Teacher emotional support in relation to social competence in preschool classrooms

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ABSTRACT

The present study aimed to investigate the associations between teachers' observed emotional support and social competence among Finnish pre-schoolers (6-year-olds). The quality of emotional support was observed using the Classroom Assessment Scoring System Pre-K in 47 preschool classrooms twice across the preschool year. Teachers rated children's social competence in autumn and again in spring, using the Multisource Assessment of Social Competence Scale (MASCS), which produced sum scores for cooperating skills, empathy, impulsivity, and disruptiveness. Consistent with the transactional model, we specified reciprocal (auto-regressive and cross-lagged) relationships within a Multilevel Structural Equation Models (MSEM) framework. The results showed that higher quality of emotional support in preschool autumn was related to more prosocial behaviours typical of the classroom during spring of the preschool year. Children's antisocial behaviours typical of the preschool classroom were not associated with quality of emotional support or vice versa. The results emphasize the importance of responsive and sensitive classroom interactions in promoting prosocial behaviours.

Introduction

A large body of evidence suggests that children's social competence plays an important role in their academic performance and adjustment (e.g. Caprara et al. 2000; McClelland, Morrison, and Holmes 2000; Vitiello and Williford 2016). Social competence is an important indicator of children's school readiness, which is directly related to their ability to form warm and supportive relationships with teachers and to engage in peer interactions and learning activities and, thereby, facilitates learning later at school (Blair 2002; Curby et al. 2015). For example, teachers are more likely to be responsive to socially competent children and, as a result, these children receive more support for their learning and more positive feedback (Denham 2006; Raver and Knitzer 2002). In preschool, children face increased expectations to acquire adequate pre-academic skills and to establish satisfactory relationships with their peers. This requires adaptive social behaviours to meet the complex social demands in classrooms. Expanding our understanding of factors that account for individual differences in children's social competence is essential for closing the school readiness gap. Following Rose-Krasnor's (1997) theoretical model, children's social competence is constructed both at the individual level, reflecting children's individual skills and differences, and in interaction with the environmental context, that is, in the preschool classroom in the present study. Previous empirical studies also

indicate that the quality of children's preschool environments may contribute to the development of social-emotional skills (Burchinal et al. 2008; Mashburn et al. 2008; Vandell 2004). Although there is an increasing evidence for the role of teacher–child interactions in academic outcomes (e.g. Hamre and Pianta 2005; Mashburn et al. 2008; Pakarinen et al. 2017), the results concerning the contribution of teacher–child interactions to social-emotional outcomes is less clear (Keys et al. 2013). Therefore, the current study aimed to increase our understanding on the classroom-level predictors of social competence by investigating associations between teacher emotional support and children's social competence across the preschool year. Multilevel structural equation models (MSEM) provides an excellent tool for investigating the classroom-level variation and predictors when controlling for individual-level differences in social competence.

Social competence

Social competence is a multidimensional construct that consists of skills related to the ability to cooperate with peers (Rubin, Bukowski, and Parker 2006), emotional understanding and emotional and behavioural self-regulation (Denham 2006), and adaptive responding in different social situations (Brophy-Herb et al. 2007). In general, social competence describes the ability to handle social interactions competently. Social competence has been defined to reflect two key behaviours: presence of prosocial and lack of antisocial behaviours (Junttila et al. 2006). Prosocial behaviours refer to socially desirable behavioural expressions, such as cooperating, helping others, sharing, solving social problems and participating in group activities (Denham 2006; Junttila et al. 2006; Miles and Stipek 2006). These behaviours are typically related to getting along well with peers (see Coie, Dodge, and Kupersmith 1990), ability to form and maintain close relationships with teachers (Garner and Waajid 2008; Ladd, Birch, and Buhs 1999) as well as better learning outcomes (Arnold et al. 2012; Caprara et al. 2000). In the present study, empathy and cooperating skills are used as indicators of prosocial behaviours. Empathy refers to ability to show and effectively communicate positive feelings and emotions and is characterized by sensitivity toward others whereas cooperating skills describe effective relating and functioning in social situations (Junttila et al. 2006). Empathic individuals, for example, are able to avoid hurting others' feelings, understand how they are feeling, and notice when somebody is getting hurt in a given situation (Cliffordsson 2002).

