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Observed Classroom Quality Profiles of Kindergarten Classrooms in Finland

Abstract

Research findings: The aim of the present study was to examine classroom quality profiles of kindergarten classrooms using a person-centered approach and to analyze these patterns in regard to teacher and classroom characteristics. Observations of the domains of Emotional Support, Classroom Organization and Instructional Support were conducted in 49 Finnish kindergarten classrooms, utilizing the Classroom Assessment Scoring System (CLASS; Pianta, LaParo, & Hamre, 2008). In addition, questionnaire data on classroom and teachers' characteristics, as well as Early Childhood Classroom Observation Measure (ECCOM; Stipek & Byler, 2004) observational ratings, were employed in the analyses. Latent profiling analysis was utilized to identify different profiles of classroom quality. Four latent profiles of classroom quality were identified, which differed from each other most clearly in the domain of Emotional Support. Profile 1 represented generally high level and Profile 4 generally low level of classroom quality compared to the other profiles, whereas the medium quality profiles 2 and 3 showed varying levels of support in the assessed dimensions of quality. Only a few differences emerged between the profiles of the classroom and teachers' characteristics: The teachers in Profile 4 provided the lowest extent of literacy instruction and had the least work experience of all teachers. The findings using the ECCOM indicated that child-centered were predominant among the profiles of higher classroom quality. *Practice or policy*: The results of this study can be used to recognize kindergarten teachers' professional strengths and weaknesses, and to support teachers' professional development with the aid of pedagogical interventions.

Keywords: classroom quality, classroom observations, CLASS, ECCOM, teacher, kindergarten.

Observed Classroom Quality Profiles of Kindergarten Classrooms in Finland

High quality in teaching and classroom practices has been shown to contribute to children's academic achievement, behavior and well-being in the classroom (e.g., Burnett, 2002; Howes et al., 2008; LaParo, Pianta, & Stuhlman, 2004; Peisner-Feinberg et al., 2001; Perry, Donohue, & Weinstein, 2007; Pianta, Steinberg, & Rollins, 1995; Rimm-Kaufman, LaParo, Downer, & Pianta, 2005; Van Petegem, Aelterman, Van Keer, & Rosseel, 2008). Heightened interest in improving pre-kindergarten programs has been spurred on in the United States by recent studies on their effectiveness and accessibility (e.g., Curby et al., 2009; LaParo et al., 2009), and by findings indicating that the classroom quality is not evenly spread across the U.S. (Bryant, Clifford, & Peisner, 1991; NICHD ECCRN, 2002). In measuring classroom quality, observations have been shown to be a more valid tool than teachers' self-reports (Connor, Son, Hindman, & Morrison, 2005; Pianta & Hamre, 2009), and the focus on indicators of quality has shifted towards the quality of processes manifested in observed teacher-child interactions (Howes et al., 2008). In the present study, the Classroom Assessment Scoring System (CLASS; Pianta, LaParo, & Hamre, 2008) was used to analyze profiles of classroom quality in Finnish kindergartens, i.e., patterns of observed teacher-child interaction in the domains of Emotional Support, Instructional Support and Classroom Organization.

Conceptualizing and Measuring Classroom Quality

Structural characteristics, such as teachers' background characteristics or the teacher-child ratio in classrooms have been shown to have some effect on classroom quality (e.g., Bredekamp & Copple, 1997; LoCasale-Crouch et al., 2007). Increasing evidence indicates, however, that in addition to structural characteristics, classroom process characteristics (such as quality of the teacher-child relationship and interaction) can be strong predictors of both children's academic and social skills

(Mashburn et al., 2008; Peisner-Feinberg et al., 2001). Classroom quality can be conceptualized in

terms of emotional, organizational and instructional support (e.g., Hamre et al., 2007). Quality in the

classroom can also be conceptualized in terms of child-centered *versus* teacher-directed practices (e.g.

Perry, Donohue & Weinstein, 2007; Stipek & Byler, 2004). In the present study, we analyze the level

of emotional, organizational, and instructional support in classrooms, as well as the extent of child-

centered versus teacher-directed teaching practices used in classrooms.

Quality of Classroom Processes

The CLASS framework (Hamre & Pianta, 2007) is a theoretically driven and empirically

supported conceptualization of three domains of classroom interaction likely to contribute to

children's development: first, a domain of interactions that promote children's social and emotional

functioning (i.e., Emotional Support); second, a domain targeted at the management of time and

activities (i.e., Classroom Organization); and third, a domain of interactions that facilitate children's

learning and higher order thinking skills (i.e., Instructional Support) (Eccles & Roeser, 1999; Hamre

& Pianta, 2007; Pianta & Hadden, 2008; Stipek & Byler, 2004). As demonstrated by a number of

studies (briefly summarized below), high levels of the quality of these domains support young

children's social and cognitive development (e.g., Early et al., 2007; Mashburn et al., 2008; Rimm-

Kaufman et al., 2005).

Firstly, positive and supportive teacher-child interactions constitute a source of *emotional*

support which has been shown to foster children's willingness to explore and participate in classroom

activities and to attend instruction provided by teachers (Early et al., 2007; Hamre & Pianta, 2005).

Children who experience a close and supportive relationship with their teacher are likely to show

greater self-directedness and fewer problem behaviors, and they appear more socially competent in

the classroom context (Mashburn et al., 2008; Pianta, LaParo, Payne, Cox, & Bradley, 2002).

Secondly, organizational support, in the form of clear structure and organization in the classroom, contributes to the development of children's self-control and behavioral self-regulation, and makes noncompliant behavior less likely to occur (Rimm-Kaufman et al., 2005; Rimm-Kaufman, Curby, Grimm, Nathanson, & Brock, 2009). Children's ability to behave in a cooperative manner in kindergarten, in turn, predicts their early achievements in school (Ladd, Birch, & Buhs, 1999). In efficiently managed classrooms, children have a constant opportunity to participate in learning activities (Bohn, Roehrig, & Pressley, 2004).

Finally, *instructional support* captures the ways in which teachers implement instructional discussions and activities to effectively support children's academic learning (Howes et al., 2008; Mashburn et al., 2008; Pianta & Hadden, 2008; Pianta & Hamre, 2009). Instruction is more effective when "scaffolding" and feedback takes children's performance into account and when productive time for learning is maximized (Burnett, 2002; NICHD ECCRN, 2002; Perry et al., 2007). A combination of high quality emotional and instructional support is believed to provide the most effective support for children to develop school readiness and social competence (Howes et al., 2008; NICHD ECCRN, 2002).

Another approach to conceptualizing instructional and emotional quality in early childhood education classrooms is the application of the concepts of child-centered and teacher-directed practices which are linked with the guidelines for "developmentally appropriate practices" (DAP, Bredekamp & Copple, 1997). An example of an observational measure representing this approach is the Early Childhood Classroom Observation Measure (ECCOM; Stipek & Byler, 2004) (see also Hauser-Cram, Sirin, & Stipek, 2003; Perry, Donohue, & Weinstein, 2007; Stipek & Byler, 2004). Child-centered practices are characterized by the teacher providing children with both guidance and opportunities for directing their own exploration of objects and academic topics, and this approach to

teaching is akin to a partnership between the teacher and the children (Schweinhart & Weikart, 1988; Stipek & Byler, 2005). Teacher-directed practices, on the other hand, involve an emphasis on structured drill-and-practice group lessons, teaching of discrete skills in small steps, and praise when predetermined goals are reached (Schweinhart & Weikart, 1988). In classrooms scoring high in child-centered practices, teachers provide strong support for children's learning efforts and social skills and are sensitive to children's needs and interests (Stipek & Byler, 2005), whereas in classrooms scoring high in teacher-directed practices, drilling of "basic" academic skills through oral recitation and worksheets is given considerably more weight while children's interests and development of social skills receive less attention (Stipek & Byler, 2004).

