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Associations among Teacher–Child Interactions, Teacher Curriculum Emphases, and
Reading Skills in Grade 1

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Abstract

Research findings: The purpose of the present study was to examine the extent to which the quality of teacher–child interactions and teachers’ self-reported curriculum emphases are related to children’s reading skill development during their first school year. To accomplish this, the reading skills of 1,029 Finnish children ($M_{age} = 85.77$ months) were assessed twice during Grade 1, and the children’s teachers ($n = 91$) completed questionnaires concerning their literacy-related curriculum emphases. Additionally, teacher–child interactions in terms of emotional support, classroom organization, and instructional support were observed in 29 classrooms. The results of multilevel modeling showed that a high global quality of teacher–child interactions was positively associated with improved children’s reading skills at the end of Grade 1. In addition, a teacher emphasis on comprehension and production skills was related to better reading skills via teacher–child interactions. Domain-specific analyses revealed that emotional support and classroom organization, in particular, were related to better reading skills. *Practice or policy:* The present study adds to previous research by showing that children had better reading skills at the end of their first school year in classrooms in which the teachers were warm, responsive, and sensitive to children’s needs and provided well-planned activities, clear rules, and expectations for behavior.

Associations among Teacher–Child Interactions, Teacher Curriculum Emphases,
and Reading Skills in Grade 1

A considerable evidence base attests to the powerful role of teachers in fostering children's reading and spelling skills in early elementary classrooms (e.g., Connor, Son, Hindman, & Morrison, 2005; National Early Literacy Panel, 2009). For example, the quality of teacher–child interactions in the classroom has been linked with children's reading skills (Curby, Rimm-Kaufman, & Ponitz, 2009; Hamre & Pianta, 2005; Ponitz, Rimm-Kaufman, Brock, & Nathanson, 2009) and vocabulary and print concepts (Cadima, Leal, & Burchinal, 2010). In addition, it has been suggested that teacher beliefs regarding language and literacy development are linked to children's outcomes (Cash, Cabell, Hamre, DeCoster, & Pianta, 2015). Even when implementing the same curriculum, different teachers may emphasize different curriculum goals or different priorities (Masseti & Bracken, 2010; Sonnenschein, Stapleton, & Benson, 2009), and these emphases may impact their practices and their interactions with the children in the classroom. For instance, depending on their goals and emphases, teachers may allocate their time and choice of pedagogical practices differently (Cunningham, Zibulsky, Stanovich, & Stanovich, 2009), thereby shaping children's daily learning experiences in diverse ways. Because the first school year is essential for later academic success (Entwisle & Alexander, 1998; Jimerson, Egeland, & Teo, 1999), there is a clear need to investigate the factors influencing children's reading skill development during the first school year.

The extant research in this field has some limitations. First, although some studies focus on the association between teachers' beliefs and practices (Fang, 1996; Hamre et al., 2012; Schachter, Spear, Piasta, Justice, & Logan, 2016; Stipek & Byler, 1997, 2004; Wilcox-Herzog, 2002), teachers' self-reported curriculum emphases and actual observed classroom

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interactions have seldom been investigated within the same study (for an exception, see Wen, Elicker, & McMullen, 2011). A cornerstone of the present study is its simultaneous inclusion of both observations of teacher–child interactions and teachers' reports of curriculum emphases. Second, only a few studies have investigated the connection between teacher curriculum-related emphases and beliefs and children's reading skills (e.g., Cash et al., 2015; Massetti & Bracken, 2010), especially in transparent languages like Finnish, which children typically learn to decode during the first months of school and for which reading skills develop much faster during the first school year than for more complex languages, such as English (Seymore, Aro, & Erskine, 2003; Soodla et al., 2015). Third, observational research on the effects of teacher–child interactions on reading skill development in cultural and educational contexts outside of the U.S. is lacking, even though empirical studies in non-U.S. countries would provide important information on the generalizability of findings. Because of the repeated success of Finnish students in The Programme for International Student Assessment (PISA) studies, Finland is an interesting context to examine whether similar kinds of teacher–child interactions can be found in Finnish and U.S. classrooms and to observe how Finnish teachers emphasize different curriculum aims. Consequently, the present study contributes to the existing literature by investigating the associations among teacher–child interactions, curriculum emphases, and reading skills in Finland. Learning more about these associations is important because the studied areas represent malleable aspects of teacher–child interactions that could serve as the focus of future interventions in teacher preparation and training.

Teacher–Child Interactions

Previous research has shown that the social-emotional, organizational, and instructional aspects of teaching contribute positively to students' successful learning and adjustment (Connor, Morrison, & Katch, 2004; Perry, Donohue, & Weinstein, 2007; Pianta,

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La Paro, & Hamre, 2008; Van de Grift, 2007). The Teaching Through Interactions framework (TTI; Hamre et al., 2013) provides a theoretical and empirically tested model that conceptualizes teacher–child interactions in terms of three domains: emotional support, classroom organization, and instructional support (Pianta, La Paro, & Hamre, 2008). *Emotional support* refers to a classroom’s supportive climate and positive tone of interactions. Emotionally supportive teachers are warm, sensitive, and responsive to children’s needs, and they provide children with appropriate levels of autonomy (Pianta et al., 2008). *Classroom organization* refers to the effective setting of rules and routines, as well as to the teacher’s management of time and attention (Yates & Yates, 1990), the promotion of student motivation, and the provision of inherently interesting activities (Pianta et al., 2008). Unlike many other conceptualizations of classroom management or organization, in addition to providing structure, high-quality classroom organization may also promote children’s interest and engagement in the classroom. *Instructional support* focuses on the quality of feedback, the teacher’s ability to stimulate thinking skills and reasoning among students, and the teacher’s ability to present content knowledge in meaningful contexts (Hamre et al., 2013; Pianta et al., 2008).

Teacher–child interactions can be seen as influential for child outcomes from many theoretical perspectives. For example, according to Bronfenbrenner and Morris’s (2007) bio-ecological model of human development, interactions between adults and children form the key proximal processes influencing child development (Pianta, 1999). Thus, consistent, adaptively orchestrated teacher–child interactions of high quality can be assumed to be the central drivers of children’s academic development. For instance, high-quality language modeling and sensitively timed process-oriented feedback from teachers provide children with rich learning opportunities and boost their literacy skills (Hamre et al., 2013, 2014).

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Existing research on the role of emotional support in classrooms has been guided by two broad theories: attachment theory and self-determination theory. The “extended” attachment theory posits that if children feel respected by and emotionally secure with their teachers, they are optimally able to focus their attention and engagement on learning (Bergin & Bergin, 2009; Pianta, 1999). Emotionally supportive and respectful interactions with a teacher, thus, provide a safe environment that allows for and encourages student exploration and inquiry without fear of embarrassment. In turn, this high emotional investment in learning is likely to lead to better learning outcomes. Self-determination theory (SDT; Ryan & Deci, 2000) explains the relation between teacher–child interactions and child outcomes slightly differently. It argues that students’ engagement in learning activities will increase if their basic psychological needs for autonomy, relatedness, and competence are met in the classroom. Teachers can promote the fulfillment of these needs by being sensitive and responsive to students’ needs, taking children’s initiatives into account, and providing process-oriented feedback through high-quality emotional and instructional support (Hamre et al., 2013).

Empirical findings concerning the role of environmental support in children’s outcomes have shown positive associations between instructional and organizational support and the development of children’s self-regulatory (Paris & Paris, 2001; Raver et al., 2009) and cognitive and linguistic skills (Wharton-McDonald, Pressley, & Mistretta-Hampston, 1998). High-quality classroom organization also helps children better regulate their behavior, enabling them to benefit more optimally from the available instruction (Cameron, Connor, & Morrison, 2005; Rimm-Kaufman et al., 2009). The concept of instructional support is drawn, in part, from cognitive learning theories (Yilmaz, 2011), which view students as active participants whose learning is supported by effective teaching that focuses on the understanding of broad concepts and ideas. Instructional support involving process-oriented

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feedback, extending, and language modeling promotes the development of higher-order thinking skills and conceptual understanding (Hamre et al., 2013; Pianta et al., 2008).

Drawing on these theoretical views and empirical results, the present study set out to investigate the associations between the quality of teacher–child interactions and children’s reading skills in Grade 1 Finnish classrooms.

Teachers’ Curriculum Emphases

A curriculum includes the learning objectives, knowledge, and skills children are expected to learn in school. In turn, pedagogy refers to how teachers engage with children to achieve their curriculum aims, as well as what directs teachers’ practices and interactions with the children. Although many factors influence classroom instruction and how time is spent in the classroom, literature indicates that teachers’ beliefs play a critical role in their decision-making and classroom practices (Stipek & Byler, 1997). Therefore, what teachers think (i.e., their emphases and beliefs) might be equally as important as how they support children’s learning through teacher–child interactions. The somewhat nebulous concept of curriculum emphases (cf. beliefs) has been measured in a variety of ways, but researchers have revealed mixed findings concerning whether or not teachers’ beliefs are associated with their practices and instruction (e.g., Justice, Mashburn, Hamre, & Pianta, 2008; Wen et al., 2011).

Despite implementing the same curriculum in their literacy instruction, teachers may vary in their focus of emphasis, which may lead them to weigh some areas over others. Taking into account teachers’ curriculum emphases is particularly important in the Finnish educational context, in which teachers are granted a great deal of pedagogical autonomy (National Board of Education, 2014). Previous literature has shown that teachers differ in their instructional emphases (Sonnenschein et al., 2010), pedagogical goals (Aunola, Leskinen, & Nurmi, 2006), curriculum beliefs (Wen et al., 2011), and curriculum goals

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(Massetti & Bracken, 2010; Stipek & Byler, 2004). For example, some teachers emphasize the social and motivational aspects of learning, such as self-conceptualizations of ability and interest in activities (Aunola et al., 2006; Massetti & Bracken, 2010), and the acquisition of higher-order thinking skills, such as problem solving and comprehension. By contrast, other teachers stress the achievement of basic skills through drills and practice (Stipek & Byler, 2004).

Although many studies have focused on teachers' developmentally appropriate beliefs and the extent to which teachers' beliefs and practices are in congruence (Wen et al., 2011), empirical studies investigating the roles of curriculum emphases and beliefs in influencing teaching practices—and, in turn, child outcomes—through teacher–child interactions are rare (Sonnenschein et al., 2010; see Cash et al., 2015, and Massetti & Bracken, 2010, as exceptions). In their study, Massetti and Bracken (2010) reported that kindergarteners in classrooms in which teachers emphasized emergent literacy skills demonstrated greater mastery of such skills than did children in classrooms emphasizing social development. In a recent study of Cash et al. (2015), teachers' beliefs about language- and literacy-related skills were not related to children's literacy outcomes.

