The quality of teacher-child interactions and teachers' occupational well-being in Finnish kindergartens: A person-centered approach

Abstract

Research Findings: The aim of the present study was to identify profiles of kindergarten teachers based on the observed quality of interactions with the children in their classrooms and to explore possible differences between the profiles in terms of teachers' occupational well-being and teacher and classroom characteristics. Participants were 54 Finnish kindergarten teachers whose interactions with children were observed with the Classroom Assessment Scoring System (CLASS Pre-K). The teachers also completed a questionnaire about their occupational well-being. Four interaction profiles were identified: Highest Quality, Moderate Quality, Lower Quality with Limited Negativity, and Lower Quality with Moderate Negativity. Differences between the profiles were found in teachers' teaching-related stress, general stress, and depressive symptoms. Furthermore, the profiles differed, albeit marginally significantly, in terms of teachers' emotional exhaustion. Overall, teachers in the Moderate Quality profile reported the most favorable occupational well-being, whereas teachers in the Highest Quality and the two lower quality profiles reported challenges to their occupational well-being. The profiles did not differ in terms of teacher and classroom characteristics. *Practice or Policy:* Results suggest that teachers' professional development opportunities should focus on both improving the quality of classroom interactions and enhancing teachers' occupational well-being by reducing their stress.

Introduction

The quality of teacher-child interactions plays an important role in children's academic development, social skills development, and motivation already during the early childhood education (ECE) years (Ansari & Pianta, 2018; Broekhuizen et al., 2016; Curby et al., 2013; Hu et al., 2020; Pakarinen, Kiuru, et al., 2010). However, the quality of interactions between teachers and children is not only important for children with whom teachers interact but also for the teachers themselves. Earlier research suggested that the quality of teacher-child interactions is related to different aspects of teachers' occupational well-being, such as stress, emotional exhaustion, and depressive symptoms (e.g., Jennings, 2015; Penttinen et al., 2020). Although prior research found associations between teachers' occupational well-being and the quality of teacher-child interactions, studies have not reached consensus on whether high-quality teacher-child interactions relate to low (Jennings, 2015; Penttinen et al., 2020; Sandilos et al., 2015), moderate (Friedman-Krauss et al., 2014), or high (Hoglund et al., 2015) levels of teachers' stress, emotional exhaustion, or depressive symptoms.

Furthermore, even though teachers are not a homogeneous group, most prior studies have been variable-oriented in examining the association between domains of teacher-child interactions (most prominently, emotional support, classroom organization, instructional support) and aspects of teachers' occupational well-being (e.g., stress, emotional exhaustion, or depressive symptoms) (e.g., Friedman-Krauss et al., 2014; Hoglund et al., 2015; Jennings, 2015; Penttinen et al., 2020). In order to better understand teachers' unique patterns of interactions and how teachers' occupational well-being differs among these interaction patterns or profiles, this study used a person-centered approach. A person-centered approach has the advantage that it allows researchers and teacher educators to identify profiles based on the observed quality of

teacher-child interactions in the classroom (Halpin & Kieffer, 2015). More specifically, this study used ten dimensions (e.g., positive climate, behavior management, and language modeling; see Figure 1) that the Teaching through Interactions (TTI) framework suggested as particularly relevant to high-quality teacher-child interactions (Hamre et al., 2013). Identified interaction profiles represent different groups of teachers whose interactions with children show similar patterns within a group but different patterns across groups (Halpin & Kieffer, 2015): For example, some teachers might display high-quality interactions in some dimensions but lower-quality interactions in other dimensions (see e.g., Virtanen et al., 2019). Thus, interaction profiles are profiles that represent groups of teachers who share similar quality of teacher-child interactions across the ten dimensions of the TTI framework. Interaction profiles can be identified with latent profile analysis (LPA; see Halpin & Kieffer, 2015).

To date, only a few studies have examined teachers' occupational well-being in relation to profiles based on the observed quality of teacher-child interactions (see Jeon et al. 2016; Virtanen et al., 2019). These studies have shown interesting associations between the interaction profiles and teachers' occupational well-being in the U.S. preschool (Jeon et al., 2016) and Norwegian secondary school classrooms (Virtanen et al., 2019). However, to our knowledge, no such person-centered approach has been taken to study these associations in kindergarten or elementary school classrooms, and earlier profiling studies at younger or older grade levels were limited by the small number of occupational well-being measures that have been examined in relation to the patterns. Addressing these gaps, the present study focuses on identifying profiles of kindergarten teachers based on the observed quality of teacher-child interactions in the classroom. Furthermore, this study explores the relationships between teachers' interaction profiles and their occupational well-being (i.e., general stress, teaching-related stress, emotional

exhaustion, and depressive symptoms) and the commonly used teacher and classroom characteristics (i.e., teachers' work experience, group size, and number of children needing support in the group). Hence, this study aims at increasing our understanding of ECE teachers' unique patterns of teacher-child interactions and individual experiences of occupational well-being. Such knowledge has important implications for providing targeted support for teachers in that it may help to enhance both the quality of teacher-child interactions and occupational well-being.

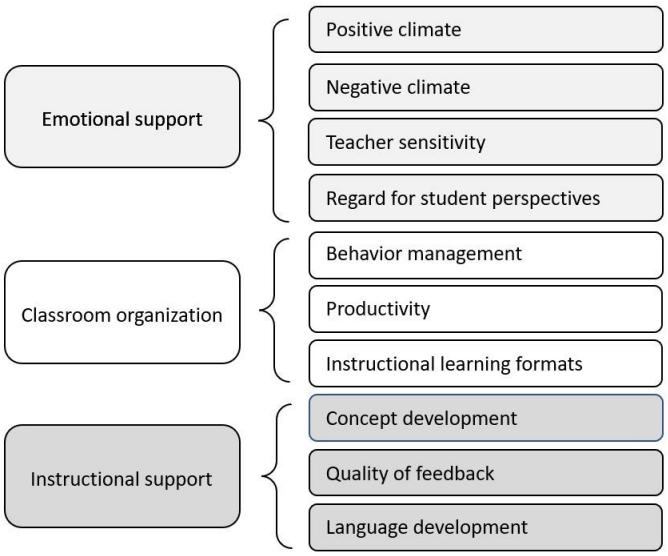
Conceptual Framework of Teacher-Child Interactions: Teaching through Interactions

In the present study, the "Teaching through Interactions" (TTI; Hamre et al., 2013) framework is used to conceptualize teacher-child interactions in classrooms. The framework has its roots in Bronfenbrenner and Morris' (2006) bioecological model which proposes that children develop in their daily interactions with significant others such as teachers, and peers (see Appendix for Figure A1). These interactions TTI differentiates under three domains of teacher-child interactions: emotional support, classroom organization, and instructional support, each of which consists of three to four dimensions (see Figure 1). The emotional support domain is based on attachment theory (Ainsworth et al., 1978; Bowlby, 1969) and self-determination theory (Ryan & Deci, 2000; Skinner & Belmont, 1993), emphasizing the importance of emotionally supportive relationships and interactions for a child's development and engagement. In emotionally supportive classrooms, warmth, respect, and enjoyment are evident and there is little negativity (Hamre et al., 2013). In addition, teacher is responsible regarding children's academic and emotional needs and takes children's interests into account in activities and interactions. Dimensions of emotional support include positive climate, negative climate, teacher sensitivity, and regard for student perspectives. Studies have shown that high-quality emotional support is

associated with, for example, children's higher levels of engagement (Castro et al., 2017) and social competence (Burchinal et al., 2010; Pakarinen et al., 2020).

Figure 1.

Three Domains and Ten Dimensions of the TTI Framework. Based on Hamre et al. (2013).



