

Xin Tang

Teaching Practices in Early Primary School

Dimensions, Patterns and Consequences



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ABSTRACT

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The present thesis tested the reliability and validity of the Early Childhood Classroom Observation Measure (ECCOM; Stipek & Byler, 2004, 2005), identified the profiles of teaching practices, i.e., teaching styles, and, finally, examined the predictive role of teaching styles in early primary students' reading skills. Specifically, the thesis had four aims: first, to examine the psychometric properties of the ECCOM in Finnish and Estonian early primary school, i.e., grades 1 and 3; second, to identify the profiles of teaching practices, i.e., teaching styles, among Finnish and Estonian teachers by using a person-oriented approach; third, to compare the use of teaching styles between Finnish and Estonian teachers; and, finally, to investigate the predictive relationships between teaching styles and reading skills. The data stem from the First Step longitudinal study in Finland, and the Kindergarten-School Study and the Reading Study in Estonia. A total of 91 first-grade teachers and 70 third-grade teachers were observed using the ECCOM instrument. One thousand and twelve first-grade students and 958 third-grade students in the classrooms of these teachers were examined in terms of their reading skills, i.e., fluency and comprehension. A subgroup of 359 Finnish students reading skills was tested longitudinally from grade 1 to grade 3. The results of the present thesis firstly suggest that the ECCOM is a valid classroom observation tool in Finnish and Estonian early primary grades. Secondly, the thesis identified four latent profiles of teaching practices in the first grade: child-centred, teacher-directed, child-dominated, and mixture teaching style, i.e., a mixture of child-centred and teacher-directed practices. In addition, one extra profile was found in the third grade: extreme-child-centred style. Thirdly, Finnish teachers used less of the child-dominated style in grade 1 and more of the child-centred style, but less of the extreme-child-centred style in grade 3 than Estonian teachers. Finally, the child-centred style and mixture teaching style showed more beneficial influences on students' reading skills development than other teaching styles. By contrast, the child-dominated style was found to have detrimental impacts on children's reading skills development. The extreme-child-centred style did not, however, contribute positively to reading fluency in grade 3. Overall, the results suggest that the ECCOM is a valid and reliable measure of classroom practices in school environments outside the United States. Moreover, the use of the person-oriented approach can expand our understanding of teaching practices in important ways, and child-centred and teacher-directed practices can be used in conjunction to support children's reading skills development in early school years.

Keywords: child-centred practices, teacher-directed practices, child-dominated practices, reading skills, person-oriented approach, primary school

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TIIVISTELMÄ (FINNISH ABSTRACT)

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Opetuskäytänteet ja niiden yhteys lukutaidon kehitykseen ensimmäisinä kouluvuosina
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Tässä väitöstutkimuksessa tarkasteltiin opetuskäytäntöjä arvioivan Early Childhood Classroom Observation Measure (ECCOM; Stipek & Byler, 2004, 2005) -havainnointimenetelmän reliabiliteettia ja validiteettia, tunnistettiin opetuskäytäntöjen profiileja (opetustyyliä) ja selvitettiin opetustyylien yhteyttä lasten lukutaitoon. Tutkimuksessa selvitettiin (1) ECCOM-havainnointimenetelmän psykometrisiä ominaisuuksia suomalaisessa ja virolaisessa alakouluaineistossa luokilla 1 ja 3, (2) tunnistettiin henkilökeskeisen lähestymistavan avulla suomalaisten ja virolaisten opettajien opetuskäytänteiden profiileja eli opetustyyliä, (3) verrattiin suomalaisten ja virolaisten opettajien opetustyyliä, ja lopuksi (4) tarkasteltiin missä määrin suomalaisten opettajien opetustyyli ennustivat lasten lukutaidon kehitystä. Tutkimuksen aineisto koostui suomalaisesta Alkuportaatt-pitkittäistutkimuksen aineistosta sekä virolaisista Kindergarten-School Study ja Reading Study -tutkimusten aineistoista. Kaikkiaan 91 ensimmäisen ja 70 kolmannen luokan opettajaa havainnoitiin ECCOM-menetelmän avulla. Ensimmäisellä luokalla arvioitiin 1012 ja kolmannella luokalla 958 oppilaan lukemisen sujuvuutta ja luetun ymmärtämisen taitoja. Lisäksi Alkuportaatt-aineistossa seurattiin 359 oppilaan lukutaitoa ensimmäiseltä kolmannelle luokalle. Tulokset osoittivat, että ECCOM oli toimiva ja luotettava menetelmänä arvioitaessa suomalaisten ja virolaisten alakoulujen opetuskäytäntöjä. Tutkimuksessa tunnistettiin neljä opetuskäytäntöjen latenttia profiilia ensimmäisellä luokalla: lapsilähtöinen, opettajajohtoinen, lasten johtama sekä lapsilähtöisten ja opettajajohtoisten käytänteiden yhdistelmäprofiili. Lisäksi kolmannen luokan opetuskäytännöistä löydettiin äärimmäisen lapsilähtöinen profiili. Suomalaiset opettajat käyttivät ensimmäisellä luokalla enemmän lapsilähtöisiä ja vähemmän lasten johtamia opetustyyliä, mutta kolmannella luokalla vähemmän äärimmäisen lapsilähtöisiä opetustyyliä kuin virolaiset opettajat. Lopuksi havaittiin, että lapsilähtöinen sekä opetustyyli, jossa yhdistyivät lapsilähtöiset ja opettajajohtoiset käytänteet, edistivät lasten lukutaidon kehitystä alakoulun ensimmäisinä vuosina muita opetustyyliä enemmän. Lasten johtamalla opetustyyllillä oli sitä vastoin kielteinen vaikutus lasten lukutaidon kehitykseen. Äärimmäisen lapsilähtöinen opetustyyli ei myöskään edistänyt lukemisen sujuvuutta kolmannella luokalla. Kaiken kaikkiaan tulokset antavat viitteitä siitä, että ECCOM on validi ja luotettava opetuskäytäntöjen havainnointimenetelmä myös Yhdysvaltojen ulkopuolella, ja että henkilökeskeinen lähestymistapa voi lisätä merkittävästi ymmärrystämme opettajien opetuskäytänteistä. Näyttää siltä, että lapsilähtöisten ja opettajajohtoisten käytänteiden joustavalla yhdistämisellä voidaan parhaiten tukea lasten lukutaidon kehittymistä ensimmäisinä kouluvuosina.

Avainsanat: lapsilähtöiset käytänteet, opettajajohtoiset käytänteet, lasten johtamat käytänteet, lukutaito, henkilökeskeinen lähestymistapa, alakoulu

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My PhD journey is coming to an end. Four years ago, I rode an airplane for the first time in my life to come to Finland—my first trip abroad, also—to study and live. I never expected the journey to be easy; however, with the guidance and friendship of the people I have met in Finland, my journey has not been that hard, either.

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LIST OF ORIGINAL PUBLICATIONS

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Taking into account the instructions given and comments made by the co-authors, the author of this thesis proposed the research questions and hypotheses, applied previously collected data, conducted the analyses and wrote the reports of the three individual articles as the first author.

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1 INTRODUCTION

When children enter primary school, their school experiences, especially in the classroom, serves as a proximal process guiding children's cognitive and social-emotional development (Bronfenbrenner & Morris, 2006; Downer, Sabol, & Hamre, 2010). Children's positive interactions with their teachers and high-quality classroom practices have been found to promote children's literacy skills (Cadima, Leal, & Burchinal, 2010; Hamre & Pianta, 2001; Kikas, Silinskas, Jõgi, & Soodla, 2016; Lerkkanen et al., 2016), math skills (Lerkkanen et al., 2016; Perry, Donohue, & Weinstein, 2007; Pianta, Belsky, Vandergrift, Houts, & Morrison, 2008), and their interests towards them (Lerkkanen, Kiuru, et al., 2012; Pakarinen et al., 2010; Stipek, Feiler, Daniels, & Milburn, 1995), as well as the children's academic self-concept (Perry et al., 2007; Stipek et al., 1995), self-regulation (Hamre, Hatfield, Pianta, & Jamil, 2014; Weiland, Ulvestad, Sachs, & Yoshikawa, 2013), and social skills (Luckner & Pianta, 2011; Perry et al., 2007; Siekkinen et al., 2013).

Because children's early academic achievement and skills lay the foundation for their later academic success at school (Cameron, Grimm, Steele, Castro-Schilo, & Grissmer, 2015; Hughes, Luo, Kwok, & Loyd, 2008; von Suchodoletz, Trommsdorff, Heikamp, Wieber, & Gollwitzer, 2009), it is important to ensure that every child achieves the basic skills in their early school years. There is also evidence that children's early school experiences have long-term benefits to their later adjustment and academic achievement (Hamre & Pianta, 2001, 2005; Sylva, Melhuish, Sammons, Siraj-Blatchford, & Taggart, 2010). Teachers, and especially what they do in the classroom, are important for children's learning (Hattie, 2008; Kiuru et al., 2012; Seidel & Shavelson, 2007). The present thesis focuses on the teaching practices in the early primary school years. The specific aims were: first, to validate the observational instrument named the Early Childhood Classroom Observation Measure (ECCOM; Stipek & Byler, 2004, 2005) in Finnish and Estonian primary schools (Study I); second, to identify different profiles of teaching practices by using a person-oriented approach; and, third, to investigate the association between profiles of teaching practices and children's reading skills in the first and third grades (Study II); and, finally,

to examine the role of profiles of teaching practices in the development of reading skills in the early school years (Study III).

1.1 Theoretical basis for teaching practices

Various theoretical approaches make an effort to explain how learning proceeds and how teaching affect children's learning (for an overview, see Driscoll, 2005; Hamilton & Ghatala, 1994; Ormrod, 2012). Thus, the conceptualisation of teaching practices used in this thesis, i.e., child-centred, teacher-directed and child-dominated, originate from different theoretical backgrounds with respect to what is important in learning and teaching.

The notion of *child-centred practices* has its roots in constructivism (Piaget, 1985; Vygotsky, 1978). Although many kinds of theories have been situated under the umbrella of constructivism (for an overview, see Phillips, 1995; Prawat & Floden, 1994), some common assumptions can be identified. Constructivists hold the epistemological view that knowledge is derived from reason and interpretation (Ertmer & Newby, 1993). As each individual interprets her or his personal experiences in a different way, the understanding of knowledge differs for each learner. In other words, a learner creates the meaning of the external world, rather than acquiring the external and objective knowledge as such. In social constructivism, the learner is seen as an active constructor of knowledge who builds her or his understanding of the world through interactions between the learner and the interpersonal environment, such as through interactions with teachers and peers. The knowledge-building learning is co-produced between the student and the teacher. In terms of instruction, teachers consider the learners' own needs and interests, and serve as supporters, facilitators, or partners in the learners' learning. Following the constructivist view of learning and teaching, in *child-centred classrooms*, teachers assist and facilitate children's learning by providing them with both guidance and opportunities to direct their own exploration of objects and academic topics, and teaching is akin to a partnership between the teacher and the children. Teachers support students to be active and self-regulated learners who acknowledge different learning strategies; they value the children's own previous experiences; they are sensitive to the children's needs and interests when they organise classroom activities; and they try to individualise their instruction and to scaffold children's learning and understanding. Teachers also create a classroom community to support children's learning with their peers and teachers.

Teacher-directed practices, in turn, can be interpreted as having their roots in traditional learning theories (see Stipek & Byler, 2004), such as behaviourism and social learning theory (Bandura, 1986; for an overview, see Ertmer & Newby, 1993; Hamilton & Ghatala, 1994). According to these theories, learning is a process in which the outside reality transfers into the learner's mind with the help of environmental forces. For example, according to Bandura (1986), 'learning is largely an information-processing activity in which information

about behaviour and about environmental events is transformed into symbolic representations that serve as guides for action'. The traditional learning theory assumes that it is the environmental conditions that dominate and motivate learning to happen. In terms of teaching, the teacher is the main actor who directs the students' learning in the classroom and creates the environmental conditions for learning. In classrooms using *teacher-directed practices*, teachers emphasise the provision of information and employ structured, drill-and-practice group lessons that are fast-paced, teach discrete skills in small steps, and include praise when predetermined goals are reached. Teachers using this practice hold the belief that basic skills should be acquired before more advanced learning can happen (Stipek et al., 1995). The teachers' role in the children's learning is prominent, as they make most of the decisions and control the instructional activities in the classroom.

The third approach, i.e., *child-dominated practices*, has its roots in constructivism also (Stipek, 2017). Teachers who rely on this type of practice show an extreme understanding of constructivist learning theories (Daniels & Shumow, 2003; Stipek, 2017). According to this view, children develop optimally at their own rate, and teachers should provide little direct guidance, control or support. However, teachers are responsive to students' questions and demands. They set up activities and learning environments that address the children's stage-related needs, only 'interfering' with children's self-directed activities when needed. However, child-dominated practices differ from child-centred practices in their overemphasis on students' natural development and autonomy. Child-centred practices presume active teacher participation, whereas in child-dominated practices, teachers remain relatively passive in respect to children's learning in the classroom.

1.2 Measuring teaching practices

It is widely agreed that teaching practices have a great impact on children's learning (Hattie, 2008; Muijs et al., 2014). Researchers have used different instruments to measure teaching practices (for an overview, see Seidel & Shavelson, 2007). Various studies have used teachers' self-reports (e.g., Zhang, 2011), interviews (e.g., Richardson, Anders, Tidwell, & Lloyd, 1991), experimental designs (e.g., Anderson, Evertson, & Brophy, 1979; Henschel, Meier, & Roick, 2016), and observation tools (e.g., Pianta, La Paro, & Hamre, 2008; Pressley et al., 2001; Stipek & Byler, 2004). Recently, the importance of using standardised classroom observational measures has been emphasised in measuring teaching practices (see Pianta & Hamre, 2009). One reason for this is that standardised classroom observation systems do not only evaluate the quality of classroom processes, but they can also be used as tools for teachers' professional development (Pianta & Hamre, 2009). By measuring and noticing classroom processes and teachers' strengths and weaknesses, classroom observations can

help to improve classroom interactions and quality of instruction (e.g., A. M. Roberts et al., 2014).

During the past decades, many standardised classroom observational measures have been developed for different purposes (for an overview, see Goe, Bell, & Little, 2008; National Research Council, 2008; Pianta & Hamre, 2009). Examples of such instruments include tools measuring the overall quality of the learning environment, e.g., Early Childhood Environment Rating Scale (ECERS; (Harms, Clifford, & Cryer, 1998), and those measuring the quality of teacher-child interactions in the classroom, e.g., Classroom Assessment Scoring System (CLASS; Pianta, La Paro, et al., 2008). Some classroom observation instruments have been developed to apply to all school subjects, e.g., Framework for Teaching (Danielson, 2007), whereas others have focussed on specific subjects, such as literacy, e.g., Individualizing Student Instruction (Connor et al., 2009), mathematics, e.g., Mathematical Knowledge for Teaching (Hill et al., 2008), or science, e.g., Reformed Teaching Observation Protocol (Sawada et al., 2002). In addition, these classroom observation instruments are typically designed to suit a certain educational level, such as early childhood education (e.g., Harms et al., 1998; Stipek & Byler, 2005), primary education (e.g., Danielson, 2007; Pianta, La Paro, et al., 2008), or secondary education (e.g., Pianta, Hamre, & Mintz, 2012).

In the present thesis, the ECCOM (Stipek & Byler, 2004, 2005) was used as the research tool. The ECCOM was chosen because it provides a standardised and valid way to measure teaching practices in early education classrooms and across different content areas. The ECCOM focuses on examining what teachers do with the available materials, i.e., their use and implementation of curriculum and materials, rather than on the available materials as such. In the ECCOM, three different approaches of teaching practices, i.e., child-centred, teacher-directed and child-dominated practices, are measured by assessing three important domains of teaching: management, climate and instruction (Brophy & Good, 1986; Pianta & Hamre, 2009; Pressley et al., 2003). Therefore, the ECCOM provides a tool to investigate a variety of teaching practices that teachers use in authentic classroom situations.

The ECCOM is an instrument to evaluate three teaching practices in a classroom, i.e., child-centred, teacher-directed and child-dominated practices (Stipek & Byler, 2004, 2005). In *child-centred* practices, children are given a central role in their learning. The teacher organises learning activities in a way that is based on the children's own interests and needs, with the aim of facilitating children to become active learners. In this sense, children are autonomous learners who actively participate in the learning community. *Teacher-directed* practices refer to classrooms in which teachers play an active role. They control the classroom activities and practices, and children are expected to follow the teachers' guidelines precisely. While teachers who use either child-centred or teacher-directed practices play an active role in the classroom, in *child-dominated* teaching, the teachers' role is rather passive in guiding and instructing children.

In child-dominated practices, children are given full autonomy for their learning, and the teachers mainly respond when children need their support.

In addition, the ECCOM measures each teaching practice by focusing on three domains (subscales): management, climate and instruction (see Table 1 for details). *Management* refers to the routines and activities that teachers employ, for example, keeping order in the classroom, disciplinary acts to reduce children's misbehaviours, and encouraging them to engage in learning (Emmer & Stough, 2001). Previous studies have shown that classrooms with efficient management, students are believed to develop their self-regulation skills (Downer et al., 2010; Hamre et al., 2014), to acquire good academic skills (Cadima et al., 2010; Ponitz, Rimm-Kaufman, Brock, & Nathanson, 2009), and to show fewer behavioural problems (Bru, Stephens, & Torsheim, 2002). Classroom *climate* refers to the teacher's sensitivity towards children (Howes, 2000; Pianta, La Paro, et al., 2008). Classrooms with warm and supportive climates foster close relationships between teachers and children, and between children and their peers; thus, fewer conflicts arise between these partners. A positive classroom climate is assumed to satisfy children's needs of relatedness and to establish a secure attachment (Downer et al., 2010; Howes, 2000). It has been found to promote engagement (McWilliam, Scarborough, & Kim, 2003) and academic skills (Cadima et al., 2010; Hamre & Pianta, 2001, 2005) in children. Finally, *instruction* consists of the activities and behaviours teachers implement to deliver the knowledge and to support children's cognitive and language development (Brophy & Good, 1986; Pianta, La Paro, et al., 2008; Rosenshine, 1983). In a classroom with high-quality instruction, teachers use questioning and process-oriented feedback effectively (Day, Sammons, & Kington, 2008; Stronge, Ward, & Grant, 2011), engage often in students' learning (Coe, Aloisi, Higgins, & Major, 2014; Downer, Rimm-Kaufman, & Pianta, 2007) and, therefore, also promote better learning outcomes (Cadima et al., 2010; Hamre & Pianta, 2005; Mashburn et al., 2008).

In the ECCOM, the three domains (management, climate and instruction) characterise the three teaching practices. For example, in respect to *management* (see Table 1), *child-centred* classrooms have clear but flexible rules, which the teachers and the children negotiate together, and the children are given autonomy to manage the classroom activities and to take responsibility. In turn, in *teacher-directed* classrooms, teachers have the dominant role in managing the rules and classroom activities. In *child-dominated* classrooms, teachers provide children with almost complete autonomy regarding their learning. There are no clear teacher management behaviours; therefore, the classroom is somehow disorderly.