Antisocial behaviours, in turn, refer to physical and verbal aggressiveness, low emotional regulation and poor emotion expression skills (Denham 2006), that is, impulsive and disruptive behaviour (Junttila et al. 2006). In the present study, disruptiveness and impulsivity are used as indicators of antisocial behaviours. These behaviours are typically related to lower academic performance (Arnold et al. 2012) and negative social outcomes, including peer problems (Bulotsky-Shearer et al. 2010; Ladd, Birch, and Buhs 1999) and less warm and supportive interactions with teachers (Ladd, Birch, and Buhs 1999).

To be considered as socially competent, a child should display high levels of prosocial behaviour and low levels of antisocial behaviour (Junttila et al. 2006). The literature has also provided evidence on background factors that may contribute to the development and expression of social competence, such as gender, age and family background. Girls typically show higher levels of prosocial behaviours and lower levels of antisocial behaviours than boys (Junttila et al. 2006). For example, boys have been shown to express more disruptive behaviours compared to girls (Lumley et al. 2002). Furthermore, children's social competence develops rapidly between ages 4 and 12 (Denham and Brown 2010), and older children generally show more socially competent behaviours (Slot and Bleses 2018; Vitiello et al. 2012). In addition, higher level of parental education is typically related to better social skills (McClelland, Morrison, and Holmes 2000). Parental level of education works largely through the way parents provide opportunities for social skills building at home, such as emotional and behavioural regulation. Age, gender and parental level of education are used as control variables in the present study as they have shown to be important aspects contributing to children's social competence in the preschool setting.

Emotionally supportive interactions in preschool

According to ecological systems theory, daily interactions between teacher and children are a central driver of child development and learning (Bronfenbrenner and Morris 2006). The theoretical under-pinnings of emotional support provided by a teacher are drawn from attachment theory and self-determination theory (Hamre et al. 2013). Attachment theory (Ainsworth et al. 1978; Bowlby 1969) posits that children are better able to explore their environment and focus on learning when they have secure and predictable relationship with their primary caregiver. Although teacher-student relationship cannot be considered as being of an attachment bond, the teacher can be regarded as an ad hoc attachment figure with a safe haven and secure base function (Verschueren and Koomen 2012) also when the caregiver is sensitive to the group of children (Ereky-Stevens et al. 2018). Furthermore, self-determination theory underscores that intrinsic motivation and engagement can be promoted when supporting children's innate needs for relatedness, competence, and auton-omy in the classroom (Ryan and Deci 2000; Skinner and Belmont 1993).

The Teaching Through Interactions (TTI) framework conceptualizes daily interactions between teacher and child in three domains, i.e. emotional support, classroom organization, and instructional support, that have theoretical and empirical foundation (Hamre et al. 2013). Emotional support, more specifically, describes the emotional climate of the classroom, positive tone of interactions, teacher's ability to sensitively respond to student needs and to support peer interactions (Downer, Sabol, and Hamre 2010; Pianta, La Paro, and Hamre 2008). High-quality emotional support is also characterized by less negative and coercive interactions. Emotionally supportive interactions in a classroom provide students with a model of relational skills, expectations, and attitudes related to peer relationships, as well as plenty of opportunities to practice those skills (Hamre et al. 2013). It has been proposed that the teacher acts as an invisible hand in classroom by orchestrating social behaviours and peer inter-actions (Farmer, Lines, and Hamm 2011). In addition, through these emotionally supportive inter-actions, the teacher provides a secure base that allows students to take academic and social risks, such as risks in their peer interactions (Birch and Ladd 1998; Verschueren and Koomen 2012). Much of recent research has used the observational measure aligned with the TTI framework, the Classroom Assessment Scoring System (CLASS; Pianta, La Paro, and Hamre 2008), which documents association between emotionally supportive interactions and child outcomes.