There are some theoretical grounds from which to assume a pathway from teachers' curriculum emphases and beliefs to their classroom practices and interactions and, ultimately, to children's learning (Desimone, 2009; Hamre et al., 2012). For example, Hamre et al. (2012) suggested that teacher beliefs and knowledge are important antecedents of teacher–child interactions (see also McMullen et al., 2006; Stipek & Byler, 1997), which, in turn, are related to child outcomes. Teacher instructional emphases serve as a foundation for setting goals and standards for learning by framing; emphasized areas are viewed as important by teachers and serve as the focuses of their attention and energy (Massetti & Bracken, 2010). Thus, instead of having a direct influence on reading outcomes, teachers' curriculum

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emphases and beliefs may affect their instructional choices, their planning of day-to-day activities, and their use of time (Cunningham et al., 2009), which may, in turn, affect children's engagement in learning (Sonnenschein et al., 2010). For instance, Guo et al. (2012) found that classroom practices mediated the role of teacher beliefs on fifth graders' literacy outcomes. Furthermore, Aunola et al. (2006) showed that children's task motivation in math developed more positively in classrooms where teachers mentioned motivation and self-concept as their instructional goals compared with classes where the teacher did not mention either of these as a pedagogical goal. Based on the postulations of self-determination theory (Ryan & Deci, 2000), it can be suggested that self-concept and motivation as a curriculum goal would be linked to a high-quality emotional support.

Teachers' goals are not always consistent with their observed instructional practices (Justice et al., 2008; Wilcox-Herzog, 2002). Wen et al. (2011), for example, found that preschool teachers' curriculum beliefs and observed classroom practices were only weakly correlated ($r_s = -.03-.22$). In another study, Justice et al. (2008) showed that, although preschool teachers reported implementing the prescribed components set down in the curriculum, the quality of their instructional practices was lower than that specified in the set criteria. Such results highlight the importance of examining teacher–child interactions through observation as well as through self-reported curriculum emphases. Thus, the present study adds to the current literature by being among the first to investigate the associations among curriculum emphases, teacher–child interactions, and children's reading skills. We hypothesized that curriculum emphases would not be directly linked to children's reading skills but would be associated with these skills via the quality of teacher–child interactions (Guo et al., 2012; Hamre et al., 2012; Sonnenschein et al., 2010). For example, based on empirical (Aunola et al., 2006) and theoretical (Downer et al., 2010; Ryan & Deci, 2000) postulations it can be assumed that teacher emphases on motivation and self-concept would

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be linked to high-quality emotional support. In addition, because classroom organization of high quality is described by efficient and productive interactions and by children being engaged in activities (Pianta et al., 2008), we assume that emphases on decoding and spelling skills would be linked to greater classroom organization. Furthermore, because instructional support of high quality is described by interactions that facilitate children's cognitive and language development through meaningful instructional discussions, process-oriented feedback that expands learning, and language stimulation and facilitation techniques (Downer et al., 2010; Pianta et al., 2008), we assumed that teacher emphases on comprehension and production skills would be linked to higher quality instructional support.

Reading Skills and Teacher–Child Interactions

Language and literacy skills in early childhood and early school years represent two interrelated constructs that are highly predictive of children's future achievements in reading (Storch & Whitehurst, 2002). Learning to read requires acquiring the foundational skills for phonological recoding: mapping between visual symbols and units of sounds (Ziegler & Goswami, 2005). The strongest proximal predictors of word reading are phonological awareness, letter knowledge, and naming speed in languages with both inconsistent (e.g., in English; see Lonigan, Burgess, & Anthony, 2000) and consistent orthographies (e.g., in Finnish; see Seymour et al., 2003). In addition, vocabulary has been found to predict early word decoding (Verhoeven, Reitsma, & Siegel, 2011). The Finnish language has a highly regular orthography consisting of only 29 grapheme-phoneme combinations, which are wholly consistent in both reading and spelling. Because of this, between a quarter and a third of Finnish children can read before they enter formal education at the age of seven (Soodla et al., 2015), and the majority of non-readers learn to read during the first semester of Grade 1 (Lerkkanen et al., 2004). However, although most Finnish children are able to quickly acquire the basic decoding skills needed for accurate word-level reading, they may struggle

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with reading fluency and reading comprehension skills (Holopainen, Ahonen, & Lyytinen, 2001).

In addition to children's pre-reading skills and their underlying cognitive antecedents (Parrila, Kirby, & McQuarrie, 2004), teaching practices (e.g., Carlisle, Kelcey, Berebitsky, & Phelps, 2011; Connor et al., 2005) and the quality of teacher–child interactions (Hamre et al., 2014) have also been linked with children's language and literacy skills in several studies. For example, emotional support has been found to contribute to the growth of phonological awareness in kindergarten and Grade 1 (Curby et al., 2009), as well as to gains in expressive and receptive language (Burchinal, Vandegrift, Pianta, & Mashburn, 2010). Teachers' warmth and sensitivity have also been shown to be related to children's vocabulary and decoding at the end of Grade 1 (Connor et al., 2005). High-quality classroom organization, in turn, has been shown to be positively related to first graders' print concepts, vocabulary (Cadima et al., 2010), and literacy gains (Cameron, Connor, Morrison, & Jewkes, 2008; Ponitz et al., 2009). Instructional support, in particular, has been found to contribute to both children's pre-literacy skills (Burchinal et al., 2010; Mashburn et al., 2008) and their growth in word reading at school (Curby et al., 2009). Teachers' efforts to show more support and provide more positive classroom environments have been shown to correlate with stronger literacy skills among fifth-grade students (Guo et al., 2012). Relatedly, Guo and colleagues (2011) have documented that classroom emotional and instructional supports contribute to third-graders' reading skills via increased student engagement. In the present study, we seek to investigate the role of the quality of teacher–child interactions in first-grade children's reading skills. Thus, to summarize, each of the three domains of teacher–child interactions has either direct or indirect effects on children's language and literacy development (Downer et al., 2010).

Control Factors

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In addition to curriculum emphases and teacher–child interactions, structural classroom factors, family backgrounds, and children’s characteristics may also shape children’s learning to read and teachers’ efforts to support their literacy skills. For instance, there is evidence that small class size has positive effects on students’ reading performance, especially during the early school years (e.g., Blatchford et al., 2003). Teacher’s work experience may also play a role in children’s skill development. For example, teachers with fewer teaching years have been found to have higher quality teacher–child interactions (e.g., Connor et al., 2005; Guo et al., 2012; Mashburn et al., 2008) and to be more sensitive in adapting their instructional practices to children’s academic skills (Nurmi et al., 2012). In addition, parents’ levels of educational qualifications have been found to predict children’s pre-reading skills and reading performance (e.g., McClelland & Morrison, 2003). Numerous studies have documented higher levels of reading skills for girls than boys during the early school years (e.g., Logan & Johnson, 2009; Robinson & Lubienski, 2011). A child’s age at school entry may also contribute to the development of reading skills (Stipek & Byler, 2001). Consequently, in our analyses, we controlled for class size, teacher’s work experience, maternal level of education, and child’s gender and age.

Research Questions

The present study tested a broad theoretical model, which is presented in Figure 1. In this model, children’s reading skills that are typical of the classroom are predicted by teacher curriculum emphases and teacher–child interactions, while controlling for children’s initial reading skills and several background variables (i.e., age, gender, mothers’ education, class size, and teaching experience).

The detailed research questions were:

1) To what extent is the quality of teacher–child interactions related to the development of children’s reading skills? We hypothesized that the global quality of teacher–child

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interactions would be linked to better reading skills (H1a; Cadima et al., 2010). In addition, we expected that high-quality emotional support (H1b; Burchinal et al., 2010), classroom organization (H1c; Cadima et al., 2010; Ponitz et al., 2009), and instructional support (H1d; Mashburn et al., 2008) would be associated with improved reading skills at the end of the first grade (Curby et al., 2009; Guo et al., 2011, 2012).

2) To what extent are teachers' curriculum emphases on reading and writing (i.e., emphases on motivation and self-concept, decoding and spelling skills, and comprehension and production skills) related to the development of children's reading skills? We hypothesized that curriculum emphases would not be directly related to reading skill development, but that they would contribute to reading skills via the quality of teacher–child interactions (H2a; Sonnenschein et al., 2011). More specifically, we hypothesized that teacher emphases on motivation and self-concept would be linked to greater emotional support (H2b; Aunola et al., 2006), emphases on decoding and spelling skills would be linked to greater classroom organization (H2c), and emphases on comprehension and production skills would be linked to higher quality instructional support (H2d). Finally, we hypothesized that these teacher emphases would ultimately—via the various teacher–child interactions described above—be linked to improved student reading skills (Guo et al., 2012; Hamre et al., 2012).

Method

Participants

Children. The present study is a part of a larger follow-up (Lerkkanen, Niemi et al., 2006). The sample consisted of 1,029 Finnish children (523 boys) from 91 first-grade classrooms. Most of the children (99.1%) spoke Finnish as a mother tongue; however, there was a small minority of children (0.9%) who spoke English, Russian, Vietnamese, Albanian, or French as their native language. We excluded special education classrooms from the

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analyses; thus, in the present sample, none of the children had any severe behavioral or emotional disabilities. Half of the teachers (50.5%) reported that there were no children with Individualized Education Program (IEP) in their classrooms, 10.8% of teachers reported that they had one student with IEP, and 17.2% reported that they had more than one student with IEP. Only children who had the same teacher for the entirety of first grade were included in the sample. However, the testing indicated that children whose teacher had changed during the first grade (e.g., due to maternity leave) did not differ significantly from the other children. The mean age of the children was 85.77 months ($SD = 3.44$ months), meaning that the children were either seven years of age at school entry or that they turned seven during the fall semester of Grade 1. Parents were asked for written consent for their children's participation in the study. The vast majority of the children (80%) came from nuclear families, 10% came from single-parent families, 8% came from blended families, and 2% came from families in which the parents were divorced and the children split their time between two homes. The sample was fairly representative of the Finnish population (Statistics Finland, 2007).