In respect to *climate* (see Table 1), *child-centred* teachers show their warmth to children, build a community that supports all children to communicate and cooperate together, and also take into account each student's individual needs and interests. In *teacher-directed* classrooms, teachers are not sensitive to children's emotional needs, are unaware of children's personal interests, and do not encourage them to communicate or engage with each other. The teachers' focus

is rather on rote learning activities. In *child-dominated* classrooms, children are given the chance to interact with their peers. However, the teachers' role is mainly to respond to the children's needs when they require support, rather than to actively engage with the children in classroom activities.

In respect to *instruction* (see Table 1), *child-centred* teachers arrange a variety of activities that aim to develop children's understanding. They also take into account children's individual interests and engage them in thoughtful dialogue and discussion. *Teacher-directed* teachers focus on children learning by practising basic skills and showing their dominant role in knowledge delivery. Finally, in *child-dominated* classrooms, the teachers' role in teaching and learning is unclear, and teachers do not clearly organise defined activities and instruction. Children are simply assigned tasks with little feedback and conversation.

TABLE 1 Descriptions of the teaching practices, subscales, and items used in the ECCOM

Subscale and item	Teaching Practices	
	<i>Child-centred</i>	<i>Teacher-Directed</i>
<i>Management</i>		
1. Child Responsibility	Children are allowed to take responsibility to the degree that they are able.	Children are not given opportunities to take responsibility (teacher control).
2. Management	Teacher has clear but somewhat flexible classroom rules and routines.	Teacher has clearly communicated expectations and classroom rules that are rigidly adhered to.
3. Choice of Activities	There is a mixture of teacher and child choice.	Teacher makes most of the choices.
4. Discipline Strategies	Conflict resolution is smooth; consequences are appropriate and apply equally.	Discipline is imposed without explanation or discussion; consequences are inconsistent.
<i>Climate</i>		
5. Support for Communication Skills	Teacher encourages children to engage in conversation and elaborate on their thoughts.	Teacher does not encourage children to engage in conversation (teacher-controlled conversation).
6. Support for Interpersonal Skills	Teacher provides opportunities for cooperative, small-group activities that promote peer interactions.	Teacher does not provide opportunities for children to develop interpersonal skills.
7. Student Engagement	Teacher attempts to engage all children in ways that will improve their skills and understanding.	Teacher engages children in rote activities (e.g., rigid expectations about being engaged in work).
8. Individualization of Learning Activities	Teacher is attentive to children's individual skill levels and adapts tasks accordingly.	Teacher does not address children's individual needs (e.g., all do the same tasks).

TABLE 1. Continued

Subscale and item	Teaching Practices		
	<i>Child-centred</i>	<i>Teacher-Directed</i>	
<i>Instruction</i>		<i>Child-Dominated</i>	
9. Learning Standards	Teacher holds children accountable for attaining some individualized standard (assists and challenges children at their respective levels). There are connections between and within academic lessons (concepts/skills are embedded into a broader set of goals). Tasks and lessons are designed to teach identifiable concepts and develop understanding.	Teacher rigidly holds children accountable for completing work and for attaining a universal standard (e.g., standards are rigid and invariable). Academic lessons are distinct and disconnected (concepts/skills are presented as an isolated set of facts or skills to be learned). Tasks are designed to help children learn facts or procedures. Problem solving is constrained.	Teacher does not hold children accountable for completing work and has no apparent standards. Lessons are disjointed and the focus is unclear (connections are on a superficial level with no unifying concept). The specific concept of tasks is unclear.
10. Coherence of Instructional Activities			
11. Teaching Concepts	Teacher solicits children's questions, ideas, solutions or interpretations around a clearly defined topic.	Teacher dominates instructional conversation; children's participation is limited.	Teacher does not engage in instructional conversations with children, or topics are unfocused or unclear.
12. Instructional Conversation	Teacher provides a broad array of literacy experiences and instructional practices.	Math instruction emphasises rote memorization, drill and practice.	Teacher provides no instruction on phonics or reading comprehension strategies.
13. Literacy Instruction	Math instruction emphasises developing understanding.		There is little evidence of math instruction or conversation about math concepts.
14. Math Instruction			

Notes. Based on the ECCOM manual by Stipek and Byler (2005). Observers rate classrooms on each of the 14 scale items, giving one code for Child-centred, one code for Teacher-Directed and one code for Child-Dominated. All items are rated on a scale of 1 to 5 (1 = these practices are rarely seen, less than 20% of the time; 5 = these practices predominate, 80%–100% of the time).

The ECCOM has at least two features which differ from other observation measures. First, the rating of the ECCOM is conducted after the whole classroom visiting period (about a half-day). The target of this procedure is to get an overall impression of the classroom teaching practices during a typical day. In other measures, such as the Classroom Assessment Scoring System (CLASS; Pianta, La Paro, et al., 2008), the teacher-child interactions are rated after every 20-minute period, and there are typically about four observation cycles during an observation day.

The second feature of the ECCOM is that it simultaneously measures all three different aspects of teaching practices, i.e., child-centred, teacher-directed, and child-dominated, and takes into account the possibility that teachers use a mixture of teaching practices in authentic classroom situations (Stipek & Byler, 2004). In other words, in some situations, teachers can be child-centred, whereas in other situations, they may deploy teacher-directed practices. The ECCOM's parallel rating system leaves space for rating all three teaching practices independently, and enables measuring a combination of practices used by teachers (for example, using a mixture of practices). In some other measures, such as ECERS (Harms, Clifford, & Cryer, 1998), the teachers' teacher-directed behaviours and child-centred behaviours are evaluated by the same dimension and related items. The ratings of the items from low to high then distinguish different teaching practices. For example, in terms of measuring language-reasoning in ECERS (see Sylva et al., 1999), a high score is given to child-initiated activities, while teacher-initiated activities are given a score in the middle of the scale.

Previous research using the ECCOM instrument includes at least three limitations. Firstly, a vast majority of research using this instrument has been conducted in the United States (Hauser-Cram, Sirin, & Stipek, 2003; Lonigan, Farver, Phillips, & Clancy-Menchetti, 2009; Perry et al., 2007; Stipek & Byler, 2004). Some studies have also been done in Finland and Estonia (Kikas et al., 2016; Lerkkanen et al., 2016; Rasku-Puttonen et al., 2011), Australia (Murray & Harrison, 2011), and China (Rao, Sun, Zhou, & Zhang, 2012). Since most previous research has been completed in the U.S., one important challenge for future research is to validate the ECCOM in cultural and educational contexts outside the U.S., and in countries whose educational systems differ in their curricular and educational systems, and their teacher education compared to the U.S. For example, in Finland children go to school much later than in most other countries at age seven, and all teachers are required to have a master's degree, however, this is not the case in the U.S. (Darling-Hammond, 2010). In fact, only two studies have examined the reliability and validity of the ECCOM – one in US kindergarten and first grade classrooms (Stipek & Byler, 2004), and another in Finnish and Estonian kindergarten classrooms (Lerkkanen, Kikas, et al., 2012). Both studies provided evidence of good psychometric properties of the ECCOM in their research contexts. Thus far, no studies have validated the ECCOM after first grade. In the present thesis, one of the aims is to validate the ECCOM in the early school years in Finland and Estonia (Study I).

Secondly, most of the previous ECCOM studies fall into the field of early childhood education (e.g., Hauser-Cram et al., 2003; Lonigan et al., 2009; Rao et al., 2012). Only a few studies have used samples from school age children (e.g., Kikas, Pakarinen, Soodla, Peets, & Lerkkanen, 2017; Kikas et al., 2016; Lerkkanen et al., 2016). In the transitions from kindergarten to first grade and from first grade to third grade teachers play an important role in children's learning (Ahtola et al., 2011), and these early transitions are extremely important in children's academic skills development (Eccles, 1999; Hamre & Pianta, 2001). Thus, further research on the suitability of the ECCOM for evaluating the early primary school years is needed. The present thesis used the ECCOM to examine the associations between teaching practices and first and third graders' reading skills (Study II).

Finally, little research has been done to examine the extent to which teaching practices measured by the ECCOM are related to the development of children's academic skills (for an exception, see Kikas et al., 2016, 2017; Lerkkanen et al., 2016). Lerkkanen et al. (2016) examined the role of teaching practices in students' reading and math skills development from fall to spring at Grade 1, and Kikas et al. (2016, 2017) examined the role of teaching practices in reading skills and interests from Grade 1 to Grade 2. In Study III of the present thesis, the ECCOM was used to investigate the role of teaching practices and primary school students' reading skills development from Grade 1 to Grade 3.

1.3 Teaching practices and student's academic skills

The debates of the benefits of child-centred practices versus teacher-directed practices have been waged for decades (Foorman, 1995; Kirschner et al., 2006; Lee & Anderson, 2013; Tobias & Duffy, 2009), with many terms in related discourse (e.g., constructivist, scaffolded, reform-minded, progressive, child-centred versus didactic, teacher-directed, traditional, conventional; Chiatovich & Stipek, 2016; Kirschner et al., 2006). Previous studies on the role of those teaching practices in students' academic skills have yielded complex, and sometimes even contradictory, findings. For example, both child-centred practices and teacher-directed practices have been found to be beneficial to children's academic skills, although the associations vary between grade level, skill level and the particular skill under focus.

Child-centred practices have been found to be positively associated with kindergarteners' letter recognition and listening, and with math performance (Marcon, 1999) as well as their interest towards reading and math (Lerkkanen, Kiuru, et al., 2012) and early primary students' reading and math skills (Kikas et al., 2017; Lerkkanen et al., 2016; Perry et al., 2007). For example, among Finnish children first entering primary school, Lerkkanen et al. (2016) found teachers' child-centred practices increased children's reading fluency and math skills by the end of Grade 1. Similar findings were also found in US samples by Perry et al. (2007) who showed that child-centred practices increased first grader's

math achievement, and helped them to reach achievement standards in reading fluency, letter-sound recognition and math. While Lerkkanen et al. (2016) and Perry et al. (2007) examined basic reading skills, e.g., decoding and fluency, Kikas et al. (2017) found that child-centred practices promoted reading comprehension by the end of Grade 1. However, in another study where teachers used predominantly child-centred practices in the classroom, Kikas et al. (2016) did not find any associations between the teacher's individual support and reading fluency and comprehension.

Teacher-directed practices have also been found to be beneficial to literacy and math skills (e.g., Hauser-Cram et al., 2003; Stipek et al., 1995, 1998), though in a complex way. For example, Stipek et al., (1995) examined preschoolers and kindergarteners in two instructional programmes, i.e., child-centred versus teacher-directed. They found that children in teacher-directed programmes had higher letter and reading achievement. In their follow-up study (Stipek et al., 1998), a subgroup of children were tested and observed again one year later. Those who stayed two years in a teacher-directed programme had better letter knowledge and reading achievement but lower verbal fluency than children in a child-centred programme. While kindergarteners in a teacher-directed programme had higher letter/reading and number/math achievement, these associations were reversed for preschoolers. In addition, studies have found that teacher-directed practices benefit children from lower income families or with learning disabilities with their academic skills, in particular (e.g., Hauser-Cram et al., 2003; for a review, see Foorman, 1995; Stahl & Miller, 1989).

Drawing from a large nationally representative sample (ECLS-K 1998-1999), Guarino et al., (2006) differentiated child-centred (e.g., student-centred instruction) and teacher-directed (e.g., didactic instruction, traditional practices) practices in reading and math, respectively. Further, they examined the associations between these practices and reading and math achievement. They found that both child-centred and teacher-directed practices were related to gains in math achievement, whereas only teacher-directed practices increased achievement in reading.

Second, studies which have compared the effects between child-centred practices and teacher-directed practices have yielded inconsistent findings. Some studies have found that teacher-directed practices are better than child-centred practices in improving letter and word recognition (Stipek et al., 1998, 1995), letter detection performance (Faust & Kandelshine-Waldman, 2011) and word recognition (Jiménez & Guzmán, 2003; Papadopoulos, 2001). Other studies have shown that child-centred practices are better for improving reading fluency (Lerkkanen et al., 2016) and reading comprehension (Block, Parris, Reed, Whiteley, & Cleveland, 2009; Kikas et al., 2017) than teacher-directed practices. Some studies, in turn, have found no difference between the two approaches on reading fluency and comprehension (LeVasseur, Macaruso, & Shankweiler, 2007; T. A. Roberts & Meiring, 2006).

Third, it has been shown that child-centred practices and teacher-directed practices can be used to complement each other (e.g., Kikas et al., 2016; Rasku-

Puttonen et al., 2011). For example, Kikas et al. (2016) included a group of first grade teachers who used child-centred practices and teacher-directed practices together in their classroom. They found that among the students whose teachers used a mixture of teaching practices, the teachers' individual support in Grade 1 was negatively associated with reading comprehension skills in Grade 2. Recently, Chambers et al., (2016) ran a meta-analysis with the aim of finding effective early childhood programmes for literacy and language skills. They found that comprehensive approach programmes, i.e., programmes focussing on both child-initiated activities and early literacy skills, promoted the most gains in literacy and language skills for preschoolers and kindergarteners. Their results implied that early childhood programmes with a balanced focus on literacy skills teaching and child-initiated activities produced better results in children's literacy and language skills than programmes focusing on either literacy skills teaching or child-initiated activities.

In addition, a few studies examining *child-dominated practices* have suggested that such teaching practices may have a negative impact on students' achievement (e.g., Walker, 2008). One study (Chien et al., 2010) found that preschoolers in free play classrooms showed smaller gains in letter naming, letter-word identification, and overall language and literacy skills than those in classrooms that implemented either scaffolded learning, individual instruction or group instruction. Another study (Kikas, Peets, & Hodges, 2014) showed that the effect of child-dominated practices was moderated by the classroom's skill level. In classrooms with high initial math skills, child-dominated practices were positively related to spelling skills and task-persistent learning behaviour, while the correlation was negative in classrooms with low initial math skills.

A review of the previous studies suggests that there are several gaps in understanding the role of teaching practices in the development of children's academic skills. Firstly, more studies are needed to examine the association between teaching practices and more advanced academic skills, e.g., reading comprehension. Due to the fact that the ECCOM has been mainly used in early childhood education, it is often the basic skills, e.g., decoding or reading fluency, that have been the focus (for an exception, see Kikas et al., 2017). Therefore, Studies II and III of the present thesis included two measures of reading skills, i.e., fluency and comprehension, in the investigation.

Secondly, the complex pattern of associations between teaching practices and academic skills (e.g., Chiatovich & Stipek, 2016; Kikas et al., 2014), such as due to grade level, difficulty of acquiring skills, and cultural groups, set up a somewhat more complex criteria design than some previous studies. Study II of this thesis examined the relationships between teaching practices and reading skills in terms of grade level, i.e., Grades 1 and 3, skill level, i.e., fluency and comprehension, and two cultural context, i.e., Finland and Estonia.

Thirdly, few studies exist about child-dominated practices. However, since Kikas et al. (2014) showed the importance of child-dominated practices in academic skills, further studies are needed. Study II of the present thesis examined the role of child-dominated practices on reading skills.

1.4 Variable-oriented versus person-oriented approach

Two approaches of data analysis, i.e., variable-oriented and person-oriented, have been applied in the research of teaching practices (e.g., Kikas et al., 2016; Lerkkanen et al., 2016; von Suchodoletz, Fäsche, Gunzenhauser, & Hamre, 2014); for a review of the two approaches, see Bergman & Magnusson, 1997; Bergman & Trost, 2006; von Eye & Bergman, 2003). The variable-oriented approach, which most classroom observational studies have applied, can be described as follows. First, the variable is the study unit of analysis and the key focus is on the relationships between variables (Bergman & Magnusson, 1997). Second, the framework typically relies on linear statistical relationships between variables (Bergman & Trost, 2006). For example, using the CLASS, Pakarinen et al., (2011) measured teacher-child interactions in terms of three variables – emotional support, classroom organisation and instructional support – in Finnish kindergarten, and examined these variables in relation to task-avoidant behaviour and math skills. By using multilevel modelling, e.g., student level or classroom level, they found instructional support to be negatively correlated with children’s task-avoidant behaviour.

Another methodological approach is the person-oriented approach. It typically examines groups of individuals on the basis of their patterns of psychological characteristics (Bergman & Magnusson, 1997). The person-oriented approach aims to identify a subsystem of study variables and to study them all together as an undivided whole (Bergman & Trost, 2006). Cluster or profile analysis are often applied in person-oriented studies. For example, in a large pre-kindergarten sample, LoCasale-Crouch et al., (2007) used the CLASS to observe the classroom practices. Using cluster analysis, they identified five profiles of pre-kindergarten classrooms. Profile 1 showed the highest overall quality in terms of emotional, organisational and instructional support. Profile 2 had moderate levels of emotional support and organisational support, and high levels of instructional support. The third profile had moderate levels of emotional support and organisational support, but low levels of instructional support. Profile 4 had moderate levels of emotional support, and yet low levels of organisational support and instructional support. Profile 5 had the lowest quality overall. Another study using the CLASS in the Finnish kindergarten context (Salminen et al., 2012) identified four profiles: highest quality profile, medium quality profile, medium quality with lower emotional support profile, and the lowest quality profile. Further Salminen et al., (2013) made a case analysis on the instructional teaching practices of kindergarten teachers in each profile.

In sum, these two analytical approaches provide different ways and methods to examine study variables. Variable-oriented methods investigate the associations between study variables: how a particular variable is related to other variable. Person-oriented methods make an effort to identify subgroups of individuals, which show distinctive patterns in terms of variables of interest. The person-oriented approach has a special value in an authentic context, in particu-

lar. For example, in authentic classrooms, teachers typically do not rely on only one type of practices but deploy a combination of practices when instructing children and interacting with them (Stipek & Byler, 2004). By using a person-oriented approach, it is possible to identify teachers who employ a combination of different practices.

As far as I know, only two person-oriented studies have used the ECCOM – one in kindergarten (Rasku-Puttonen et al., 2011) and another in first grade (Kikas et al., 2016). Both have identified four groups of teachers: teachers predominantly using child-centred practices; teachers predominantly using teacher-directed practices; teachers predominantly using child-dominated practices; and teachers using a mixture of child-centred and teacher-directed practices. Rasku-Puttonen et al. (2011) found that kindergarteners in a classroom where the teacher was predominantly using child-centred practices showed higher interest in preschool activities, e.g., letter and reading tasks, mathematics, and play, than their peers in classrooms where the teacher was predominantly using teacher-directed practices (Rasku-Puttonen et al., 2011). Also, moderate effects of teaching profiles were found between teachers' individualised support and children's reading interest and skills in Grades 1 and 2 (Kikas et al., 2016). When children were in classrooms with teachers who employed mixed child-centred and teacher-directed practices, their teachers' individualised support enhanced their reading interest, while the effect was reversed when children were in classrooms with teachers who predominantly used child-dominated practices (Kikas et al., 2016).

Since only two ECCOM studies have relied on the person-oriented approach thus far, our understanding of the relationships between teaching profiles and students' academic skills is very limited. Therefore, the present thesis intends to fill this gap by identifying profiles of teaching practices in Finnish and Estonian early primary schools (Studies II and III), and by examining the relationships between profiles of teaching practices and children's reading skills cross-sectionally (Study II) and longitudinally (Study III).