Emotional support and social competence

Drawing from Rose-Krasnor's (1997) theoretical model, children's social competence development is highly influenced by interactions in their classroom environment. Through positive interactions with teachers, children develop their social competence and emotional understanding via the social learn-ing process. As a result, children are able to handle situations and interactions with others in a more positive manner that is contusive to positive emotions (Verschueren and Koomen 2012). Jennings and Greenberg (2009) have presented a model of the prosocial classroom, which proposes that teacher well-being and quality of interactions in a classroom promote children's socially competent behaviours and well-being. Through a proper socialization process, children can acquire skills for reg-ulating their and expressing their emotions appropriately (Denham et al. 2012; Jennings and Green-berg 2009). Emotional support may affect children, in part, through the stress response system. Stress typically increases throughout the day for children in out-of-home settings, but not when children are in classrooms in which teachers offer warm and supportive care (Hatfield et al. 2013).

Emotionally supportive teacher–child interactions have been shown to promote children's social competence and behaviour (Burchinal et al. 2008; Curby et al. 2009; Mashburn et al. 2008) as well as their academic skills (Curby, Brock, and Hamre 2013). For example, a high level of emotional support in the kindergarten classroom was positively related to children's social competence (Pianta et al. 2002). Furthermore, Luckner and Pianta (2011) demonstrated that emotionally supportive inter-actions between teacher and students was related to higher teacher ratings of prosocial behaviour.

Brophy-Herb et al. (2007) indicated that teacher-rated low social competence in pre-schoolers was predicted by a less optimal teacher behaviours and classroom climate. When teachers develop positive relationships with children and are sensitive to their needs, children gain important prosocial (Johnson et al. 2013) and self-regulatory (Williford et al. 2013) skills. Emotional support can also buffer children with behaviour problems from the way those problems hinder learning (Domínguez et al. 2011). The consistency of emotional support is also important: Children in classrooms in which teachers are more consistent in providing emotional support across a day gain more in early academic skills (Curby, Brock, and Hamre 2013).

The association between emotional support and children's social competence can also be child-driven. Teachers have been shown to be more responsive to socially competent children and provide more support for their learning and more positive feedback (Denham 2006; Raver and Knitzer 2002). Transactional models of development propose that children's behaviours and other characteristics influence teacher emotions and behaviours in a classroom (see Nurmi 2012, for a meta-analysis). Transactional models are optimally suited for understanding how two or more factors influence each other reciprocally, resulting in particular individual outcomes or relational qualities (Sameroff 2009). Following the transactional model, the current study investigated auto-regressive effects and cross-lagged associations between emotional support and social competence variables.

The present study

The present study aimed to contribute to the existing literature by using a cross-lagged multilevel study design to investigate associations between observed emotional support and pre-schoolers' social competence across a preschool year. The more specific research questions were:

(1) To what extent is emotional support related to pre-schoolers' prosocial behaviours (empathy, cooperating skills) and vice versa? It is expected that teacher's emotional support of a high quality promotes children's higher prosocial behaviours (H1; Burchinal et al. 2008; Curby et al. 2009; Mashburn et al. 2008). It is also hypothesized that children's higher prosocial behaviours are related to higher quality emotional support (H2; Denham 2006; Raver and Knitzer 2002).
(2) To what extent is emotional support related to pre-schoolers' antisocial behaviours (disruptiveness, impulsivity) and vice versa? Based on the previous literature, it is expected that teacher's emotional support of high quality diminishes children's antisocial behaviours (H3; Hamre and Pianta 2005). In addition, it is also hypothesized that children's more antisocial behaviours relate to less emotionally supportive interactions later on (H4; Nurmi 2012).

Method

Participants and procedure

The study is part of larger longitudinal study following children and their teachers from preschool to third grade (Lerkkanen and Pakarinen [2016] 2022). Participants were recruited from five municipalities in Central Finland by contacting either the day care centre director or the preschool teacher directly. The initial sample consisted of 54 Finnish teachers with their preschool classrooms ($n =$ 536 children). Participation in the study was voluntary, and participants were able to discontinue their participation at any point. All participants (teachers and children's guardians) provided written consent for their own or their child's participation. The ethical approval from the ethical committee of the university was received prior to commencing the study.