Findings on the benefits of child-centered and teacher-directed practices have varied depending on outcome variables and the age and skill level of the children (Stipek, Feiler, Daniels, & Milburn, 1995; Stipek et al., 1998). Child-centered practices have been found to be effective for supporting pre-literacy and problem solving skills (e.g., Huffman & Speer, 2000; Marcon, 1999) as well as motivation (e.g., Lerkkanen et al., in press; Stipek et al., 1998), whereas teacher-directed practices have been found to be effective for supporting the development of reading and math skills in kindergarten and first grade (Stipek et al., 1995, 1998), and this particularly among children with low performance or learning disabilities (e.g., Adams & Carnine, 2003; Connor et al., 2004; Lovett, Barron, & Benson, 2003).

There is substantial overlap in how practices beneficial to children's development are conceptualized within the CLASS and ECCOM frameworks. For example, all the CLASS dimensions under the domain of Instructional Support focus on teacher-child interactions that support children's active participation and deeper understanding (e.g., the use of open-ended questions, asking for clarification), while similar types of practices are also noted in the ECCOM as child-centered

instructional practices. Closed-ended questions and few opportunities for problem solving are characteristics of lower instructional quality in the CLASS, while also being central features of teacher-directed practices in the ECCOM (Pianta, LaParo & Hamre, 2008; Stipek & Byler, 2004). Due to the conceptual parallels between these two observational measures, it is likely that teachers who receive high scores for quality in CLASS domains would, in the ECCOM, be rated as demonstrating a high extent of child-centered rather than teacher-directed practices.

Teacher and Classroom Characteristics

Among the teacher characteristics that may be relevant with regard to classroom quality are teachers' educational background (Burchinal, Peisner-Feinberg, Pianta, & Howes, 2002; Gerber, Whitebook, & Weinstein, 2007) and work experience (LoCasale-Crouch et al., 2007). Pianta et al. (2005), for instance, showed that early childhood teacher training following a bachelor's degree (BA) contributes positively to teacher effectiveness. On the other hand, some studies have failed to confirm such an association (Early et al., 2007).

However, it seems that teachers' attitudes and goals predict classroom quality more strongly than their education or work experience (LaParo et al., 2009; Pajares, 1992). A high extent of enriching literacy activities can be considered to provide a high quality classroom environment supporting children's academic development. For example, Connor, Morrison and Slominski (2006) found that the amount and type of language and literacy activities observed in classrooms consisting of four-year-olds had a significant and systematic relation to children's growth in their knowledge of the alphabet, letter-word recognition, and vocabulary skills. Moreover, the findings by LoCasale-Crouch and colleagues (2007) suggested that moderate connections exist between the observed classroom quality and certain other types of classroom and teacher characteristics (e.g., pre-kindergarten experience, teachers' and children's ethnicity, and classroom poverty level). The number

of children in the classroom and the teacher-child ratio are also well known contributors to classroom quality: The quality of teaching in classrooms is typically higher in smaller groups with a low teacher-child ratio (e.g., Bredekamp & Copple, 1997).

Profiling Studies Utilizing the CLASS

A recent study by LoCasale-Crouch and colleagues (2007) used cluster analysis in a data set consisting of CLASS observations of 692 pre-kindergarten classrooms with the aim of classifying teachers' practices and validating the CLASS ratings. Of the five classroom quality profiles that were identified, one represented a particularly high level of overall quality (Profile 1, approximately 15% of the classrooms), while another showed a low level of overall quality (Profile 5, approximately 19% of the classrooms) and the three remaining profiles fell between these two extremes. Profile 2 represented a positive emotional climate combined with high instructional quality, and Profile 3 represented positive emotional support and mediocre instructional quality. Finally, Profile 4 represented a moderate emotional climate combined with low instructional quality. The lowest quality profile was associated with a higher level of classroom poverty, meaning that children who would need the highest quality program seldom receive that kind of teaching.

Curby and colleagues (2009) extended the results of the profiling study by LoCasale-Crouch et al. (2007) by examining how children's achievements and social competence were supported in the classrooms within the five profiles of teacher-child interaction, thereby further validating the five profiles. Somewhat unexpectedly, their results indicated that it was not the children in the profile with the highest overall quality, but rather the children in the profile with the highest levels of concept development, that showed the greatest academic gains (highest levels in vocabulary skills and ability to solve applied problems). Children in classrooms with the highest emotional support, however,

showed highest social competence. The findings by Curby et al. (2009) suggested that even relatively small differences in classroom quality can have a substantial impact on the academic gains of children, and concept development may be a particularly strong predictor of academic gains. Aside from these two studies, studies profiling teachers on the basis of their observed classroom practices, and examinations of the prevalence of such profiles, are scarce.

The present study used an approach similar to that of LoCasale-Crouch and colleagues (2007) with respect to the analytical profiling strategy. The aim was to examine profiles of classroom quality in a sample of kindergarten classrooms in Finland and to study the differences between the profiles with respect to teacher and classroom characteristics. We also examined the associations between observed classroom quality as assessed with the CLASS and the observations of teachers' practices using the Early Childhood Classroom Observation Measure (ECCOM; Stipek & Byler, 2004) in order to further validate our profiling procedure. This study aims to generate further information regarding the use of the CLASS in identifying and delineating unique patterns of favorable and less favorable ways in which teachers provide the various subcomponents of emotional, instructional and organizational support. We had a specific interest in being able obtain information useful for the development of accountability systems in early childhood education and to be able to pinpoint areas which would be beneficial targets for pedagogical development, and which could be effective points of focus for basic and continued training programs designed for the development of personnel in the field of Early Childhood Education (ECE).

Our study may expand the knowledge base of previous studies in the following ways. LoCasale-Crouch and colleagues (2007) utilized a two-factor CLASS model (Pianta et al., 2004) in which classroom quality is conceptualized along two domains, namely Social-Emotional Climate and Instructional Quality. In the more recent CLASS studies (Curby et al., 2009; LaParo et al., 2009;

Pianta & Hamre, 2009), however, a three-factor model (i.e., Emotional Support, Classroom

Organization, Instructional Support) has been employed. Findings on the use of the CLASS in Finland

(see authors removed for reviewing purposes, 2010) have provided support for the construct validity

of the three-factor model and evidence for its concurrent validity through expected associations with

teacher questionnaire items, as well as evidence for the reliability (high item and domain correlations

as well as high inter-rater-reliability) of the CLASS in an educational context where a relatively

homogenous general education is provided for a whole age group. We examined the extent to which

classroom quality profiles similar to those assessed by LoCasale-Crouch et al. (2007) and Curby et al.

(2009) are identifiable in the present sample of Finnish kindergartens by using a person-centered

approach with latent profile analysis. The major advantages of the person-centered approach

(Bergman & Magnusson, 1991), compared with a variable-centered framework, is that it allows the

researcher (1) to identify different groups of individuals according to the patterns that they show with

respect to certain criterion variables (e.g., different types of instructional support), (2) to examine the

proportion of the sample showing a particular pattern (Bergman, Magnusson, & El-Khouri, 2003),

and (3) to investigate whether any of the subgroups show a pattern of key variables that one cannot

expect to find using a variable-centered analysis. Interesting patterns of teacher-child interactions

might go undetected in a variable-centered approach. It is noteworthy that the examining of

association between classroom process quality and teacher characteristics has mostly consisted of

looking at bivariate relationships, except in the studies by LoCasale-Crouch et al. (2007) and Curby et

al. (2009). Our study, however, examines whether teacher characteristics are related to certain

patterns across different process quality indicators, rather than only broadly at mean levels of process

quality.