1.5 Finland and Estonia as learning and teaching contexts

1.5.1 Finnish and Estonian educational systems

Finland and Estonia are neighbouring countries with many similarities in culture, language and educational system, but they also have important differences in their political history (Kikas & Lerkkanen, 2011). For example, when Finnish and Estonian children turn seven years of age, they are required to enter primary school. Their compulsory education lasts nine years. Before children start their primary school, one year of pre-primary education is offered. In the latest Programme for International Student Assessment (PISA), both Finnish and Estonian students showed top performances in science, reading and maths (OECD, 2016).

In terms of their national curriculum (Estonian Ministry of Education and Research, 2011; Finnish National Board of Education, 2004, 2014), both Finnish and Estonian basic education curricula share similarities. For example, they have similar underlying values, such as human rights, democracy, environmental sustainability and cultural diversity. The academic demands are also similar for their early primary schools. For example, in both countries, language teaching and initial reading instruction is based on phonics due to their transparent languages (Soodla et al., 2015). Both countries emphasise literacy skills practice in their core curriculum and require 6-7 hours of literacy lessons per week during the first two school years.

However, Estonia and Finland have experienced very different histories, which are still reflected in their educational systems. Estonia was part of the Soviet Union until 1991; therefore, authoritarian management practices are commonly seen in Estonian schools. In their primary schools, teacher-directed methods, e.g., whole-class teaching, teacher-talk and assessing factual knowledge, have been the predominant methods of teaching (Ruus et al., 2008). Although reforms in schools and teacher education institutions have taken place over the last two decades in which constructivist theories of learning and teaching are introduced and valued, changes in values, beliefs and practices take time. For example, empirical studies have found that a teacher's preference for teacher-directed methods depends on her or his age and experience, i.e., teacher-directed practices are favoured more by older and more experienced teachers than by younger teachers (Palu & Kikas, 2007). Whereas in Finland, child-centred practices, adaptation of instruction according to students' skills and individualised support for learning are highly valued and evident in primary school teaching practices (Lerkkanen, Kikas, et al., 2012; Nurmi et al., 2013).

In sum, a long and close relationship between these two small neighbouring countries has had an effect on shared values of education and teacher training. For example, the teacher's learning targets in academic areas are rather similar in both countries (Ojala & Talts, 2007). Therefore, it is reasonable to have studies that include both Finnish and Estonian samples and to examine their data in an integrated fashion (Study I and II).

1.5.2 Learning to read in Finnish and in Estonian

Finnish language and Estonian language have common origins as both are in the Balto-Finnic branch of the Finno-Ugric family of languages, and both have highly transparent orthographies (Dasinger, 1997). Basically, their orthographies are guided by phonemic principles, with each phoneme corresponding to one grapheme (see Seymour, Aro, & Erskine, 2003 for Finnish; Viise, Richards, & Pandis, 2011 for Estonian). In both languages, some phonemes are differentiated by their phonetic speech sound duration (Soodla et al., 2015).

In terms of learning to read, the high transparency of Finnish and Estonian languages is evident in the fact that children's reading skills, e.g., decoding skill and reading accuracy, develop much faster than in deep orthographic lan-

languages such as English and French (Seymour et al., 2003; Viise et al., 2011). One difference between Finland and Estonia is that in Estonia, formal reading instruction begins in kindergarten at age 6, whereas in Finland, instruction begins in primary school at age 7 (Soodla et al., 2015). In Estonia, children are taught to decode and spell simple words already in kindergarten and are expected to know all Estonian letters before they begin primary school (Estonian Ministry of Education and Research, 2011; Soodla et al., 2015). In turn, in Finnish kindergartens, literacy is practised by listening, speaking, discussing and shared reading activities, and no systematic reading instruction takes place (Finnish National Board of Education, 2010).

Studies have found that in Estonia, 84% of kindergarten-age children are able to decode simple words (Jürimäe, 2004), while about 30% of children are decoders at the beginning of primary school in Finland (Lerkkanen, Rasku-Puttonen, Aunola, & Nurmi, 2004). Therefore, in first grade, more emphasis is placed on learning basic reading skills in Finland than in Estonia. Due to the transparency of the language, basic literacy skills are easy to acquire and non-readers typically develop their reading skills faster than their peer readers just after entrance into primary school (Lerkkanen et al., 2004). A recent study (Soodla et al., 2015) has shown that although Estonian children had better reading skills at the beginning of school, by the end of first grade, Finnish children had the same reading-skill level as their Estonian counterparts.

1.6 Aims of the research

The present thesis aimed to investigate the applicability of the ECCOM in Finnish and Estonian early primary schools, and by using a person-oriented approach, examine the predictive associations between teaching practices and children's reading skills.

The thesis consists of three empirical studies. Study I investigated the reliability and validity of the ECCOM (Stipek & Byler, 2004, 2005) in the context of Finland and Estonia in Grades 1 and 3. The teachers' curriculum goals, their working experience and class size were also used as criterion variables.

Study II, using a person-oriented approach, first aimed to identify profiles of teaching practices in Finland and Estonia. Then, the differences between the countries' profiles of teaching practices were compared. Finally, the first graders' and third graders' reading skills, i.e., fluency and comprehension, in different profile classrooms were compared to examine whether different teaching styles contribute differently to reading performance.

Study III examined the role of first grade teaching practice profiles in the development of reading skills among Finnish children from Grades 1 to 3. Children's previous reading skills and their age and gender were also controlled for.

2 METHOD

2.1 Participants and procedure

The three empirical studies included in this thesis used data from three longitudinal studies: the First Steps study (FS; Lerkkanen, Niemi et al., 2006) in Finland, and the Kindergarten-School Study (KISS; see Kikas et al., 2014) and the Reading Study (READ; see Soodla et al., 2015) in Estonia.

The FS study is an extensive age-cohort study from kindergarten to grade 9 until the end of comprehensive school, conducted during the years 2006–2016. About 2,000 children from three medium-sized towns and one less urban municipality in Finland has been followed. The children's teachers (about 160) and parents (about 3,500) also participated in the study. The average age of the Finnish children was 7.15 years ($SD = 0.3$) when they entered Grade 1.

The KISS study followed children from kindergarten until the end of comprehensive school (2006–2017). From Grade 1 to Grade 3, where the present thesis focused, there were 864 students (52% boys) from 53 classrooms in 33 schools from both urban and rural areas of Estonia. The average age of the KISS sample children was 7.46 years ($SD = 0.52$) when they entered Grade 1.

In the READ study, 433 first graders (49% boys) from 22 classrooms in three municipalities in different parts of Estonia were followed until Grade 2. Data were collected in 2011–2013. The average age of the READ sample children was 7.34 years ($SD = 0.32$) when they entered Grade 1.

In both countries, the researchers first contacted school principals and teachers to inform them about the project and to invite them to participate. Parents were asked to sign an informed consent for their children's participation. The children's and their parents' background information was measured at the beginning of each project.

Study I

In Study I, sub-samples, i.e., observed teachers, were chosen from the FS study in Finland, and the KISS and READ study in Estonia (total of 91 teachers from Grade 1 and 70 teachers from Grade 3). In the Finnish sample, 32 first-grade teachers (28 female, 4 male) and 33 third-grade teachers (24 female, 9 male) were observed on a voluntary basis in the spring semester in 2008 and 2010, respectively. In the sample of observed classrooms, seven teachers were the same at the two measurement points.

In the Estonian sample, 38 first-grade teachers were observed in 2008 (KISS) and 21 first-grade teachers in 2012 (READ). Thirty-seven teachers from the KISS study were observed in Grade 3. Most of them ($n = 31$) were the same teachers who were observed also in Grade 1. Only six of the observed teachers were new ones in Grade 3.

Observations were conducted in classrooms during the spring term of the first and third grades (February–March) by experienced researchers (with at least master's degree in education or psychology). Each observation session lasted three lessons, i.e., at least half a school day, and began at the beginning of the school day. At least one literacy lesson was observed in each classroom.

Study II

The same observed teachers in Study I were included also in Study II. In total, 91 first-grade (32 Finnish and 59 Estonian) and 70 third-grade (33 Finnish and 37 Estonian) teachers were included in the study.

Students from the observed classrooms were included in Study II from Grade 1 (total of 1,212, students) and Grade 3 (total of 958 students). The reading skills of the Finnish children (359 in grade 1 and 502 in grade 3) were assessed at the beginning of the fall term of Grade 1 (September, 2007) and at the end of Grades 1 (April, 2008) and 3 (April, 2010). The reading skills of the Estonian children of the KISS study (456 in both grades) were assessed at the beginning of Grade 1 (September–October, 2007) and at the end of Grade 3 (April–May, 2010). The reading skills of the Estonian children of the READ study (397 in Grade 1) were assessed at the beginning of Grade 1 (September–October, 2011) and at the end of Grade 1 (April–May, 2012).

Study III

In Study III, a sub-sample of the FS study in Finland was used. The sample included 32 teachers who were observed in Grade 1 and 359 children who were followed from Grades 1 to 3. The Finnish children's reading skills were assessed at the beginning of Grade 1 (September, 2007) and at the end of Grades 1, 2, and 3 (April).

2.2 Measures and statistical methods

A summary of the variables and statistical methods used in Studies I, II and III is presented in Table 2. More detailed descriptions of the measures are available in the original papers (see Studies I, II, and III).

Study I. Finnish and Estonian first- and third-grade classrooms were observed at Spring term using the ECCOM (Stipek & Byler, 2004, 2005). The teachers' curriculum goals for reading, writing and maths were measured in the Finnish sample based on a questionnaire used by Stipek and Byler (2004). The questions were formulated according to descriptions in the National Core Curriculum for Basic Education in Finland (2004). In both countries, teachers were asked to indicate their work experience as a teacher. In addition, the number of students in the classroom during each observation session was recorded.

Study II. Finnish and Estonian first- and third-grade classrooms were observed at Spring term using the ECCOM (Stipek & Byler, 2004, 2005). In Grade 1 FS sample and READ sample, and Grade 3 FS sample and KISS sample, reading fluency and comprehension were measured using a group-administered subtest of the standardised reading test battery (ALLU – Reading Test for Primary School; Lindeman, 1998). In the FS Grade 1 sample, the initial phoneme identification test (ARMI – A tool for assessing reading and writing skills; Lerkkanen, Poikkeus, & Ketonen, 2006) was also used. However, in Grade 1, different measures of reading accuracy were used in the Finnish FS sample and the Estonian KISS sample. The KISS sample measured reading fluency in terms of phoneme-grapheme correspondence and reading accuracy. In both countries, the children's mothers were asked to indicate their level of education.

Study III. Finnish first-grade classrooms were observed at Spring term using the ECCOM (Stipek & Byler, 2004, 2005). Reading fluency was measured using ALLU (Lindeman, 1998) and reading comprehension was measured using The Test of Sentence Reading Efficiency and Comprehension (TOSREC; Wagner, Torgesen, Rashotte, & Pearson, 2009) in Grades 1, 2 and 3.

TABLE 2 Overview of the empirical studies

Study	Sample	Variables	Statistical methods
Study I Validating the early childhood classroom observation measure in first- and third-grade classrooms	91 observed first-grade teachers (32 Finnish, 59 Estonian) 70 observed third-grade teachers (33 Finnish, 37 Estonian)	Observed teaching practices in Grade 1 and Grade 3 by the ECCOM Teacher curriculum goals Teacher work experience Class size (number of students)	Confirmatory Factor Analysis Pearson correlations
Study II Profiles of teaching practices and reading skills at the first and third grade in Finland and Estonia	91 observed first-grade teachers (32 Finnish, 59 Estonian) 70 observed third-grade teachers (33 Finnish, 37 Estonian) 1,212 first-grade students (359 Finnish, 853 Estonian) 958 third-grade students (502 Finnish, 456 Estonian)	Observed teaching practices in Grade 1 and Grade 3 by the ECCOM Reading fluency in Grade 1 (fall and spring) and Grade 3 (spring) Reading comprehension in Grade 1 and 3 (spring) Child's age and gender Mother's level of education Teacher's age Teacher's work experience Class size (number of students)	Latent Profile Analysis Cross-tabulation Analysis ANCOVA
Study III The longitudinal associations of first grade teaching with reading skills development from grade 1 to 3	32 observed Finnish first-grade teachers 359 Finnish students across grades 1 and 3	Observed teaching practices in Grade 1 by the ECCOM Reading fluency in Grade 1 (fall and spring) and Grade 3 (spring) Reading comprehension in Grades 1 and 3 (spring) Child's age and gender	Latent Profile Analysis Repeated measures ANCOVA

3 OVERVIEW OF THE EMPIRICAL STUDIES

3.1 Study I: Validating the early childhood classroom observation measure in first and third grade classrooms

This study investigated the reliability and validity of the ECCOM (Stipek & Byler, 2004, 2005) in Finnish and Estonian first- and third-grade classrooms. First, the structure of the ECCOM was examined by testing whether it is in accordance with a three-factor model, i.e., climate, management and instruction, or a one-factor model for each teaching practice, i.e., child-centred, teacher-directed and child-dominated. Second, reliabilities were examined at the levels of both items and scales. Third, concurrent validity of the ECCOM was investigated by examining the relationship between the ECCOM scores and teachers' self-reported curriculum goals, work experience and class size.

The confirmatory factor analysis showed that the three-factor model for the domains of teaching practices, i.e., climate, management and instruction, displayed good or acceptable model fit for each teaching practice, i.e., child-centred, teacher-directed and child-dominated. The three-factor model was consistently better than the one-factor model for both grades in terms of model fit, though there were high correlations between the three factors.

The analyses indicated that the ECCOM had good inter-rater reliabilities (.60 - .86; Hallgren, 2012) for both grades. Internal consistencies (Cronbach alphas) were good for each factor (.72 - .93) and for overall dimensions (.94 - .97) for both grades.

In addition, the ECCOM had good item reliabilities. In the first grade, the latent factors of child-centred practices explained between 20% and 90% of the variance in items, suggesting that all the rated items had good reliability (> 30%; Bollen, 1989), except for 'choice of activities' and 'student engagement'. The latent factors of teacher-directed practices in the first grade explained between 30% and 76% of the variance in items; the latent factors of child-dominated practices explained between 41% and 88% of the variance in items, which again suggests that all of the rated items had good reliability. In the third grade, be-

tween 50% and 91% of the variance in items were explained by the latent factors of child-centred practices, between 50% and 91% by teacher-directed practices, and between 13% and 91% by child-dominated practices. These suggested that all of the items, except for 'support for communication skills' and 'literacy instruction' in child-dominated practices, had quite good reliability. Furthermore, except for those items, almost all ECCOM items had high standardised factor loadings, which suggests that they had high construct validity.

The findings also provided some evidence for concurrent validity of the ECCOM scales. Each teaching practice was associated with teachers' curriculum goals in a meaningful way. For example, in the Finnish first-grade sample, child-centred teaching was positively associated with teachers' curriculum goals in 'advanced reading and writing skills' and 'working skills', while teacher-directed teaching was negatively related to those goals. Teachers' work experience was negatively associated with child-centred practices among Finnish third-grade teachers and with child-dominated practices among Estonian first-grade teachers.

Furthermore, independent samples *t*-tests were run to test the two countries' differences in their teaching practices. The results showed that Finnish teachers scored lower on the child-dominated dimension than Estonian teachers, in both first and third grades.

Overall, the results suggested that the ECCOM is a reliable and valid instrument for measuring teaching practices in early primary school classrooms, and can be used in the context outside the US, for example, in Finland and Estonia.

3.2 Study II: Profiles of teaching practices and reading skills at the first and third grade in Finland and Estonia

This study used a person-oriented approach to first identify the profiles of teaching practices, i.e., teaching styles, in Finnish and Estonian first- and third-grade classrooms. It was then used to examine to what extent the children's reading skills, i.e., fluency and comprehension, who were taught by teachers using different teaching styles, differed. Specifically, the study aimed to answer three questions: (1) What kinds of profiles of teaching practices, i.e., teaching styles, can be identified in authentic classroom settings in Grade 1 and Grade 3? (2) To what extent do Finnish and Estonian teachers differ in their use of teaching styles in Grade 1 and Grade 3? (3) Do children whose teachers use different teaching styles differ in their performance in reading fluency and reading comprehension in Grade 1 and Grade 3?

Using latent profile analysis, in a sample of first-grade teachers, four profiles of teaching were found: (1) Teachers using the child-centred style comprised 43% (39 teachers) with the highest means for child-centred practices; (2) Teachers using predominantly the teacher-directed style comprised 11% (10

teachers) with high means for teacher-directed practices and low means for the other teaching practices; (3) Teachers using the child-dominated style comprised 11% (10 teachers) with the highest means for child-dominated practices; and (4) Teachers using a mixture of child-centred and teacher-directed styles (mixture teaching style) comprised 35% (32 teachers) with nearly equal means for both child-centred and teacher-directed practices. For the third-grade teachers, one additional profile was found, namely, teachers using the extreme-child-centred style, comprising teachers with extremely high mean levels for child-centred practices.

In addition, differences in teaching styles between Finland and Estonia were compared. In the first grade, the Estonian sample contained significantly more teachers who used a child-dominated style than the Finnish sample. In the third grade, the Finnish sample contained more teachers who deployed the child-centred style than the Estonian sample. Moreover, the Estonian sample contained more teachers who deployed the extreme-child-centred style than the Finnish sample.

Finally, reading skills, i.e., fluency and comprehension, were compared between children whose teachers used different teaching styles, after controlling for previous reading fluency, child's age, gender, and mother's level of education. In the first grade, children taught by teachers in the child-centred style profile scored higher in *reading fluency* than children taught by teachers in the profiles of the mixture teaching style and the child-dominated style. Children taught by teachers in the mixture teaching style profile performed better in *reading fluency* than children with teachers in the profile of the child-dominated style. Secondly, children whose teachers were characterised by the child-centred style performed better in *reading comprehension* than children taught by teachers in the child-dominated style.

In the third grade sample, children taught by teachers in the child-centred style profile had higher scores in *reading fluency* than children taught by teachers in the teacher-directed style, extreme-child-centred style and the child-dominated style profiles. Children whose teachers belonged to the mixture teaching style profile had higher scores in *reading fluency* than children taught by teachers in the teacher-directed style profile. Moreover, children whose teachers belonged to the child-centred style, extreme-child-centred style and the mixture teaching style profiles had higher scores in *reading comprehension* than children whose teachers belonged to the child-dominated style profile.

Overall, the findings of Study II indicated four profiles of teaching practices in Grade 1: the child-centred style; the teacher-directed style; the child-dominated style; and a mixture of the child-centred and the teacher-directed style. In Grade 3, an additional profile, the extreme-child-centred style, was found. In addition, the results of the study found that more Estonian than Finnish teachers applied the child-dominated style in Grade 1 and the extreme-child-centred style in Grade 3. In general, children taught by child-centred teachers showed the highest reading skills, whereas children taught by child-dominated teachers showed the lowest skills.

3.3 Study III: The longitudinal associations of first grade teaching with reading skills development from grade 1 to 3

Study III examined the longitudinal associations between teaching practices profiles, i.e., teaching styles, and children's reading skills. By using the Finnish sample, the following research questions were investigated: (1) What kinds of profiles of teaching practices can be identified in Finnish Grade 1 classrooms? and (2) Does the development of children's reading fluency and comprehension differ depending on their teacher's teaching style in Grade 1?