Four teachers changed between autumn and spring. In addition, three teachers did not provide ratings of children's social skills at both time points. Therefore, the analytical sample comprised 47 teachers (46 female, 1 male), who participated in video-recordings of teacher–child interactions and evaluated the children at two time points. The teachers' mean age was 44 years ($SD = 9.44$;

min = 24, max = 60 years), and their working experience in preschool or school varied from 1 to 5 years to more than 15 years (mode = more than 15 years). Four hundred and forty-one preschool children (212 boys, 229 girls; M_{age} = 73.51 months, SD = 3.56 months) participated from 47 classrooms in 30 centres. Of these, 19 were municipal day care centres; six were private day care centres; and five were primary schools. Every teacher was qualified as a kindergarten teacher and had at least a bachelor's degree.

At each wave, video-recordings from one regular school day were rated using the Classroom Assessment Scoring System (CLASS Pre-K; Pianta, La Paro, and Hamre 2008). In addition, teachers were asked to rate children's social competence twice using the Multisource Assessment of Social Competence Scale (MASCS; Junttila et al. 2006) at autumn and spring. Parents were asked to provide information on their child's age, gender and socio-economic background in terms of parental level of vocational and academic education.

All parents of six-year-old children from each preschool classroom in which the teacher participated in the larger study were sent a letter home describing the study and inviting the child's, and their own, participation. Children whose parents provided written consent prior to data collection were included in the present analyses. Preschool classrooms in this study typically included 12.26 children (SD = 3.62; range = 3-20 children). All classrooms were Finnish-speaking.

In Finland, preschool education is provided free of charge for all six-year-old children during the year before they enter school at the age of seven. Preschool-aged children are taught either in day care centres (84.2%) or in primary schools (15.8%) (Statistics Finland 2019). Regardless of location, preschool education follows the same national core curriculum, which emphasizes play-like activities, with the aim of supporting a child's capacity to grow and learn at his/her own pace and to promote the transversal skills needed for constructive participation in the society and for a smooth transition to school (National Agency of Education 2014). Moreover, the curriculum strongly emphasizes support for multifaceted language use and social skills in varying social situations. Children are not formally taught academic skills such as reading or arithmetic, but they are provided with activities related to letters and phonemes as well as numbers.

Measures

Social competence

Preschool teachers rated children's social competence using the Multisource Assessment of Social Competence Scale (MASCS; Junttila et al. 2006; see also Junttila et al. 2012; Magotsiou, Goudas, and Hasandra 2006, for validity information). The MASCS questionnaire was formatted as a table, with items as rows and names of children in the classroom as columns. Items (15 in total) were rated on a four-point scale (1 = *never*, 4 = *very frequently*). The following four subscales were used as measures of prosocial and antisocial aspects of social competence: Cooperating Skills (five items, e.g. 'effectively participates in group activities'; a = .85 [T1] and .84 [T2]), Empathy (three items, e.g. 'is sensitive to the feelings of others'; a = 84 [T1 and T2]), Disruptiveness (four items, e.g. 'argues and quarrels with peers'; a = .88 [T1] and .91 [T2]), and Impulsivity (three items, e.g. 'has a short fuse'; a = .88 [T1] and .89 [T2]). Higher scores on each scale indicated higher levels of prosocial and antisocial behaviours.

Emotional support

The CLASS Pre-K (Pianta, La Paro, and Hamre 2008; see Pakarinen et al. 2010, for validation in Finland) instrument was used to assess the quality of emotional support on one school day at both waves. Emotional support consists of the following dimensions: positive climate, negative climate (reversed), teacher sensitivity and regard for student perspectives. Each dimension includes more specific behavioural indicators, which are described in detail in the CLASS manual (Pianta, La Paro, and Hamre 2008). Certified research assistants (n = 12) coded the quality of emotional support on a scale from one to seven (1–2 low, 3–5 moderate, and 6–7 high), according to the CLASS manual.