Teachers and classrooms. All of the 91 teachers in our sample provided their written consent before the study. The participating classes were selected from mainstream schools in two medium-sized towns and one smaller municipality located in Central and Eastern Finland. Finnish was the principal language used in the schools. The mean class size was 16.66 children ($SD = 6.25$; range 3 to 27 children). Nearly all (97.5%) of the 91 teachers had at least a master's degree in education. The teachers' teaching experience ranged from less than a year to more than 15 years (*mode* = more than 15 years). Of the 91 teachers, 29 teachers (3 males) participated in classroom observations on a voluntary basis. The remaining 62 teachers chose not to participate in the observations. However, data on the children's

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reading skills, class size, and other background variables were available for all children from all 91 classrooms.

Missing data analysis. Since only a subsample of 29 of the 91 teachers participated in classroom observations, we needed to address the issue of missingness of the design. To use all available data in cases of missing by design, the missingness should be random (Muthén & Muthén, 1998–2012). Consequently, the missingness of the data was tested in two ways. First, we conducted a set of independent samples *t*-tests to compare the 29 teachers who participated in observations to those who did not participate ($n = 62$). The results showed no statistically significant differences between the compared teacher groups in terms of age, educational background, work experience, number of children in the classrooms, mean age of the children, or number of personnel available (i.e., the number of teachers and teacher's aids in the classroom). Furthermore, no differences were found in relation to teachers' self-reported stress, classroom management strategies, or efficacy beliefs. However, teacher-reported affection towards students was slightly higher among the observed teachers ($M = 4.34, SD = 0.41$) than among the teachers who chose not to participate in observations ($M = 4.13, SD = 0.38, t(70) = 2.16, p < .05$). Thus, overall, there were very minimal differences between the observed teachers and classrooms and the teachers and classrooms that were not observed. As a second step, we tested the missing-completely-at-random assumption in relation to the study variables. To accomplish this, we conducted Little's (1988) missing-completely-at-random (MCAR) test. Little's (1988) MCAR test indicated that the data were not missing completely at random: $\chi^2(178) = 211.17, p = .045$ (with *p*-values $>.05$ indicating that the data fulfill the MCAR assumption).

The problem of missing data in between-level predictors (in our case, observed teacher–child interactions at the classroom level) has received relatively little attention in prior research (van Buuren, 2010). It has, however, been suggested that removing all of the

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observations in a class when there is missingness in one classroom-level predictor is not only wasteful, but can lead to selection effects at the between level (van Buuren, 2010). Two recommended alternative methods to handle missingness are using the full information maximum likelihood (FIML) estimation and multiple imputation (Enders, 2010; Schafer & Graham, 2002). Although researchers have indicated greater confidence in imputing data, there is still no consensus about the maximum amount of missingness in multilevel data that can be safely imputed or handled using FIML (van Buuren, 2010). FIML performs well even when the proportion missing is substantially high (Johnson & Young, 2011). Many simulation studies have tested missing data approaches with 50% or more missing values in model variables (e.g., Allison, 2001; Collins et al., 2001) and shown little change in findings based on missing-at-random (MAR) assumptions for missing data levels of up to 50% or more; however, beyond this level, there may be some differences among the results of estimators using different missing data strategies (Johnson & Young, 2011). FIML has been recommended as one of the most appropriate ways of dealing with possible selective attrition (e.g., Enders, 2010), as is the case in our study. In addition, simulation studies have shown that FIML yields less biased regression parameter estimates than other missing data procedures (e.g., Enders, 2001).

Consequently, we used the standard MAR approach to FIML estimation for missingness (Muthén & Muthén, 1998–2008). On this basis, we were able to use the data for all teachers ($N = 91$) and children ($N = 1,029$) in further analyses. However, to make sure that the results would be similar in the smaller sample, we carried out additional analyses using only the subsample of 29 observed teachers. The pattern of results using this subsample was highly similar to the results for the whole sample, although the power to detect significant results somewhat decreased with the decrease in sample size.

Procedure

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Children were tested on their reading skills in group test situations at the beginning (T1; fall 2007 in September) and end (T3; spring 2008 in April) of Grade 1. Teachers were sent questionnaires on their curriculum emphases and background factors by mail in the spring (T2, in March). Classroom observations were carried out on two different days in the early spring of Grade 1 (T2 in February), four to six weeks before the assessments of children's reading skills at the end of the first grade (T3 in April).

Measures

Reading skills. A group-administered subtest of the nationally normed reading test battery (ALLU; Lindeman, 1998) was used to assess word-level reading. In this test, a maximum of 80 items can be attempted within a two-minute time limit. On each item, a child is asked to read four phonologically similar words and to draw a line connecting a picture to the word that matches it semantically. Due to the nature of this speed test, the score reflects both the child's fluency in reading the stimulus words and his or her accuracy in making the correct choice from among alternatives. In the highly transparent Finnish language, this kind of reading speed test has frequently been used to identify differences among children (see Holopainen et al., 2001; Lerkkanen et al., 2004). The mean score for the test was 20.01 ($SD = 9.20$). According to the test manual (Lindeman, 1998), the Kuder–Richardson reliability coefficient for Grade 1 was 0.97.

Quality of teacher–child interactions. The classrooms were observed using the Classroom Assessment Scoring System (CLASS K–3; Pianta et al., 2008). The CLASS consists of ten dimensions measuring three domains of classroom quality: (1) Emotional Support (4 dimensions: Positive Climate, Negative Climate, Teacher Sensitivity, and Regard for Student Perspectives), (2) Classroom Organization (3 dimensions: Behavior Management, Productivity, and Instructional Learning Formats), and (3) Instructional Support (3 dimensions: Concept Development, Language Modeling, and Quality of Feedback). Each

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dimension was rated on a seven-point scale: low (1, 2), moderate (3–5), and high (6, 7). The manual (Pianta et al., 2008) provides detailed indicators of each dimension, as well as examples of teacher behaviors and classroom interactions for these ratings. The ratings provide scores on the global quality of teacher–child interactions in the classroom, with a primary focus on the teacher. The CLASS measure has been validated in many countries, such as in Finland (Pakarinen et al., 2010), China (Hu et al., 2016), Chile (Leyva et al., 2015), and Germany (von Suchodoletz et al., 2014). Previous studies have provided evidence of both the structural validity and the predictive validity of the CLASS instrument. Overall, there is evidence of the applicability of the CLASS instrument to educational and cultural contexts different from that of the U.S.

In the present study, the 12 observers (2 male), all graduate or doctoral students in education or psychology, were carefully prepared with 10 hours of training and 3 hours of live observation practice over a two-week period. In cases in which the ratings by a pair of observers showed a discrepancy of more than one point, extra rating practice in a live classroom situation was required, after which the inter-rater agreement was monitored again. This extra practice was necessary for two of the observer pairs. At the end of the training, the observers' pairwise inter-rater reliability was 0.81. Subsequently, all observers who had completed the training were allowed to proceed with the classroom observations (see Pianta et al., 2008).

Each observation session lasted three lessons (three hours) and began when the school day started (in Finland, the school day in Grade 1 typically begins at 8:00 a.m. or 9:00 a.m. and lasts three to five hours). There were always two observers present in the classroom, and each conducted independent ratings. The observations followed the CLASS manual, meaning that they were completed in 30-minute cycles. In other words, the observers first observed for a 20-minute period, while making notes on indicators on a separate sheet of paper. In the

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subsequent 10-minute period (before beginning the next observation cycle), the observers recorded their coding on the proper scoring sheet. The number of CLASS observation cycles ranged from four to six ($M = 5.10$, $SD = 0.54$), according to the core instructional components of the day. The number of observed cycles varied depending on the class timetables, since we mainly observed lessons in Literacy, Math and Science (while lessons in Physical Education, Music, and Arts and Crafts were typically not observed). For each CLASS dimension, the ratings were averaged across all cycles. The observers' inter-rater reliabilities were calculated using intra-class correlation coefficients (*ICCs*) and were found to be between .76 and .96 (the only exception being the behavior management $ICC = .66$). In subsequent analyses, a mean score for each dimension was calculated from the ratings of the two observers.

Curriculum emphases. Teachers were asked to rate 11 items on a scale from one to five (1 = *not at all important*; 5 = *very important*) based on the level of importance they placed on the provided goals of literacy skills instruction. The items were adapted from Stipek and Byler (1997, 2004), who reported two factors: basic skills beliefs/basic activities, isolated skills and child-centered beliefs/contextualized activities). In the present data, a factor analysis (principal axis factoring with and oblimin rotation with a Kaiser normalization) on the 11 items produced the following three factors with eigenvalues over 1.0, accounting for 67.29% of the variance (see Table 1): Comprehension and Production Skills (3 items), Motivation and Self-Concept (2 items), and Decoding and Spelling Skills (4 items). Productive Writing item had almost equal factor loadings on two factors (Table 1) but we decided to place it on the Comprehension and Production Skills factor because it makes more sense conceptually. Two items (Letter-Sound Correspondence and Working Habits) were excluded from the final solution due to their low factor loadings. The Cronbach alphas

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for the summary scores were .68, .68, and .68 for Comprehension and Production Skills, Motivation and Self-Concept, and Decoding and Spelling Skills, respectively.

Work experience. Teachers were asked to rate their work experience at school on a six-point scale (0 = *none at all*; 5 = *more than 15 years*). Teachers' work experience ranged from less than a year to more than 15 years. Teachers typically had more than 15 years of teaching experience (mode = *more than 15 years*).

Mothers' education. Mothers were asked to report their education using questionnaires (T1). The measure of the vocational educational level was used in the analyses as a control variable. Accordingly, a total of 6.1% (general population = 6%) of the mothers in the sample had a basic education (nine years of formal education, grades 1–9), 25.5% (general population = 30%) had a secondary education (high school or vocational school degree, grades 10–12), 37% (general population = 35%) had a vocational college degree, a polytechnic or bachelor's degree (three years of education at a college or university) and 35% (general population = 29%) had a master's degree (four to five years of education at university) or a higher university degree (i.e., a licentiate or doctoral degree). The sample was fairly representative of the Finnish population, although the mothers showed a somewhat higher level of education than the general population (Statistics Finland, 2007). Although they were representative of Finland, the mothers in our sample typically had high levels of education from an international perspective.