Kindergarten Education in Finland

Before beginning formal schooling at age seven, Finnish children have a statutory right to receive kindergarten education free of charge for one year. Nearly all (98%) of Finnish six-year-old children attend kindergarten education (OECD, 2006) either in daycare centers (78 %) or in primary schools. The kindergarten curriculum (Core Curriculum for Preschool Education, 2000) emphasizes promoting children's social, emotional and motor development, academic pre-skills, preventing learning difficulties, supporting appreciation of ethics, art and culture, the development of cultural identity, personal health, and safety habits (Ojala & Talts, 2007). Kindergarten teachers tend to place a strong emphasis on child-centered activities developing children's positive self-concept and social skills, as well as promoting their learning potential (Hytönen, Krokfors, Talts, & Vikat, 2003). For example, instead of formal teaching of reading, children are encouraged to practice their phonological awareness and letter-knowledge through play.

Recent international comparisons (i.e., Programme for International Student Assessment, PISA) of children's academic skills have shown that Finnish school children are among the best-performing, particularly in literacy and mathematics (OECD /PISA, 2007; 2009). It has been suggested that the homogenous quality of Finnish education may play a role in securing a solid basis for skill development and this may have contributed to the finding that differences between children, schools and regional areas are comparatively small in Finland. In addition to this, the teaching profession is highly valued in Finland, and teacher education programs in universities are able to select their incoming students from a range of highly motivated and qualified applicants. There is little variation in program content between the teacher education units, and almost no students drop out. This has resulted in Finland having a high number of qualified teachers available for employers to choose from all over the country. Moreover, there are common guidelines for educational activities

in classrooms of all levels, and these curriculum guidelines ensure that there is relatively little

variation in the content of the education provided in the classrooms.

Aims and Hypotheses

The present study aims at examining kindergarten classroom quality profiles by applying

latent profiling analyses, as well as exploring the differences between the profiles in regard to teacher

and classroom characteristics. Our study utilizes a similar analytical profiling strategy as that used in

the study conducted by LoCasale-Crouch and colleagues (2007) and that by Curby et al. (2009). By

applying the CLASS to a highly homogenous educational system and in a cultural context differing

from that of the United States, we aimed to generate further information regarding the usability of the

CLASS. Specifically, our study addresses the following research questions:

1. How many latent profiles of classroom process quality can be identified in this sample of

Finnish kindergarten classrooms? We expected to identify less than five latent profiles that would

differ from each other (Hypothesis 1). In the studies by LoCasale-Crouch et al. (2007) and Curby et al.

(2009), five profiles were identified; but the relatively small sample size in the present study and the

more homogenous nature of the educational system in Finland (compared to that of the U.S.) lead us

to expect that a lesser number of differentiable profiles would be identified.

2. What kind of patterns of dimensions will emerge within the three domains of Emotional

Support, Classroom Organization, and Instructional Support? In accordance with previous findings by

LoCasale-Crouch et al. (2007), we expected that we will mostly find classrooms of an overall high

classroom quality and only a small proportion of those of a relatively low overall quality (Hypothesis

2).

3. Do the profiles differ with regard to teacher characteristics (education, work experience, and extent of literacy instruction) and classroom characteristics (class size, number of additional personnel in classroom, and maternal education)? Previous studies have reported moderate associations between higher classroom quality and more extensive teacher education or work experience (Burchinal et al., 2002; Early et al., 2007; Gerber et al., 2007; LoCasale-Crouch et al., 2007; LaParo et al., 2009; Pajares, 1992). We expected that teachers having gained more training (e.g., master's rather than bachelor's degree in ECE) and teachers with more work experience would tend to be represented in greater numbers in profiles of higher classroom quality (Hypothesis 3a: Teacher characteristics). Moreover, we expected that a higher extent of literacy activities reported by kindergarten teachers (e.g., daily rather than once or a few times per week) indicates a higher value being placed on and greater investment made in these kinds of activities, and contributes to the provision of a more favorable classroom environment for the development of children's pre-literacy skills (Connor et al., 2006), leading to an association with higher classroom quality. Finally, prior literature has suggested associations between higher classroom quality and smaller class size (Bredekamp & Copple, 1997). Based on these findings, we expected that the profiles would differ in regard to class size, with the assumed direction of the classroom quality being higher when the class size is smaller (Hypothesis 3b).

4. Do the profiles differ with respect to classroom quality as assessed by another observational measure, the ECCOM (Stipek & Byler, 2004)? Based on characterizations and findings by Stipek and Byler (2004), Marcon (1999), and Huffman and Speer (2000) concerning correlates of child-centered practices, we expected that child-centered rather than teacher-directed classroom practices would be predominantly associated with higher classroom quality profiles (Hypothesis 4).

Method

Participants

The data were collected as part of the *First Steps* follow-up study (authors removed for reviewing purposes, 2006).The follow-up began in 2006 in four Finnish municipalities, with the participation of approximately 2,000 children and their parents and teachers. An age cohort of children born in the year 2000 is presently still being followed from kindergarten through 4th grade. Teachers participating in the observations were selected on a voluntary basis from a total of 137 kindergarten teachers. Observational data were collected regarding 49 kindergarten teachers (47 females, 2 males). 36 classrooms were situated in daycare centers and 13 in primary schools. The majority of the classrooms (60%) were located in urban areas, while smaller proportions were located in semirural (26%) and rural (14%) areas. The classroom sizes ranged from 8 to 24 children ($M =$ 13.85; $SD = 5.92$). On average, 10.89 ($SD = 3.35$) children were present during each classroom observation. All of the teachers were qualified to work as kindergarten teachers and had at least a tertiary-level (college) qualification as such. All teachers and children in this sample were Caucasian and Finnish-speaking. The teachers' experience of working in educational settings ranged from less than a year to more than 15 years (*Mode* = more than 15 years). The representativeness of the children's family background with respect to the general Finnish population was good. When the parents' socioeconomic status (SES) was examined within the participating classrooms, no significant variation between classrooms was discovered.

<div align="center">Measures and procedures</div>

Classroom Observations

CLASS. The Classroom Assessment Scoring System (CLASS; Pianta et al., 2008) focuses on the observed quality of classroom practices. The CLASS measures classroom variables in 10 dimensions of three domains (See Table 1). The domain of *Emotional Support* contains four

dimensions: Positive Climate, Negative Climate (reversed for analysis), Teacher Sensitivity, and

Regard for Student Perspectives. The domain of *Classroom Organization* contains three dimensions:

Behavior Management, Productivity, and Instructional Learning Formats. The domain of

Instructional Support includes three dimensions: Concept Development, Quality of Feedback, and

Language Modeling. Each of the dimensions is rated on a 7-point scale, utilizing the behavioral

markers provided by the CLASS manual (Pianta et al., 2008). Scores 1-2 are seen as *low*, 3-5 as *mid-*

range, and 6-7 as *high*.