The domain of classroom organization relies on classroom management research (see Emmer & Stough, 2001), highlighting the importance of teachers' proactive behavior management, well-established routines, and effective instructions in maintaining children's attention and interest in learning. In well-organized classrooms, there are clear expectations for child behavior and the strategies used to manage child behavior are proactive rather than reactive (Hamre et al., 2013). Moreover, the teacher has clear plans, and their time management is efficient. Dimensions of classroom organization include behavior management, productivity, and instructional learning formats. Research has indicated that high-quality classroom organization is related to, for example, children's higher levels of motivation (Pakarinen, Kiuru et al., 2010),

higher levels of academic skills (Cadima et al., 2010), fewer behavior problems, and more cooperative behavior with peers (Luckner & Pianta, 2011).

Instructional support stems from research on children's cognitive and language development (e.g., Bransford et al., 2000; Mayer, 2002; Taylor et al., 2003), which underscores the importance of teachers placing an emphasis on supporting children's understanding, instead of having children only learn facts, by prompting thought processes, giving specific feedback, and using effective language modeling techniques. In instructionally supportive classrooms, the teacher promotes children's higher-order thinking skills, gives high-quality feedback to support children's learning and participation and uses language-stimulation techniques (Hamre et al., 2013). Dimensions of instructional support include concept development, quality of feedback, and language modeling. Studies have shown that high-quality instructional support is associated with children's academic skills such as math- and literacy-related skills (Bartholo et al., 2022; Burchinal et al., 2010; Hu et al., 2020). Quality of teacher-child interactions within the three domains and the dimensions under them can be assessed with an observational measure, The Classroom Assessment Scoring System (CLASS; Pianta, La Paro et al., 2008).

Teacher-Child Interactions in Relation to Teachers' Occupational Well-Being

In this section, first, the phenomenon of teachers' occupational well-being is introduced. Second, it is discussed how teacher-child interactions and teachers' occupational well-being are related. It is known that teaching is considered a highly stressful occupation (Herman et al., 2018; Skaalvik & Skaalvik, 2015) and, as a consequence, teachers are at risk of low occupational well-being characterized by high levels of work-related stress, emotional exhaustion, and depressive symptoms (for a review on ECE teachers' occupational well-being, see Cumming, 2017). Indeed, research has shown that teachers typically report more stress (Johnson et al.,

2005) and poorer mental health (Stansfeld et al. 2011; Whitaker et al., 2013) when compared to other occupations. Teacher stress is defined as teachers' experiences of negative emotions, such as anxiety, frustration, or tension, caused by work-related stressors (Kyriacou, 2001). In the long term, stress can lead to emotional exhaustion (Maslach et al., 2001) or experiences of depressive symptoms (Gluschkoff, 2017; Steinhardt et al., 2011). Exhaustion is defined as the emotional component of burnout, which reflects the strain that is caused by an overtaxing job (Salmela-Aro et al., 2011). Depressive symptoms refer to teachers' experiences of fatigue, guilt, inferiority, and disappointment in themselves (Beck et al., 1961). Comorbidity of indicators of low occupational well-being is common. For example, if teachers experience stress or burnout, they are more likely to also experience depressive symptoms (Desouky & Allam, 2017; Jeon et al., 2019; Papastylianou et al., 2009; Shin et al. 2013).

In Finland where the present study was conducted, 42% of teachers reported in a recent national survey experiencing stress often or quite often (Golnick & Ilves, 2022). In the U.S., 73% of teachers reported experiencing stress frequently (Doan et al., 2022). The high percentage of exhausted ECE teachers is alarming, since teachers' stress is related to children's lower motivation (Pakarinen, Kiuru, et al., 2010), and social competence (Siekkinen et al., 2013).

Jennings and Greenberg (2009) propose in their Prosocial Classroom model that teachers' social-emotional competence and well-being enhance teacher-child relationships, effective classroom management and effective social-emotional curriculum implementation which, together, contribute to a healthy classroom climate and thereby to children's social, emotional, and academic outcomes. Thus, in their model, they suggest that teachers with high social-emotional competence and occupational well-being are better able to respond to children's individual needs, show empathy, be proactive rather than reactive, manage child behavior

effectively, and support children's interest in learning. In line with the Prosocial Classroom model, research has shown that teachers who experience stress, emotional exhaustion and depressive symptoms are more likely to display negative reactions with children (Buettner et al., 2016). Furthermore, there is evidence that teachers who experience stress are more likely to have conflictual relationships with children (Whitaker et al., 2015). Regarding observed quality of teacher-child interactions, studies have further supported the Prosocial Classroom model by showing that teachers' stress is associated with lower quality of emotional support and classroom organization (Penttinen et al., 2020) and teachers' emotional exhaustion with a lower quality of emotional support (Jennings, 2015).

Research on caregivers' depressive symptoms has traditionally focused on maternal depression and its relation with parenting behavior (see e.g., Lovejoy, Graczyk, O'Hare, & Neuman, 2000). However, recent research has also been interested in the role of teachers' depressive symptoms in the quality teacher-child interactions. These studies have, in line with the Prosocial Classroom model, shown that teachers who experience depressive symptoms are more likely to show less closeness and more conflict in teacher-child relationships (Whitaker et al., 2015) and lower-quality teaching practices (i.e., individualized instruction, organization/planning, and warmth/responsiveness) (McLeon & Connor, 2015). Moreover, teachers experiencing depressive symptoms are more likely to be less sensitive with children, withdraw from interactions, and have negative interactions with children (Hamre & Pianta, 2004). With respect to the TTI framework, teachers' depressive symptoms have been negatively associated with all three domains of teacher-child interactions (Jennings, 2015).

Although many studies have indicated that teachers' low levels of occupational well-being are associated with a lower quality of teacher-child interactions, stress is not unequivocally

a threat for the quality of teacher-child interactions in the classroom. In fact, a moderate amount of stress can act as a motivator, which enhances teachers' work performance whereas too little stress (boredom) and too much stress (burnout) can weaken performance (Gmelch, 1983). Indeed, one study in early childhood education reported that both preschool teachers' high and low stress levels were related to a lower quality of emotional support, whereas moderate levels of stress were related to higher quality of emotional support (Friedman-Krauss et al., 2014). Additionally, in one study, higher levels of burnout among kindergarten to Grade 3 teachers have been associated with higher-quality classroom organization (Hoglund et al., 2015).

Approaches to the Study of Teacher-Child Interactions: Variable-Oriented vs. Person-Centered

In the preceding two sections, mostly variable-oriented studies examining either teacher-child interactions, teachers' occupational well-being or the relationship between these two, were introduced. In this section, two research approaches – variable-oriented and person-centered – are compared. Most previous studies on teacher-child interactions using the TTI framework have been variable-oriented, providing information about the average teacher's quality of teacher-child interactions (for exceptions, see, e.g., Hu et al., 2016; LoCasale-Crouch et al., 2007; Salminen et al., 2012). Moreover, in most of the previous studies, the three domains and their associations with, for example, teachers' occupational well-being have been examined separately (e.g., Jennings, 2015; Sandilos et al., 2015). In contrast, a person-centered approach can facilitate recognition of inter-individual differences in a sample, thereby providing relevant information about different patterns of teachers' actual practices in their classrooms (Halpin & Kieffer, 2015).

When examining variations in the quality of individual teachers' interactions with children, groups of teachers can be identified based on similar patterns of interactions with children in their classrooms. in the present study, the TTI framework (Hamre et al., 2013) that describes ten dimensions of teacher-child interactions was used to identify groups of individuals who shared similarities in their scores of observed categorical variables drawn from the TTI. However, although earlier research has shown that individual teachers' scores on each of the ten dimensions are highly related (e.g., Hamre et al., 2013; Pakarinen, Lerkkanen et al., 2010), the challenges that highly correlated variables can cause (i.e., that changes in one dimension are associated with shifts in another dimension), suggests the need for an approach that aims at identifying groups of individuals who share similarities in their scores of observed categorical variables. A person-centered approach (Lanza et al., 2007) enables the examination of the dimensions simultaneously not separately (McCutcheon, 2002), thus making it possible to get detailed information about the complexity of interactions where different dimensions of interactions occur at the same time.