Analysis Strategy

The multilevel modeling technique (Heck & Thomas, 2009) was used in the analyses because it enabled variance in the reading skill variable to be differentiated into two components: 1) variation due to differences between classrooms (*between-classroom variation*) and 2) variation due to individual differences in academic skills (*within-classroom*

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variation). Further, it enabled us to enter various predictors at both the classroom level (*between-level*) and the level of the individual children (*within-level*).

The analyses were conducted using the following three steps: First, *ICCs* were calculated at both the beginning (T1) and the end of Grade 1 (T3) to determine the proportion of variance in children's reading skills due to classroom differences (*between-classroom variation*) (Heck & Thomas, 2009). Second, classroom-level correlations between teacher–child interactions and reading skills were calculated. Third, multilevel models, which are represented in Figure 1, were constructed to include teacher–child interactions and curriculum emphases as predictors of reading skills. The CLASS scores were included in the models as three latent factors (Emotional Support, Classroom Organization, and Instructional Support) consisting of 10 observable dimensions (see Figure 1). Because the three factors correlated so highly with one another, a second-order factor called Teacher–Child Interactions (i.e., global quality of teacher-child interactions) was constructed. The final set of analyses examined the associations at the level of domains: that is, the three domains of teacher–child interactions (Emotional Support, Classroom Organization, and Instructional Support) replaced the factor of the global quality of Teacher–Child Interactions in the models described above.

In the tested model (see Figure 1), children's reading skills at the beginning (T1) and end (T3) of Grade 1, measured at the individual level, were allowed to vary randomly between classrooms (the small, filled ovals in the reading skills variables at the individual level, below the dashed line). The random intercepts of the children's reading skills are indicated by large ovals at the classroom level (in Figure 1, see *between-level*, above the dashed line), since these intercepts are continuous latent variables that vary across classrooms. Maternal education level ($ICC = .10, p < .01$) was analyzed at both the *between-* and *within-*levels. The children's genders and ages, however, were only analyzed at the

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individual level due to a lack of classroom differences ($ICC = .001$ and $.005$ and $p = .98$ and $.76$ for gender and age, respectively). Global quality of teacher–child interactions, teachers’ curriculum emphases, work experience, and class size, in turn, were treated as classroom-level variables. In the tested model (see Figure 1), reading skills at the end of Grade 1 (T3) were regressed on reading skills at the beginning of Grade 1 (T1) at both the individual level and the classroom level. A classroom’s typical level of maternal education was entered as a predictor of classroom differences in children’s reading skills at the classroom level, whereas gender, age, and maternal education were entered as predictors of individual differences in children’s reading skills at the beginning of Grade 1 (T1). Finally, teacher–child interactions and teachers’ curriculum emphases at T2 were predicted by class size, work experience, and classroom differences in reading skills at T1, whereas classroom differences in reading skills at the end of the academic year (T3) were predicted by teacher–child interactions, work experience, and teachers’ curriculum emphases at T2, when controlling for classroom differences at the beginning of the academic year. In addition, teacher–child interactions at T2 were predicted by teachers’ curriculum emphases.

The analyses were performed using the Mplus statistical package (version 7.3; Muthén & Muthén, 1998–2012). The standard MAR approach was applied (Muthén & Muthén, 1998–2012). The parameters of the models were estimated using the FIML estimation with non-normality robust standard errors (MLR estimator; Muthén & Muthén, 1998–2012). For all the models, goodness-of-fit was evaluated using four indicators: χ^2 , Bentler’s Comparative Fit Index (CFI), the Root Mean Square Error of Approximation (RMSEA), and the Standardized Root Mean Square Residual (SRMR). The cutoff values for well-fitting models were as follows: $\chi^2 = ns$ ($p > .05$), $SRMR < .05$, $RMSEA < .05$, and $CFI > .95$ (Byrne, 2012).

Results

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Intra-Class Correlations and Descriptive Statistics

The results of the intra-class correlations for reading skills showed that differences *between* classrooms were statistically significant: in reading skills at school entry, 6% ($p < .01$; T1), and in reading skills at the end of first grade, 7% ($p < .01$; T3) of the total variance was due to classroom differences. The rest of the variance in reading skills was due to individual differences *within* classrooms. In addition, 10% ($p < .01$) of the total variance in maternal education levels was due to classroom differences. Children's gender or age in months had no statistically significant between-level variance.

The descriptive statistics and correlations between the study variables are shown in Table 2. The means of emotional support dimensions were somewhat lower ($M = 5.19$) and the means of classroom organization ($M = 5.28$) and instructional support ($M = 4.17$) dimensions were considerably higher than those reported in prior literature in the U.S. (approximately $M = 5.50$ for emotional support, $M = 4.20$ for classroom organization, and $M = 2.00$ for instructional support; Burchinal et al., 2010; Howes et al., 2008; Mashburn et al., 2008; Rimm-Kaufman et al., 2009; Weiland et al., 2013). Items measuring teacher–child interactions correlated positively with children's reading skills at T3. In addition, teachers' curriculum emphases with respect to comprehension and production skills correlated positively with reading skills (T3).

The Role of Global Teacher–Child Interactions in Children's Reading Skills

The tested model (Figure 1) did not fit the data well: $\chi^2(138, N_{\text{within}} = 1,029, N_{\text{between}} = 91) = 232.764$; $p < 0.01$; $CFI = .907$; $RMSEA = .026$; $SRMR_{\text{between}} = .161$, $SRMR_{\text{within}} = .007$. The modification indices suggested that the model fit would be improved if the residual correlations between (a) Productivity and Regard for Student Perspectives, (b) Quality of Feedback and Negative Climate, and (c) Concept Development and Regard for Student Perspectives were to be allowed. Following these modifications, the final model (see Figure

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2) including only statistically significant predictors had a reasonable fit: $\chi^2(135, N_{\text{within}} = 1,029, N_{\text{between}} = 91) = 196.140; p < 0.01; CFI = .940; RMSEA = .021; SRMR_{\text{between}} = .161, SRMR_{\text{within}} = .007$, although the χ^2 test, the SRMR at the between-level, and the CFI were somewhat below acceptable values (Byrne, 2012). The results (Figure 2) showed, first, that the higher the global quality of teacher–child interactions in the class was, the better the children’s reading skills were at the end of Grade 1, when controlling for previous reading skills, curriculum emphases, class size, teachers’ work experience, and maternal education levels at the classroom level and previous reading skills, gender, child’s age, and maternal education levels at the individual level. A teacher emphasis on comprehension and production skills was associated with the global quality of teacher–child interactions, but not with reading skills.

At the within-level (the level of individual differences), reading skills at school entry contributed strongly to subsequent skills. Girls exhibited better reading skills at school entry than boys. In addition, children’s ages and maternal education levels were related to reading skills at school entry, such that older children and children of highly educated mothers had better end-of-grade reading skills than their peers.

CLASS Domain-specific Effects on Children’s Reading Skills

The next step consisted of separate analyses of the three CLASS domains (i.e., Emotional Support, Classroom Organization, and Instructional Support) as predictors of end-of-Grade 1 reading skills in separate models.

Emotional Support. The model fit the data well: $\chi^2(52, N_{\text{within}} = 1,029, N_{\text{between}} = 91) = 68.497; p = 0.06; CFI = .981; RMSEA = .018; SRMR_{\text{between}} = .201, SRMR_{\text{within}} = .032$. The results showed that a latent factor of emotional support was significantly associated with reading skills ($\beta = .52, p < .01$). Teacher curriculum emphases were not associated with emotional support or end-of-grade reading skills.

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Classroom Organization. The model fit the data well: $\chi^2(52, N_{\text{within}} = 1,029, N_{\text{between}} = 91) = 58.276; p = 0.256; CFI = .992; RMSEA = .011; SRMR_{\text{between}} = .177, SRMR_{\text{within}} = .021$. Furthermore, a latent factor of classroom organization ($\beta = .401, p < .05$) was significantly associated with reading skills at the end of Grade 1. A teacher emphasis on comprehension and production skills was associated with the observed quality of classroom organization ($\beta = .43, p < .05$), but not with reading skills.

Instructional Support. The model fit the data well: $\chi^2(52, N_{\text{within}} = 1,029, N_{\text{between}} = 91) = 68.152; p = 0.066; CFI = .980; RMSEA = .017; SRMR_{\text{between}} = .166, SRMR_{\text{within}} = .032$. Instructional support, however, was not significantly related to reading skills at the end of the first school year ($\beta = .14, p > .10$). A teacher emphasis on comprehension and production skills was associated with the observed quality of instructional support ($\beta = .55, p < .001$), but not with children's subsequent reading skills.

The Role of Curriculum Emphases in Reading Skills

Children's reading skills in the fall were associated with curriculum emphases, such that the higher the children's reading skills typical of a classroom were at the beginning of Grade 1, the more teachers emphasized comprehension and production skills in their literacy instruction in the spring. Teachers' curriculum emphases were not significantly associated with children's end-of-Grade 1 reading skills. However, a teacher emphasis on comprehension and production skills was related to the observed quality of teacher–child interactions, as well as to observed classroom organization and instructional support. The quality of teacher–child interactions and classroom organization, in turn, were linked to children's end-of-Grade 1 reading skills (standardized estimate of indirect effect = .22; $p < .01$).

Discussion

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The present study contributes to the previous literature by examining whether the quality of teacher–child interactions and teachers’ curriculum emphases play a role in the development of children’s reading skills during the first school year. The results showed that a high global quality of teacher–child interactions was positively associated with improvements in children’s reading skills at the end of the first school year. Investigation of the domain-specific effects further showed that warm and responsive interactions (emotional support) and clear rules and expectations for behavior (classroom organization) were associated with better reading skills at the end of Grade 1. The results also revealed that teacher curriculum emphases were not directly related to children’s end-of-year reading skills. However, a teacher emphasis on comprehension and production was associated with the quality of teacher–child interactions, which, in turn, was linked to reading skills. The present study is among the first to investigate the associations between observed teacher–child interactions, teacher-rated curriculum emphases, and children’s reading skills within the same study. In addition, our study is among the few studies that have so far investigated the links between the observed quality of teacher–child interactions and child outcomes in a European sample of school-age children (see also Cadima et al., 2010).