By using latent profile analysis, three profiles of teaching practices were identified. The first and largest profile, i.e., teachers characterised by use of the mixture teaching style, comprised 63% of teachers (20 teachers) with nearly equal means on both child-centred and teacher-directed practices. The second profile, i.e., the users of the child-centred style, comprised 22% of teachers (7 teachers) with the highest means in child-centred practices and low means on the other two teaching practices. The third profile, i.e., the users of the teacher-directed style, comprised 15% of teachers (5 teachers) with high means on teacher-directed practices and low means in the other teaching practices.

Next, ANCOVAs with repeated measures were conducted to compare the effect of Grade 1 teaching styles on reading fluency and reading comprehension across Grades 1 and 3. The results showed that the children whose teachers deployed a mixture teaching style in Grade 1 had consistently higher *reading fluency* than those taught by teachers deploying the teacher-directed style. For reading comprehension, the results showed that children whose Grade 1 teachers used the child-centred style and the mixture teaching style performed better in *reading comprehension* than those whose teachers deployed the teacher-directed style. Moreover, the *reading comprehension* skills of children taught by Grade 1 teachers employing the child-centred style and the mixture teaching style also developed faster in their reading comprehension skills than those in the teacher-directed style across Grades 2 and 3.

Overall, the findings suggest that three profiles were found in Finnish Grade 1 classrooms: child-centred style, teacher-directed style, and a mixture of child-centred and teacher-directed styles. Further, in general, children whose Grade 1 teachers used a mixture of child-centred and teacher-directed styles showed better and faster reading skills development than those taught by Grade 1 teachers using only the teacher-directed style.

4 GENERAL DISCUSSION

Previous studies have shown that the teaching practices teachers employ in the classroom are important for students' learning and achievement in the early primary school years (e.g., Curby, Rimm-Kaufman, et al., 2009; Hamre & Pianta, 2005; Perry et al., 2007; Stipek et al., 1998). The present thesis first examined the reliability and validity of an observational tool for teaching practices, i.e., the ECCOM (Stipek et al., 2004, 2005). The findings indicated that the ECCOM is a reliable and valid tool for measuring teaching practices in Finland and Estonia in the early primary school years. In addition, since most previous research has used a variable-oriented approach, the present thesis also made an effort to identify different profiles of teaching practices, i.e., teaching styles, that teachers use. The child-centred style, teacher-directed style, child-dominated style, a mixture of child-centred and teacher-directed styles (mixture teaching style), and extreme-child-centred style (only in Grade 3) were identified. The results showed further that the child-centred style and the mixture teaching style were the most beneficial to reading skills development, whereas the child-dominated style showed the least benefits.

4.1 The reliability and validity of the ECCOM in Finland and Estonia in early primary school

The first aim of the present thesis was to examine the reliability and validity of the ECCOM in Finnish and Estonian early primary school classrooms (Study I). Although Lerkkanen et al. (2012) have investigated the validity and reliability of the ECCOM in Finnish and Estonian kindergartens, the applicability of ECCOM in the early primary school years has not been previously examined. Stipek and Byler, the developers of the measure, have validated and used the ECCOM in kindergarten and first grade classrooms in the US (Stipek & Byler, 2004).

Our results provided evidence that the ECCOM is a valid and reliable instrument for investigating teaching practices in Finnish and Estonian primary school classrooms up to third grade. In line with the study by Stipek and Byler (2004) in US kindergarten and first grade, and Lerkkanen et al.'s (2012) study in Finnish and Estonian kindergarten settings, the findings of inter-rater reliabilities, internal consistencies, and item reliabilities were good for all the domains (subscales: management, climate and instruction) in each ECCOM teaching practice (child-centred, teacher-directed and child-dominated).

The findings concerning the factor structure of the ECCOM in first and third grade classrooms in Finland and Estonia showed that the three-factor model (management, climate and instruction) does indeed fit the data well – not only for each teaching practices (child-centred, teacher-directed and child-dominated) but also for both grades when compared to the one-factor model. This result suggests that the ECCOM is a multi-componential instrument that can be used not only with young children but also in early primary school classrooms. However, the fact that the three factors correlated very highly provided evidence for the interrelated nature of management, climate and instruction in the primary school context. In other words, efficient management and instruction are typically related to a warm and supportive climate in the classroom. Previous ECCOM studies in Finnish and Estonian kindergartens have shown that management, climate and instruction are highly associated (Lerkkanen et al., 2012). Another possible explanation is that although they theoretically represent different practices, it is difficult for observers to tease these dimensions apart while observing them in actual classroom situations. These findings suggest that the ECCOM can be used in two ways: either as a three-factor model or as one general factor. The decision concerning how to use the ECCOM depends on the research questions. For example, if researchers are interested in the relationship between factors of teaching practices and child outcomes, it may be better to use the ECCOM in a multi-factorial way to examine which aspects of teaching practices are most influential. If they use the ECCOM more as a background or control variable, then a total score might be enough.

Some evidence of concurrent validity of the ECCOM in Finnish and Estonian early primary schools was also found. For example, Finnish Grade 1 teachers' goals in 'advanced reading and writing', 'problem-solving skills' and 'working skills' showed positive associations with almost every subscale of child-centred practices, and negatives correlation with most subscales of teacher-directed practices. These findings are understandable because teachers who deploy child-centred practices typically rely on a constructivist method of teaching, for example, by promoting high-order thinking skills in their students (Stipek & Byler, 2004; Stipek et al., 1995). In turn, teachers who typically deploy teacher-directed practices are more likely to emphasise factual knowledge of basic skills, and use drills or rote learning (Stipek & Byler, 1997, 2004; Stipek et al., 1995).

The present thesis also found that the domain of 'instruction' within child-dominated practices was negatively correlated with curriculum goals, 'basic

reading and writing' and 'problem-solving skills, in first grade, yet positively associated with 'problem-solving skills' in third grade. One possible explanation for this grade-level difference is that teachers who deploy child-dominated practices in the third grade are more likely to give children autonomy in the classroom, maybe because the children are older and more capable of independent in their school work. In turn, in the first year of primary school, child-dominated teachers are specifically concerned about how children adapt to school than about their learning of basic literacy and math skills. In later school years, those teachers may also begin to focus more on students' attainment and academic achievement (NICHD ECCRN, 2002, 2005).

Further, the present thesis also showed that teaching experience was negatively correlated with child-centred practices, but positively correlated with teacher-directed practices among the Finnish third-grade teachers. These results suggest that, in Finland, child-centred teaching is more typically used by less-experienced teachers, while teacher-directed practices are more common among teachers with more years of experience. These results echo previous studies, which have suggested that the longer the teacher's teaching experience, the less time teachers spend on non-academic activities (NICHD ECCRN, 2005). Another reason for this result might be that teachers with more years of experience have received more traditional teacher training. It is typical that recent teacher education for younger teachers in Finland and Estonia is deemphasising teacher-directed practices and emphasising child-centred practices (Kikas & Lerkkanen, 2011; Lerkkanen et al., 2016; Palu & Kikas, 2007).

In addition, significant associations between teaching experience and teaching practices for Estonian Grade 1 and Grade 3 teachers were found: the less experienced teachers were more likely to use child-dominated practices. One possible reason for this finding is that less-experienced teachers have misunderstood the child-centred practices in their training. Therefore, they over-emphasised the children's role in the learning, and were passive in their role to organise classroom practices. The study by Lerkkanen et al. (2012) also found that, at the kindergarten level, child-dominated practices were negatively associated with teaching experience among teachers in Estonia. In the current study, no significant associations were found between the class size and teaching practices in first- or third-grade classrooms. This result is reasonable because class sizes are typically small in both Finland and Estonia and the variations of class sizes are minimal in both country (OECD, 2014).

4.2 Profiles of teaching practices in early primary school

In authentic classroom settings, some of the teachers may use a combination of different practices instead of employing only one practice (Kikas et al., 2016; Pressley et al., 2003; Rasku-Puttonen et al., 2011). The present thesis used the person-oriented approach in order to test this notion, and to identify different patterns of teaching practices (Studies II and III).

In line with Kikas et al. (2016) and Rasku-Puttonen et al. (2011), for the Finnish and the Estonian sample, the present thesis identified four profiles of teaching practices in Grade 1 (Study II): the child-centred teaching style, teacher-directed teaching style, child-dominated teaching style and a mixture of teaching styles. One additional profile was found in Grade 3: the extreme-child-centred teaching style. The findings further showed that the child-centred style (if counted together with the extreme-child-centred style) represented the largest group of teachers, which was almost half of all participating teachers.

These findings are in accordance with the recent core curricula and teacher education practices implemented in both Finland and Estonia (Kikas & Lerkkanen, 2011; Sahlberg, 2011; Vitikka, Krokfors, & Hurmerinta, 2012). The national core curricula of both countries emphasise teacher sensitivity to students' individual differences in competence and interests, respect for students' perspectives, a warm and supportive classroom climate, and collaboration and interaction in the classroom (Estonian Ministry of Education and Research, 2011; Finnish National Board of Education, 2004, 2014). Moreover, pre-service teacher training in both countries reflects the constructivist theory of learning and teaching. Studies conducted among Finnish teachers and children have reported empirical findings, suggesting that the poorer a child's reading skills were in Grade 1, the more instructional support and individual attention the teacher subsequently gave to that particular child (e.g., Kiuru et al., 2015; Nurmi et al., 2013). For these reasons, it is reasonable that most of the teachers were found to deploy child-centred teaching practices. However, the emergence of the extreme-child-centred style in Grade 3 may reflect the fact that some teachers over-emphasise child-centred practices over other teaching practices.

In addition, the results of the present thesis showed that about one-third of the teachers deployed the mixture teaching style in Grades 1 and 3. This result is in line with previous studies conducted in kindergarten (Rasku-Puttonen et al., 2011) and in primary school (Kikas et al., 2016). Both studies found that teachers in the profile of the mixture teaching style represented about 30% of all teachers. The present results correspond with the proposition by Pressley et al. (2003) that, in an authentic classroom, teaching practices may involve both direct transmission and constructivist elements, practices they called 'balanced teaching'. The high proportion of Finnish teachers using the mixture teaching style is also in accordance with the objectives of the National Core Curriculum for Basic Education, which emphasises flexibility in the use of teaching approaches (Finnish National Board of Education, 2004, 2014).

4.3 Differences between Finland and Estonia in teaching practices and styles

Although there are many similarities in terms of educational system, curriculum (Kikas & Lerkkanen, 2011) and language (Dasinger, 1997) between Finland and Estonia, both countries have their unique history. Therefore, one aim of the present thesis was also to compare the differences between Finnish and Estonian teachers in their use of teaching practices (Study I) and teaching styles (Study II).

The present thesis found (Studies I and II) that Estonian teachers used more child-dominated practices and the child-dominated teaching style compared to Finnish teachers in Grade 1. No country differences were found in Grade 3. In addition, none of the Finnish teachers were found to use the child-dominated style in Grade 1. One reason for these differences between Estonia and Finland is related to the fact that Estonian children are taught decoding already in kindergarten (Soodla et al., 2015), whereas systematic reading instruction in Finnish schools begins in the first grade. It is likely that Estonian children need less support than Finnish children in acquiring basic reading skills in Grade 1, as Estonian children are expected to be able to decode before entering primary school. Therefore, the use of the child-dominated style by some Estonian teachers might be related to the children's higher level of reading skills in Estonian first-grade classrooms in the beginning of their schooling (see also Kikas et al., 2014). Later, in Grade 3, the average support needed in the classroom by Finnish and Estonian students becomes similar when also Finnish children have acquired fluent reading skills.

Furthermore, in Study II, it was found that more Finnish teachers deployed the child-centred style, whereas more Estonian teachers deployed the extreme-child-centred style. Together with the finding that Estonian teachers used the child-dominated style more in Grade 1, it is possible that the Estonian teachers have somehow misinterpreted the meaning of child-centred practices. Given that Estonian teachers had mainly experienced teacher-directed practices during their own school days and teacher training (Kikas & Lerkkanen, 2011), they might have interpreted child-centredness as letting the children decide for themselves how to study. Therefore, Estonian teachers may be hesitant to set clear rules and limitations for the children in classroom contexts. The Estonian teachers may also exaggerate the benefits of constructivist practices and the importance of granting children autonomy, and, consequently, they use extreme-child-centred practices more often. By contrast, the Finnish teachers tend to be more flexible in their classroom practices. For example, Finnish teachers have been found to adapt their instruction according to the children's characteristics and performance (Nurmi et al., 2013).

The history of being part of the Soviet Union for Estonians and the transformation toward a democratic society afterwards may have led the Estonian teachers in a conflictual way when deploying teaching practices. On one hand,

they may emphasise their authoritarian role in the classroom. On the other hand, they are expected to use more 'new and advanced' ways of teaching. However, since they do not have enough experience in child-centred practices, they might easily go to the extreme end of child-centred teaching. The results of the present thesis showed that Estonian teachers used the extreme-child-centred style and child-dominated style more frequently than their Finnish counterparts.

4.4 Teaching styles and reading skills

It has been shown that teaching practices and teacher-child interactions influence children's reading skills (Cadima et al., 2010; Hamre & Pianta, 2001; Perry et al., 2007; Stipek et al., 1998, 1995). However, most of the previous studies have used a variable-oriented approach to investigate this possibility. The present thesis used a person-oriented approach to examine the predictive role of teaching profiles, i.e., teaching styles, in children's reading skills in their early primary school years.

In general, the results of the present thesis showed that children who were taught by a teacher deploying the child-centred style showed the highest performance in reading fluency and reading comprehension (Study II), and also faster reading development (Study III). These findings suggest that in classrooms where children were given more room to communicate and cooperate with others, to be autonomous, and to develop their understanding, children showed better reading performance. These results are in line with previous studies that have shown a link between child-centred teaching practices and reading fluency (Kikas et al., 2017; Lerkkanen et al., 2016; Perry et al., 2007) and reading comprehension (Block et al., 2009; Kikas et al., 2017). Studies from Finland (Lerkkanen et al., 2016), Estonia (Kikas et al., 2017) and the US (Perry et al., 2007) have demonstrated that child-centred practices promoted first graders' reading skills and interest towards reading already at kindergarten (Lerkkanen et al., 2012). One experimental study (Block et al., 2009) compared six instructional approaches and their consequences for reading comprehension in primary school. The results showed that children placed into constructivist approach programmes, i.e., individualised schema-based learning, conceptual learning and transactional learning, had better reading comprehension than those in the didactic approach programmes, i.e., workbook practice and traditional instruction, across Grade 2 to Grade 6. Since teachers who use child-centred practices have been shown to place more emphasis on high-order skills as compared to teacher-directed teachers (Stipek & Byler, 2004), it is plausible that children in child-centred classrooms are likely to have better reading comprehension.

However, the findings of the present thesis showed that children whose teachers deployed the extreme-child-centred style had lower reading fluency than those taught by teachers using the child-centred style in Grade 3 (Study II). These results suggest that, although the child-centred teaching style positively contributes to children's reading fluency, the extreme end of this style is not

anymore beneficial to reading fluency. It should be noted that the teachers characterised as the extreme-child-centred style strongly emphasised child-centred practices and, therefore, scored much lower in the other practices. However, the teachers characterised as the child-centred style had medium scores in child-centred practices along with low to medium scores in the other practices. One reason for the fact that the extreme-child-centred style was not beneficial for children's reading fluency may be that the teachers who employed this style also showed a very low level of teacher-directed practices. In other words, a certain amount of teacher-directed practices are crucial for children in the early phases of reading skills development. Some previous studies have also shown that teacher-directed practices (Stipek et al., 1995) are beneficial for basic reading skills and for struggling readers in particular (Hauser-Cram et al., 2003).

The results of the present thesis also showed that children who were taught by teachers using the child-dominated style had the lowest reading fluency and comprehension skills (Study II). Previous research has demonstrated that instruction with minimal guidance often fails to produce effective learning (for a review, see Kirschner, Sweller, & Clark, 2006). These results are understandable in that the teacher's role in child-dominated practices is minimal when compared to child-centred and teacher-directed practices. The teachers using the child-dominated style tend to give their students full autonomy; presumably, they believe that students can construct knowledge by themselves and study according to their own interests (Kikas et al., 2016; Stipek & Byler, 2005). Child-dominated teaching practices do not seem to pay attention to children's individual needs and individual differences in learning and skills development (Kirschner et al., 2006), and teachers using these practices do not adapt their instruction or support to meet the needs of each individual child in the classroom.

The results of the present thesis also showed that children in teacher-directed style classrooms showed the poorest level of reading fluency in Grade 3, while this was not the case in Grade 1 (Study II). Stipek et al. (1995, 1998) found that kindergarteners and first graders under teacher-directed programmes had better reading skills, e.g., decoding, than other students. However, the present thesis did not find that children taught by teachers using the teacher-directed style would show better reading fluency in Grade 1 than those taught by the child-dominated style. One reason may be due to the transparent orthography of both the Finnish and Estonian languages. It is plausible that in countries with a transparent language, children usually learn to read faster (Seymour et al., 2003) without too much emphasis on drills and decoding practice, which are typical of teacher-directed teaching practices.

The results of the present thesis showed further that the children whose teachers employed the mixture teaching style had the highest reading skills in Grade 3 (Study II) and showed faster reading skills development (Study III). It may be that combining the potential benefits of constructivist practices and didactic practices can provide flexible and effective support for children with different needs, and still create a warm classroom atmosphere and climate. Using a

mixture of child-centred and teacher-directed practices creates a learning context in which teachers do not only take children's initiatives and choices into account and, by doing so, promote their autonomy, but they also use suitable instructional activities and emphasise the facts and basic skills. Such combinations provide children with both autonomy support and a warm classroom climate, as well as a structure for learning. For example, Jang et al. (2010) showed that students demonstrated the highest engagement in learning activities when the teacher provided both autonomy support and a structure for learning. Another study by Kiuru et al. (2012) found that children whose teachers demonstrated high affection and behavioural control (authoritative teaching) showed faster spelling skills development across Grades 1 to 2 than other children. As little observational research has examined the use of different combinations of teaching practices, more studies on the topic are needed.

Overall, the results suggest that a combination of teaching practices and use them flexible depending on students' needs is more beneficial for children's reading skills development than an extreme emphasis on a specific teaching practice. The long tradition of academic debate over whether didactic or constructivist teaching is the superior teaching method (Foorman, 1995; Gage, 2009; Tobias & Duffy, 2009) has made the choice of teaching practices challenging for educational practitioners. Our results suggest that the answer is not so simple. In fact, both child-centred practices and teacher-directed practices have their benefits and can be used to complement each other. Effective teaching, as argued by Pressley et al. (2003) and Good et al. (2009), requires flexible use of a variety of methods, depending on the instructional goals and needs of the student. The studies included in the present thesis are among the few efforts to provide empirical support for this claim. It should also be noted that the associations between teaching practices and reading skills may be also be highly dependent on each child's skill level, because teachers need to adapt their practices according to the child's individual needs in the classrooms. However, further studies are needed to investigate this in more detail.

4.5 Practical implications

The results of the present thesis provide several practical implications. First, the results confirm earlier findings about the beneficial effects of teachers' child-centred style on reading skills and the development of these skills (e.g., Lerkkanen et al., 2016; Perry et al., 2007) in the early primary school years. The results remind the teachers and teacher educators that they should continue their efforts to support the use of child-centred practices in classrooms. Child-centred practices, regarding children's interests and needs, pursuing the understanding, and involving cooperation and conversation between teachers, children and peers, are beneficial for children's learning outcomes.