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Table 1 somewhere here

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For this study, observations were conducted in the Spring term of the kindergarten year, in

January and February 2007. Two observers rated each kindergarten classroom on two observation

days according to ten CLASS dimensions. The observations were conducted in observation cycles

lasting 30 minutes of which a 20-minute *observation period* was always followed by a 10-minute

rating period. Each kindergarten classroom was observed on two different days (typically one or three

days apart) and each observer rated the observed situations independently. A total of 3 to 5

observation cycles were rated per each participating teacher on each observation day (making a total

of 6 to 10 observation cycles per teacher across two days).

Before starting the observations, the observers (17 female university students) were carefully

trained to use the CLASS and the ECCOM tools, including 3 hours of practice coding in authentic

real-life classroom situations. Ratings that were within 1 point of each other were considered to reflect

an acceptable degree of rating accuracy (see Pianta et al., 2008). In two cases where a pair of

observers showed discrepancies of more than one point between two scores, extra scoring practice

was undertaken using recorded video footage.

Inter-rater reliability between the pairs of observers was determined by calculating intraclass correlation coefficients. To calculate the intraclass correlations, we used a two-way mixed effect model (measures fixed, observers random), the absolute agreement definition, and the average measure intraclass correlation (which assumes no interaction effect) (see McGraw & Wong, 1996). All of the inter-rater reliabilities were high and varied between .80 and .96 on the first observation day (except .63 for Concept Development), and between .76 and .94 on the second observation day. For the subsequent analyses, a mean score was calculated for each dimension using the ratings by the two observers. These scores were also aggregated across the two observation days.

ECCOM. To validate the classroom profiles which were based on the latent subgroup analysis of the CLASS scores, the Early Childhood Classroom Observation Measure (ECCOM; Stipek & Byler, 2004) was used. The ECCOM ratings were conducted using a two-column format. In this format, two dimensions, i.e., Child-Centered Practices and Teacher-Directed Practices are each assessed on a 5-point scale along the following three subscales: The *Management* subscale (4 items; Child Responsibility, Management, Choice of Activities, Discipline Strategies), the *Climate* subscale (4 items; Support for Communication Skills, Support for Interpersonal Skills, Student Engagement, Individualization of Learning Activities), and the *Instruction* subscale (6 items; Learning Standards, Coherence of Instructional Activities, Teaching Concepts, Instructional Conversation, Literacy Instruction, Math Instruction). The subscales comprise of 14 items, applicable to both dimensions. The observers use a 5-point scale (*1 = practices are rarely seen,* i.e., 0-20% of the time; *5 = practices predominate* i.e., 80-100% of the time) to first rate each of the 14 items relating to the Child-Centered dimension, after which they rate the same 14 items in connection with the Teacher-Directed dimension, making a total of 28 ratings. For example, a specific item (e.g., Child Responsibility)

might be given a score of 3 points in the Child-Centered dimension while being given a score of 5 points in the Teacher-Directed dimension (Stipek & Byler, 2005). A mean composite score was calculated separately for the Child-Centered practices and Teacher-Directed practices by averaging their respective 14 items. Recently, the ECCOM has also been found to be a valid and reliable tool for assessing classroom processes in the Finnish educational context (Lerkkanen et al., in press).

The training procedure was similar for both the CLASS and the ECCOM. The same observers who conducted the CLASS observations also completed the ECCOM ratings based on the same observation period (3 hours) on the same two observation days. The ECCOM ratings were conducted only once by the two observers after the half-day observation session. After having rated the ECCOM scales independently, the raters discussed and agreed on a consensus rating. The final scores of the ECCOM scales were calculated as mean scores of the consensus ratings, that is, separate summary scores consisting of 14 items for Child-Centered and the same for Teacher-Directed practices. The inter-rater reliabilities between the observers varied between .74 and .90 for the ECCOM items. The Cronbach's alpha reliabilities for the sum scores were as follows: Child-Centered practices = .96; Teacher-Directed practices = .93.

Questionnaires

Teacher questionnaire. Following the observations by the researcher, teachers were asked to complete questionnaires regarding their demographics (i.e., basic education, years of work experience in educational settings, number of children in the classroom, and number of additional personnel in the classroom) and concerning their instructional activities with regard to the amount of literacy-related activities they provide. One kindergarten teacher did not report her education or work experience.

Teachers were asked to rate 10 items pertaining to curriculum-based instructional activities in their classrooms with regard to literacy (i.e., shared reading, phonological awareness, letter knowledge, word recognition, and pre-spelling activities), which was rated on a 5-point scale (i.e., *How often do you use the following activities in your classroom?: 1 = not at all*, *2 = seldom, 3 = weekly*, *4 = daily*, *5 = several times a day*). The questions were based on a study by Stipek and Byler (2004), and the descriptions were formulated on the basis of the Finnish Core Curriculum for Preschool Education (2000). Hence, teachers' ratings of the amount of literacy-related activities they provide were seen to reflect their instructional goals, with a higher extent of literacy activities indicating a higher value placed on and investment made in these kinds of activities. The Cronbach's alpha reliability for the sum score (frequency of literacy activities in the classroom) was .82.

Parents' questionnaire. Mothers were asked to rate their level of vocational education on a 5-point scale as follows: *1 = no occupational education or only short courses, 2 = vocational school degree, 3 = vocational college degree, 4 = polytechnic degree or bachelor's degree, 5 = master's degree or licentiate / doctoral degree.*

Analysis Strategy

In the CLASS studies, observational ratings have generally been composited across dimensions, dividing information into two or more global domains (LoCasale-Crouch et al., 2007). To gain more specific information on profiles of classroom quality, it is important to explore the differences between dimensions rather than only between domains. LoCasale-Crouch et al. (2007) used a three-stage cluster analysis to identify the core profile types of classroom process quality among pre-kindergarten programs within two domains: Emotional Climate and Instructional Climate. In the present study, however, the mixture modeling procedure of the Mplus 5.0 statistical package (Muthén & Muthén, 1998–2008) was adopted to identify latent subgroups (profiles) that display

similar patterns across the CLASS dimensions in the domains of Emotional Support, Classroom

Organization, and Instructional Support (see also Curby et al., 2009).

We chose the mixture modeling method because it holds several advantages in comparison to

the use of cluster analysis. First, there are two common ways to compare models; one is using

statistical tests of model fit (such as the likelihood-ratio test of neighboring models), and the other is

using statistical indicators (such as information criteria). The mixture modeling procedure enables

both statistical testing for the selection of the number of latent classes and the use of information

criteria. Cluster analysis, in turn, is more descriptive and there are no exact rules of thumb for

selecting a best solution. Second, the mixture modeling procedure also provides entropy values and

posterior probabilities for the evaluation of models. The entropy value was calculated for models with

more than one class in order to quantify the uncertainty of the classification of subjects into latent

classes. Entropy values range from 0 to 1, with 0 corresponding to randomness and 1 to a perfect

classification (Celeux & Soromenho, 1996). Third, one of the advantages of using the Mplus 5.1

statistical package (Muthén & Muthén, 1998-2008) is that it has a *random stars* feature that generates

a different number of random starting value sets to facilitate finding the global solution. The use of

multiple sets of randomly generated starting values is one way to avoid converging on a local solution

(McLachlan & Peel, 2000). Observing the same maximum likelihood for multiple sets of starting

values makes it more likely for a global solution to be found. In the present study, all models were

fitted using the Mplus 5.1 program and applying maximum likelihood estimation (Muthén & Muthén,

2008). To ensure that the best solution corresponds to a global optimum rather than a local maximum

likelihood solution, we repeated the fitting procedure at least 500 times with different sets of random

starting values and with 100 final optimizations. Only solutions that were replicated with different

starting values were accepted.