The Role of Teacher–Child Interactions in Children’s Reading Skills

In accordance with Hypothesis 1a, the results showed that a high global quality of teacher–child interactions was associated with high levels of reading skills among children at the end of their first school year, after controlling for the children’s previous skills. This result aligns with studies showing that child–adult interactions in their immediate environment are key proximal processes driving child development (Bronfenbrenner & Morris, 2007; Pianta, 1999). Our results are also in accordance with previous findings suggesting that emotionally supportive and sensitive interactions (Burchinal et al., 2010; Curby et al., 2009; Guo et al., 2012), well-organized activities and routines, and clear

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expectations for behavior (Cadima et al., 2010; Ponitz et al., 2009) provide a basis for the beneficial development of children's reading skills (Hamre et al., 2014). Previous literature has emphasized the importance of well-organized classrooms (Cadima et al., 2010; Ponitz et al., 2009) and instructional support and language exposure in preschool (Mashburn et al., 2008; Pianta et al., 2008); however, our findings suggest, in line with those of Curby and colleagues (2009) and Guo and colleagues (2012), that a warm and supportive climate and teacher sensitivity are also important for reading skill development.

Investigation of the domain-specific effects showed that emotional support and classroom organization, but not instructional support, were significantly associated with reading skills at the end of Grade 1. The results emphasizing the importance of emotional support for reading skill development can be interpreted through at least two theories: attachment theory and self-determination theory. Attachment theory posits that when adults provide emotional support and respond to children's needs contingently, children are more self-reliant and better able to profit from their environment (Bergin & Bergin, 2009; Pianta, 1999). Self-determination theory suggests that teachers can support students' needs for autonomy, competence, and relatedness by, for example, showing caring for and interest in the students, creating a warm and supportive classroom atmosphere, and giving students the freedom to make their own choices (Roorda et al., 2011). Recent studies using the self-determination framework have also shown that both teacher autonomy support and structure play an important role in student outcomes (Jang et al., 2010; Reeve, 2006). Earlier findings indicate that experiences of comfort and emotional safety in classrooms are important for maintaining interest in reading, especially among students with lower skills (Hamre & Pianta, 2005). Overall, our findings and the extant research in the field suggest that emotionally supportive classroom interactions are critical for maximizing students' motivation and initiative to learn to read in the first school year.

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The results showing that reading skills develop better in classrooms with high-quality classroom organization can be interpreted, for example, in the context of the empirical and theoretical work on children's self-regulatory skills (Paris & Paris, 2001; Raver, 2004). Self-regulatory skills have been found to be important for successful learning (Morrison, Ponitz, & McClelland, 2010), and the development of such skills is seen as being highly dependent on external regulations imposed by parents and teachers (Raver, 2004; Rimm-Kaufman et al., 2002). By providing clear rules and expectations for behavior, teachers ensure that time is allocated for learning and provide structure for engaging children in learning effectively (Pianta et al., 2008). Our findings parallel those of Ponitz et al. (2009), who found a significant relation between well-organized classrooms and reading skills gains among first-graders.

In contrast to our expectation (Hypothesis 1d) and to many previous studies (e.g., Burchinal et al., 2010; Mashburn et al., 2008), our results did not show instructional support to be significantly associated with children's reading skills. Although instructionally supportive teachers typically provide children with rich learning opportunities through scaffolding; extending; and consistent, process-oriented feedback (Pianta et al., 2008b), instructional support was not a significant predictor in the present study. One explanation for this result may be that the reading skill test used in the present study measured reading accuracy and speed (i.e., reading fluency), while instructional support might be associated with more complicated skills, such as reading comprehension. Another possible reason for the insignificance of the link between instructional support and reading skills may be the lack of a linear association between the constructs; however, there is a threshold after which effective instructional support begins to play a role. Recent studies have provided evidence of curvilinear associations between teacher–child interactions and children's outcomes (Burchinal et al., 2010, 2011; Weiland et al., 2013). However, it should be noted that the

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standardized estimate ($\beta = .14$) of the association between instructional support and reading skills in the present study was similar in size to those found in previous studies (e.g., Burchinal et al., 2010; Howes et al., 2008; Mashburn et al., 2008), despite not reaching statistical significance.

The results further showed that class size was negatively related to the global quality of teacher–child interactions, whereas teacher experience was not. This suggests that a small class size in first grade is favorable for high global quality of teacher–child interactions. Teachers engage in more individual interactions with students and take more time for individual tutoring in small classes than they do in large classes (Blatchford et al., 2003). One possible explanation for the insignificance of the link between teacher experience and teacher–child interactions is that, in the present sample, work experience had very limited variance, since most of the teachers had more than 15 years of experience.

The Role of Curriculum Emphases in Reading Skills

We expected that teacher curriculum emphases would predict children's reading skills via high-quality teacher–child interactions (Hypothesis 2a). In line with the theoretical underpinnings of Desimone (2009) and Hamre et al. (2012), the results of the present study showed that a teacher emphasis on comprehension and production skills was indirectly related to children's reading skills: In other words, teacher curriculum emphases were relevant to reading skills only to the extent that they were related to teacher–child interactions. This finding is in line with the results of Sonnenschein et al. (2010), who suggested that teachers' curriculum emphases are related to the quality of interactions in the classroom and, via this correlation, to reading outcomes.

Partly in line with our expectations (Hypothesis 2d), we found that a teacher emphasis on comprehension and production skills was related to a high global quality of teacher–child interactions, as well as to high levels of classroom organization and instructional support.

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This result suggests that the observed quality of teacher–child interactions and teachers’ self-rated curriculum emphases go partly hand-in-hand: Teachers emphasizing higher-order literacy skills (i.e., comprehension and production skills) in their instruction seem to be able to provide cognitively stimulating instruction and create classroom environments with well-organized and motivating activities. Teachers who placed more value on listening and reading comprehension and the production of own texts than the correctness of reading and spelling were also observed to score highly in teacher–child interaction quality. It may be that these teachers are better able to promote children’s thinking skills and conceptual understanding. In a similar vein, Stipek and Byler (2004) found that teachers who reported stronger emphases on social development and higher-order thinking skills scored higher on child-centered practices than other teachers. However, the results of the present study showed that teacher emphases on motivation and self-concept skills and decoding and spelling skills were not associated with the observed quality of interactions. One possible reason for the insignificance of these results is that a teacher emphasis on motivation and self-concept, for example, is rather narrow one, including only two items. One explanation can also be the fact that all three curriculum emphases were investigated in the same model which may have caused that only the most powerful associations were significant. The correlation analyses, however, showed that an emphasis on motivation and self-concept was significantly related to some of the CLASS dimensions whereas an emphasis on decoding and spelling skills was not. It may be that a teacher emphasis on decoding and spelling skills reflects more drill and practice teaching which is not reflected in CLASS scores. In addition, a teacher emphasis on decoding and spelling skills may be more relevant at the beginning of the first school year. It should also be noted that the measure of teacher–child interactions was one of global interaction quality within the classroom, not curriculum actions or the instructional quality of

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literacy as content. Further research is needed to examine the associations between curriculum emphases and teacher–child interactions in more detail.

The results of the present study also showed that a classroom's typical initial level of reading skills was associated with teachers' curriculum emphases: When the children in a classroom had a high typical level of reading skills at the beginning of the first grade, their teachers emphasized comprehension and productive skills more heavily. This finding suggests that teachers actively monitor children's progress and adapt their instructional goals and practices according to the children's academic skills (Nurmi et al., 2012). Such behavior is particularly important in the context of transparent languages, such as Finnish, in which the learning of basic decoding skills tends to happen very quickly during the first school year (Lerkkanen et al., 2004).

Neither teachers' work experience nor class size was related to the teachers' curriculum emphases. This finding suggests that Finnish teachers emphasize curriculum goals in a similar way despite of their years of experience and a number of children in the classroom. This finding aligns with the Finnish educational context, in which teachers have highly homogenous and high-quality teacher training. Teachers follow the core curriculum and differences in their emphases seem to be related to children and their skill level. Another possible explanation involves the very limited variance in teacher work experience.

Overall, the results of the present study contribute to the literature by showing that high global of quality teacher–child interactions provide a basis for reading skill development, when taking into account teachers' curriculum emphases and other background factors. For policy makers, this result highlights the importance of quality assurance in teacher–child interactions. The implementation of the curriculum within classroom instructional practices (*how*) appears to have a stronger impact on child outcomes than the content of the curriculum (*what*) (Pianta et al., 2008). Our results also suggest that both pre-

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service and in-service teacher training may benefit from an emphasis on training and reflection as ways to improve future teacher–child interactions. Observations of the quality of teacher–child interactions can be an excellent tool for such training and interventions. In addition to professional development, which involves the acquisition of knowledge and practical skills, analytic skills related to reflecting on one’s own teacher–child interactions should be emphasized (Hamre et al., 2012).

Limitations and Future Directions

The present study has certain limitations that need to be taken into account when trying to generalize the findings. First, there was a great deal of missing data regarding classroom observations, and the sample size of the observed teachers was small. This naturally decreases the power of the statistical testing. In addition, although the observed teachers were not found to differ from those who chose not to participate in classroom observations for many of the variables, we were not able to rule out the possibility that these teacher groups differed, for example, in their motivation or teaching practices. We found that the observed teachers had somewhat higher self-reported affection than the other teachers, which may have led to some bias in our findings. This possibility warrants further examination in future studies. Relatedly, we do not really know whether the observed teachers fully reflect the 62 who did not agree to participate in observations. Second, although the present study was longitudinal, the analyses were correlational. Therefore, causal inferences cannot be drawn. Third, the experiences children have at home, both prior to and after school entry, also predict their literacy skills (Morrison, Connor, & Bachman, 2006); this relationship should be taken into consideration. Although we controlled for maternal education levels, this measure provides only a very limited estimate of the home environment. Thus, future studies should include a wider range of measures of home literacy environments, such as parental teaching of reading, literacy-related materials available at

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home, parental sensitivity and autonomy support, and the home–school relationship. Fourth, teacher–child interactions were operationalized via global quality, and we did not have data on children’s individual experiences or a detailed analysis of the quality of the literacy instruction. Recent studies have emphasized the need to consider the interactions among children’s skills, instruction types, and teacher practices (Cadima et al., 2010; Connor et al., 2009; Nurmi et al., 2012). A particularly important topic for future study is comparing the influence of teacher instruction on the learning of reading among children with diverse skills. Fifth, we assessed teacher curriculum emphases using only a few measurement items, which may have caused certain measurement problems, such as low internal consistencies among variables. Thus, future studies utilizing multi-dimensional measures for teachers’ curriculum emphases are warranted. Moreover, the teacher ratings were collected during the spring term, when most children can already decode accurately in the Finnish language. Furthermore, the constructs used in the present study (i.e., curriculum emphases rather than beliefs or goals) were somewhat different from those used in several previous studies (e.g., Stipek & Byler, 1997, 2004); this warrants caution in the interpretation of the results. Sixth, the work experience variable was very limited, since most of the teachers had worked for longer than 15 years. This may have led to restricted variance and a lack of predictive power regarding this variable and the insignificance of the link between teacher education and teacher–child interactions. Seventh, although rigorous and carefully conducted, the training and the method of ensuring observational reliability in the present study differed somewhat from the typical CLASS training, in which observers score against master codes of videos. Finally, the CLASS instrument focuses on content-neutral teacher–child interactions, not literacy-related teaching quality; thus, future studies might benefit from the use of complementary content-specific observational methods, such as individualized student instruction (ISI; Connor et al.,

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2009), and from taking into account the books and other materials available in the classroom or teachers' use of specific instructional approaches when teaching reading.