About five cycles ($M = 4.53$, $SD = 0.99$) were assessed per teacher on one school day, with an approximate duration of 21 min for one cycle ($M = 20.50$, $SD = 3.96$). A mean score of all cycles per one teacher for emotional support was used in the further analysis (Cronbach alpha reliabilities were as follows: $a = .67$ [T1] and .70 [T2]). Twenty percent of the video recordings were double coded to calculate inter-rater reliability. Inter-rater reliabilities were calculated with adjacent agreement (i.e. agreement within one point; Pianta, La Paro, and Hamre 2008), and they were between 87.5% (teacher sensitivity) and 100% (positive climate, negative climate) in autumn, and between 81.3% (regard for student perspectives) and 100% (negative climate) in spring. Inter-rater reliabilities in terms of intraclass correlation coefficients (Landers 2015) were between .33 (teacher sensitivity) and .77 (regard for student perspectives) in autumn, and between .18 (positive climate) and .60 (regard for student perspectives) in spring.

Analysis strategy

The analyses were conducted using the Mplus statistical package 8.4 (Muthén and Muthén [1998] 2017). The nested structure of the data (individual students nested within preschool classrooms) was taken into account by using multilevel structural equation modelling (MSEM). Multilevel analysis partitions the variance into a within (student-level) and between part (preschool group or classroom-level). The question of interest in the present study was what proportion of the variance was due to belonging to certain preschool classroom and to what extent observed emotional support in the classroom can explain that variance.

As a first step, a CFA was carried out using emotional support (available at the between-level only). Measurement invariance of the latent construct was tested. A configural invariance test allows one to examine whether the overall factor structure of the measure fits well for both time points. Metric invariance indicates that factor loadings are equivalent at both time points. Scalar invariance indicates that the item intercepts are equivalent across time. The presumed factorial structure of social competence variables was investigated with four separate multilevel CFA models (MCFA) in which factor loadings were set as equal at both levels across time and uniquenesses of the same constructs were correlated across time (Morin et al. 2014). Following Morin et al. (2014), all uniquenesses were forced to be non-zero to help the model to converge on a proper solution. Next, we specified four multilevel structural equation models (MSEM; Marsh et al. 2009; Morin et al. 2014) in which we analysed the associations between latent constructs of emotional support and social competence constructs. Emotional support was used as a latent variable consisting of positive climate, reversed negative climate, teacher sensitivity, and regard for student perspectives at both time points, and social competence variables were used as latent variables in separate models (cooperating skills, empathy, impulsivity, disruptiveness).

Next, we also tested a separate multilevel MCFA model for prosocial behaviours (a latent construct consisting of empathy and cooperating skills) and antisocial behaviours (a latent construct consisting of impulsivity and disruptiveness). As a next step, separate MSEM models were specified for prosocial behaviours (a latent construct consisting of scale scores of cooperating skills and empathy), and antisocial behaviours (a latent construct consisting of scale scores of disruptiveness and impulsivity) to investigate the contribution of teacher-provided emotional support in the development of these social constructs across the preschool year and vice versa. All variables were standardized ($M = 0$, $SD = 1$) to facilitate the interpretation of the results.