Our data analysis involved identifying latent subgroups with respect to teachers' observed classroom practices using the nine CLASS dimension scores, namely, the total ratings for the dimensions of Positive Climate, Teacher Sensitivity, Regard for Student Perspectives, Behavior Management, Productivity, Instructional Learning Formats, Concept Development, Quality of Feedback, and Language Modeling. Previous factor analyses of Finnish CLASS data (authors removed for reviewing purposes, 2010) suggested a poor discriminating validity for Negative Climate, i.e., the modification indices indicated that Negative Climate loads on more than one factor. Based on these findings, the dimension of Negative Climate was excluded from the final model. In addition, the ratings for Negative Climate were very low in our sample, suggesting that this dimension of classroom quality has not adequately differentiated itself between teachers in the observed Finnish kindergarten classrooms.

The mixture modeling procedure enables the identification of mixtures of subpopulations (i.e., latent classes) from the observed data and provides statistical tests for evaluating the existence and number of those subpopulations. In order to evaluate the appropriate number of latent subgroups, we used three criteria recommended by Muthén and Muthén (2000), and Muthén (2001, 2003): 1) Fit of the model; 2) classification quality; and 3) the interpretability of the latent subgroups in practice. The fit of the model was evaluated using three criteria: 1) The Akaike Information Criterion (AIC); 2) the Bayesian Information Criterion (BIC); 3) and the adjusted Bayesian Information Criterion (ABIC). For statistical testing of the number of latent subgroups, we used the following tests: The Vuong-Lo-Mendel-Rubin test (VLMR), the Lo-Mendell-Rubin Adjusted LRT (LMR), and the Parametric Bootstrapped Likelihood Ratio Test (BLRT). Lower AIC, BIC, and ABIC values indicate a better model, and significant test results ($p < .05$) indicate a higher number of subgroups. The highest log likelihood value (logL) 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), as well as in relation to the number of teachers assigned to a latent subgroup. The usefulness and interpretational value of the latent classes in practice was determined by the number of teachers assigned to each latent subgroup and the number of estimated parameters.

<div align="center">Results</div>

Identification of Subgroups

In the mixture modeling procedure, we fitted models with different numbers of latent subgroups. The four-subgroup solution was better than the two-, three- or five-subgroup solutions with respect to four information criteria and one statistical test (see Table 2); it also produced the highest log likelihood value, indicating that it is the best fit of all the models. Consequently, the solution with four subgroups was chosen as it best described the quantitative differences between the observed teaching practices. The subgroup membership was also stable. Teachers' probabilities of being in a certain profile were high (mainly over .98 with a few exceptions of .59, .81, .84, .88, and .91), indicating a reliable solution. Further, the entropy value was .95, indicating a clear classification. In the four-subgroup model, the group sizes were as follows: Subgroup 1 (n = 26), Subgroup 2 (n = 14), Subgroup 3 (n = 6), and Subgroup 4 (n = 3).

<div align="center">_____</div>

<div align="center">*Table 2 somewhere here*</div>

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Classroom Profiles

Table 3 presents the overall classroom quality of the profiles. Standard deviations, significant pairwise differences and sample means are provided to facilitate the interpretation of the profiles.

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Table 3 somewhere here

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The latent profile analysis of the nine CLASS dimensions (i.e., Positive Climate, Teacher Sensitivity, Regard for Student Perspectives, Behavior Management, Productivity, Instructional Learning Formats, Concept Development, Quality of Feedback, and Language Modeling) produced four latent classroom profiles. In the following paragraphs, a description of each profile is provided. The names of the profiles were derived from the individual variations within each profile in the three CLASS domains (Emotional Support, Classroom Organization, and Instructional Support), and the profiles were organized in order from the most prevalent to the least prevalent.

Profile 1 – Highest Quality (prevalence = 53%). In general, classrooms in this profile attained scores that were overall higher than the sample means of all nine dimensions, and higher than for all other profiles. The ratings in this profile were either in the mid- or high-range for all dimensions of Emotional Support (scores between 5.2 and 5.8) and all dimensions of Classroom Organization (scores between 5.3 and 6.0). Ratings for Instructional Support were in the mid-range (scores between 4.1 and 5.0), but as mentioned above they were higher than for any of the other profiles. The Quality of Feedback, in particular, was close to 1 SD above the sample mean. This was the most prevalent profile in the present sample.

Profile 2 – Medium Quality (prevalence = 29%). Classrooms in this profile attained scores very close to the sample means of all nine dimensions. The scores were slightly above the sample mean of the dimension of Teacher Sensitivity and slightly below the sample means of the other

dimensions. The ratings of classroom quality in this profile were in the mid-range for the dimensions of Emotional Support and Classroom Organization (scores between 4.7 and 5.6), but in the lower mid-range in the dimension of Instructional Support (scores between 3.4 and 4.0). The scores for Profile 2 were slightly lower than those for Profile 1 in all dimensions (especially in Quality of Feedback and Language Modeling). Scores for Profile 2 did not differ statistically from those for Profile 3 regarding Classroom Organization and Instructional Support, most probably because of low statistical power. This was the second most prevalent profile in the sample.

Profile 3 – Medium Quality with Lower Emotional Support (prevalence = 12%). Classrooms in this profile attained scores that were below the sample mean. Scores were one point below the mean in the dimension of Positive Climate, and nearly one point below the mean in Teacher Sensitivity, Regard for Student Perspectives, Quality of Feedback and Language Modeling. In the remaining dimensions, scores were marginally below the sample mean. The clearest distinction between profiles 2 and 3 is that Emotional Support provided by teachers was clearly of lower quality in Profile 3 than in Profile 2; the mean scores for Positive Climate and Teacher Sensitivity are one point lower in Profile 3 than in Profile 2. Profiles 2 and 3 did not differ from each other in any dimensions of Classroom Organization; however, the score for Language Modeling was higher in Profile 2 than in Profile 3.

Profile 4 – Lowest Quality (prevalence = 6%). Classrooms in this profile attained scores clearly below the sample mean. The scores were below the sample mean for six of the nine dimensions, while the scores for the three dimensions of Regard for Student Perspectives, Productivity and Concept Development were about 1.5 points below the sample mean. Emotional Support, Classroom Organization and Instructional Support were clearly of lower quality than in the

other profiles, and the quality of Instructional Support was strikingly low. This profile applied to only three teachers and was the least prevalent profile in this study.

Profile Differences regarding Teacher and Classroom Characteristics

Five variables of characteristics (i.e., years of experience in educational settings, class size, number of additional personnel in the classroom, extent of instructional activities supporting literacy, and classroom mean maternal education level) were measured and analyzed separately with one-way ANOVAs ($p < .05$). A general description of the teacher and classroom variables for each profile is presented in Table 4. The pairwise comparisons were conducted using Tukey HSD (Honestly Significant Difference) procedures. Since the group sizes were so small, especially in profiles 3 and 4, the statistical results were double-checked using the Nonparametric Kruskall-Wallis Test, which yielded results similar to those of the one-way ANOVAs.

