010).

By contrast, in Grade 1, the worse children's reading skills were in kindergarten and at the beginning of Grade 1, the more frequent teaching of reading parents engaged in the Spring semester of Grade 1. Similarly, the worse children's reading skills were at the beginning of Grade 1, the more frequent shared reading parents reported in the Spring semester of Grade 1. Similar results have also been found in some previous studies (Chen & Stevenson, 1989; Cooper et al., 2000; Hoglund et al., 2009; Levin et al., 1997; Silinskas, Leppänen, et al., 2010). There are at least two possible explanations for these results. The first explanation is that parents who perceive that their children are struggling with letter names or decoding may become concerned about their children's school achievement, and therefore begin to support their children's development by engaging in shared reading and teaching of reading. This might be particularly true for Finnish children because the majority of them know the most frequently used letters in the Finnish language, and 25% of children are able to decode simple words already before Grade 1 (Holopainen et al., 2001; Lerkkanen et al., 2004; Lyytinen et al., 2006; Silinskas, Parrila, et al., 2010). Another possible explanation is that, starting from the end of kindergarten and the beginning of Grade 1, teachers give an increasing amount of feedback about children's academic progress. This feedback and advice by teachers on how to support the child's literacy development at home may then encourage parents to engage in shared reading and teaching of reading.

The present study contributes to previous research by using longitudinal data that provide a possibility to control the frequency of teaching reading and the frequency of shared reading in kindergarten while predicting those in Grade 1. The results of the present study emphasize the importance of children's "evocative impact" (Bell, 1968; Rutter, 1997) on their parents' behavior and responses in academic contexts: Children's academic skills influence the frequency of teaching reading and the frequency of shared reading among their parents (Hoover-Dempsey & Sandler, 1995). Interestingly, this evocative impact was found to be different in kindergarten and Grade 1.

Consistent with our expectations, in kindergarten, the frequency of parental teaching of reading was positively related to the development of word reading skills during the kindergarten year. This finding is similar to some previous findings suggesting that parental teaching had an effect on the development of kindergarten children's letter knowledge (Manolitsis et al., 2009; Sénéchal & LeFevre, 2002; Sénéchal et al., 1998; Torppa et al., 2006), and word decoding (Sénéchal & LeFevre, 2002). However, the findings of the present study showed that parental teaching of reading contributed to the

development of word reading skills only among boys. This is a new finding, since in the previous studies gender differences were either not found (Hood et al., 2008) or were not examined (Evans et al., 2000; Levin et al., 1997; Sénéchal & LeFevre, 2002; Silinskas, Leppänen, et al., 2010). This result might be due to the fact that literacy skills develop earlier in girls than boys (Silvén, Poskiparta, & Niemi, 2004). As boys have poorer skills than girls, they may benefit more than girls from being taught reading by their parents. Our descriptive analyses showed also that boys obtain lower reading scores than girls at the start of kindergarten indicating earlier emerging reading skills in girls than boys. However, consistent with the previous literature (Hood et al., 2008; Sénéchal & LeFevre, 2002), shared reading had no effect on word decoding skills.

The results of our study showed, however, that the frequency of parents' reading-related activities in Grade 1 did not benefit children's reading skills. Consistent with our hypothesis, parents' teaching of reading was negatively related to children's reading skills: The more parents taught their children to read, the worse skills in reading a child had later on. A negative association between home-based parents' involvement in children's schooling and children's reading skills has also been found in previous studies (Chen & Stevenson, 1989; Cooper et al., 2000; Levin et al., 1997; Silinskas, Leppänen, et al., 2010). It would be unrealistic to assume that the frequency of parental reading-related activities at home would inhibit children's reading skills. Instead, this negative association might have some other underlying explanations. One possible reason for this negative relation is that parents increase their involvement in teaching their children at home when the children are doing poorly. Although parents seek to help their children, the reading difficulties their children have may be too severe for parents to handle. An alternative explanation for this result is that parents of poor readers may lack the skills required to teach reading to their children. Also, parental help with homework in the case of poorly performing children is frequently intrusive (Ng, Kenney-Benson, & Pomerantz, 2004; Pomerantz & Eaton, 2001; Pomerantz & Ruble, 1998; Pomerantz, Wang, & Ng, 2005). This may then intensify a negative atmosphere during parent–child reading-related activities and increase children's negative feelings about reading. Also, non-skilled or old-fashioned parental teaching of reading may confuse the child's efforts to learn to read rather than support reading skill development, and therefore increase frustration and a sense of helplessness in poor readers.

Limitations

There are some limitations that need to be considered in any generalization made on the basis of this study. First, our study focused on the frequency of the home literacy practices. However, it should be emphasized that, in addition to the frequency of the home literacy practices, parents differ also in respect to how they communicate with their children during their literacy activities (Reese & Cox, 1999; Tracey & Young, 2002). According to the recent literature review on the topic (Pomerantz et al., 2007), parental involvement which is autonomy supportive, process focused, and includes positive affect and positive beliefs is the most beneficial for children's skills and motivation. Consequently, there is an evident need for future studies to include both measures of the frequency of the home literacy practices as well as the measures tapping the ways in which parents communicate with their children during these practices.

Second, the frequency of parents' reading-related activities were assessed by self-reports, which may be a less valid instrument than home observations (Tracey & Young, 2002) or the diary method (Pomerantz & Eaton, 2001). That is, the data may have been distorted by social desirability. However, measures similar to ours have been used in previous studies (e.g., Haney & Hill, 2004; Hood et al., 2008; Sénéchal & LeFevre, 2002).

Third, some of variables to assess the frequency of parents' reading-related activities were measured by single items, which may not reflect the richness of the construct, and be quite unreliable. However, single item measures were used in the previous studies (e.g., Haney & Hill, 2004). In their meta-analysis, Bus et al. (1995) have reported that the strength of the relationship between shared reading and children's reading was similar if a single item or a composite measure was used.

Fourth, we only measured children's word reading skills and reading fluency. Consequently, other aspects of reading skills (e.g., reading comprehension) or pre-reading skills (e.g., phonological awareness or letter knowledge) were not investigated. The results might have been different if more developed literacy skills had been measured. Fifth, our questionnaire did not include questions about parents' rationales for increasing or decreasing their reading-related activities; this remains a challenge for future research.

Finally, children's testing in kindergarten (April) was almost contemporaneous with parent reports of home practices (March). The same was true for Grade 1 measurement points. However, parents were asked to report their typical behavior with reference to the longer period of time during kindergarten or Grade 1, not just the time when they were answering the questions.

Conclusion

The results of the present study revealed that in kindergarten parents provide more frequent teaching of reading and shared reading to children with relatively good early reading skills. By contrast, when children move to Grade 1, parents begin to pay attention in particular to children who show poor reading skills.

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