Previous studies examining profiles based on the observed quality of teacher-child interactions in ECE have identified four to five profiles with two extremes — high quality and low quality (Hu et al., 2016; LoCasale-Crouch et al., 2007; Salminen et al., 2012). For example, LoCasale-Crouch et al. (2007) identified five profiles among U.S. pre-kindergarten teachers through cluster analysis: 1. Highest quality; 2. Positive emotional climate, high instructional quality; 3. Positive emotional climate, mediocre instructional climate; 4. Mediocre emotional climate, low instructional quality; and 5. Poorest quality. After LoCasale-Crouch et al. (2007), Salminen et al. (2012) and Hu et al. (2016) have identified four profiles through latent profile analysis. In Chinese preschool classrooms (Hu et al., 2016), the identified profiles were: 1. High

quality, 2. Medium quality with higher instructional support, 3. Medium quality with lower instructional support, and 4. Low quality. In Finnish kindergarten classrooms (Salminen et al., 2012), the identified profiles were: 1. Highest quality, 2. Medium quality, 3. Medium quality with lower emotional support, and 4. Lowest quality. Thus, besides the two extreme profiles with highest and lowest quality of teacher-child interactions, both Salminen et al. (2012) and Hu et al. (2016) identified two profiles of moderate quality of interactions. However, in Finland (Salminen et al., 2012), the moderate quality profiles differed in the quality of emotional support dimensions, whereas in China (Hu et al., 2016), the two moderate quality profiles differed in the quality of several dimensions across the domains. Overall, the three studies (Hu et al., 2016; LoCasale-Crouch et al., 2007; Salminen et al., 2012) differed in the number and content of the remaining profiles that fall between the two extreme profiles (see Appendix for Figure A2). Because of these inconsistent results, more research is needed in the context of ECE.

In terms of the association between the quality of teacher-child interactions and teachers' occupational well-being, there are only a few previous person-centered studies. In their study of preschool classrooms, Jeon et al. (2016) expanded profiles beyond the quality of teacher-child interactions to include teachers' work experience, and teachers' job attitudes (i.e., work-related stress, job satisfaction, and professional commitment). Of the three identified profiles, teachers in the profile, "Less experienced, lower quality, and more positive attitude," experienced less work-related stress, more job satisfaction, and more professional commitment than did teachers in the profile, "Less experienced, average quality, less positive attitudes." Teachers in the third profile, "More experienced, better quality, and mixed attitudes," experienced slightly more than average work-related stress but also more job satisfaction and professional commitment. These results indicate that teachers with average quality of teacher-child interactions reported less job

satisfaction and professional commitment than did teachers with the highest quality of interactions. Furthermore, teachers with the lowest quality of teacher-child interactions reported the lowest amount of stress, whereas teachers with average quality of interactions experienced the highest amounts of stress. The authors (Jeon et al., 2016) suggested that teachers with the lowest quality of teacher-child interactions might not recognize their challenges in providing a high-quality classroom environment in ECE, and for this reason, they do not feel stressed. Overall, these results indicate that profile analysis can increase our understanding of the relationship between the quality of interactions and teachers' occupational well-being. However, more research across different educational levels and in different cultural contexts is needed to identify important areas in pre- and in-service teacher training that could support teachers' professional learning. Given the importance of high-quality teacher-child interactions (e.g., Burchinal et al., 2010; Hu et al., 2020) and teachers' occupational well-being (e.g., Arens & Morin, 2016; Pakarinen, Kiuru et al., 2010; Siekkinen et al., 2013) for children's academic skills, social skills, and motivation, it is important to recognize practices which increase the quality of teacher-child interactions and enhance teachers' occupational well-being.

Other Factors Related to the Quality of Teacher-Child Interactions

Besides the relation between the quality of teacher-child interactions and teachers' occupational well-being, earlier research has examined the role of different teacher and classroom characteristics in the quality of teacher-child interactions. Especially teachers' work experience has been associated with the observed quality of teacher-child interactions in both variable-oriented (e.g., Pakarinen, Lerkkanen et al., 2010) and person-centered (e.g., Hu et al., 2016; Salminen et al., 2012) studies. Person-centered studies have reported teachers in the low-quality profiles having the least work experience (Hu et al., 2016; Salminen et al., 2012).

Variable-oriented studies, in contrast, have not reached a consensus on whether teachers' work experience is positively (Li Grining et al., 2010) or negatively (Pakarinen, Lerkkanen et al., 2010) related to the quality of teacher-child interactions.

In terms of group size, research findings have also been mixed: In an earlier person-centered study teachers in different interaction profiles did not differ with regard to group size (Salminen et al., 2012) whereas some variable-oriented studies have reported a negative association between quality of teacher-child interactions and group size (Friedmann-Krauss et al., 2014; Wang et al., 2020). Furthermore, it might not only be group size but also number of children who need support in terms of learning, language, or behavior, which has an association with the quality of teacher-child interactions. Variable-oriented studies have indicated that quality of teacher-child interactions has declined in classrooms with a higher number of children with behavior problems (Partee et al., 2019) or children from different ethnic backgrounds (Hoglund et al., 2015). Thus, there is evidence to show that teacher and classroom characteristics such as teachers' work experience, group size, and number of children needing support for example in behavior, can — alongside teachers' occupational well-being — contribute to the quality of teacher-child interactions. However, the information regarding the associations is somewhat mixed. For this reason, more research is needed on the role of teacher and classroom characteristics in the observed quality of teacher-child interactions in the ECE classrooms.

Kindergarten Education in Finland

In Finland, compulsory and free kindergarten education (cf. preschool in UK and kindergarten in US) is provided for 6-year-old children for one year before they begin 9 years of comprehensive school. According to the Finnish national core curriculum for pre-primary education (Finnish National Board of Education, 2016), children learn through interactions with

peers and teachers. In addition, guided and free play is a very important pedagogical approach in kindergarten education. Teaching practices are typically child-centered, developmentally appropriate for early childhood education and take into account children's own interests (Lerkkanen et al., 2012). The curriculum further highlights the importance of providing feedback that encourages children in their learning and supports their positive self-concept as a learner. Activities and the curriculum of Finnish kindergarten more closely resemble those in U.S. preschools than practices in U.S. kindergartens.

In Finland, kindergarten teachers are required to have at least a bachelor's degree in ECE. Teachers have high levels of autonomy related to how they might implement the curriculum (Finnish National Board of Education, 2016). The kindergarten curriculum builds on the ECE curriculum, both with a focus on supporting children's comprehensive development during the early childhood years (Finnish National Board of Education, 2016; 2019). Importantly, instruction and learning activities are integrated in thematic learning and play throughout the day.

Kindergarten activities provided by the teacher last approximately four hours per day, including time for outdoor activities, free play, and meals. Kindergarten classrooms can be located in either daycare centers or schools. Regardless of the location, there is an opportunity for additional care after the kindergarten hours (Hartonen, 2014). Group sizes vary but the maximum group size recommended by The Ministry of Education and Culture (Finnish National Agency for Education, n.d.) is 13 children or 20 if another kindergarten teacher or day care worker is present in the group.

The Present Study

The aim of the present study is to examine teachers' interaction profiles and, further, to explore whether teachers with these profiles differ with regard to their occupational well-being and to both teacher and classroom characteristics. More specifically, the following research questions are investigated:

1. What kinds of profiles can be identified among Finnish kindergarten teachers based on the observed quality of their interactions with children in the classroom?