The profiles did not differ from each other in the majority of the teacher and classroom characteristics (i.e., teacher's level of education, maternal education, class size, number of additional personnel in the classroom). However, two sets of statistically significant differences were obtained. First, Profile 4 differed significantly from the other profiles in regard to the teachers' work experience [$F(3, 43) = 3.77$, $p < .05$]. The teachers in Profile 4 had clearly less work experience in educational settings than the teachers in the other profiles. Second, profiles 1 and 4 differed significantly from each other in respect to the extent of teacher's self reported literacy instruction [$F(3, 44) = 2.86$, $p < .05$]; the teachers in Profile 1 provided children with more literacy activities than those in Profile 4.

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Table 4 somewhere here

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Relation to the ECCOM

The external validity of the resulting profiles was also examined by evaluating differences between profiles against the ECCOM observational ratings. The ANOVA results showed statistically significant differences between the profiles concerning child-centered [$F(3, 45) = 25.66$, $p < .001$] and teacher-directed practices [$F(3, 45) = 26.26$, $p < .001$] (See Table 4). In general, the teachers in the higher quality profiles (1 and 2) were observed to have applied more child-centered practices than did the teachers in the lower quality profiles (3 and 4). Teacher-directed practices were also more commonly used in the lower quality profiles than in the higher quality profiles. These results reflect the rankings of the profiles in that child-centered practices were more strongly represented in the higher quality profiles while teacher-directed practices were more prevalent in the lower quality profiles.

Discussion

The aim of the present study was to identify and examine classroom quality profiles in a sample of kindergarten classrooms in Finland and to analyze differences between these profiles with respect to teacher and classroom characteristics. Four latent profiles of classroom quality were identified: Profile 1 represented a generally higher classroom quality, whereas Profile 4 showed patterns of generally lower classroom quality, and profiles 2 and 3 showed medium and varying levels of support in the assessed dimensions. The four profiles did not differ from each other in regard to most of the teacher and classroom characteristics. However, the teachers in Profile 1 reported providing a higher extent of instructional activities supporting literacy learning than did teachers in Profile 4. The teachers in Profile 4 had less work experience than the teachers in the other profiles. The findings also indicated that it is possible to filter out subtle differences in teacher-child interactions by profiling teachers according to child-centered versus teacher-directed practices, thus

contributing to the previous CLASS profiling studies of LoCasale-Crouch et al. (2007) and Curby et al. (2009).

Number of the Profiles

In the present study, four latent profiles of observed classroom quality were identified, which is in line with Hypothesis 1, suggesting that less than five profiles are likely to be identified in the quite homogenous Finnish sample which was notably smaller than the samples in the studies by LoCasale-Crouch et al. (2007) and Curby et al. (2009). The internal validity of the four profiles was good, with clear profile membership and clear differentiation between the four profiles. The low proportion of teachers in profiles of medium (3) and low (4) quality, and the majority of teachers being rated as showing relatively high quality teaching practices, may be due to the fact that teacher education is one of the most popular programs of study in Finland and because the selection process guarantees that highly motivated and skilled students enter into teacher education programs. Moreover, the unified teacher education system provides homogenous guidelines which may result in teachers sharing more similarities than differences in their practices (see Ojala & Talts, 2007). International comparisons have also shown that Finnish kindergarten classrooms utilize many high-quality practices (i.e., small amounts of whole-group activities and the opportunity to learn within a wide variety of social contexts) and generally feature high-quality structural characteristics (i.e., relatively small group sizes; availability of a wide range of learning materials) (Ojala, 2004).

Combinations of Observed Process Quality Profiles assessed with the CLASS

In accordance with previous findings by Curby et al. (2009), we expected that the classroom profiles may show different combinations of support (Hypothesis 2). Our results provided partial support for this hypothesis. For instance, classrooms in Profile 1 showed relatively high levels of Emotional Support and Classroom Organization but in terms of absolute levels even this group only

reached the mid-range in quality of Instructional Support. Profile 3 showed mid-range Classroom

Organization but relatively lower Emotional and Instructional Support.

Differences between the profiles were clearest in the domain of Emotional Support (all

profiles differed from each other, except for Profile 3 and Profile 4 which showed the same level of

Regard for Student Perspectives). The quality of Emotional Support was at least of medium level in

the majority of the classrooms (profiles 1, 2 and 3). This seems logical since the stiff selection process

of the Finnish kindergarten teacher education system with its intensive interviews and suitability tests

only guarantees admission to highly motivated students who demonstrate high levels of sensitivity

and emotional supportiveness in their personality. At the same time it should be noted that although

the absolute level of Emotional Support fell in the higher end of the mid-range (scores were around 5

on the 7-point scale), this was the domain which showed most variation across the profiles.

The differences between the profiles were least pronounced in the domain of Classroom

Organization, where profiles 2 and 3 had highly similar scores. This finding may reflect the strong

emphasis on good pedagogical skills in the training programs and the high extent of supervised

practice in which the students are exposed to different classroom contexts and receive detailed

feedback concerning their teaching. Even in daycare groups for children between the ages of 2 and 4,

at least one teacher is required to have a minimum of a bachelor's degree level educational training.

In the domain of Instructional Support, scores for Profile 1 were higher than for the other

profiles, but again the scores for profiles 2 and 3 did not differ from each other. In the domain of

Instructional Support, statistically significant differences were found between all profiles in, and only

in, the dimension of Language Modeling. It is possible that the relatively low scores and large

variation of Language Modeling by the teachers reflect the traditionally strong emphasis on children's

social development and lesser emphasis on academic learning in the form of effective language

stimulation within Finnish kindergartens. Profiles 2 and 3 differed from each other only in Language

Modeling, Positive Climate and Teacher Sensitivity, which suggests that teachers in Profile 2 may be

more sensitive to the academic needs and abilities of children and may utilize this knowledge more

effectively to verbally support children's learning.

Differences between Profiles in Teacher and Classroom Characteristics

In our third hypothesis (Hypothesis 3a), we expected that differences are likely to emerge

between profiles in the extent of the teachers' education and work experience (Burchinal et al., 2002;

Early et al., 2007; Gerber et al., 2007; LaParo et al., 2009; LoCasale-Crouch et al., 2007; Pajares,

1992), and in the extent of their literacy instruction, as well as in the number of children in the

classroom (Hypothesis 3b) (Bredekamp & Copple, 1997). The results indicated that although the four

profiles were distinct from each other in terms of their observed process quality, they were not well

differentiated concerning teacher and classroom characteristics, which is contradictory to what we

expected. Only two sets of differences were obtained. The first significant difference was found

regarding teachers' work experience in educational settings, showing that teachers in the lowest

quality profile (Profile 4) had significantly less work experience than the teachers in the other profiles.

However, the number of teachers in Profile 4 (only three teachers) is possibly too small for making

any generalizations. The second significant difference was that teachers who belonged to the highest

quality profile (Profile 1) reported providing support to children in literacy skills to a greater extent

than teachers in the lowest quality (Profile 4). In line with LaParo et al. (2009), this finding suggests

that teachers' background characteristics (such as age or education) may be less influential than

factors like attitudes or educational goals in explaining differences between teachers.

Observed Process Quality in Classroom Profiles assessed according to Child-Centered and Teacher-

Directed Practices

In accordance with previous characterizations and findings by Stipek and Byler (2004), Marcon (1999), and Huffman and Speer (2000) on the correlates of child-centered practices, we expected that those classrooms in which teacher practices were considered to be predominantly child-centered would be associated with the higher quality classroom profiles (Hypothesis 4). In line with our hypothesis, our results indicated that the ratings of child-centered practices were higher for the higher quality profiles 1 and 2 (especially Profile 1). These results reflect the overlapping nature of the CLASS and ECCOM constructs. For example, the combination of both high quality Emotional Support and Classroom Organization shown in the highest quality profile (Profile 1) is conceptually very similar to the characterizations of a high extent of child-centered practices being used in relation to the dimensions of Climate and Management in the ECCOM, where such teachers are described as sensitively responding to children's needs while having clearly established and shared rules in the classroom.