Conclusions

Overall, the results of the present study broaden the previous understanding of effective teacher–child interactions and the impact of teachers' curriculum emphases on children's literacy outcomes. The results indicated that a high global quality of teacher–child interactions is associated with children's reading skill development during their first school year. Along with expectations for behavior and well-organized activities, warm and sensitive teacher–child interactions were found to be influential in children's reading skills development in Grade 1. Teachers emphasizing production and comprehension in literacy instruction were more likely to engage in highly organized activities and cognitively stimulating instruction, which, in turn, had positive consequences for the development of children's reading skills. Teacher curriculum emphases, however, seemed to be important for children's reading skills only through their effects on high-quality interactions. Therefore, what teachers think might be important only when taking into account how teachers support children's learning through teacher–child interactions. Professional development programs focusing on supportive teacher–child interactions, in particular, may be important for enhancing teacher effectiveness in promoting students' learning.

References

- Allison, P. (2011). *Missing data—Quantitative applications in the social sciences*. Thousand Oaks, CA: Sage.
- Aunola, K., Leskinen, E., & Nurmi, J.-E. (2006). Developmental dynamics between mathematical performance, task-motivation and teachers' goals during the transition to primary school. *British Journal of Educational Psychology*, 76, 21–40.
- Bergin, C., & Bergin, D. (2009). Attachment in the classroom. *Educational Psychology Review*, 21, 141–170.
- Blatchford, P., Bassett, P., Goldstein, H., & Martin, C. (2003). Are class size differences related to pupils' educational progress and classroom processes? Findings from the Institute of Education Class Size Study of Children Aged 5–7 Years. *British Educational Research Journal*, 29, 709–730.
- Bronfenbrenner, U., & Morris, P. A. (2007). The bioecological model of human development. In R. M. Lerner & W. Damon (Eds.), *Handbook of child psychology: Theoretical models of human development* (6th ed., Vol. 1, pp. 793–828). Hoboken, NJ: Wiley & Sons.
- Burchinal, M., Kainz, K., & Cai, Y. (2011). How well do our measures of quality predict child outcomes? A meta-analysis and coordinated analysis of data from large scale studies of early childhood settings. In M. Zaslow, I. Martinez-Beck, K. Tout, & T. Halle (Eds.), *Measuring quality in early childhood settings*. Baltimore: Brookes Publishing.
- Burchinal, M., Vandergrift, N., Pianta, R. C., & Mashburn, A. J. (2010). Threshold analysis of associations between child care quality and child outcomes for low-income children in pre-kindergarten programs. *Early Childhood Research Quarterly*, 25, 166–176.

TEACHER–CHILD INTERACTIONS AND READING SKILLS

- van Buuren, S. (2011). Multiple imputation of multilevel data. In J. J. Hox, & J. K. Roberts (Eds.), *The handbook of advanced multilevel analysis*, (pp. 173–196). New York: Routledge.
- Byrne, B. M. (2012). *Structural equation modeling with Mplus: Basic concepts, applications, and programming*. New York: Routledge.
- Cadima, J., Leal, T., & Burchinal, M. (2010). The quality of teacher–student interactions: Associations with first graders' academic and behavioral outcomes. *Journal of School Psychology, 48*, 457–482.
- Cameron, C. E., Connor, C. M., Morrison, F. J., & Jewkes, A. M. (2008). Effects of classroom organization on letter–word reading in first grade. *Journal of School Psychology, 46*, 173–192.
- Carlisle, J., Kelcey, B., Berebitsky, D., & Phelps, G. (2011). Embracing the complexity of instruction: A study of the effects of teachers' instruction on students' reading comprehension. *Scientific Studies of Reading, 15*, 409–439.
- Cash, A. H., Cabell, S. Q., Hamre, B. K., DeCoster, J., & Pianta, R. C. (2015). Relating prekindergarten teacher beliefs and knowledge to children's language and literacy development. *Teaching and Teacher Education, 48*, 97–105.
- Catts, H. W., Fey, M. E., Zhang, X., & Tomblin, J. B. (1999). Language basis of reading and reading disabilities: Evidence from a longitudinal investigation. *Scientific Studies of Reading, 3*, 331–361.
- Collins, L. M., Schafer, J. L., & Kam, C.-M. (2001). A comparison of inclusive and restrictive strategies in modern missing data procedures. *Psychological Methods, 6*, 330–351.

TEACHER–CHILD INTERACTIONS AND READING SKILLS

- Connor, C. M., Morrison, F. J., & Katch, L. E. (2004). Beyond the reading wars: Exploring the effect of child–instruction interactions on growth in early reading. *Scientific Studies of Reading, 8*, 305–336.
- Connor, C. M., Piasta, S. B., Fishman, B., Glasney, S., Schatschneider, C., Crowe, E., Underwood, P., & Morrison, F. J. (2009). Individualizing student instruction precisely: Effects of child by instruction interactions on first graders' literacy development. *Child Development, 80*, 77–100.
- Connor, C. M., Son, S.-H., Hindman, A. H., & Morrison, F. J. (2005). Teacher qualifications, classroom practices, family characteristics, and preschool experience: Complex effects on first graders' vocabulary and early reading outcomes. *Journal of School Psychology, 43*, 343–375.
- Crossner, S. L. (1991). Summer birth date children: Kindergarten entrance age and academic achievement. *Journal of Educational Research, 84*, 140–146.
- Cunningham, A. E., Zibulsky, J., Stanovich, K. E., & Stanovich, P. J. (2009). How teachers would spend their time teaching language arts: the mismatch between self-reported and best practices. *Journal of Learning Disabilities, 42*, 418–430.
- Curby, T. W., Rimm-Kaufman, S. E., & Ponitz, C. C. (2009). Teacher–child interactions and children's achievement trajectories across kindergarten and first grade. *Journal of Educational Psychology, 101*, 912–925.
- Desimone, L. M. (2009). Improving impact studies of teachers' professional development: toward better conceptualizations and measures. *Educational Researcher, 38*, 181–199.
- Downer, J. T., Lopez, M. L., Grimm, K., Hamagami, A., Pianta, R. C., & Howes, C. (2012). Observations of teacher–child interactions in classrooms serving Latinos and dual language learners: Applicability of the Classroom Assessment Scoring System in diverse settings. *Early Childhood Research Quarterly, 27*, 21–32.

TEACHER–CHILD INTERACTIONS AND READING SKILLS

- Downer, J. T., Sabol, T. J., & Hamre, B. K. (2010). Teacher–child interactions in the classrooms: Toward a theory of within- and cross-domain links to children’s developmental outcomes. *Early Education and Development, 21*, 699–723.
- Enders, C. K. (2001). The performance of the Full Information Maximum Likelihood estimator in multiple regression models with missing data. *Educational and Psychological Measurement, 61*, 713–740. doi:10.1177/0013164401615001
- Enders, C. K. (2010). *Applied missing data analysis*. New York, NY: Guilford Press.
- Entwisle, D. R., & Alexander, K. L. (1998). Facilitating the transition to first grade. *Elementary School Journal, 98*, 351–364.
- Fang, Z. (1996). A review of research on teacher beliefs and practices. *Educational Research, 38*, 47–65.
- Guo, Y., Connor, C. M., Tompkins, V., & Morrison, F. J. (2011). Classroom quality and student engagement: Contributions to third-grade reading skills. *Frontiers in Educational Psychology, 2*, 1–10.
- Guo, Y., Connor, C. M., Yang, Y., Roehrig, A. D., & Morrison, F. J. (2012). The effects of teacher qualifications, teacher self-efficacy and classroom practices on fifth graders’ reading outcomes. *The Elementary School Journal, 113*, 3–24.
- Hamre, B. K., Hatfield, B., Pianta, R. C., & Jamil, F. (2014). Evidence for general and domain-specific elements of teacher-child interactions: Associations with preschool children’s development. *Child Development, 85*, 1257–1274.
- Hamre, B. K., & Pianta, R. C. (2005). Can instructional support in the first-grade classroom make a difference for children at risk of school failure? *Child Development, 76*, 949–967.
- Hamre, B. K., Pianta, R. C., Burchinal, M., Field, S., LoCasale-Crouch, J., Downer, J. T., Howes, C., ... Scott-Little, C. (2012). A course on effective teacher-child interactions:

TEACHER–CHILD INTERACTIONS AND READING SKILLS

- Effects on teacher beliefs, knowledge, and observed practice. *American Educational Research Journal*, 49, 88–124.
- Hamre, B. K., Pianta, R. C., Downer, J. T., Decoster, J., Jones, S., Brown, J., Cappella, E. Hamagami, A. (2013). Teaching through interactions: Testing a developmental framework of effective teaching in over 4,000 classrooms. *Elementary School Journal*, 113, 461–487.
- Heck, R. H. & Thomas, S. L. (2009). *An introduction to multilevel modeling techniques*. New York: Routledge.
- Holopainen, L., Ahonen, T., & Lyytinen, H. (2001). Predicting delay in reading achievement in a highly transparent language. *Journal of Learning Disabilities*, 34, 401–413.
- Howes, C., Burchinal, M., Pianta, R. C., Bryant, D., Early, D., Clifford, R., & Barbarin, O. (2008). Ready to learn? Children's pre-academic achievement in pre-Kindergarten programs. *Early Childhood Research Quarterly*, 23, 27–50.
- Hu, B. Y., Fan, X., Gu, C., & Yang, N. (2016). Applicability of the Classroom Assessment Scoring System in Chinese preschools based on psychometric evidence, *Early Education and Development*, DOI: 10.1080/10409289.2016.1113069
- Jang, H., Reeve, J., & Deci, E. L. (2010). Engaging students in learning activities: It is not autonomy support or structure, but autonomy support and structure. *Journal of Educational Psychology*, 102, 588-600.
- Jimerson, S., Egeland, B., & Teo, A. (1999). A longitudinal study of achievement trajectories: Factors associated with change. *Journal of Educational Psychology*, 91, 116–126.
- Johnson, D. R., & Young, R. (2011). Toward best practices in analyzing datasets with missing data. Comparisons and recommendations. *Journal of Marriage and Family*, 73, 926–945.