Second, the results remind the teachers and teacher educators that there is a need to be aware of the different effects of the child-centred style and the ex-

treme-child-centred style on reading skills. One must be cautious, for example, to use the extreme-child-centred style. The results of the present thesis showed that children whose teachers used the extreme-child-centred style showed lower reading fluency than children whose teachers used the child-centred style in Grade 3. This means that the extreme form of child-centred practices does not provide additional benefits for children's reading fluency. Therefore, teacher training needs to be more precise and give concrete examples of the differences between child-centred practices and extreme-child-centred practices, and their specific effects.

Third, in respect to teacher education, extra effort should be invested to introduce the possible negative consequences of the child-dominated style, especially for the children with low academic skills (Kikas, Peets, & Hodges, 2014). In the present thesis, it was found that the child-dominated style consistently produced the lowest progress in reading compared to the other practices. Although the idea of giving the child full autonomy seems appealing to some teachers, the results showed that this teaching style is detrimental for the development of reading skills, especially at the lower primary school level. In addition, since some teachers and educators may misinterpret child-dominated practices as one type of constructivist learning (Phillips, 1995), more precise and concrete examples of different teaching practices should be provided in teacher training.

Fourth, one promising finding of this thesis was that the use of a combination of child-centred and teacher-directed teaching styles contributed positively to children's reading development. It is possible, in fact, that such a combination provides both a warm classroom climate and autonomy support, as well as a structure for learning simultaneously, which have all been found to be beneficial for learning (Jang et al., 2010; Kiuru et al., 2012). In addition, as argued earlier by Pressley et al. (2003) and Good et al. (2009), effective teaching requires flexible use of a variety of methods depending on the instructional goals and needs of the individual student. Therefore, the results of the present thesis suggest that teachers should use their teaching practices in various ways combining warm classroom interactions and autonomy support with guidance, direction and structure for children's learning.

Fifth, the associations between teaching styles and students' academic skills found in the current thesis also imply that ECCOM can be used as a tool for teacher professional development. Since mixture teaching style, i.e., combining child-centred and teacher-directed practices, showed the most promising benefits for children's reading skills development, teacher educators and policy makers could include more practical examples of this combination in teacher education and teacher professional programs. The stakeholders in teacher training programs (both pre-service and in-service) can also use the ECCOM in teachers' self-reflection on their own beliefs and teaching practices because it provides detailed and in-depth descriptions for each teaching practice.

Finally, one possible suggestion for Estonian educators is placing the focus on child-centred practices and de-emphasising the use of child-dominated prac-

tices in their teacher training. In the present thesis, it was found that Estonian teachers used the child-dominated style more in Grade 1 and the extreme-child-centred style in Grade 3, and employed less of the child-centred style in Grade 3. Since the results of the present thesis showed that child-dominated practices tend to lead to negative effects on reading development and that child-centred practices tend to be beneficial for reading skills, there is an evident need to further develop Estonian teacher training.

4.6 Limitations

The present thesis also has some limitations that need to be considered. First, the sample of the observed teachers was relatively small (91 Grade 1 and 70 Grade 3 teachers in Studies I and II; 32 Grade 1 teachers in Study III). This limited the power of the statistical testing and decreased the generalisability of the findings. However, because it is usually challenging to involve teachers to observational studies this amount of teachers was satisfactory and large enough to be able to answer to the research questions of the present thesis. Second, teachers chose to attend classroom observations on a voluntary basis. Although the present thesis did not find significant differences between teachers who chose to participate in the observation and teachers who chose not to participate, it is possible that, for example, only teachers with enough self-confidence decided to attend observations. Therefore, the results should be interpreted with caution due to the relatively small sample size and possible selectivity.

Third, although two observers rated each observed classroom, the present data for the observed teaching practices only consisted of one-day observations, which meant that it was hard to verify the test-retest reliability of observational practices. Therefore, it is important to investigate the variability of teaching practices in future studies. However, it is important to note that in Finland, two days were observed but the data used in the present thesis included only one day's data, because this was the case in Estonia. The Finnish data were found to show high stability between the two days of observations.

Fourth, in Study I, the self-reported variables were used as the criterion indicators for the concurrent validity of the ECCOM. It would have been better to use another standardised observation instrument for this purpose. Salminen et al. (2012) found that Finnish kindergarten teachers who had been rated as providing high-quality teacher-child interactions, e.g., high emotional support, classroom organisation, and instructional support, according to CLASS, also evidenced high scores in child-centred practices evaluated by the ECCOM. As an additional limitation, in the Estonian sample, only teaching experience and class size were used as criterion variables.

Fifth, although the study focused on the development of reading skills, the teaching practices observed were not only limited to literacy lessons. The observation session lasted at least half a day and included at least one literacy lesson, but teaching in other subjects was observed as well. As Stipek and Byler

(2004) have noted, the ECCOM focuses on the general nature or characteristics of teaching practices in the classroom during the school day rather than on its contents. Therefore, one must be cautious when making conclusions about the effective reading instruction.

Sixth, in Study II, the Grade 3 Finnish sample and the Estonian sample did not have the exact same measures of reading skills as Grade 1. Therefore, a composite score of Grade 1 reading skills was created by standardising the somewhat different reading measures which were used in the samples. Again, it would have been better to also have the identical measures for both samples in Grade 1 (see Soodla et al., 2015).

Seventh, in Study III, teaching styles were measured only in Grade 1, whereas children's reading skills were measured annually from Grade 1 to Grade 3. Consequently, the study focused on the role of teaching styles of first-grade teachers in the development of children's reading skills a few years later than the teaching styles were measured (see also Pakarinen et al., 2017). However, future studies might benefit from investigating teaching practices annually also to enable more stringent testing of the associations.

Finally, the studies of the present thesis were conducted in two relatively small countries: Finland and Estonia. They have some similar characteristics at least in terms of language, curricula and educational system. Moreover, Finnish and Estonian are relatively easy languages to learn to decode, because of their systematic letter-sound correspondence. Therefore, caution is needed when trying to generalise the findings to other cultural and educational systems. For example, Finnish and Estonian first graders are older (age 7) than children in the US (age 6) and the UK (age 5), which might have influenced the results.

4.7 Future directions

The present thesis also raises some important questions that should be examined in the future. First, although observational studies in classroom have been conducted for several decades, it is only recently that researchers have made an effort to establish standardised observational measures (Pianta & Hamre, 2009). Standardised observations can be used as a tool to measure teaching quality, but also as a tool to train teachers (see A. M. Roberts et al., 2014), either in a way that teachers are watching and reflecting on their own teaching practices or watching others' classroom teaching and instruction. Therefore, it is important for future studies to use standardised observation tools, such as ECCOM and CLASS, to learn more about teacher practices in authentic classrooms.

Second, by using a person-oriented approach, the present thesis identified one group of teachers who were using both child-centred practices and teacher-directed practices in their classrooms. In addition, evidence was found for the beneficial role of combining teaching practices for early primary students' reading skills development (Study III). The mixture of teaching practices not only has important theoretical implications (see Good et al., 2009; Pressley et al.,

2003), but it also provides practical implications for teachers and educators (Studies II and III). Therefore, a fruitful combination of different teaching practices deserves closer examination in the future. For example, the antecedents for teachers choosing to use a mixture teaching style remain unknown.

Third, the present thesis examined the teaching practices and styles, and their role in reading development until Grade 3. However, it would be interesting to investigate the associations also in later grades. Because children's cognitive and social-emotional competencies develop quickly during the primary school years (see Eccles, 1999), it is important to examine the research questions of the present thesis also after the early primary school years. For example, in the present thesis, one extra group of grade 3 teachers was found, i.e., extreme-child-centred style, when compared to Grade 1 teachers. Also, it is still unclear how teaching styles measured by observations in the early primary school years has longitudinal effect on children's reading skills development in later grades.

Fourth, some previous studies on the effectiveness of teaching have also considered the context of a particular study (see Good et al., 2009), both larger-scale contexts like culture, but also smaller-scale contexts like classroom mean level for a specific skill. In other words, dynamic relationships between teaching and its contexts, e.g., grade level, skill level, should be examined in the future when investigating the effects of teaching on children's learning. For example, one study by Kikas et al. (2014) found that in classrooms with high initial math skills, child-dominated practices had a positive association with children's spelling and task-persistent behaviour, while in classrooms with low initial math skills the correlation was negative. The complex relationships between teaching practices and child-level characteristics, e.g., individual skill, gender, socio-economic status – class-level characteristics, e.g., class mean skill, teacher's stress – context, e.g., grade, subject domain – and their joint contribution to academic skills will need further investigation in the future studies.

Fifth, researchers have recently started to investigate the bidirectional relationships between teaching and children's development (e.g., Kiuru et al., 2015). In fact, teaching is not only a unidirectional process from teacher to child, but also a bidirectional process in which child characteristics, such as their previous skill level and learning difficulties, will evoke teachers' use of practices in classrooms (Gage, 2009; Nurmi & Kiuru, 2015). Consequently, in future studies, the bidirectional associations between teachers and children should also be targeted.

Sixth, the current thesis found that Finnish teachers typically used less child-dominated style and extreme-child-centred style than Estonian teachers. However, I did not examine the relations between teaching styles and reading skills in both countries separately. Instead, I combined the Finnish and Estonian data to examine the relationships between teaching style and reading skills. In the future, there should be more studies, which investigate the associations in different cultural and educational contexts, to uncover the possible unique patterns between teaching practices and children's developmental outcomes. These efforts are important because, on the one hand, they may identify common patterns of associations across countries, and on the other hand, they may find

country-specific patterns of associations, which can better inform us about educational interventions and policies for the particular educational system.

4.8 Conclusions

The present thesis examined first the applicability of the ECCOM to Finnish and Estonian early primary schools. The results suggest that the ECCOM is a valid classroom observation tool also outside the US. In addition, by using a person-oriented approach, the present thesis found that some of the teachers use a combination of child-centred and teacher-directed practices. Also, by using a person-oriented approach, it was found that Finnish teachers tend to use a more child-centred style, but less of the child-dominated style and the extreme-child-centred style than their Estonian counterparts. The results of the present thesis also showed that the child-centred style and a mixture of child-centred and teacher-directed practices positively influence reading skills development at early primary grades compared to other teaching styles. The child-dominated style was found to be particularly detrimental for children's reading skills. Overall, with the standardised ECCOM observation system and by using a person-oriented approach, it is possible to identify different teaching styles, and to further examine the extent to which teaching styles influence reading skills development during the early school years.

YHTEENVETO (SUMMARY)

Opetuskäytänteet ja niiden yhteys lukutaidon kehitykseen ensimmäisinä kouluvuosina

Viime vuosina on julkaistu lukuisia tutkimuksia erityisesti varhaiskasvatuksen ja alkuopetuksen opetuksen laadun ja opetuskäytänteiden yhteydestä lasten kehitykseen ja oppimiseen. Niissä on havaittu, että opettajan opetuskäytänteillä on tärkeä merkitys varhaisten kouluvuosien oppimiseen ja suoriutumiseen koulussa. Opettajan opetus- ja ohjauksikäytänteiden arvioimiseen on myös kehitetty useita standardoituja havainnointimenetelmiä. Tässä väitöstutkimuksessa käytettiin Deborah Stipekin kehittämää Early Childhood Classroom Observation Measure (ECCOM) -arviointimenetelmää suomalaisissa ja virolaisissa kouluissa. ECCOM:in avulla voidaan tarkastella missä määrin opettaja käyttää koulupäivän aikana lapsilähtöisiä, opettajajohtoisia tai lasten johtamia opetuskäytänteitä. ECCOM-menetelmän toimivuutta on kuitenkin tarkasteltu vasta vähän ja lähinnä amerikkalaisessa kontekstissa. Tämän väitöstutkimuksen tavoitteena oli 1) tarkastella ECCOM-menetelmän toimivuutta suomalaisissa ja virolaisissa koululuokissa, 2) tunnistaa suomalaisten ja virolaisten opettajien opetuskäytänteiden profiileja ns. opetustyyliä, 3) vertailla suomalaisten ja virolaisten opetustyylien eroja, ja 4) tarkastella opetustyylien yhteyttä suomalaislasten lukutaidon kehitykseen ensimmäisinä kouluvuosina.

Väitöstutkimus koostuu kolmesta osatutkimuksesta, joissa kaikissa käytettiin suomalaista Alkuportaat-pitkittäistutkimusaineistoa ja kahdessa ensimmäisessä osatutkimuksessa myös virolaisia Kindergarten-School Study- ja Reading Study -tutkimusten aineistoja. Tutkimuksessa oli mukana yhteensä 91 ensimmäisen luokan ja 70 kolmannen luokan opettajaa, joiden opetuskäytänteitä havainnointiin ECCOM-menetelmän avulla. Näiden opettajien luokissa oli ensimmäisellä luokalla 1012 oppilasta ja kolmannella luokalla 958 oppilasta, joiden lukemisen sujuvuutta ja luetun ymmärtämisen taitoja testattiin. Kolmannessa osatutkimuksessa keskityttiin 359 suomalaisen oppilaan lukutaidon kehityksen tarkasteluun luokilla 1-3.

Ensimmäisessä osatutkimuksessa tarkasteltiin ECCOM-havainnointimenetelmän toimivuutta suomalaisessa ja virolaisessa kouluympäristössä. Tulokset osoittivat, että ECCOM oli validi ja luotettava havainnointimenetelmä opettajan opetuskäytänteiden arvioimiseen suomalaisissa ja virolaisissa kouluissa ensimmäiseltä kolmannelle luokalle saakka. Konfirmatorinen faktorianalyysi osoitti, että kolmen faktorin malli, joka koostui ilmapiirin, ryhmän hallinnan ja opetuksen osa-alueista, sopi hyvin käsillä olevaan aineistoon sekä opettajan lapsilähtöisille, opettajajohtoisille että lasten johtamille opetuskäytänteille. Kolmen faktorin malli sopi johdonmukaisesti yhden faktorin mallia paremmin aineistoon sekä ensimmäisellä että kolmannella luokalla, vaikkakin kolme faktoria korreloivat voimakkaasti keskenään. Tulokset antoivat myös joitakin viitteitä ECCOM-dimensioiden samanaikaisvaliditeetista. Havainnoidut opetuskäytänteet olivat yhteydessä opettajien itsensä raportoimiin opetussuunnitel-

man painotuksiin. Myös työkokemus oli yhteydessä opetuskäytäntöjen painotuksiin: Mitä pidempi työkokemus suomalaisilla kolmannen luokan opettajilla oli, sitä vähemmän lapsilähtöisiä opetuskäytänteitä he käyttivät, ja mitä pidempi työkokemus virolaisilla ensimmäisen luokan opettajilla oli, sitä vähemmän he painottivat lasten johtamia opetuskäytänteitä.

Toisen osatutkimuksen tavoitteena oli tunnistaa henkilökeskeistä lähestymistapaa käyttäen opetuskäytänteiden latenteja profiileja ensimmäisellä luokalla. Suomalaisten ja virolaisten opettajien yhdistetystä aineistosta tunnistettiin neljä profiilia: lapsilähtöinen, opettajajohtoinen, lasten johtama sekä lapsilähtöisen ja opettajajohtaisen yhdistetty opetustyyli. Näiden lisäksi kolmannella luokalla löydettiin vielä äärimmäisen lapsilähtöinen opetustyyli. Tutkimuksessa verrattiin myös suomalaisten ja virolaisten opettajien opetustyylien eroja. Tulokset osoittivat, että suomalaisilla ensimmäisen luokan opettajilla oli tyypillisesti enemmän lapsilähtöisiä opetustyyliä ja vähemmän lasten johtamia opetustyyliä kuin virolaisilla opettajilla, mutta kolmannella luokalla taas vähemmän kuin Virossa äärimmäisen lapsilähtöistä opetustyyliä. Kun tarkasteltiin opetustyylien yhteyttä lasten lukutaitoon, tulokset osoittivat, että lapsilähtöisiä opetustyyliä painottavien opettajien luokissa lapsilla oli muita luokkia parempi lukutaito, kun taas lasten johtamaa opetustyyliä painottavissa luokissa oli muita heikompi lukutaito luokilla 1 ja 3.

Kolmannen osatutkimuksen tavoitteena oli tarkastella opetustyylien yhteyttä suomalaislasten lukutaidon kehitykseen ensimmäiseltä kolmannelle luokalle. Ensin tunnistettiin ensimmäisen luokan opettajien aineistosta kolme opetuskäytänteiden profiilia eli opetustyyliä: lapsilähtöinen, opettajajohtoinen ja näiden kahden yhdistelmä. Seuraavaksi tulokset osoittivat, että lapsilähtöisen ja opettajajohtaisen opetustyylien yhdistelmäprofiilin luokissa lasten lukutaito kehittyi paremmin kuin niillä lapsilla, joiden luokissa opettaja painotti vain opettajajohtoista opetustyyliä.

Kaiken kaikkiaan tulosten perusteella voidaan todeta, että ECCOM on toimiva ja luotettava opetuksen havainnointimenetelmä opetuskäytänteiden arvioimiseen varhaisina kouluvuosina myös Yhdysvaltojen ulkopuolella. Lisäksi tulokset korostavat henkilökeskeisen lähestymistavan merkitystä opetuskäytänteiden ymmärtämisessä. Tulokset vahvistavat näkemystä lapsilähtöisten opetuskäytänteiden hyödyistä lasten oppimiselle, mutta myös sitä, että lapsilähtöisten ja opettajajohtaisen opetuskäytänteiden joustava yhdistelmä tukee suomalaisessa koulussa parhaiten lasten lukutaidon kehitystä koulun ensimmäisinä vuosina.

Jatkotutkimuksissa tulisi keskittyä entistä enemmän opetustilanteiden autenttiseen havainnointiin ja opetuskäytänteiden hienosyisempään tarkasteluun henkilökeskeisten tilastomenetelmien avulla. Lisäksi olisi tärkeää tarkastella eri luokka-asteilla opetuskäytänteiden yhteyttä oppimiseen suhteessa lasten erilaiseen lähtötasoon ja muihin ominaisuuksiin sekä selvittää opetuskäytänteiden merkitystä esimerkiksi matemaattisten taitojen ja sosiaalisten taitojen kehitykselle sekä motivaatiolle. Jatkotutkimuksissa tulisi huomioida missä määrin lapset vaikuttavat opettajan opetuskäytänteisiin.

Väitöstutkimuksen tuloksilla on myös käytännön merkitystä. Ensinnäkin tulokset vahvistavat näkemystä siitä, että opettajien joustavaa lapsilähtöisten ja opettajajohtoisten opetuskäytänteiden harjoittelua ja käyttöä tulisi tukea niin opettajankoulutuksessa kuin opettajien täydennyskoulutuksessakin. Opetuskäytänteet, joissa lämmin opettaja-oppilasvuorovaikutus ja lasten autonomian tukeminen yhdistyvät perustaitojen opetukseen ja selkeiden rakenteiden luomiseen opetustilanteissa, ovat lasten lukutaidon kehityksen kannalta suotuisimpia. Toiseksi opettajien ja opettajankouluttajien tulisi olla tietoisia lapsilähtöisen ja äärimmäisen lapsilähtöisen opetustyylin erilaisesta merkityksestä lasten edistymiselle sekä pelkästään lasten johtamien opetuskäytänteiden tehottomuudesta lukutaidon kehitykselle. Tästä syystä olisi opettajankoulutuksessa tärkeää tarjota konkreetteja esimerkkejä lapsilähtöisistä opetuskäytännöistä ja miten ne eroavat lasten johtamista opetuskäytännöistä.