The highest degree of teacher-directed practices, on the other hand, was observed in the lowest quality profile (Profile 4), as was expected (Hypothesis 4). Teachers in Profile 4 also received somewhat lower scores in the dimensions of Instructional Support than teachers in the other profiles. The lower CLASS scores in Instructional Support reflect a lesser degree of teachers constructing knowledge *together* with children and also less support having been provided for conceptual understanding. These characterizations align with the teacher-directed practices in the ECCOM. The high scores relating to teacher-directed practices in Profile 4 suggest that, in these classrooms, routine practicing of skills is given considerably more weight and perhaps so at the expense of fostering thinking skills, conceptual understanding and problem solving (Stipek & Byler, 2004).

Reflections regarding Differences between the Profiles in the Finnish and the U.S. studies

LoCasale-Crouch et al. (2007) identified five classroom profiles among pre-kindergarten classrooms in the United States, whereas four profiles were identified in our present study in Finland. Both studies similarly identified unique patterns of interactions within classrooms. Both studies identified two extreme profiles, one of a generally high and the other of a generally low classroom quality, while the other profiles (three in the U.S. and two in Finland) fell between these two extremes. In both studies, classrooms in Profile 1 showed a higher quality than the other profiles in the dimensions comprising Emotional Support and in the comparable dimensions of Classroom Organization in the newest version of the CLASS (i.e., Behavioral Management, Productivity, and Learning Format). Both of these aspects are also connected to children's high-quality learning experiences as reviewed in previous studies (e.g., Hamre & Pianta, 2005; NICHD-ECCRN, 2002; Rimm-Kaufman et al., 2005). The lowest quality profiles (Profile 4 in the Finnish sample and Profile 5 in the U.S. study) differed somewhat from each other: While the scores for most of the dimensions in these profiles indicated a generally low quality, teachers in Profile 5 of the U.S. study scored relatively high in Positive Climate and Instructional Learning Formats, whereas the teachers Finland scored relatively high in Productivity. The relatively high level of productivity in Finnish kindergarten classrooms may result from the organization and rhythm of daily program in kindergarten classrooms in Finland. The formal instructions in the Finnish kindergarten classrooms were held during a relatively short period in the morning hours while the classroom observations took place in the kindergarten classrooms. Teachers usually plan these lessons carefully and make sure that this time is dedicated to focused and active learning. For these reasons the level of productivity may seem to be relatively high in the present sample.

The three profiles (2, 3, and 4) falling between the two extreme profiles in the U.S. study by LoCasale-Crouch et al. (2007) shared relatively similar levels of Emotional Support. In the Finnish

sample, profiles 2 and 3 differed from each other in Emotional Support, but not in Classroom Management. In the Finnish sample, the levels of Emotional Support appear to have varied more and were of a lower level than in the U.S. study. In other previous studies, medium to high scores have been reported for U.S. classrooms in the domain of Emotional Support (e.g., LaParo et al., 2004) while somewhat lower scores were given in the same domain to the Finnish kindergarten classrooms (authors removed for reviewing purposes, 2010). This may be explained by cultural differences; for example, although Finnish kindergarten teachers are generally warm and sensitive, their expression of praise for children may be more subtle and subdued in comparison to teacher's approach to giving feedback in some other cultures. Profiles 2, 3, and 4 in the study by LoCasale-Crouch (2007) differed more from each other more in Instructional Support than in Emotional Support; this was rather converse in the Finnish profiles where the biggest differences between profiles 2 and 3 appeared in the domain of Emotional Support.

Limitations

In the present study, there are some limitations that need to be taken into account. First, the small number of teachers (n = 49) in the sample decreases the power of our statistical analyses and the generalizability of the results across kindergartens in Finland and other countries. Further, the combined factors of the small sample size and homogeneous nature of the Finnish educational system may result in highlighting only subtle differences between profiles regarding teachers' practices and background characteristics. This calls for caution when interpreting the profiles. Second, the teachers whose classrooms were observed participated in this part of the study on a voluntary basis. However, when the 49 kindergarten teachers who volunteered were compared to those who chose not to participate in the observations (n = 88), no statistically significant differences were found in the teachers' background characteristics (e.g., basic or additional teacher education, work experience,

number of additional personnel in the classrooms, classroom size, efficacy beliefs, or teacher stress).

Third, the comparisons made between the Finnish and the U.S. profiles must be interpreted with

caution due to the large difference in sample size between the studies and due to the fact that there is

less variation in the socioeconomic status of families in Finland and ethnic minorities are rarer than in

the United States. Fourth, in our study of kindergarten classrooms in Finland the sample comprised

six-year-old children and their teachers, whereas the U.S. study by LoCasale-Crouch and colleagues

(2007) consisted of four-year-old children. In both studies, however, children were at the stage just

prior to the transition to more formal schooling at these respective ages. Fifth, the CLASS and

ECCOM observations were conducted by the same observers (each teacher was rated by the same

observer for the CLASS and ECCOM scores) and were based on the same observation periods, which

may lead to intercorrelated ratings. Sixth, the dimension of Negative Climate was excluded from our

final model because factor analyses of Finnish CLASS data in a previous validation study (authors

removed for reviewing purposes, 2010) showed that Negative Climate possessed poor discriminant

validity as this dimension was rarely evidenced in the Finnish classrooms.

Practical Implications and Future Directions

The results of this study have some practical implications. First, profiles differed quite clearly

in the domain of Emotional Support, which should be addressed in the field of Teacher Education by

providing more examples of effective practices featuring high quality teacher-child interaction.

Second, despite the fact that profiles did not differ as clearly in the domain of Instructional Support as

they did in Emotional Support, the levels relating to Instructional Support were of the lowest quality

in the present sample, wherefore there is a need for continued teacher training in this area. It is also of

importance that shorter work experience was related to lower classroom quality in this sample. Hence,

the results suggest that there might be a need to support new teachers in their professional development at the very beginning of their career.

The results of this study may serve as a useful tool for teacher education for the purpose of enhancing the quality of teaching practices in kindergarten classrooms. There are no nationwide observational assessment tools in use to examine the process quality of classrooms in Finland. The CLASS could serve this purpose; however, in such a case it would be important to offer sufficient reliability training to ensure accurate use of the CLASS. This study has shown that the CLASS can be used to identify different patterns in teachers' classroom practices. The results are derived by utilizing latent profile analysis, which collapses the data on similar classrooms together and provides potentially more useful information than could be gained by simply comparing means and standard deviations. The results of this study can also be used to recognize teachers' professional strengths as well as their weaknesses in helping them to develop further in areas that were not of high quality. More qualitative approaches need to be utilized in order to more closely determine in which areas of teaching practices further interventions would be beneficial to individual teachers in their professional development.

The results of our study provide evidence for the educational usefulness of profiling studies in different geographical contexts, not only in the United States. The previous CLASS studies have convincingly shown associations between classroom quality and child outcomes (e.g., Curby et al., 2009; Justice et al., 2008). In further Finnish studies, it would be particularly relevant and beneficial to use a person-centered approach for examining the impact of the different factors of the various classroom quality profiles on the children's developmental outcomes and gains in achievement.