TEACHER–CHILD INTERACTIONS AND READING SKILLS

- Justice, L. M., Mashburn, A., Hamre, B. K., & Pianta, R. C. (2008). Quality of language and literacy instruction in preschool classrooms serving at-risk pupils. *Early Childhood Research Quarterly*, 23, 51–68.
- Lerkkanen, M.-K., Niemi, P., Poikkeus, A.-M., Poskiparta, M., Siekkinen, M., & Nurmi, J.-E. (2006). *The First Steps Study. Unpublished data*. Finland: University of Jyväskylä.
- Lerkkanen, M.-K., Rasku-Puttonen, H., Aunola, K., & Nurmi, J.-E. (2004). Predicting reading performance during the first and the second year of primary school. *British Educational Research Journal*, 30, 67–92.
- Lindeman, J. (1998). *ALLU–Ala-asteen lukutesti* [ALLU–Reading Test for primary school]. University of Turku, Turku, Finland; The Center for Learning Research.
- Little, R. J. A. (1988). A test of missing completely at random for multivariate data with missing values. *Journal of the American Statistical Association*, 83, 1198–1202.
- Logan, S., & Johnson, R. (2009). Gender differences in reading ability and attitudes: Examining where those differences lie. *Journal of Research in Reading*, 32, 199–214.
- 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.
- Mashburn, A. J., Pianta, R. C., Hamre, B. K., Downer, J. T., Barbarin, O. A., Bryant, D., ... Howes, C. (2008). Measures of classroom quality in prekindergarten and children's development of academic, language, and social skills. *Child Development*, 79, 732–749.
- Masseti, G. M., & Bracken, S. S. (2010). Classroom academic and social context: relationships among emergent literacy, behavioural functioning and teacher curriculum goals in kindergarten. *Early Child Development and Care*, 180, 359–375

TEACHER–CHILD INTERACTIONS AND READING SKILLS

- McClelland, M., & Morrison, F. (2003). The emergence of learning-related social skills in preschool children. *Early Childhood Research Review Quarterly*, 18, 206–224.
- McMullen, M. B., Elicker, J., Goetze, G., Huang, H., Lee, S., Mathers, C.,... Yang, H. (2006). Using collaborative assessment to examine the relationship between self-reported beliefs and the documentable practices of preschool teachers. *Early Childhood Education Journal*, 34, 81–91.
- Morrison, F. J., Connor, C. M., & Bachman, H. J. (2006). The transition to school. In D. K. Dickinson & S. B. Neuman (Eds.) *Handbook of Early Literacy Research*, Vol. 2. (pp. 375–394). New York, NY: Guilford Press.
- Morrison, F. J., Ponitz, C. C., & McClelland, M. M. (2010). Self-regulation and academic achievement in the transition to school. In S. D. Calkins & M. Bell (Eds.), *Child development at the intersection of emotion and cognition* (pp. 203–224): Washington, DC: American Psychological Association.
- Muthén, L., & Muthén, B. O. (1998–2012). Mplus users guide and Mplus version 7.1. Retrieved from <http://www.statmodel.com/index2.html>.
- National Board of Education (2014). National core curriculum for basic education 2014. National core curriculum for basic education intended for pupils in compulsory education. Retrieved from http://www.opf.fi/english/curricula_and_qualifications/basic_education
- National Early Literacy Panel (2009). *Developing Early Literacy: Report of the National Early Literacy Panel*. Washington, DC: National Institute for Literacy.
- NICHD Early Child Care Research Network. (2002). The relation of global first grade classroom environment to structural classroom features, teacher, and student behaviors. *The Elementary School Journal*, 102, 367–387.

TEACHER–CHILD INTERACTIONS AND READING SKILLS

- Nurmi, J.-E., Viljaranta, J., Tolvanen, A., & Aunola, K. (2012). Teachers adapt their instruction according to students' academic performance. *Educational Psychology: An International Journal of Experimental Educational Psychology*, 571-588.
- Pakarinen, E., Lerkkanen, M.-K., Poikkeus, A.-M., Kiuru, N., Siekkinen, M., Rasku-Puttonen, H., & Nurmi, J.-E. (2010). A validation of the Classroom Assessment Scoring System in Finnish kindergartens. *Early Education and Development*, 21, 95–124.
- Paris, S. G., & Paris, A. H. (2001). Classroom applications of research on self-regulated learning. *Educational Psychologist*, 36, 89–101.
- Parrila, R., Kirby, J. R., & McQuarrie, L. (2004). Articulation rate, naming speed, verbal short-term memory, and phonological awareness: Longitudinal predictors of early reading development. *Scientific Studies of Reading*, 8, 3–26.
- Perry, K. E., Donohue, K. M., & Weinstein, R. S. (2007). Teaching practices and the promotion of achievement and adjustment in first grade. *Journal of School Psychology*, 45, 269–292.
- Pianta, R. C., La Paro, K. M., & Hamre, B. K. (2008). *The Classroom Assessment Scoring System. Manual, K–3*. Baltimore, MD: Brookes.
- Ponitz, C., Rimm-Kaufman, S. E., Brock, L. L., & Nathanson, L. (2009). Early adjustment, gender differences, and classroom organizational climate in first grade. *The Elementary School Journal*, 110, 142–162.
- Raver, C. C. (2004). Placing emotional self-regulation in sociocultural and socioeconomic contexts. *Child Development*, 75, 346–353.
- Reeve, J. (2006). Teachers as facilitators: What autonomy-supportive teachers do and why their students benefit. *The Elementary School Journal*, 106, 225–236.

TEACHER–CHILD INTERACTIONS AND READING SKILLS

- Rimm-Kaufman, S. E., Early, D. M., Cox, M. J., Saluja, G., Pianta, R. C., Bradley, R. H., & Payne, C. (2002). Early behavioral attributes and teachers' sensitivity as predictors of competent behavior in the kindergarten classroom. *Journal of Applied Developmental Psychology, 23*, 451–470.
- Robinson, J. P., & Lubienski, S. T. (2011). The development of gender achievement gaps in mathematics and reading during elementary and middle school: Examining direct cognitive assessments and teacher ratings. *American Educational Research Journal, 48*, 268–302.
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist, 55*, 68–78.
- Schachter, R. E., Spear, C. F., Piasta, S. B., Justice, L. M., & Logan, J. A. (2016). Early childhood educators' knowledge, beliefs, education, experiences, and children's language-and literacy-learning opportunities: What is the connection? *Early Childhood Research Quarterly, 36*, 281–294.
- Schafer, J. L., & Graham, J. W. (2002). Missing Data: Our view of the state of the art. *Psychological Methods, 7*, 147–177.
- Seymour, P. H. K., Aro, M., & Erskine, J. M. (2003). Foundation literacy acquisition in European orthographies. *British Journal of Psychology, 94*, 143–174.
- Skinner, E., & Belmont, M. (1993). Motivation in the classroom: Reciprocal effects of teacher behavior and student engagement across the school year. *Journal of Educational Psychology, 85*, 571–581.
- Sonnenschein, S., Stapleton, L. M., & Benson, A. (2010). The relation between the type and amount of instruction and growth in children's reading competencies. *American Educational Research Journal, 47*, 358–389.

TEACHER–CHILD INTERACTIONS AND READING SKILLS

Soodla, P., Lerkkanen, M.-K., Niemi, P., Kikas, E., Silinskas, G., & Nurmi, J.-E. (2015).

Does early reading instruction promote the rate of acquisition? A comparison of two transparent orthographies. *Learning and Instruction*, 38, 14–23.

Statistics Finland. (2007). Statistical database. Retrieved from

http://www.stat.fi/tup/tilastotietokannat/index_en.html

Stipek, D. J., & Byler, P. (1997). Early childhood education teachers: Do they practice what the preach? *Early Childhood Research Quarterly*, 12, 305–326.

Stipek, D. J., & Byler, P. (2001). Academic achievement and social behaviors associated with age of entry into kindergarten. *Applied Developmental Psychology*, 22, 175–189.

Stipek, D. J., & Byler, P. (2004). The early childhood classroom observation measure. *Early Childhood Research Quarterly*, 19, 375–397.

Storch, S. A., & Whitehurst, G. J. (2002). Oral language and code-related precursors to reading: Evidence from a longitudinal structural model. *Developmental Psychology*, 38, 934–947.

von Suchodoletz, A., Fäsche, A., Guntzenhauser, C., & Hamre, B. K. (2014). A typical morning in preschool: Observations of teacher–child interactions in German preschools. *Early Childhood Research Quarterly*, 29, 509–519.

Van de Grift, W. (2007). Quality of teaching in four European countries: A review of the literature and an application of an assessment instrument. *Educational Research*, 49, 127–152.

Verhoeven, L., Reitsma, P., & Siegel, L. S. (2011). Cognitive and linguistic factors in reading acquisition. *Reading and Writing*, 24, 387–394.

TEACHER–CHILD INTERACTIONS AND READING SKILLS

- Weiland, C., Ulvestad, K., Sachs, J., & Yoshikawa, H. (2013). Associations between classroom quality and children's vocabulary and executive function skills in an urban prekindergarten program. *Early Childhood Research Quarterly, 28*, 199–209.
- Wen, L., Elicker, J. G., & McMullen, M. B. (2011). Early childhood teachers' curriculum beliefs: Are they consistent with observed classroom practices? *Early Education and Development, 22*, 945–969.
- Wharton-McDonald, R., Pressley, M., & Mistretta-Hampston, J. (1998). Literacy instruction in nine first-grade classrooms: Teacher characteristics and student achievement. *The Elementary School Journal, 99*, 101–128.
- Wilcox-Herzog, A. (2002). Is there a link between teachers' beliefs and behaviors? *Early Education and Development, 13*, 81–106.
- Yates, G. C. R., & Yates, S. M. (1990). Teacher effectiveness research: Towards describing user-friendly classroom instruction. *Educational Psychology, 10*, 225–238.
- Yilmaz, K. (2011). The cognitive perspective on learning: Its theoretical underpinnings and implications for classroom practices. *Clearing House: A Journal of Educational Strategies, Issues and Ideas, 84*, 204–212.
- Ziegler, J. C., & Goswami, U. (2005). Reading acquisition, developmental dyslexia, and skilled reading across language: A Psycholinguistic grain size theory. *Psychological Bulletin, 131*, 3–29.