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ORIGINAL PAPERS

I

VALIDATING THE EARLY CHILDHOOD CLASSROOM OBSERVATION MEASURE IN FIRST AND THIRD GRADE CLASSROOMS

by

Xin Tang, Eija Pakarinen, Marja-Kristiina Lerkkanen,
Eve Kikas, Joonas Muotka, & Jari-Erik Nurmi, 2017

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II

PROFILES OF TEACHING PRACTICES AND READING SKILLS AT THE FIRST AND THIRD GRADE IN FINLAND AND ESTONIA

by

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Research paper

Profiles of teaching practices and reading skills at the first and third grade in Finland and Estonia[☆]Xin Tang^{a,*}, Eve Kikas^b, Eija Pakarinen^c, Marja-Kristiina Lerkkanen^c, Joonas Muotka^a, Jari-Erik Nurmi^a^a Department of Psychology, University of Jyväskylä, P.O. Box 35, FI-40014, Finland^b School of Natural Sciences and Health, Tallinn University, Narva mnt 25, 10120, Tallinn, Estonia^c Department of Teacher Education, University of Jyväskylä, P.O. Box 35, FI-40014, Finland

HIGHLIGHTS

- Using person-oriented approach to identify different profiles of teaching practices.
- Child-centred style was most beneficial while child-dominated style was least beneficial for reading skills.
- Mixture of child-centred and teacher-directed style was beneficial in grade 3.
- Extreme-child-centred style did not guarantee reading fluency in grade 3.
- Less beneficial styles showed more in Estonian teachers than in Finnish teachers.

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ABSTRACT

The Early Childhood Classroom Observation Measure was used to observe 91 first-grade and 70 third-grade teachers in Estonia and Finland. Using a person-oriented approach, four profiles of teaching practices were identified in grade 1: the child-centred style, teacher-directed style, child-dominated style and a mixture of the child-centred and teacher-directed styles. An additional profile, the extreme-child-centred style, was found in grade 3. Children taught by child-centred teachers showed the highest reading skills, whereas children taught by child-dominated teachers showed the lowest skills. More Estonian than Finnish teachers applied the child-dominated style in grade 1 and the extreme-child-centred style in grade 3.

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There is substantial evidence to show that teaching practices play an important role in early learners' academic performance (e.g., Early et al., 2007; Hamre & Pianta, 2005; Lerkkanen et al., 2016). Teachers' practices are typically based on their own beliefs

and philosophy of teaching, as well as their education and experience (Stipek, Daniels, Galluzzo, & Milburn, 1992; Stipek, Givvin, Salmon, & MacGyvers, 2001). Although the associations between teaching practices and child outcomes have been studied in authentic classroom settings, only a few studies have applied a person-oriented approach to identify subgroups of teachers who show different teaching practices. By going beyond a variable-oriented approach and by using person-oriented methods, the present study aimed at identifying subgroups of teachers in Finnish and Estonian primary school classrooms on the basis of their teaching practices as measured by the Early Childhood Classroom Observation Measure (ECCOM; Stipek & Byler, 2005). The study further examined the extent to which these subgroups differed in terms of children's reading skills in the first and third grades.

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1. Teaching practices and reading skills

Teachers vary in the practices they use when interacting with pupils and instructing them in the classroom (e.g., Connor, Son, Hindman, & Morrison, 2005). The previous literature has typically focussed on child-centred and teacher-directed practices when analysing the role of instructional approaches in children's skill development (Lerikainen et al., 2016; Pressley et al., 2003). Recently, child-dominated practices also have been under investigation (Kikas, Peets, & Hodges, 2014; Kikas, Silinskas, Jögi, & Soodla, 2016). *Child-centred* practices, which are based on the constructivist theories of learning and teaching (Piaget, 1985; Vygotsky, 1978; for an overview, see Bransford, Brown, & Rodney, 2000), are based on the assumption that children are active learners who construct knowledge based on their prior understanding and experiences. Children's initiatives and interests are emphasised and children are given an appropriate level of autonomy and an active role in decision making in the classroom. Teachers also actively use guidance and scaffolding to assist children in developing their own knowledge and understanding and provide possibilities for children to explore and manipulate objects (Stipek & Byler, 2004). In turn, *teacher-directed* (i.e., didactic) practices, with an emphasis on concrete and rote learning (Stipek & Byler, 2004), stress that teacher make most of the decisions, control the instructional activities, and emphasise the importance of facts and training basic skills. In child-centred practice and in teacher-directed practices the teachers' role is active in guiding and instructing children. By contrast, in *child-dominated* practices, teachers provide children with little direction, control or feedback (Kikas et al., 2014; 2016; Stipek & Byler, 2005). The classroom rules are often unclear and there are no systematically designed learning tasks present. Teachers, however, may interrupt and control activities when the children's behaviour is out of control (Stipek & Byler, 2005). In the present study, we examined teaching practices in light of the above-mentioned three definitions, using an observational instrument developed by Stipek and Byler (2004; 2005), the Early Childhood Classroom Observation Measure (ECCOM see Table 1).

Because teachers who use different teaching practices have been shown to vary in their instructional emphases (Stipek & Byler, 2004), it can be assumed that each teaching practice plays a different role in different reading skills, that is, in basic skills, such as decoding, and in more advanced reading skills, such as comprehension. Previous studies have shown that the beneficial effects of different teaching practices on academic outcomes vary depending on the skill domain, skill level, and on the age of the children. For example, child-centred practices, in general, have a positive impact on kindergarteners' reading performance (Marcon, 1999), first graders' reading fluency (Lerikainen et al., 2016; Perry, Donohue, & Weinstein, 2007), and the development of reading comprehension (Block, Parris, Reed, Whiteley, & Cleveland, 2009). Teacher-directed practices, in turn, have been found to be beneficial for kindergarteners' and first graders' basic reading skills, such as letter knowledge and word recognition skills (Stipek, Feiler, Daniels, & Milburn, 1995; Stipek et al., 1998). However, little research has been conducted on the effect of teacher-directed practices on more advanced reading skills, such as reading comprehension. A recent study by Kikas et al. (2014) showed that the effect of child-dominated practices was moderated by children's skill level in the classroom. In classrooms with high initial math skills, child-dominated practices were positively associated with spelling skills and task-persistent learning behaviour, while in classrooms with low initial math skills the impact was negative. Given the importance of reading development at this age (e.g., Adams, 1990; Landerl & Wimmer, 2008), the present study focusses on the development of reading skills during the early school years.

2. Teaching styles

In authentic classrooms, however, teachers' use of teaching practices is more complex. Instead of employing predominantly one practice, they may use a combination of different practices (Pressley et al., 2003; Rasku-Puttonen et al., 2011). The predominant use of a specific teaching practice or combinations of different teaching practices can be described as teaching styles (Kikas et al., 2016). Teaching styles refer to patterns or profiles of teaching practices. However, most of the previous research has been variable-oriented and has examined teaching practices in terms of specific dimensions. Studies aimed at identifying different teaching styles and their combinations are rare. As far as we know, only two previous studies have sought to identify subgroups of teachers with different profiles of teaching practices as measured by the ECCOM (Kikas et al., 2016; Rasku-Puttonen et al., 2011). In both studies, one in kindergarten and another in first grade, four teaching styles were identified: the *child-centred style*, *teacher-directed style*, *child-dominated style* and a *mixture of the child-centred and teacher-directed style (mixture teaching style)*. Both studies also found that most teachers showed a child-centred style. The second largest group was those with mixture teaching style. Furthermore, Rasku-Puttonen et al. (2011) found that more kindergarten teachers used the *teacher-directed style* and *mixture teaching style* in Finland than in Estonia, and that more kindergarten teachers used the *child-centred style* and *child-dominated style* in Estonia than in Finland. So far, teaching styles have not been examined in later primary school grades using the ECCOM procedure.

3. Educational system and reading acquisition in Finland and Estonia

The Finnish and Estonian school systems are rather similar. In both countries, compulsory formal education consists of nine years of comprehensive school, beginning in the year the child turns seven and continuing with the same class teacher for the main subjects. In addition, the academic demands in the early years of primary school are similar in both national core curricula (Finnish National Board of Education, 2014; Vabariigi Valitsus, 2011/2014). For example, in both countries, initial reading instruction in these transparent languages is based on phonics. Both countries emphasise practice in reading fluency and comprehension in grade 1 and their curricula include 6–7 hours of literacy lessons per week during the first two school years.

Teacher training is also similar in both countries. Constructivist learning theories and related teaching methods are introduced, and the individualisation of instruction is valued. However, Estonia and Finland have experienced very different histories, which are reflected in their educational systems. Until 1991, when Estonia was part of the Soviet Union, authoritarian management practices and teacher-directed teaching methods were commonly applied in schools. Even in primary schools, teacher-directed methods (e.g., whole-class teaching, teacher-talk and assessing factual knowledge) were the predominant modes of instruction (Ruus et al., 2008). Although reforms in schools and teacher education institutions have taken place over the last two decades, changes in values, beliefs and practices take time. Empirical studies have shown that Estonian teachers hold a variety of child-rearing values (Tulviste & Kikas, 2010) and that teachers' preference for teacher-directed teaching methods depends on their age and experience: teacher-directed approaches are favoured more by older and more experienced teachers than by younger teachers (Palu & Kikas, 2007). In Finland, child-centred practices, adaptation of instruction according to students' skills and individualised support for learning are highly valued and also evident in primary school

Table 1
Description of the teaching practices, subscales, and items used in the ECCOM.

Subscale and item	Teaching Practices		
	Child-Centred	Teacher-Directed	Child-Dominated
Management			
1. Child Responsibility	Children are allowed to take responsibility to the degree that they are able.	Children are not given opportunities to take responsibility (teacher control).	No one seems to take responsibility for maintaining an orderly environment.
2. Management	Teacher has clear but somewhat flexible classroom rules and routines.	Teacher has clearly communicated expectations and classroom rules that are rigidly adhered to.	There are no clearly defined expectations or rules. The classroom is chaotic.
3. Choice of Activities	There is a mixture of teacher and child choice.	Teacher makes most of the choices.	Children make most of the choices.
4. Discipline Strategies	Conflict resolution is smooth; consequences are appropriate and apply equally.	Discipline is imposed without explanation or discussion; consequences are inconsistent.	Teacher rarely disciplines.
Climate			
5. Support for Communication Skills	Teacher encourages children to engage in conversation and elaborate on their thoughts.	Teacher does not encourage children to engage in conversation (teacher-controlled conversation).	Teacher does not engage children in interactive conversation.
6. Support for Interpersonal Skills	Teacher provides opportunities for cooperative, small-group activities that promote peer interactions.	Teacher does not provide opportunities for children to develop interpersonal skills.	There are opportunities but no support for the development of children's interpersonal skills.
7. Student Engagement	Teacher attempts to engage all children in ways that will improve their skills and understanding.	Teacher engages children in rote activities (e.g., rigid expectations about being engaged in work).	Teacher makes no systematic effort to engage children in productive activity.
8. Individualisation of Learning Activities	Teacher is attentive to children's individual skill levels and adapts tasks accordingly.	Tasks are not flexible or adapted to children's individual needs (e.g., all do the same tasks).	Teacher does not address children's individual needs.
Instruction			
9. Learning Standards	Teacher holds children accountable for attaining some individualised standard (assists and challenges children at their respective levels).	Teacher rigidly holds children accountable for completing work and for attaining a universal standard (e.g., standards are rigid and invariable).	Teacher does not hold children accountable for completing work and has no apparent standards.
10. Coherence of Instructional Activities	There are connections between and within academic lessons (concepts/skills are embedded into a broader set of goals).	Academic lessons are distinct and disconnected (concepts/skills are presented as an isolated set of facts or skills to be learned).	Lessons are disjointed and the focus is unclear (connections are on a superficial level with no unifying concept).
11. Teaching Concepts	Tasks and lessons are designed to teach identifiable concepts and develop understanding.	Tasks are designed to help children learn facts or procedures. Problem solving is constrained.	The specific concept of tasks is unclear.
12. Instructional Conversation	Teacher solicits children's questions, ideas, solutions or interpretations around a clearly defined topic.	Teacher dominates instructional conversation; children's participation is limited.	Teacher does not engage in instructional conversations with children, or topics are unfocused or unclear.
13. Literacy Instruction	Teacher provides a broad array of literacy experiences and instructional practices.	Teacher's literacy instruction places a heavy emphasis on phonics and paper-and-pencil tasks.	Teacher provides no instruction on phonics or reading comprehension strategies.
14. Math Instruction	Math instruction emphasises developing understanding.	Math instruction emphasises rote memorisation and drill and practice.	There is little evidence of math instruction or conversation about math concepts.

Notes: Based on [Stipek and Byler \(2005\)](#). Observers rate classrooms on each of the 14 scale items, giving one code for Child-Centred, one code for Teacher-Directed and one code for Child-Dominated. All items are rated on a scale of 1 to 5 (1 = these practices are rarely seen, less than 20% of the time; 5 = these practices predominate, 80%–100% of the time).

teaching practices ([Lerikkanen, Kiuru et al., 2012](#); [Nurmi et al., 2013](#)).

In terms of learning to read, Finnish and Estonian languages have shallow orthographies and high transparency which affects reading skills development: the acquisition of decoding skill and reading accuracy progresses faster in shallow orthographies than deep orthographies ([Seymour, Aro, & Erskine, 2003](#)). Both Finnish and Estonian children have shown high-level reading results in the Program for International Student Assessment (PISA; [OECD, 2014, 2016](#)). However, the two countries vary in the time when children's reading instruction begins. Whereas in Finland formal reading instruction begins in primary school (at age 7), in Estonia it begins in kindergarten (at age 6) ([Soodla et al., 2015](#)). In Estonia, children are taught to decode and spell simple words already in kindergarten ([Vabariigi Valitsus, 2008/2011](#)), while in Finland no systematic reading instruction takes place in kindergarten. Thus, it can be assumed that more emphasis is placed on the learning of basic reading skills in first-grade reading instruction in Finland than in Estonia. Moreover, as the reading skills of Finnish first graders are more heterogeneous ([Soodla et al., 2015](#)), more individualisation in reading instruction, in accordance with the child's reading skills, is needed.

4. The present study: research questions and hypotheses

Previous studies on the importance of different teaching practices in the development of students' reading skills have some limitations. First, most of the previous studies have examined only one or two types of teaching practices or the composite score of two practices (e.g., [Lerikkanen, Kiuru et al., 2012](#); [Perry et al., 2007](#)). Although researchers have claimed that it is important to examine mixtures of teaching practices, such as the combination of didactic and constructivist practices (see [Pressley et al., 2003](#)), empirical research on such combinations is rare (for exceptions, see [Kikas et al., 2016](#); [Rasku-Puttonen et al., 2011](#)). Second, child-dominated practices have rarely been examined in the field, limiting the formation of a broader view of teaching practices (for an exception, see [Kikas et al., 2014, 2016](#)). Third, most of the previous studies have been conducted in kindergarten and preschool classrooms, and only a few at the primary school level (for exceptions, see [Kikas et al., 2016](#); [Lerikkanen et al., 2016](#)). Thus, the present study sought to identify subgroups of teachers who use different combinations of teaching practices, i.e., teaching styles ([Kikas et al., 2016](#)), in a sample of Finnish and Estonian primary school teachers, and to examine how these subgroups differ in

terms of children's reading skills, i.e., fluency and comprehension. Specifically, the present study examined the following research questions:

1. What kinds of profiles of teaching practices (i.e., styles) can be identified in authentic classroom settings in grade 1 and grade 3? Based on previous findings (Kikas et al., 2016; Rasku-Puttonen et al., 2011), we expected to find four profiles: the *child-centred style*, *teacher-directed style*, *child-dominated style*, and a *mixture of the child-centred and teacher-directed styles (mixture teaching style)* (Hypothesis 1).
2. To what extent do Finnish and Estonian teachers differ in their use of teaching styles in grade 1 and grade 3? Based on the cultural and historical differences between the educational systems in Finland and Estonia (Kikas & Lerkkanen, 2011), we expected that a higher proportion of Finnish than Estonian teachers would use a *child-centred style* (Hypothesis 2).
3. Do children whose teachers use different teaching styles differ in their performance in reading fluency and reading comprehension in grade 1 and grade 3? Because both child-centred practices (e.g., Lerkkanen et al., 2016; Marcon, 1999; Perry et al., 2007) and teacher-directed practices (e.g., G. Adams & Carnine, 2003; Stipek et al., 1995) have been found to be positively related to basic reading skills, we expected that, in *reading fluency*, children in classrooms where teachers use a *child-centred style*, *teacher-directed style* or *mixture teaching style* would outperform children in classrooms where teachers use a *child-dominated style* (Hypothesis 3a). Moreover, because teacher-directed teachers have been shown to place less emphasis on high-order skills (Stipek & Byler, 2004; Tang et al., 2016), we expected that children in classrooms where teachers use a *child-centred style* or *mixture teaching style* would outperform children in classrooms where teachers use a *teacher-directed style* or *child-dominated style* in *reading comprehension* (Hypothesis 3b). In addition, in grade 1, we expected that children whose teachers use a *child-centred style* or *teacher-directed style* would show better reading fluency and comprehension than children in classrooms where teachers use a *child-dominated style* (Hypothesis 3c). For grade 3, no specific hypothesis was formulated, owing to the lack of empirical evidence.

5. Methods

5.1. Participants and procedures

The total sample of the present study comprised 91 first-grade teachers (32 in Finland and 59 in Estonia) and 70 third-grade teachers (33 in Finland and 37 in Estonia), and the children in their classrooms. Both datasets were collected as part of other ongoing longitudinal studies; the First Step (FS) study in Finland (Lerkkanen, Niemi, et al., 2006), and the Kindergarten-School Study (KISS) study (see Kikas et al., 2014) and the Reading Study (READ) study (see Soodla et al., 2015) in Estonia.

5.1.1. The Finnish sample

This study is part of an extensive age-cohort study from kindergarten to grade 4 conducted during the years 2006–2011. The sample comprised 1132 children from 93 classrooms with their teachers. Thirty-two first-grade teachers (28 female, 4 male), and 33 third-grade teachers (24 female, 9 male) were observed on a voluntary basis in the spring semester, in 2008 and 2010, respectively. In the sample of observed classrooms, seven teachers and most of the children were the same at the two measurement points. Most teachers (86% of the first-grade and 97% of the third-grade

teachers) had a master's degree or above. Teachers' work experience was measured by asking them to select from one of five options (1 = less than a year, 2 = 1–5 years, 3 = 6–10 years, 4 = 11–15 years, 5 = more than 15 years). The majority of the first- and third-grade teachers had more than 15 years' teaching experience (Median = 5, Mode = 5, for first grade; Median = 4, Mode = 5, for third grade). The schools were in two medium-sized towns and one less urban municipality in Finland. Mean class size was 19.22 ($SD = 4.52$) in grade 1 and 19.94 ($SD = 5.88$) in grade 3, which is the typical class size in Finnish primary schools. The average age of the children was 7.15 years ($SD = 0.3$) when they entered grade 1.