As teachers have been shown to vary in the quality of teacher-child interactions (Hamre et al., 2013) and earlier research has identified meaningful patterns of interactions (e.g., LoCasale-Crouch et al., 2007), we expect to find different profiles of teacher-child interactions. Based on previous person-centered studies in early childhood education (Hu et al., 2016; Salminen et al., 2012), we expect to identify four profiles showing the observed quality of teacher-child interactions: one with higher quality, one with lower quality, and two with medium quality and differences between the two in some dimensions of teacher-child interactions (Hypothesis 1).

2. To what extent do kindergarten teachers' interaction profiles differ in terms of their occupational well-being (i.e., teaching-related stress, general stress, emotional exhaustion, and depressive symptoms) and teacher and classroom characteristics (i.e., work experience, group size, number of children in need of special support)?

Because earlier variable-centered research has shown that the quality of teacher-child interactions is associated with teachers' stress (e.g., Friedman-Krauss et al., 2014), emotional exhaustion (e.g., Jennings, 2015), and depressive symptom (e.g., Sandilos et al., 2015), we expect to find differences in teachers' occupational well-being across the different interaction profiles. However, studies have shown inconsistent findings regarding whether teachers'

occupational well-being has been positively (e.g., Jennings, 2015) or negatively (e.g., Hoglund et al., 2015) associated with the quality of teacher-child interactions. Based on the Prosocial Classroom model (Jennings & Greenberg, 2009), we expect that teachers in the high-quality profile will report most-favorable levels of occupational well-being (i.e., less stress, emotional exhaustion, and depressive symptoms; Hypothesis 2a).

Furthermore, in line with earlier research reporting associations between the quality of teacher-child interactions and teachers' work experience (see Hu et al., 2016; Salminen et al., 2012), group size (see Friedmann-Krauss et al., 2014; Wang et al., 2020) and number of children who need support in terms of learning, language, or behavior (see Hoglund et al., 2015; Partee et al., 2019), we expect that teachers belonging to different interaction profiles would differ also with regard to these teacher and classroom characteristics. More specifically, we expect that teachers in the low quality profile will have the least work experience, largest group sizes, and most children needing support in terms of learning, socioemotional skills or behavior, and Finnish language (Hypothesis 2b).

Method

Participants and Procedures

The participants of this study were 54 kindergarten teachers with their classrooms of 6-year-old children from Central Finland, participating in a larger longitudinal study (Lerkkanen & Pakarinen, 2016–2022). The teachers' mean age was 44.4 years (*SD* = 9.95), and most of them (N = 53) were female. They were relatively experienced: 59.3% of the teachers had worked more than 15 years in ECE or in primary school, 5.6% 11–14 years, 18.5% 6–10 years, and 14.8% 1–5 years. All teachers had at least a bachelor's degree in ECE. The sizes of their groups varied from

6 to 25 children (M = 12.11, SD = 4.04), and the classrooms were located either in a daycare center (87%) or in a school (13%). The study received ethical approval from the ethics committee of the university prior to commencing the study. Participation in the study was voluntary and all participants gave written consent.

Three teachers participated in the pilot study in spring 2016, and 51 teachers in the second phase of the study in spring of 2017. Importantly, for all teachers across both phases of the study, the procedures were similar. Classrooms were video recorded for approximately 2–2.5 hours during one kindergarten day to observe teacher-child interactions. Video recordings were conducted between mid-February and mid-May of each year. Moreover, teachers completed a questionnaire about their occupational well-being between March and June. Two occupational well-being measures (general stress and depressive symptoms) were added to the questionnaire after the pilot study and are therefore not available for the three teachers participating in the pilot study.

Measures

The quality of teacher-child interactions. The quality of teacher-child interactions in kindergarten classrooms was measured with the CLASS Pre-K (Pianta, La Paro, et al., 2008), which has been validated in Finland (Pakarinen, Lerkkanen, et al., 2010). The Pre-K version of the CLASS was used because the Finnish kindergarten curriculum and teaching practices resemble U.S. preschool practices. The CLASS tool assesses quality of teacher-child interactions in terms of 3 domains and 10 dimensions: emotional support (dimensions: positive climate, negative climate, teacher sensitivity, and regard for student perspectives); classroom organization (dimensions: behavior management, productivity, and instructional learning formats); and instructional support (dimensions: concept development, quality of feedback, and instructional

learning formats). The quality of the dimensions is rated as low (1–2), mid (3–5), or high (6–7), according to the coding manual instructions (Pianta, La Paro, et al., 2008).

In the present study, approximately four (M = 4.48, SD = .91) 20-minute (M = 19.80, SD = 3.67) cycles per classroom and teacher were coded by 12 research assistants certified as CLASS Pre-K observers. In order to calculate inter-rater reliability, 20% of the video recordings were double coded. Inter-rater reliabilities with regard to adjacent agreement (i.e., agreement within one point; Pianta, La Paro, et al., 2008) varied from 84.6% (positive climate) to 100% (negative climate) for emotional support, from 69.2% (instructional learning formats) to 88.5% (productivity) for classroom organization, and from 46.2% (concept development) to 75% (quality of feedback) for instructional support dimensions. Inter-rater reliabilities were further examined with intraclass correlation coefficients which were calculated using a two-way random model with absolute agreement (Landers, 2015). Intraclass correlations varied between .18 (positive climate) and .60 (regard for student perspectives) (see Koo & Li, 2016 for more information regarding intraclass correlations). The mean scores of all cycles for each dimension were used in the analysis.

Teachers' occupational well-being. Four aspects that threaten teachers' occupational well-being—teaching-related stress, general stress, emotional exhaustion, and depressive symptoms—were self-rated by the teachers.

Teaching-related stress. A modified version of the Parental Stress Inventory (Gerris et al., 1993) was used to measure teaching-related stress. The inventory was modified by changing the context from parenting to teaching and translating the items into Finnish. This modified version of the inventory has been used in previous studies with kindergarten (Pakarinen, Kiuru, et al. 2010; Pakarinen, Lerkkanen et al. 2010) and elementary school teachers (Virtanen et al.,

2018). The inventory consists of three items (e.g., "I have a lot more problems in guiding the children than I expected") which teachers rated on a scale from 1 ("hardly describes me") to 5 ("describes me very well"). The reliability of the measure with three items was acceptable (α = .69).

General stress. Teachers' general stress was measured with a question that is part of the Occupational Stress Questionnaire: "Stress means a situation in which a person feels tense, restless, nervous, or anxious, or is unable to sleep at night because his/her mind is troubled all the time. Do you feel this kind of stress these days?" (Elo et al., 2003). This single-item stress measure has been verified as acceptable for measuring variances in occupational well-being (Elo et al., 2003). The teachers answered the question on a scale from 1 (not at all) to 6 (very much).

Emotional exhaustion. The exhaustion dimension of Bergen Burnout Inventory (Salmela-Aro et al., 2011) was used to measure teachers' emotional exhaustion. The dimension consists of three items (e.g., "I am snowed under with work"), rated on a scale from 1 (strongly disagree) to 6 (strongly agree). A mean score of the three items was used in the analysis. The reliability of the measure was good (α = .76).

Depressive symptoms. Teachers' depressive symptoms were measured with four questions modified from the Beck Depression Inventory (Beck et al., 1961). The items (e.g., "I get tired more easily than I used to") were translated into Finnish, and the teachers were asked to rate them on a scale from 1 (not true at all) to 5 (completely true). A mean score of the items was used in the analysis. The reliability of the measure was acceptable (α = .72).

Teacher and classroom characteristics. The teachers reported their work experience and the number of children in their groups who needed support in the areas of: 1) learning, 2)

socioemotional skills or behavior, and 3) language, if their native language was not Finnish. The teachers also reported their group size. For analysis, the number of children who needed support in each group was divided by the group size to get percentages of the children needing support for learning, socioemotional skills or behavior, and the Finnish language.