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Table 1

Exploratory Factor Analysis Results on the Curriculum Emphases

Curriculum Emphases	Extraction	Factor		
		Comprehension and Production Skills	Decoding and Spelling Skills	Motivation and Self- Concept
1. <i>Letter–sound correspondence</i>	.12		.31	
2. <i>Technical basic reading skills (reading words correctly)</i>	.74		.68	
3. <i>Fluent reading skills (reading unbroken texts fluently)</i>	.47		.79	
4. <i>Listening comprehension</i>	.44	.85		
5. <i>Reading comprehension</i>	.65	.55	-.38	
6. <i>Motoric fluency of letter shapes and writing</i>	.25		.37	
7. <i>Spelling (at the level of syllables, words, and sentences)</i>	.46		.50	
8. <i>Productive writing (own stories, own texts)</i>	.68	.41	-.42	
9. <i>Motivation (interest, hobbyism)</i>	.53			.78
10. <i>Positive self-concept as a reader and a writer</i>	.53			.69
11. <i>Working habits (listening, being concentrated, persistence)</i>	.08			
Eigenvalue		1.00	3.53	1.53
% explained variance		11.14	39.17	16.99

Note. Loadings below .30 are not presented. Final solution in bold.

Table 2

Descriptive Statistics and Correlations between the Study Variables at the Classroom Level

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	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
<i>Emotional Support (T2)</i>																		
1 Positive Climate																		
2 Negative Climate	.58***																	
3 Teacher Sensitivity	.81***	.38*																
4 Regard for Student Perspectives	.68***	.50**	.66***															
<i>Classroom Organization(T2)</i>																		
5 Behavior Management	.49**	.09	.50**	.17														
6 Productivity	.16	-.27	.35*	.00	.66***													
7 Instructional Learning Formats	.49**	.16	.64***	.59***	.51***	.69***												
<i>Instructional Support (T2)</i>																		
8 Concept Development	.27	-.08	.34*	.64***	.26	.27	.63***											
9 Quality of Feedback	.51***	.29+	.53***	.63***	.40*	.25	.66***	.82***										
10 Language Modeling	.52***	.14	.55***	.75***	.32+	.24	.62***	.76***	.72***									
<i>Curriculum Emphases (T2)</i>																		
11 Decoding and Spelling Skills	.01	.34	.08	.15	.03	.05	.14	.16	.07	.08								
12 Motivation and Self-Concept	.25	.23	.22	.34+	.39*	.27	.31+	.35*	.38*	.34*	.22*							
13 Comprehension and Production Skills	.36+	.35	.36+	.46**	.35+	.35+	.44**	.50**	.58***	.39*	.48*	.41*						
<i>Reading Skills</i>																		
14 Reading Skills (T1)	.02	-.23	-.07	.15	-.08	.19	.11	.33	.40	.04	-.06	-.23	.40*					
15 Reading Skills (T3)	.12	.17	.45	.42	.41	.40	.44+	.38	.54*	.39	.08	-.17	.19	-.02				

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<i>Control variables</i>																		
16	Maternal Education	-.53*	-.24	-.52*	-.25	-.51*	-.39+	-.35	-.26	-.34	-.40+	-.02	.01	-.04	.31	-.59*		
17	Work Experience (T2)	-.17	-.12	-.11	-.13	.24	.29+	.04	.11	.04	-.05	.04	.02	.04	.43*	.20	.12	
18	Class Size (T2)	-.32	-.13	-.47*	-.24	-.42*	-.13	-.21	-.04	-.19	-.27	-.01	.01	-.11	.12	-.39*	.26	-.11
	M	5.69	4.81	5.43	4.84	5.50	5.33	5.01	4.07	4.26	4.18	4.11	4.16	3.93	8.67	19.51	3.20	3.93
	SD	.13	.06	.13	.17	.08	.14	.13	.19	.18	.18	.06	.05	.07	.27	.38	.07	.14

Note. ¹ reversed; + $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$; T = Time

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Figure Captions

Figure 1. Tested model. *Note.* T1 = Time 1, first Grade fall; T2 = Time 2, first Grade early spring; T3 = Time 3, first Grade spring; I = Item

Figure 2. The associations between teacher–child interactions, teacher curriculum emphases, and children’s reading skills. T1 = Time 1, first Grade fall; T2 = Time 2, first Grade early spring; T3 = Time 3, first Grade spring; I = Item

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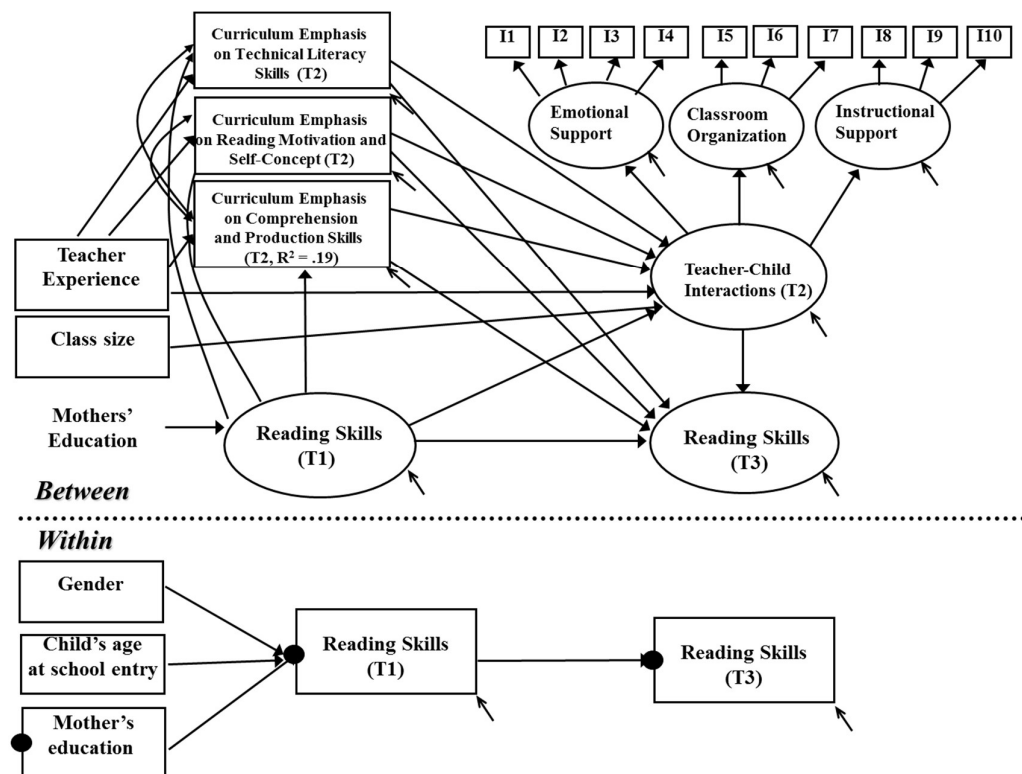


Figure 1. Theoretical model. Note. T1 = Time 1, first Grade fall; T2 = Time 2, first Grade early spring; T3 = Time 3, first Grade spring; I = Item

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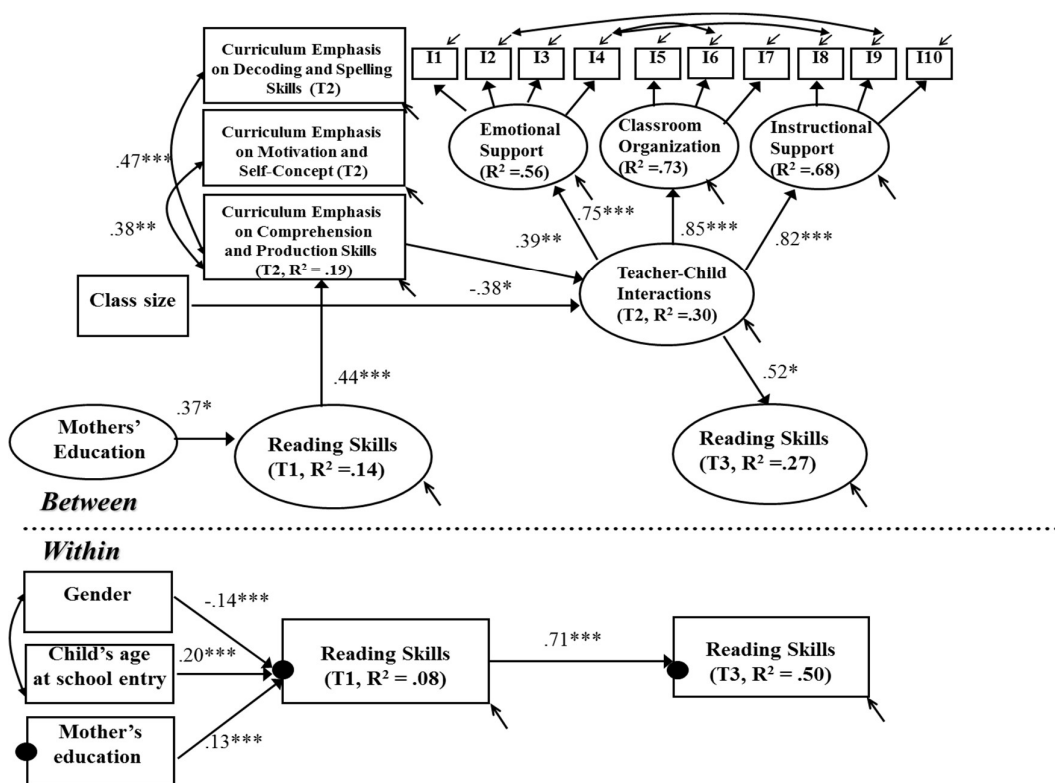


Figure 2. The associations between teacher-child interactions, teacher curriculum emphases, and children's reading skills. T1 = Time 1, first Grade fall; T2 = Time 2, first Grade early spring; T3 = Time 3, first Grade spring; I = Item