5.1.2. The Estonian sample

The Estonian grade 1 samples comprised teachers from two separate studies: 38 teachers (all female) and 869 children from the KISS study, and 21 teachers (all female) and 465 children from the READ study. All the teachers were classroom teachers and all of them had a master's level education. Thirty-eight first-grade teachers were observed in 2008 (from KISS) and 21 in 2012 (from READ). Thirty-seven teachers from the KISS study were observed two years later in grade 3; almost all of them were the same (only six teachers had changed). The majority of the first- and third-grade teachers had more than 15 years' teaching experience (Median = 5, Mode = 5, for both grades). The average class size was 19.72 ($SD = 4.90$) in grade 1, and 16.67 ($SD = 4.59$) in grade 3. The average age of the children when they entered grade 1 was 7.46 years ($SD = 0.52$) and 7.34 years ($SD = 0.32$) for the KISS and READ study samples, respectively.

5.1.3. Procedure

In both countries, the researchers contacted school principals and teachers first to inform them about the project and invited them to participate. Second, parents were asked to sign an informed consent for their children's participation. The children's and their parents' background information was measured at the start of each project.

During the spring term of the first and third grades (February–March), observations were conducted in classrooms by experienced observers (with a master's or doctoral degree in education or psychology). Before starting the observations, the observers were carefully trained until the intra-class correlation (ICC) reliability between two observers reached 0.81 or above for each subscale. The classroom observations were conducted following the procedures described in the ECCOM manual, and thus two observers, producing independent ratings, were always present in a classroom (Stipek & Byler, 2005; see also Lerkkanen, Kikas et al., 2012). Each observation session lasted three lessons (i.e., at least half a day) and began at the start of the school day. All observations included at least one literacy lesson.

The Finnish FS children's reading skills were assessed at the beginning of the fall term of grade 1 (September) and at the end of grades 1 and 3 (April). The Estonian KISS children were assessed on their reading skills at the beginning of grade 1 (September–October) and at the end of grade 3 (April–May). In both countries, the grade 3 measurements of reading skills were performed with the same instruments. However, different measures of reading skills were used with the grade 1 Finnish FS sample and Estonian KISS sample (see Appendix). The Estonian READ children were assessed on their reading skills at the beginning of grade 1 (September–October) and at the end of grade 1 (April–May). The same reading skills measures were used as with the Finnish FS sample (see Appendix).

5.2. Measures

5.2.1. Classroom observations

The ECCOM (Stipek & Byler, 2004; 2005) was used to measure teaching practices on the extent (proportion of time) to which they were child-centred, teacher-directed and child-dominated. Each practice is rated on 14 items and over the same three subscales: *management* (four items), *climate* (four items) and *instruction* (six items), as shown in Table 1. The rating scale is based on the percentage of the time that each type of practice is demonstrated during the observation: 1 = *the practice is rarely seen* (0%–20% of the time) to 5 = *the practice predominates* (80%–100% of the time). The use of each of the three teaching practices was independently rated by two observers. For example, at the end of the observation day, for a specific item (e.g., choice of activities), the use of a child-centred practices might be rated as 4, a teacher-directed practices as 3, and a child-dominated practices as 2 (Stipek & Byler, 2005). The mean scores of both observers were used in this study. The inter-rater reliabilities varied between 0.67 and 0.80, which can be regarded as good or excellent (Hallgren, 2012).

5.2.2. Reading fluency

A group-administered subtest of the standardised reading test battery (ALLU—Reading Test for Primary School; Lindeman, 1998) was used to assess word-level reading accuracy and fluency in the grade 1 FS sample and READ sample, and grade 3 FS sample and KISS sample. In this speed test, a maximum of 80 items can be attempted within a 2-min time limit. For each item, a child was asked to read four (phonologically similar) words and draw a line connecting a picture and the word that semantically matched it. The score used in the analyses was the sum of correct answers (maximum 80). In 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 the alternatives. In a highly transparent language, such as Finnish and Estonian, only a fluency measure can differentiate between children's decoding skills across their primary school years. According to the test manual (Lindeman, 1998), the Kuder–Richardson reliability coefficient was 0.97 in both grade 1 and grade 3. No floor or ceiling effects were detected.

In grade 1, different measures of reading skills (i.e., phoneme awareness or phoneme-grapheme correspondence, and the reading accuracy or fluency test) were used in the FS and in KISS samples. In the KISS sample, the tests included phoneme-grapheme correspondence and reading accuracy, whereas reading skills in the FS sample were measured as phoneme awareness (identification of the initial sound from the word) and reading fluency (word level reading accuracy and speed; ALLU test).

In the KISS sample, children's phoneme-grapheme correspondence was assessed with nine items. In the first five items, the children were shown pictures of familiar objects. Underneath each picture was a number of blank spaces corresponding to the number of letters in the word for the object represented in the picture; for example, 8 blank spaces appeared under the picture of the target word *mesilane* [bee]. The experimenter said the target word aloud and the child was shown one letter in the word (e.g., the grapheme E). The child's task was to mark where the letter should be placed in the series of blank spaces. In the remaining four items, the children were presented with three pictures each showing a different object. The child's task was to mark the object that corresponded to the word the experimenter said aloud. Although the objects were familiar to the children, they need to listen carefully to the names of the three objects, as they differed in the duration of the sounds (e.g., *saba-saabas-sabas*; *keeb-kepp-kepp*). For each child, the sum of correct answers was calculated (maximum score = 9). Actual scores

ranged from 1 to 9 ($M = 7.63$, $SD = 2.08$). Cronbach's alpha was 0.85.

In the test of reading accuracy, the KISS children were given a list of seven words that described objects needed in school (e.g., *vihik* [copybook]), objects that were not needed in school (e.g., *suvi* [summer]), and a non-word (*raamatop*, which looks very similar to the word "*raamat*" [book]). The children read each word and marked whether the object it named was needed at school. Each correct answer scored 1 point. Actual scores ranged from 1 to 7. Cronbach's alpha was 0.83.

In the FS sample, the initial phoneme identification test (ARMI test battery; Lerkkanen, Poikkeus, & Ketonen, 2006) was also used. The children were shown four pictures of objects that were named aloud by the experimenter. The children were then asked to select the correct picture based on oral presentation of the initial phoneme of the target word. All the words comprised one to three syllables, with two vowels and eight consonants. The sum score was based on the number of correct items (maximum score = 10). Cronbach's alpha was 0.74.

5.2.3. Reading comprehension

A group-administered subtest of the standardised reading test battery (ALLU—Reading Test for Primary School; Lindeman, 1998) assessed the child's reading comprehension skills in gleaned factual knowledge, concepts and inferences from text. The children were asked to answer 12 multiple-choice questions based on a silently read text. The children received 1 point for each correct answer (maximum score 12). The maximum time allotted was 45 min. To ensure that task difficulty was optimal for each age, the texts and multiple choice questions of this normed test were different for grade 1 and grade 3. The topics of the texts were 'Judo' (grade 1) and 'Operating a Camera' (grade 3). The Kuder–Richardson reliability coefficients, drawn from the test manual, for the reading comprehension task in grades 1 and 3 were 0.85 and 0.75, respectively.

5.2.4. Mothers' level of education

The children's mothers' level of education was measured on a scale of 1–3 (1 = basic education, 2 = high school education, 3 = college education and above). For the Finnish mothers, the distribution was 6.6% at level 1, 31.9% at level 2, and 61.5% at level 3. For the Estonian KISS sample mothers, the corresponding percentages were 9.5%, 58.6% and 31.9%, and for the Estonian READ sample mothers 6.2%, 45.2% and 48.6%.

5.3. Analysis strategy

Our first aim was to identify subgroups of teachers who use different teaching practices in classroom settings in grades 1 and 3. For this purpose, we utilised the mixture modelling (Mplus version 7.0; Muthén & Muthén, 2012). This method allowed us to identify teaching profiles (i.e., latent classes) from the observed data that differ from other profiles but that are homogenous within each group. Mixture modelling also provides statistical tests to evaluate the appropriate number of profiles. To do this, we used three criteria: (a) the model fits, (b) mean probabilities and numbers of teachers in the latent profiles, and (c) the interpretability of the identified profiles. The model fits were evaluated upon three criteria: the Bayesian information criterion (BIC), adjusted Bayesian information criterion (ABIC), and Akaike's information criterion (AIC). For the statistical testing of the number of latent profiles, we used the following tests: the Vuong–Lo–Mendel–Rubin test (VLMR), Lo–Mendell–Rubin adjusted LRT test (LMR) and entropy value. Lower AIC, BIC and ABIC values indicate a better fit, and significant test ($p < 0.05$) results indicate a higher number of profiles. The highest log-likelihood value (log L) also indicates the best fit of the

model. Classification quality was determined by examining the posterior probabilities and entropy values (as suggested by Celeux & Soromenho, 1996; entropy values range from 0 to 1, with 0 corresponding to randomness and 1 to a perfect classification).

Our second aim was to examine whether the Finnish teachers differ from the Estonian teachers in their teaching styles (i.e., profiles). To do this, we conducted a cross-tabulation analysis by using IBM SPSS statistical package. The chi-square test ($p < 0.05$) in the analysis provided the overall differences between the Finnish and Estonian teachers in the use of teaching styles. The adjusted residuals (t-values showing 0.05 deviation $-1.96 > x > +1.96$) allowed us to compare differences in the use of each teaching style between the two countries.

Our last aim was to examine whether children whose teachers used different teaching styles differed from each other in reading fluency and comprehension. For this purpose, we conducted several ANCOVAs in which children's reading performance variables were compared in respect to their teachers' teaching style. In these analyses we controlled for the children's characteristics (i.e., age, gender), their mother's education level and previous reading skills to predict group differences in reading fluency and comprehension. The samples and control variables used in these analyses differed between grade 1 and grade 3 due to practical reasons. In the grade 1 ANCOVAs, we used the Estonian READ sample (21 teachers and 397 students) and the Finnish FS sample (32 teachers and 359 students). These samples had been administered the same measures of reading fluency and reading comprehension in grade 1 spring, and of reading fluency in grade 1 fall. In the grade 3 ANCOVAs, the Estonian KISS sample (37 teachers and 456 students) and the Finnish FS sample (33 teachers and 502 students) were used. These samples had used the same measures of reading fluency and reading comprehension in grade 3 spring. However, the FS and KISS grade 3 samples had not been administered the same measures for reading skills in grade 1. To deal with this limitation, we standardised each of the reading measures in grade 1 and computed a composite score for the children's previous reading skills. In the KISS sample (Z stands for standardised score), grade 1 reading skills were computed as $Z_{\text{phone-graph}} + Z_{\text{reading accuracy}}$; in the FS sample, grade 1 reading skills were computed as $Z_{\text{phoneme awareness}} + Z_{\text{reading fluency}}$.

6. Results

The descriptive statistics for the teaching practices subscales and items, separately for the Finnish and Estonian samples, have been reported earlier (Tang et al., 2016). Both the Finnish and Estonian teachers' mean scores were slightly higher for *child-centred* practices than *teacher-directed* practices. The lowest means were found for *child-dominated* practices in both countries in both grades. Moreover, the Finnish teachers scored lower than the Estonian teachers in *child-dominated* practices, in both the first

($t = -3.95, p < 0.001$) and third ($t = -2.37, p < 0.05$) grades.

6.1. Latent profiles of teaching practices

6.1.1. First grade teachers

In the mixture modelling procedure, we fitted models with different numbers of latent profiles (Table 2). The results of the model fits showed that the BIC, ABIC, AIC and log-likelihood values decreased as the number of classes increased. However, the VLMR and LMR tests suggested that the four-class solution was significantly better than the three-class solution, and that the five-class solution was not better than the four-class solution. The entropy value of the four-class solution indicated a very good classification (>0.90). Each of the four groups had a high average value (>0.92) for the probability of group membership, and none of the groups overlapped with one another, as indicated by other probabilities lower than 0.05. Finally, the interpretability of the four-class solution was best on theoretical grounds. Consequently, the four-class solution was selected.

Table 3 presents the descriptive statistics for the four-class solution. In grade 1, the first and largest profile, i.e., teachers characterised by the use of the *child-centred style*, comprised 43% (39) of teachers with highest means for child-centred practices. The second profile, i.e., the users of the *teacher-directed style* consisted 11% (10) of the teachers with high means for teacher-directed practices and low means for the other teaching practices. The third profile, i.e., the users of the *child-dominated style*, comprised 11% (10) of teachers with highest means for child-dominated practices. The fourth profile, i.e., the users of the *mixture of child-centred and teacher-directed styles (mixture teaching style)*, consisted 35% (32) of teachers with nearly equal means for both child-centred and teacher-directed practices.

Next, we ran ANOVAs to examine whether the identified profiles differed in class size, teacher's age and teaching experience. However, none of the variables showed significant differences between the profiles.

6.1.2. Finnish versus Estonian first grade teachers

Next, we examined the extent to which the Finnish and Estonian teachers differed with respect to the profile to which they belonged. The results showed that most teachers in both countries were in the latent profile labelled as *child-centred style*; in that group, there were slightly more Finnish teachers (47% of the total number of Finnish teachers) than Estonian teachers (41% of the total number of Estonian teachers). In the second largest latent profile, users of the *mixture teaching style*, there were 44% of the total number of Finnish teachers and 31% of the total number of Estonian teachers. In the third latent profile, users of the *teacher-directed style*, there were 9% of the total number of Finnish teachers and 13% of the total number of Estonian teachers. Finally, in the latent profile of users of the *child-dominated style*, there were 17% of

Table 2
Indices for mixture models with different numbers of latent classes, grade 1.

Class	log L	BIC	ABIC	AIC	VLMR	LMR	Entropy	N
1	-335.72	698.50	679.56	683.43			1.00	91
2	-290.04	625.18	593.62	600.07	0.00	0.01	0.98	11/80
3	-247.42	558.00	513.81	522.85	0.04	0.05	0.89	11/29/51
4	-228.00	537.20	480.39	492.00	0.02	0.02	0.91	39/10/10/32
5	-217.03	533.31	463.87	478.87	0.44	0.46	0.92	10/30/38/4/9
6	-207.84	532.96	450.90	467.68	0.35	0.37	0.89	4/30/24/10/14/9

Notes: log L = Log-likelihood; BIC = Bayesian Information Criterion; ABIC = Adjusted Bayesian Information Criterion; AIC = Akaike Information Criterion; VLMR = Vuong–Lo–Mendell–Rubin test p-value; LMR = Lo–Mendell–Rubin test p-value.

The bolded line means the option showed in this line is better than other options showed in other lines.

Table 3
Descriptive statistics of the four profiles of teaching styles in grade 1.

	Child-centred Style M(SD)	Teacher-directed Style M(SD)	Child-dominated Style M(SD)	Mixture Teaching Style M(SD)	F value
N	39	10	10	32	
Percentage	43%	11%	11%	35%	
Score of Child-centred Practices	3.71 ^a (0.36)	1.59 ^c (0.28)	1.98 ^c (0.34)	2.66 ^b (0.31)	161.97***
Score of Teacher-directed Practices	1.87 ^c (0.49)	4.13 ^a (0.50)	2.50 ^b (0.57)	2.91 ^b (0.43)	67.80***
Score of Child-dominated Practices	1.18 ^c (0.28)	1.43 ^{bc} (0.43)	3.54 ^a (0.55)	1.45 ^b (0.35)	116.89***
Classroom size	18.92 (5.24)	19.55 (5.36)	20.89 (5.09)	19.91 (4.74)	ns
Teacher's age	43.33 (9.36)	46.8 (11.82)	37.2 (10.16)	39.94 (10.93)	ns
Teaching experience	Med = 5	Med = 5	Med = 4	Med = 4	ns
Less than a year	5.3%	10%	20%	9.7%	
1–5 years	5.3%	10%	20%	12.9%	
6–10 years	13.2%	–	10%	16.1%	
11–15 years	13.2%	10%	–	16.1%	
More than 15 years	63.2%	70%	50%	45.2%	

Notes: Pairs with the same subscript letters do not differ significantly ($p > 0.05$) based on ANOVA post-hoc comparisons. Tamhane's T2 was used when variances were not equal; in other cases, Bonferroni post hoc comparisons were used. Med = Median.

the total number of Estonian teachers and no Finnish teachers. We subsequently ran a cross-tabulation analysis between teaching styles and country. The analysis of the adjusted residuals showed that the Estonian sample contained significantly more teachers who used a *child-dominated style* (adjusted standardised residual = 2.5) than the Finnish sample (adjusted standardised residual = -2.5).

6.1.3. Third grade teachers

A similar mixture modelling procedure was conducted for the third-grade teachers. Our results for model fit (see Table 4) again showed that the BIC, ABIC, AIC and log-likelihood values decreased as the number of classes increased. However, VLMR and LMR tests revealed that the five-class solution was significantly better than the four-class solution, and that the six-class solution was not better than the five-class solution. In addition, the entropy value of the five-class solution indicated a very good classification (>0.91). Each of the five profile groups had a high average value (>0.92) for the probability of group membership, and none of the groups overlapped with one another, as indicated by the values for the other probabilities, which were lower than 0.07. Consequently, we chose the five-class solution as our final solution.

The first latent profile, i.e., users of the *extreme child-centred style*, comprised the teachers with extremely high mean levels for child-centred practices, and accounted for 13% (9) of all teachers. The second profile, i.e., users of the *child-centred style*, included the teachers with medium-high means on child-centred practices, and accounted for 30% (20) of all teachers. The third profile, i.e., users of the *teacher-directed style*, accounted for 15% (11) of the all teachers. The fourth profile, i.e., users of the *child-dominated style* accounted for 10% (7) of all teachers. The fifth profile, i.e., the users of the *mixture teaching style*, accounted for 32% (23) of all teachers.

Again, no significant differences were found between the profiles in relation to class size, teacher's age or teaching experience

(see Table 5).

6.1.4. Finnish versus Estonian third grade teachers

The results showed that most Finnish teachers fell into the latent profiles of users of the *child-centred style* (42%) and the *mixture teaching style* (42%), compared to 16% and 24% of the Estonian teachers. Fewer Finnish teachers were in the latent groups of users of the *extreme child-centred style* (3%), *teacher-directed style* (9%) and *child-dominated style* (3%) compared to their Estonian counterparts: corresponding proportions 22%, 22% and 16%. The analysis of the adjusted residuals in cross-tabulation analysis revealed that the Finnish sample contained more teachers who deployed the *child-centred style* (adjusted standardised residual = 2.4) than the Estonian sample (adjusted standardised residual = -2.4). Moreover, the Estonian sample contained more teachers who deployed the *extreme child-centred style* (adjusted standardised residual = 2.3) than the Finnish sample (adjusted standardised residual = -2.3).

6.1.5. Teaching styles and Children's reading skills

6.1.5.1. First grade. To examine whether reading fluency and reading comprehension would differ across the four latent profiles of teaching practices (i.e., teaching styles), we conducted ANCOVAs in which teaching style was an independent variable and the children's age, gender, mother's level of education, and children's reading fluency measured in first grade fall were included as covariates. The results showed that the four latent profiles differed from each other with respect to the children's *reading fluency*, $F(3) = 10.75$, $p < 0.001$, and *reading comprehension*, $F(3) = 5.49$, $p = 0.001$. The pairwise comparisons showed first that, in *reading fluency*, children with teachers in the *child-centred style* profile scored higher than children with teachers in the profiles of the *mixture teaching style* ($p < 0.05$) and the *child-dominated style* ($p < 0.001$). Children with teachers in the *mixture teaching style*

Table 4
Indices for mixture models with different numbers of latent classes, grade 3.