Data Analysis

In order to identify interaction profiles based on teachers' mean scores of the CLASS Pre-K dimensions, a latent profile analysis (LPA) was conducted with Mplus version 8 (Muthén & Muthén, 1998–2017). Halpin and Kieffer (2015) recommend using LPA when examining teacher-child interactions for three reasons: first, it provides item-level diagnostic information about teacher-child interactions; second, it provides estimates of measurement error; and third, the results are easy to interpret. The following criteria were used to evaluate the number of profiles in the LPA: log likelihood (logL), Akaike's information criterion (AIC), adjusted Bayesian information criterion (aBIC), entropy, Vuong-Lo-Mendell-Rubin test (VLMR), Lo-Mendell-Rubin test (LMR), and parametric bootstrapped likelihood ratio test (BLRT). Good fit of the model is indicated by a high log likelihood value and small AIC and aBIC (Nylund, Asparouhov, & Muthén, 2007), whereas an entropy value close to 1 indicates distinct groups. If the *p*-values of the VLMR, LMR, and BLRT statistical tests are statistically significant, the current number of classes is better than the previous solution with one less class (Lo et al., 2001; McLahlan & Peel, 2000). In addition to the statistical criteria, also evaluated was whether the profile solutions were useful (e.g., the number of participants in each class was sufficient for further analysis) and made sense in relation to earlier research. Due to the small overall sample size as well as the relatively small profile group sizes, the Kruskal-Wallis test was used to examine differences between profiles in terms of teachers' occupational well-being and teacher

and classroom characteristics in IBM SPSS Statistics 24. The group comparisons were conducted using the Mann-Whitney U test.

Results

Profile Identification

The first aim of the study was to investigate what kinds of interaction profiles could be identified in kindergarten classrooms based on the 10 dimensions of the CLASS instrument. The goodness-of-fit indices of the LPA, particularly the AIC index and the BLRT tests, suggested that the four-profile solution fitted the data best (see Table 1). In this solution, smaller AIC and aBIC values, and higher logL value indicated better fit of the model than in the two- or three-profile solution. Moreover, although the aBIC value decreased again in the five-profile solution and the logL increased in both the five- and six-profile solutions, the *p*-values of BLRT were not significant for these solutions, whereas for the four-profile solution, the BLRT *p*-value was significant. Thus, according to the BLRT test, the five-profile solution was not better than four-profile solution, and the four-profile solution was better than the three-profile solution. Moreover, in profile solutions three, five, and six, there was one very small group with only five teachers whereas in the four-profile solution, the smallest group was 7 teachers. For these reasons, the four-profile solution was selected as the final one.

Location of Table 1. Goodness-of-fit Statistics and Group Sizes for the Estimated Unconditional Latent Profiles

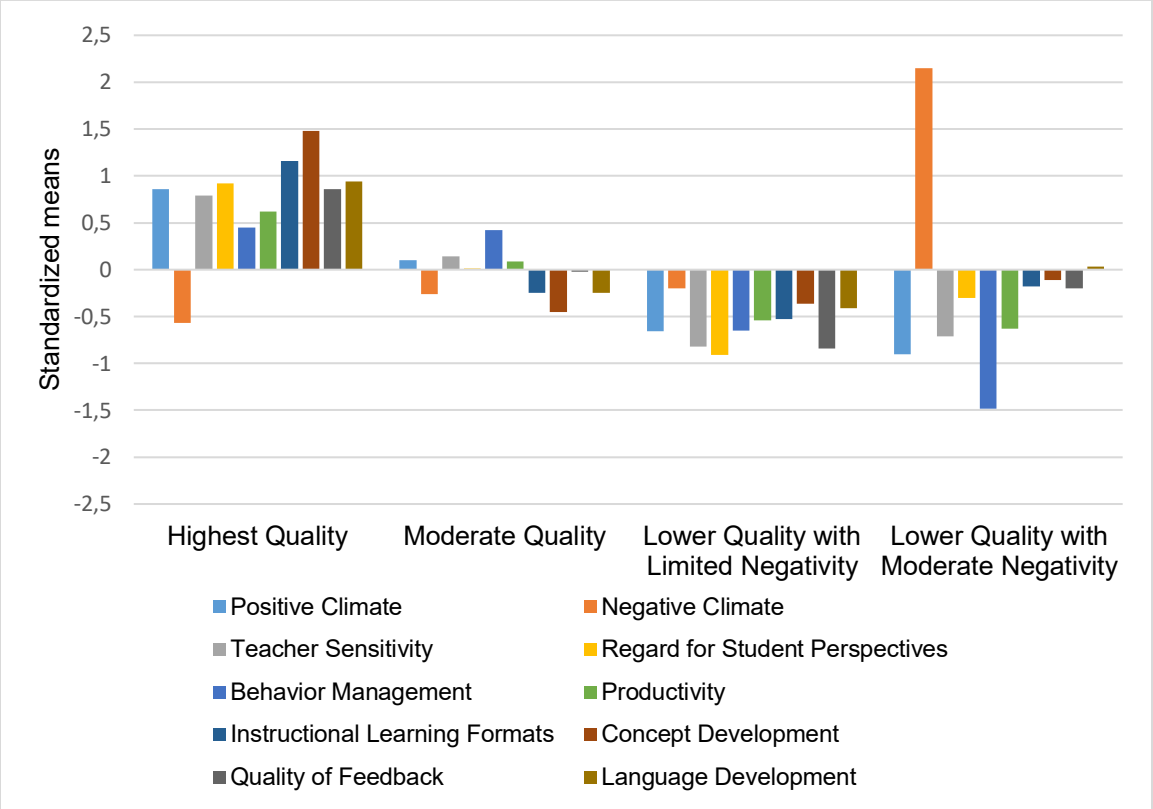
Identified Interaction Profiles

The differences across profiles in terms of the 10 interaction dimensions were further examined with the Kruskal-Wallis test. As shown in Table 2, the differences between profiles

were statistically significant with regard to the 10 dimensions, indicating empirical support for the profile solution. Based on the patterns and mean differences, the four interaction profiles (see Figure 2 and Table 2) were labelled *Highest Quality* (20.4%), *Moderate Quality* (50%), *Lower Quality with Limited Negativity* (16.7%), and *Lower Quality with Moderate Negativity* (13%). It is important to note that although according to the CLASS manual, low quality of teacher-child interactions is determined as CLASS ratings of 1–2, moderate quality 3–5, and high quality 6–7 (Pianta, La Paro, et al., 2008), the profiles are not named according to this determination but in relation to the mean scores of the sample. Thus, the teachers in the *Highest Quality* profile had, on average, the lowest scores in negative climate (meaning that there were few negative interactions in the classroom) and the highest scores in the other nine CLASS dimensions. The teachers in the *Moderate Quality* profile scored near to the sample mean (mean scores within 0.5 standard deviation from the sample mean) in all 10 CLASS dimensions. The teachers in the *Lower Quality with Limited Negativity* profile scored below the sample mean in all interaction dimensions. However, their scores for negative climate were, on average, only 0.2 standard deviations from the sample mean, whereas the other dimensions ranged from 0.36 to 0.91 standard deviations below the sample mean. When compared to the *Moderate Quality* profile, teachers in the *Lower Quality with Limited Negativity* profile scored lower in four dimensions: teacher sensitivity, regard for student perspectives, behavior management, and quality of feedback. The teachers in the *Lower Quality with Moderate Negativity* profile scored below the sample mean in 8 of the 10 dimensions. These teachers had particularly high scores in negative climate, indicating more negative interactions in these classrooms compared to the other profiles (see Table 2).

Figure 2.