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Table 1

CLASS Domains and Dimensions

_____

Domain of Emotional Support	Domain of Classroom Organization	Domain of Instructional Support

_____

Dimensions	*Dimensions*	*Dimensions*

_____

Positive Climate Reflects the emotional connection between teacher and children and among children.	*Behavior Management* Reflects teacher's ability to use effective methods of preventing and redirecting misbehavior and to provide children with clear behavioral expectations.	*Concept Development* Reflects the teacher's use of instructional discussions and activities to promote children's higher order thinking skills and understanding.
Negative Climate Reflects the overall level of expressed negativity in the classroom.	*Productivity* Reflects how well the teacher manages instructional times and routines so that children have opportunities to be involved in learning activities.	*Quality of Feedback* Reflects the degree to which the teacher's provision of feedback is focused on expanding learning and understanding, and how children's continued participation is encouraged.
Teacher Sensitivity Reflects the teacher's responsiveness and awareness to children's academic and emotional needs.	*Instructional Learning Formats* Reflects the ways in which the teacher aims to maximize children's engagement, interest, and ability to learn during lessons.	*Language Modeling* Reflects the quality and amount of teacher's use of language stimulation and language facilitation techniques in interactions with children.
Regard for Student Perspectives Reflects the degree to which the teacher's interactions with children place an emphasis on the children's motivation and points of view, and encourage children's responsibility.		

Table 2

Indices for Mixture Models with Different Numbers of Latent Classes (Subgroups)

Class	logL	BIC	ABIC	AIC	VLMR	LMR	BLTR	n(class1)	n(class2)	n(class3)	n(class4)	n(class5)
1	-507.000	1,084.053	1,027.568	1,050.000	-	-	-	49				
2	-308.780	870.532	782.666	817.561	0.0075	0.0083	0.0000	4	45			
3	-308.419	764.726	645.481	692.837	0.4256	0.4336	0.0000	3	17	29		
4	-280.904	748.615	597.989	657.808	0.3067	0.3159	0.0000	3	26	6	14	
5	-389.587	1,004.899	822.892	895.173	0.2398	0.2398	1.0000	0	8	41	0	0

Note log L=log likelihood; *VLMR*=Vuong-Lo-Mendell-Rubin test, *p*-value; *LMR*=Lo-Mendel-Rubin test, *p*-value; *BLTR*=Parametric Bootstrapped Likelihood

Ratio Test, *p*-value

Table 3

CLASS Raw Mean Profile Scores (Standard Deviations)

CLASS variables	Profile types				
	Profile 1	Profile 2	Profile 3	Profile 4	Total sample *mean*
	(n = 26)	(n = 14)	(n = 6)	(n = 3)	(n = 49)
Emotional Support					
Positive Climate	5.79 (0.35)[a]	5.35 (0.29)[b]	4.31 (0.26)[c]	2.98 (0.20)[d]	5.31 (0.83)
Teacher Sensitivity	5.73 (0.32)[a]	5.42 (0.38)[b]	4.48 (0.44)[c]	3.33 (0.29)[d]	5.34 (0.74)
Regard for Student Perspectives	5.17 (0.59)[a]	4.68 (0.55)[b]	3.90 (0.23)[c]	2.97 (0.59)[c]	4.74 (0.82)
Classroom Organization					
Behavior Management	5.95 (0.35)[a]	5.31 (0.46)[b]	4.77 (0.72)[b]	3.10 (0.40)[c]	5.45 (0.85)
Productivity	5.90 (0.20)[a]	5.58 (0.36)[b]	5.53 (0.18)[b]	4.44 (0.62)[c]	5.68 (0.45)
Instructional Learning Formats	5.27 (0.33)[a]	4.72 (0.37)[b]	4.67 (0.25)[b]	2.86 (0.37)[c]	4.89 (0.67)
Instructional Support					
Concept Development	4.17 (0.72)[a]	3.54 (0.67)[b]	3.32 (0.53)[b,c]	2.21 (0.70)[c]	3.76 (0.85)
Quality of Feedback	4.62 (0.58)[a]	3.36 (0.65)[b]	2.96 (0.79)[b,c]	1.93 (0.38)[c]	3.89 (1.04)
Language Modeling	4.85 (0.40)[a]	4.02 (0.37)[b]	3.46 (0.47)[c]	2.05 (0.35)[d]	4.27 (0.86)

Note ANOVA pairwise significant differences are denoted by superscript letters *a - d*, with differing letters indicating statistically significant differences. Scores 1 - 7 are expressed along *CLASS dimensions*.

Table 4

Means, Standard Deviations and Percentages of Teacher and Classroom Characteristics and ECCOM scores by Profile

	Profiles				
	Profile 1 (n = 26)	Profile 2 (n = 14)	Profile 3 (n = 6)	Profile 4 (n = 3)	Total (n = 49)
Teacher Characteristics					
Education					
Kindergarten teacher (2-3-year)	57.7%	61.5%	66.7%	33.3%	57.1%
Bachelor of Education (BA)	23.0%	23.1%		33.3%	18.4%
Master of Education (MA)	11.5%	7.7%			8.1%
Other (e.g., Social Pedagogue)	7.6%	7.7%	33.3%	33.3%	12.3%
Work experience[1]	$4.04^{a,b,c}$	$4.15^{a,b}$	$4.83^{a,b}$	$2.33^{a,c}$	4.06
	(1.02)	(1.34)	(0.41)	(0.58)	(1.15)
Less than a year		7.7%		66.7%	2.1%
1-5 years	12.0%	7.7%		33.3%	12.8%
6-10 years	12.0%	7.7%	16.7%		10.6%
11-15 years	36.0%	15.4%	83.3%		25.5%
More than 15 years	40.0%	61.5%			48.9%
Extent of Literacy Instruction[2]	3.26^{a}	$3.35^{a,b}$	$3.11^{a,b}$	2.57^{b}	3.22
	(0.41)	(0.57)	(0.24)	(0.21)	(0.46)
Classroom Characteristics					
Class size	13.08	13.93	15.5	14.33	13.69
	(5.14)	(5.98)	(5.54)	(6.66)	(5.40)
Additional personnel in classroom	1.73	2.08	1.67	0.33	1.73
	(1.56)	(1.12)	(0.82)	(0.58)	(1.36)
Maternal education[3]	2.97	3.19	3.08	3.23	3.06
	(0.69)	(0.54)	(0.71)	(0.49)	(0.64)
Teaching Practices (ECCOM)					
Child-Centered Practices[4]	3.35^{a}	2.54^{b}	$2.08^{b,c}$	1.34^{c}	2.84
	(0.54)	(0.43)	(0.37)	(0.35)	(0.77)
Teacher-Directed Practices[4]	1.82^{a}	2.56^{b}	3.30^{c}	3.79^{c}	2.33
	(0.43)	(0.58)	(0.48)	(0.75)	(0.80)

Note [1] Work experience scale 1-5, where 1 = *less than a year* and 5 = *more than 15 years*;
[2]Instructional activities scale 1-5, where 1 = *not at all* and 5 = *several times a day*;
[3] Maternal education scale 1-5, where 1 = *no occupational education or only short courses* and 5 = *master's degree or licentiate/ doctoral degree*;
[4]ECCOM scale 1-5, where 1 = *practices are rarely seen*; 0-20% of time to 5 = *practices predominate*; 80-100% of time.
[a-c]ANOVA pairwise significant differences are denoted by differing superscript letters *a - c*, similar letters denoting no differences and differing letters indicating statistically significant differences.