Class	log L	BIC	ABIC	AIC	VLMR	LMR	Entropy	N
1	-252.60	530.68	511.68	517.78				70
2	-210.46	463.41	431.91	440.93	0.05	0.05	0.99	9/61
3	-182.06	423.61	379.51	392.13	0.07	0.08	0.89	33/7/30
4	-167.16	410.79	354.09	370.32	0.55	0.57	0.86	19/28/16/7
5	-152.65	398.77	329.47	349.30	0.03	0.04	0.93	23/11/9/20/7
6	-142.91	396.27	314.38	337.81	0.23	0.25	0.94	23/20/9/7/2/9
7	-133.22	393.90	299.40	326.44	0.09	0.10	0.94	6/9/23/20/9/1/2

That bolded line means the option showed in this line is better than other options showed in other lines.

Table 5
Descriptive statistics of the five profiles of teaching styles in grade 3.

	Extreme Child-centred Style M(SD)	Child-centred Style M(SD)	Teacher-directed Style M(SD)	Child-dominated Style M(SD)	Mixture Teaching Style M(SD)	F values
N	9	20	11	7	23	
Percentage	13%	30%	15%	10%	32%	
Score of Child-centred Practices	4.65 ^a (0.31)	3.53 ^b (0.31)	1.68 ^c (0.27)	2.13 ^d (0.31)	2.68 ^e (0.29)	159.28***
Score of Teacher-directed	1.31 ^a (0.28)	1.98 ^c (0.29)	4.02 ^b (0.46)	2.09 ^{bcd} (0.82)	2.94 ^b (0.42)	64.49***
Score of Child-dominated	1.04 ^a (0.13)	1.12 ^b (0.15)	1.37 ^b (0.39)	2.95 ^a (0.37)	1.19 ^b (0.22)	82.68***
Classroom size	15.66 (5.78)	18.8 (5.54)	17.18 (5.15)	16.29 (2.69)	19.78 (5.76)	ns
Teacher's age	44.11 (13.10)	43.10 (9.30)	47.18 (9.69)	42.00 (9.51)	43.48 (10.07)	ns
Teaching experience	Med = 5	Med = 4.5	Med = 5	Med = 4.5	Med = 4.5	ns
Less than a year	—	—	—	—	—	
1–5 years	11.1%	25%	9.1%	—	9.1%	
6–10 years	22.2%	15%	9.1%	33.3%	27.3%	
11–15 years	—	10%	—	16.7%	13.6%	
More than 15 years	66.7%	50%	81.8%	50%	50.0%	

Notes. The pairs with the same subscript letters do not differ significantly ($p > 0.05$) based on ANOVA post-hoc comparisons. Tamhane's T2 was used when variances were not equal; in other cases, Bonferroni post hoc comparisons were used. Med = Median.

profile performed better in reading fluency than children with teachers in the latent profile of the *child-dominated style* ($p < 0.01$). Second, children whose teachers were characterised by the *child-centred style* performed better in reading comprehension than children with teachers in the *child-dominated style* profile ($p < 0.001$). Since no differences were found between the latent profiles for class size, teacher's age or teaching experience, these variables were not included in the ANCOVAs (see Fig. 1).

6.1.5.2. *Third grade.* Children's reading performance was compared for five latent profiles by conducting ANCOVAs in which teaching style was an independent variable and the children's age, gender and mother's level of education, and their previous reading skills in grade 1 were covariates. The previous reading skills variable was a composite score of the standardised scores of the first-grade reading measures. The results showed that the five latent profiles differed in the children's scores for reading fluency, $F(4) = 10.99, p < 0.001$, and

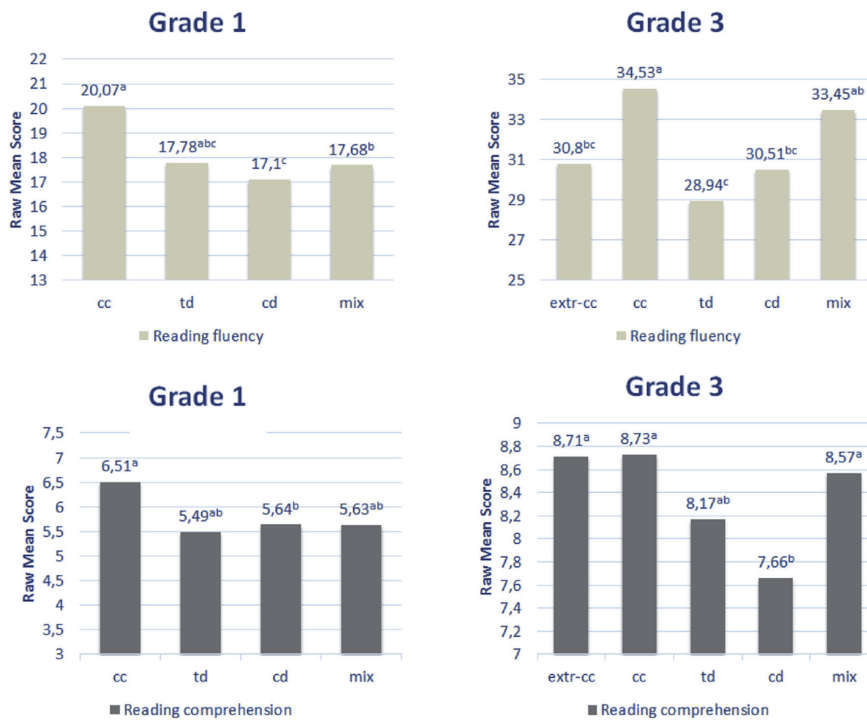


Fig. 1. Differences between the teaching styles on reading fluency and comprehension in Grade 1 and Grade 3. Notes. Pairs with the same subscript letters do not differ significantly ($p > 0.05$) based on post-hoc comparisons; extr-cc = extreme child-centred style; cc = child-centred style; cd = child-dominated style; td = teacher-directed style; mix = mixture of child-centred and teacher-directed styles.

reading comprehension, $F(4) = 4.73$, $p < 0.01$. First, the pairwise comparisons showed that children with teachers in the *child-centred style* profile had higher scores in reading fluency than children with teachers in the *teacher-directed style* ($p < 0.001$), *extreme child-centred style* ($p < 0.01$) and the *child-dominated style* ($p < 0.05$) profiles. Children whose teachers belonged to the *mixture teaching style* profile had higher scores in reading fluency than children with teachers in the *teacher-directed style* profile ($p < 0.001$). Second, the results showed further that children with teachers in the *child-centred style*, *extreme child-centred style* and the *mixture teaching style* profiles had higher scores in reading comprehension than children with teachers in the *child-dominated style* profile ($p < 0.01$; $p < 0.01$; $p < 0.05$; respectively). Since no differences were found between the latent profiles for class size, teacher's age or teaching experience, these variables were excluded in the ANCOVAs.

7. Discussion

This study is among the few that have investigated the profiles of teaching practices among primary school teachers. Four profiles were identified among the samples of Finnish and Estonian grade 1 teachers: the *child-centred style*, *teacher-directed style*, *child-dominated style*, and *mixture teaching style*. In grade 3, an additional profile, the *extreme-child-centred style*, was identified. There were also differences between the Finnish and Estonian teachers in their teaching profiles. Namely, in grade 1, a higher proportion of Estonian than Finnish teachers used the *child-dominated style*, and a higher proportion of Finnish than Estonian teachers used the *child-centred style*. However, in grade 3, a lower proportion of Estonian than Finnish teachers used the *extreme-child-centred style* and a higher proportion of Finnish than Estonian teachers used the *child-centred style*. Children in classrooms where the teacher deployed the *child-centred style* showed better performance in reading fluency and reading comprehension than children whose teachers deployed the *child-dominated style*.

7.1. Profiles of teaching practices in grade 1 and 3

Our first aim was to examine what kinds of profiles of teaching practices can be identified among first and third grade teachers. In line with previous findings (Kikas et al., 2016; Rasku-Puttonen et al., 2011), we also identified four profiles in grade 1: the *child-centred style*, *teacher-directed style*, *child-dominated style* and *mixture teaching style*. This result was consistent with Hypothesis 1. In grade 3, we found one additional profile, namely the *extreme-child-centred style*. This profile differed from the profile of the *child-centred style* in that the teachers in the profile of the *extreme-child-centred style* had very high scores for child-centred practices but rather low scores for teacher-directed practices.

The results also showed that, in both grades, the *child-centred style* (if counted together with the *extreme-child-centred style*) represented the largest group of teachers, almost half of all participants. These findings show good fit with the recent core curricula and teacher education practices implemented in both Finland and Estonia (Kikas, & Lerikkanen, 2011; Sahlberg, 2011; Vitikka, Krokfors, & Hurmerinta, 2012). Both national core curricula emphasise teacher sensitivity to students' individual differences in competence and interests, regard for students' perspectives, a warm and supportive classroom climate, and the importance of collaboration and interaction in the classroom (Finnish National Board of Education, 2014; Vabariigi Valitsus, 2011/2014). Moreover, pre-service teacher training in both countries reflects the constructivist theory of learning and teaching. For these reasons, it is understandable that most of the teachers were found to deploy child-centred teaching practices. However, the

emergence of the *extreme-child-centred style* in grade 3 may reflect the fact that some teachers greatly emphasise child-centred practices over other teaching practices.

In addition, the results showed that about one-third of the teachers deployed the *mixture teaching style* in grades 1 and 3. This result is in line with previous studies conducted in preschool and kindergarten (Rasku-Puttonen et al., 2011), and in primary school (Kikas et al., 2016). Both studies found that teachers in the *mixture teaching style* profile represented about 30% of all teachers. The present results correspond with the proposition by Pressley et al. (2003) that, in an authentic classroom, teaching practices may involve both direct transmission and constructivist elements; this they called 'balanced teaching'.

7.2. Differences in the profiles of teaching practices between Finland and Estonia

Our second aim was to compare Finnish and Estonian teachers in their teaching styles. The results partly supported Hypothesis 2 in that some of the Estonian teachers, but none of the Finnish first grade teachers, deployed the *child-dominated style* in grade 1. In grade 3, however, the number of Finnish and Estonian teachers who used the *child-dominated style* did not differ significantly. One reason for the difference in grade 1 may be related to the fact that Estonian children are taught decoding in kindergarten (Soodla et al., 2015) whereas systematic reading instruction in Finnish schools begins in the first grade. It is likely that Estonian children need less support than Finnish children in acquiring basic reading skills in grade 1, as Estonian children have already mastered these skills before entering primary school. Therefore, the use of the *child-dominated style* by some Estonian teachers might be related to the children's higher level of reading skills in the Estonian first-grade classrooms (see also Kikas et al., 2014). Later, in grade 3, when fluent reading skill has been acquired in both countries, the average support needed in the classroom by Finnish and Estonian students might have become similar.

In grade 3, between-country differences emerged in the use of the *child-centred* and *extreme-child-centred styles*: more Finnish teachers deployed the *child-centred style*, whereas more Estonian teachers deployed the *extreme-child-centred style*. Together with the finding that Estonian teachers used the *child-dominated style* in grade 1, it is possible that the Estonian teachers may have somehow misinterpreted the meaning of child-centred practices. Given that they had mainly experienced teacher-directed practices during their own school days, the Estonian teachers might have interpreted child-centredness as letting children decide for themselves how to study and thus as not setting children any limits or providing them with sufficient guidance. The Estonian teachers may also exaggerate the benefits of constructivist practices and the importance of granting children autonomy, and in consequence use more often extreme child-centred practices. By contrast, the Finnish teachers tend to be more flexible in their classroom practices.

7.3. Teaching styles and reading skills

The third aim of this study was to examine the extent to which children's reading fluency and comprehension in grade 1 and grade 3 differed according to the teaching styles employed by their teachers. After controlling for child age and gender, previous reading skills and mother's level of education, the results showed that, in grade 1, children who were in classrooms characterised by the *child-centred style* showed the highest performance in reading fluency and reading comprehension, whereas children whose teachers applied the *child-dominated style* had the lowest reading

performance. In grade 3, children whose teachers deployed either the *child-centred style* or *mixture teaching style* performed better on reading fluency and reading comprehension than those taught by teachers who used the *child-dominated* or *teacher-directed styles*. Overall, these results partly supported Hypotheses 3a, 3b and 3c. They are also in line with previous studies on the role of teaching practices that have found constructivist teaching to be associated with high levels of reading fluency in the first grade (Lerkkanen et al., 2016; Perry et al., 2007) and reading comprehension (Block et al., 2009) among lower primary students. However, children whose teachers deployed the *extreme-child-centred style* showed lower reading fluency than those in the *child-centred style* classroom in grade 3; however, no differences between the two groups were found in reading comprehension. These results suggest that, although the *child-centred style* teaching has, overall, stronger associations with children's reading performance than the other styles, particularly the *child-dominated style*, the extreme end of this style is not further positively related to children's reading performance. It should be noted that the teachers in the profile characterised by the *extreme-child-centred style* placed strong emphasis on child-centred practices while scoring lower in the other practices, whereas the teachers in the profile characterised by the *child-centred style*, had medium scores in child-centred practices along with low to medium scores in the other practices. One explanation for the absence of an association between reading performance and the *extreme-child-centred style* may be that the teachers who employed this style also showed a very low level of teacher-directed practices. In other words, some use of teacher-directed practices might be beneficial for children in the early phases of reading skills development. Overall, our results suggest that a combination of practices or balanced teaching practices has stronger associations with children's reading skill development than an extreme emphasis on specific teaching practices. It should also be noted that the associations between teaching practices and reading skills may be also highly dependent on children's skill level, because teachers need to adapt their practices according to the child's individual needs in the classrooms. However, further studies are needed to investigate this in more detail.

Our results also showed that children who were taught by teachers with the *child-dominated style* had the lowest reading fluency and reading comprehension skills in both grades. Previous research has demonstrated that instruction with minimal guidance often fails to produce effective learning (for a review, see Kirschner, Sweller, & Clark, 2006). These results are understandable in that the teacher's role in child-dominated practices is minimal when compared to child-centred and teacher-directed practices. The teachers using the *child-dominated style* tend to give their students full autonomy; presumably, they believed that students can construct knowledge by themselves and study by following their own interests (Kikas et al., 2016; Stipek & Byler, 2005). However, child-dominated teaching practices do not seem to recognise children's individual needs and individual differences in learning and skills development (Kirschner et al., 2006), and teachers using these practices do not adapt their instruction or support to meet the needs of each child in the classroom.

Our results also showed some differences between grades in the associations between the *teacher-directed style* and reading skills. In grade 1, the performance in reading fluency and reading comprehension of children taught by teachers using the *teacher-directed style* fell in between that of the children taught by teachers using the *child-centred style* and that of the children taught with the *child-dominated style*, whereas in grade 3, these children showed the poorest level of reading fluency. Previous studies have shown that teacher-directed practices are detrimental for early learners' motivation (Lerkkanen, Kiuru et al., 2012; Stipek et al., 1998, 1995).

Since the development of reading fluency is strongly linked with reading motivation—the more you read, the more fluent you become—it is understandable that children who were taught by teachers using the *teacher-directed style* showed lower reading fluency in grade 3. This finding implies that although teacher-directed teaching may predict children's basic reading skills, such as decoding in the early grades, this style of teaching does not lead to improvements in reading fluency later on. Moreover, the results of the present study did not support Hypotheses 3a and 3c that children taught with the *teacher-directed style* would show better reading fluency in grade 1 than children taught with the *child-dominated style*. One reason may be due to the orthographic transparency of both Finnish and Estonian languages. It is plausible that in countries with transparent language children learn to read easier and faster without too much emphasis on drills and practices of decoding and spelling that typify *teacher-directed* teaching practices.

The results showed further that the children whose teachers employed the *mixture teaching style* had the highest reading skills scores in grade 3 despite showing an in-between level of performance in grade 1. It may be that combining the potential benefits for motivation and skills of constructivist practices and didactic practices can provide flexible and effective support for children's self-regulation and behaviour and yet still create a warm classroom atmosphere and climate. One possible explanation for these results is that such a mixture of teaching practices supports autonomy while also providing children with structure. For example, Jang, Reeve, and Deci (2010) found that teacher provision of structure and support for autonomy was the most beneficial combination for promoting students' engagement in learning activities. As little teaching observation research has examined the use of mixtures or combinations of teaching practices, more studies on the topic are needed.

7.4. Limitations

The present study has some limitations that need to be considered before generalising the research findings. First, the sample of teachers was relatively small (91 in grade 1 and 70 in grade 3). This might have limited the power of the statistical tests. Second, for practical reasons, we controlled for reading fluency when we investigated reading comprehension. Although reading fluency typically predicts reading comprehension, the ideal situation would nevertheless be to use identical measures as a covariate. Moreover, because identical measures had not been used to assess grade 1 reading skills in the Finnish and Estonian grade 3 samples, the grade 1 reading scores of these two samples were standardised to compute a composite score, which was then used as a covariate. Third, the datasets used in the grade comparisons were cross-sectional. Fourth, teaching practices were observed over three lessons, including at least one literacy lesson but also other subjects. Therefore, we cannot draw any detailed conclusions on specific literacy instruction practices or the effectiveness of methods. However, Stipek and Byler (2004) have suggested that the ECCOM focuses on the general characteristics of teaching practices in the classroom during the school day rather than on subject matter contents.

7.5. Conclusions and implications for Teacher training

By using a person-oriented approach, the present study identified different teaching styles, i.e., patterns of teaching practices, among Finnish and Estonian primary school teachers. The results also suggest that both a child-centred teaching style and a teaching style including both child-centred and teacher-directed elements

were typical among teachers of students whose reading performance developed better, whereas the *child-dominated style* and an extreme form of child-centred style were associated with a less positive development of children's reading performance. The results indicate that teaching styles which require teachers to take a more active role benefit children's reading skills during the early years of primary school. The associations between the *teacher-directed style* and reading skills were weaker in the third grade than in the first grade, whereas the *mixture teaching style* showed stronger associations with reading skills in the third grade.

Our findings have also some implications for teacher training. First, teacher training needs to be more precise and give concrete examples of the differences between teaching practices and their specific benefits. This seems to be especially important in the case of child-centred practices vs. extreme-child-centred practices. The extreme form of child-centred practices does not seem to provide any additional benefits for children's reading fluency. Second, more effort is needed to introduce the possible negative consequences of the *child-dominated style*. Although the idea of giving the child full autonomy seems appealing to some teachers, our results showed that this teaching style is detrimental for reading skills, especially at the lower primary school level. Third, the promising finding from our analysis on the use of the *mixture teaching style* in grade 3 should be further studied and understood to encourage teachers to use a flexible repertoire of teaching practices suited to their learners' needs.

Appendix. Description of identical measures in reading skills

Identical measures of reading skills in ANCOVAs

	Finn FS	EST-READ	EST-KISS
1 st grade fall	reading fluency	reading fluency	
1 st grade spring	reading fluency reading comprehension	reading fluency reading comprehension	
3 rd grade spring	reading fluency reading comprehension		reading fluency reading comprehension

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III

THE LONGITUDINAL ASSOCIATIONS OF FIRST GRADE TEACHING WITH READING SKILLS DEVELOPMENT FROM GRADE 1 TO 3

by

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