Identified Four Interaction Profiles



Location of Table 2. The Sample and Profile Means and Standard Deviations for the Investigated Variables

Differences Between Interaction Profiles in Teachers' Occupational Well-Being and Teacher and Classroom Characteristics

Teachers' occupational well-being. The second aim of the present study was to examine whether the teachers in the four interaction profiles differed according to their occupational well-being or teacher and classroom characteristics. The Kruskal-Wallis test (see Table 2) indicated that there were statistically significant differences between interaction profiles with regard to teaching-related stress, general stress, and depressive symptoms. Moreover, the profiles differed, albeit marginally significantly, with regard to emotional exhaustion. Group comparisons with the Mann-

Whitney U test further indicated that the teachers in the *Lower Quality with Limited Negativity* and *Lower Quality with Moderate Negativity* profiles experienced significantly more teaching-related stress compared to the teachers in the *Moderate Quality* profile. With regard to general stress, the teachers in the *Highest Quality* and *Lower Quality with Moderate Negativity* profiles experienced significantly more general stress than did the teachers in the *Moderate Quality* profile. In terms of emotional exhaustion, the teachers in the *Moderate Quality* profile were significantly less exhausted compared to those in the *Highest Quality* profile. Similar to emotional exhaustion, there was a significant difference in depressive symptoms between the *Moderate Quality* and *Highest Quality* profiles. The teachers in the *Moderate Quality* profile reported fewer depressive symptoms compared to the teachers in the *Highest Quality* profile.

Teacher and classroom characteristics. The Kruskal-Wallis test (see Table 2) indicated that there were no statistically significant differences between interaction profiles in relation to teacher and classroom characteristics (teachers' work experience, group size, and the number of children who need support in a) learning, b) socioemotional skills and behavior, or c) the Finnish language).

Discussion

The aim of this study was to identify interaction profiles in kindergarten classrooms in Finland and to explore differences among these profiles with regard to teachers' occupational well-being and teacher and classroom characteristics. First, four interaction profiles were identified: *Highest Quality* (20.4%), *Moderate Quality* (50%), *Lower Quality with Limited Negativity* (16.7%), and *Lower Quality with Moderate Negativity* (13%). Second, differences between the profiles with regard to teachers' occupational well-being were identified. Overall, by adopting a person-centered approach to teacher-child interactions, this study obtained a more

detailed understanding of individual differences between teachers in their quality of teacher-child interactions and in their occupational well-being.

The Four Interaction Profiles

Recent person-oriented research in kindergarten classrooms (Hu et al., 2016; Salminen et al., 2012) identified four interaction profiles. Although the number of profiles in the present study was similar to the findings from two previous studies, the patterns of interactions within the profiles were somewhat different. Thus, Hypothesis 1 was supported in terms of the number of profiles, whereas the patterns of interactions within the profiles partially differed from the expected profiles. In both Chinese (Hu et al., 2016) and earlier Finnish (Salminen et al., 2012) samples, one profile with low quality, one profile with high quality, and two profiles with medium quality of teacher-child interactions differing in either the dimensions of emotional support (Salminen et al., 2012) or in all three interaction domains (Hu et al., 2016), were identified. Interestingly, in the present study, one profile with higher quality, one profile with moderate quality, and two profiles with lower quality of teacher-child interactions were identified. More specifically, the two lower quality profiles differed in the negative climate dimension of the CLASS. Negative climate reflects the amount and intensity of disrespect, irritation, yelling, threats, and verbal or physical bullying in the classroom (Pianta, La Paro, et al., 2008). Similar to the present study, in another Finnish kindergarten sample, it was found that the amount of negative climate in classrooms is, on average, very low (Pakarinen, Lerkkanen, et al., 2010). Thus, the results of the present study indicate that the few teachers in the *Lower Quality with Moderate Negativity* (N = 13%) profile, who had more negative climates in their classrooms than other teachers, also had lower quality of teacher-child interactions in terms of the other CLASS dimensions. However, it should be noted that although there were significantly

more indicators of negative climate in the *Lower Quality with Moderate Negativity* profile classrooms, the amount of negative climate was still relatively low for all four profiles. Mean score for negative climate in the *Lower Quality with Moderate Negativity* profile was 1.61 (in a scale from 1 to 7) whereas the mean scores for negative climate in the other three profiles varied from 1.00 to 1.08.

There are a few possible explanations for the differences in the patterns of the interactions within the present study's profiles and those in previous research. When comparing the profiles of the present study to the Chinese profiling study, it needs to be acknowledged that Hu et al. (2016) had a larger sample than the present study (180 vs. 54 teachers, respectively). Moreover, the differences in the profiles might be due to the ages of the children in the classrooms. In the Chinese study, the participating classrooms were from three different grade levels with children 4–6 years of age, whereas the current study only included kindergarten classrooms with 6-year-old children. It might be that teachers have different kinds of interactions with younger children, and this is reflected in the interaction profiles. Furthermore, when comparing the profiles identified in the current study to the previous Finnish study (Salminen et al., 2012), it should be noted that the data of the latter one were collected 15 years ago when kindergarten was still voluntary for children in Finland, and the number of staff in classrooms was higher. It is possible that teaching practices and patterns of interactions in kindergarten classrooms have changed during this timeframe, as a new curriculum was implemented in Finland and the kindergarten year is now mandatory for every child. For these reasons, work in today's kindergarten classrooms might be more exhausting as group sizes are bigger and the demands on teachers have increased. Overall, the results of the current study extend previous research by providing more information on the diversity of the quality of teacher-child

interactions and variations in the interaction dimensions among teachers in kindergarten classrooms.

Differences Among Profiles in Teachers' Occupational Well-Being and Teacher and Classroom Characteristics

Teachers' occupational well-being. The results of the study indicate that Finnish kindergarten teachers with the highest-quality teacher-child interactions experience more challenges in their occupational well-being in terms of general stress, emotional exhaustion, and depressive symptoms, compared to teachers with moderate quality of teacher-child interactions. Thus, the results were not in line with Hypothesis 2a: teachers with the highest quality interactions did not report most favorable well-being. Although the Prosocial Classroom model (Jennings & Greenberg, 2009) argues that teachers' occupational well-being enhances classroom climate, behavior management, and teacher-child relationships, one earlier study has also reported a positive association between burnout and the quality of classroom organization (Hoglund et al., 2015) which is in line with the current results. This association is alarming in the sense that high stress is also related to certain illnesses, such as cardiovascular disease (Melamed et al., 2006), teachers' quitting intentions (Buettner et al., 2016; Klassen & Chiu, 2011), and children's lower motivation, academic skills, and social skills (Hoglund et al., 2015; Pakarinen, Kiuru, et al., 2010; Siekkinen et al., 2013).

Based on the current results, it is possible that aiming at high quality interactions with children is exhausting and may threaten a kindergarten teacher's occupational well-being. It has been previously shown that high-achieving women typically experience stress (Wolontis & Hoff, 2018). However, the results of this study are not longitudinal and for that reason, it is not possible to say whether high-quality interactions or stress, emotional exhaustion, and depressive

symptoms come first. Earlier research has indicated that a moderate amount of stress can act as a motivator in the workplace (Gmelch, 1983) and be associated with a high quality of teacher-child interactions (Friedman-Krauss et al., 2014). It is also typical that stress and depressive symptoms are experienced at the same time (e.g., Jeon et al., 2019; Shin et al. 2013).

The results of the current study further indicated that the Finnish kindergarten teachers in the *Lower Quality with Moderate Negativity* profile reported more general stress than did the teachers in the *Moderate Quality* profile. Moreover, teachers in both the *Lower Quality with Limited Negativity* and *Lower Quality with Moderate Negativity* profiles reported more teaching-related stress than did the teachers in the *Moderate Quality* profile. Interestingly, the teachers in these profiles did not differ from the teachers in the *Highest Quality* and *Moderate Quality* profiles in terms of emotional exhaustion and depressive symptoms. The measure of teaching-related stress reflects stress that is specifically related to guiding children, and that might be the reason why this specific aspect of teachers' occupational well-being is related to actual challenges in interacting with children in the classroom. An association between higher teaching-related stress and lower quality of teacher-child interactions has been reported in Finland in the elementary school context as well (Virtanen et al., 2018).

Overall, the results of the present study suggest that teachers with a moderate quality of interactions with children report higher occupational well-being than do teachers in the other three profiles. Possibly, the previous variable-centered research has not found this group of teachers who report high occupational well-being and have a sufficient quality of teacher-child interactions. This interesting result broadens the picture of the associations between the quality of teacher-child interactions and teachers' occupational well-being, supporting the interpretation that a person-centered approach provides new information on the relationship between teachers'

occupational well-being and observed quality of interactions. Still, it is not yet clear why teachers with a higher and a lower quality of teacher-child interactions have more challenges with their occupational well-being, compared to teachers with a moderate quality of interactions with children. For this reason, more research is needed on the causes of stress and the possible ways to cope with the demands of work as a teacher.

Teacher and classroom characteristics. Contrary to Hypothesis 2b, no statistically significant differences between interaction profiles in terms of teacher and classroom characteristics (i.e., work experience, group size, and number of children needing support) were found. This result might reflect the limited variations in the teacher and classroom characteristics of the present sample: the standard deviation in group sizes was relatively small, and almost 60% of the teachers had more than 15 years of teaching experience. In Finland, group sizes in kindergarten are also regulated, as The Ministry of Education and Culture (Finnish National Agency for Education, n.d.) recommends 13 children as a maximum group size with one teacher and 20 if there is another teacher or children's nurse in the group. Overall, the results of this study highlight the importance of considering teachers' occupational well-being, in addition to teacher and classroom characteristics, when aiming to enhance the quality of teacher-child interactions. However, caution is warranted in generalizing the findings as different educational contexts have different recommendations for adult-child ratios.

Practical Implications

By identifying interaction profiles and examining them more thoroughly in terms of teachers' occupational well-being, it is possible to recognize areas that should be emphasized in both pre-service and in-service teacher training programs to increase teachers' quality of teacher-child interactions and occupational well-being (Halpin & Kieffer, 2015). For example, the

current results demonstrate that in this sample, teachers in the two lower-quality profiles could benefit from an intervention aimed at enhancing the quality of teacher-child interactions. However, the interventions should focus on different aspects of teacher-child interactions, depending on whether the teacher has a limited or moderate negative climate in the classroom. It could be wise to raise the overall quality of interactions in classrooms that have lower general quality of teacher-child interactions but limited negative climates. In classrooms with moderate negativity, it might be good to start with reducing the negative climate. One option to support teachers in their interactions with children are video-based professional development programs such as My Teaching Partner (MTP), which has shown increases in the quality of the participants' teacher-child interactions (Early et al., 2017; Pianta, Mashburn, et al., 2008). In MTP, teachers video record their interactions with children and receive consultation and feedback guided by the CLASS dimensions to support their growth and development (Early et al., 2017; Pianta, Mashburn, et al., 2008). Based on the results of the present study, these interventions could be targeted so that teachers receive tools for professional development in the specific aspects of the interactions they find challenging in their teaching.

Furthermore, the results of the current study indicate that in this data set, teachers in the *Highest Quality* profile could benefit from an intervention that targets their occupational well-being, so that they do not tire themselves while aiming at high-quality interactions. Thus, it is important to not only aim for high-quality interactions at the expense of teachers' occupational well-being, but also to provide teachers with tools that help them cope with the stress. Earlier research has indicated that teachers experience less stress, emotional exhaustion, and depressive symptoms if their workload is reasonable (Ferguson et al., 2012; Hakanen et al., 2006), they have good relationships with colleagues and supervisors (Jeon et al., 2018; Schaack et al., 2020),

enough control over their job (Hakanen et al., 2006; Schaack et al., 2020), and enough possibilities for professional development (Jeon et al., 2018). Hence, teachers' occupational well-being can be supported in schools by taking into consideration, for example, the amount of work and the time that teachers have to complete their work, supportive relationships between the staff members, opportunities for professional development, and how much control teachers have over their work. In Finland, teachers have high autonomy in their work and previous studies have indicated that high autonomy is related to a more favorable occupational well-being (Hakanen et al., 2006; Skaalvik & Skaalvik, 2014). In summary, given that both quality of teacher-child interactions (e.g., Broekhuizen et al., 2016; Hu et al., 2020) and teachers' occupational well-being (e.g., Arens & Morin, 2016; Roberts et al., 2016) are important to optimally promote children's academic and social skills development, it is critical to support teachers in both their interactions with children and their occupational well-being to guarantee high-quality learning environments for all children.

Limitations and Future Directions

The study has some limitations that need to be acknowledged. First, the sample size of the study was small, and this might be why not all the differences between the profiles were statistically significant. Because of the small sample size, caution is warranted with interpreting the results. In addition, it is possible that the results do not generalize beyond the present Finnish sample and, thus, further studies with larger samples from different cultural contexts are needed to draw conclusions about associations between interaction profiles and teachers' occupational well-being internationally. Second, the measure of general stress consisted of only one item. However, the content, criterion, and construct validity of this single-item measure has been confirmed previously (Elo et al., 2003). Furthermore, measures of teaching-related stress,

emotional exhaustion, and depressive symptoms were used in the present study to gain a more diverse understanding of teachers' occupational well-being. Third, although teaching-related stress and emotional exhaustion were measured for all participants, the measures of general stress and depressive symptoms were not available for the three teachers in the pilot study. In future research, several measurement points with a wider variety of teachers' occupational well-being are recommended. Fourth, both teachers' occupational well-being and children's need for support were teacher-rated. In future, objective measures of children's needs for support should be included. Fifth, inter-rater reliability for the quality of teacher-child interactions with regard to concept development was relatively low although all coders were certified CLASS coders. Earlier research has shown that dimensions of instructional support are usually the most difficult to rate for CLASS coders (e.g., Bell et al., 2014). In the future, special attention should be paid to training coders to rate the quality of instructional support and especially concept development. Moreover, it would be important to further examine what causes stress for teachers in the *Highest Quality* and *Lower Quality* profiles and which factors support the occupational well-being of teachers in the *Moderate Quality* profile. To better support teachers in their occupational well-being, interviews and other qualitative measures are also needed to gain a deeper understanding of the phenomenon. Finally, to gain more detailed information of the differences in the quality of teacher-child interactions among the interaction profiles, micro-level analysis and qualitative analysis of video-recordings are needed.

Conclusion

This study provides new information on two issues. First, it broadens our understanding of the diversity of teacher-child interactions in classrooms by examining interaction profiles based on 10 observed dimensions of teacher-child interactions in Finnish kindergarten

classrooms. Second, the study extends the previous literature by examining the differences between profiles with respect to Finnish kindergarten teachers' teaching-related stress, general stress, emotional exhaustion, and depressive symptoms. The results of the study revealed challenges in occupational well-being among teachers in both the highest-quality and lowest-quality profiles. In contrast, the teachers in the moderate quality of teacher-child interactions profile seemed to have the most favorable occupational well-being, suggesting that the well-being of teachers should be at the center when aiming at enhancing the quality of teacher-child interactions. These findings highlight the importance of taking a holistic approach, whereby the quality of teacher-child interactions is examined together with teachers' occupational well-being. Hopefully the results will encourage researchers to further explore the individual differences in the associations between teacher-child interactions and teachers' occupational well-being in different cultural and educational contexts.

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Table 1

Goodness-of-Fit Statistics and Group Sizes for the Estimated Unconditional Latent Profiles

No. of Profiles	logL	AIC	aBIC	Entropy	VLMR	LMR	BLRT	Group sizes
2	-363.306	836.611	773.213	0.977	0.3265	0.3328	0.0128	43/11
3	-319.627	795.254	705.343	0.991	0.6123	0.6163	0.0000	5/39/10
4	-289.560	781.119	664.696	0.984	0.7623	0.7623	0.0385	9/27/7/11
5	-268.336	784.672	641.736	0.974	0.2399	0.2399	1.0000	5/11/6/23/9
6	-267.875	829.749	660.302	0.974	0.6828	0.6831	0.3333	6/13/5/12/11/7

Note. logL = log likelihood, AIC = Akaike's information criterion, aBIC = adjusted Bayesian information criterion, VLMR = Vuong-Lo-Mendell-Rubin test, *p*-value; LMR = Lo-Mendell-Rubin test, *p*-value; BLTR = parametric bootstrapped likelihood ratio test, *p*-value.

Table 2

The Sample and Profile Means and Standard Deviations for the Investigated Variables

	Total sample (N = 54)		Profiles								
			Highest Quality (N = 11)		Moderate Quality (N = 27)		Lower Quality with Limited Negativity (N = 9)		Lower Quality with Moderate Negativity (N = 7)		
	M	SD	M	SD	M	SD	M	SD	M	SD	$\chi 2$
Emotional support											
Positive climate	5.45	.80	6.13_{a}	.34	5.53_{b}	.75	$4.92_{b,c}$	.75	4.73_{c}	.56	18.98***
Negative climate	1.13	.23	1.00_{a}	.00	1.07_{b}	.11	1.08_{b}	.13	1.61_{c}	.23	27.62***
Teacher sensitivity	5.45	.71	6.00_{a}	.14	5.54_{b}	.64	4.87_{c}	.80	4.95_{c}	.63	18.33***
Regard for student perspectives	4.55	.82	5.30_{a}	.56	4.55_{b}	.74	3.80_{c}	.65	$4.30_{b,\ c}$	.68	16.65**
Classroom organization											
Behavior management	5.65	.57	5.91_{a}	.20	5.89_{a}	.29	5.29_{b}	.52	4.81_{b}	.81	19.40***
Productivity	5.63	.58	5.98_{a}	.28	5.68_{b}	.41	5.31_{b}	.78	5.26_{b}	.85	10.51*
Instructional learning formats	4.91	.65	5.66_{a}	.46	4.75_{b}	.53	4.57_{b}	.71	4.79_{b}	.40	17.02**
Instructional support											
Concept development	2.98	.89	4.29_{a}	.65	2.57_{b}	.53	2.65_{b}	.60	2.88_{b}	.72	24.01***
Quality of feedback	3.34	.79	4.02_{a}	.88	3.32_{b}	.61	2.67_{c}	.49	$3.18_{a,b,c}$	.84	13.57**
Language modeling	3.55	.78	4.28_{a}	.96	3.35_{b}	.64	3.23_{b}	.53	$3.57_{a,b}$	.59	8.42*
Teacher and classroom characteristics											
Group size	12.11	4.04	11.73	3.64	11.59	3.38	15.00	6.38	11.00	1.63	2.20/ns.
Work experience[1]	4.11	1.19	3.91	1.14	4.22	1.12	4.44	1.13	3.5	1.64	2.68/ns.
Support in learning[2]	20.48	12.75	20.42	14.07	22.87	12.36	11.81	7.21	24.42	15.74	5.28/ns.
Support in behavior[2]	17.23	14.71	18.08	13.43	17.69	12.65	7.33	8.25	24.72	22.73	4.45/ns.
Native language other than Finnish[2]	6.79	13.00	4.53	7.78	11.68	17.35	2.72	7.69	1.85	4.54	4.75/ns.
Occupational well-being											
Teaching-related stress	2.15	.63	1.94_{a}	.70	2.01_{a}	.53	2.52_{b}	.73	2.52_{b}	.47	8.78*
General stress	3.12	1.32	4.00_{a}	1.34	2.58_{b}	1.14	3.11_{a}	1.54	3.57_{a}	.79	9.33*
Emotional exhaustion	3.13	1.09	3.82_{a}	1.10	2.80_{b}	1.11	$3.15_{a,b}$	.93	$3.29_{a,b}$	.80	$6.50^{\dagger}$
Depressive symptoms	2.13	.73	2.55_{a}	.40	1.85_{b}	.60	$2.22_{a,b}$	1.11	$2.29_{a,b}$	.70	8.64*

Note: $^{\dagger}p < .10$, *< .05, **< .01, ***< .001. Means within a row with different subscripts are significantly different at the level of $p < .05$ based on Mann-Whitney U test. *[1]Work experience measured: 0 = none, 1 = less than a year, 2 = 1–5 years, 3 = 6–10 years, 4 = 11–15 years, 5 = more than 15 years. [2]Percentage of children who need support in the group.*

Appendix

Figure A1.

The Relationship Between Bioecological Model and TTI Framework. Based on Hamre et al. (2013).

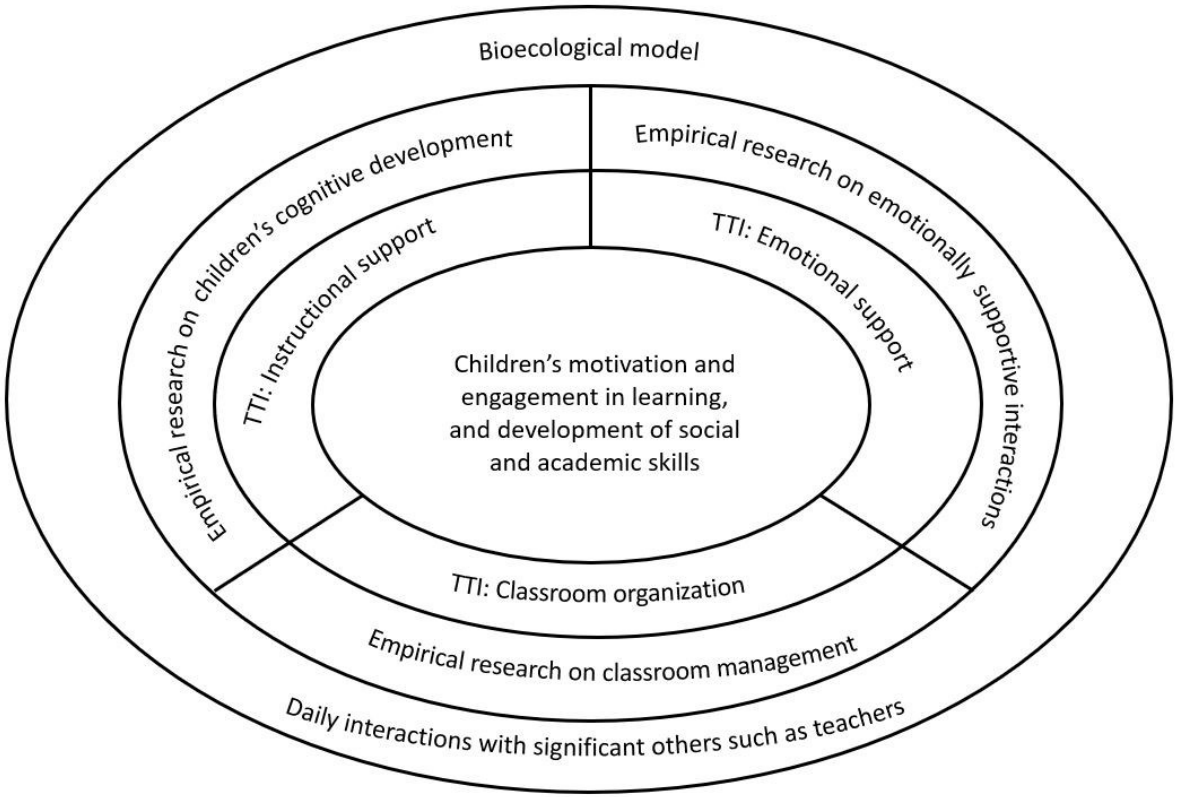

Figure A2.

Interaction Profiles Identified in Previous Profiling Studies Conducted in the ECE Settings.