As a last step of the analysis, teacher work experience, class size, child's gender and age were included as covariates in the analyses. Following the comprehensive framework in defining measures of explained variance in multilevel models by Rights and Sterba (2019), standardized effects and explained proportion of variance with respect to the overall variance of the outcome were reported. This was done by first standardizing the study variables and using unstandardized coefficients of Mplus when interpreting the effects. Furthermore, contextual effect was tested, that is, whether
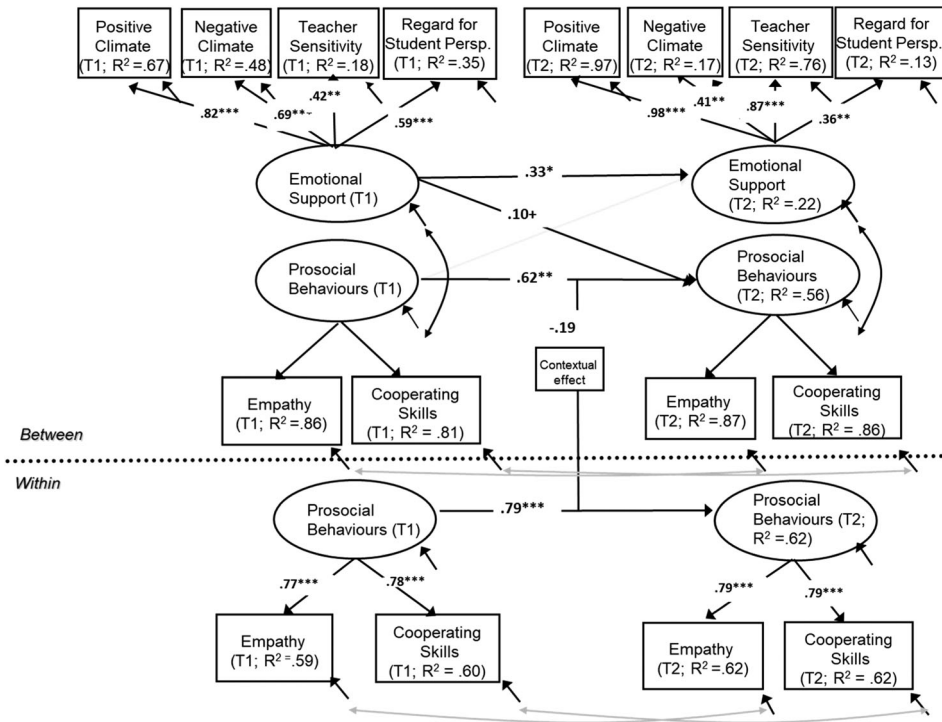
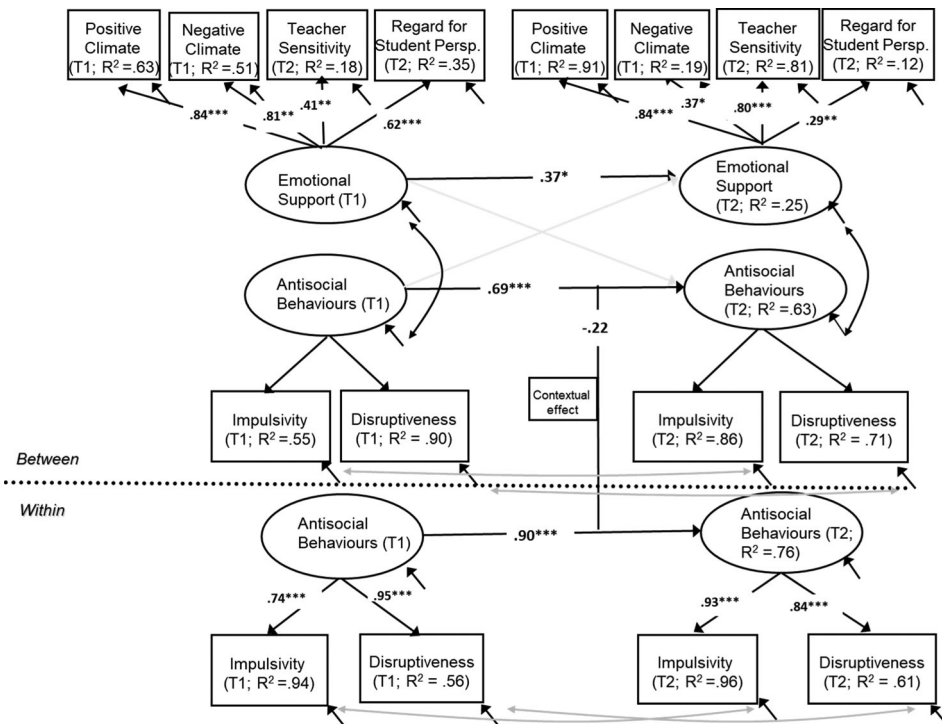**Figure 1.** MSEM Model for Emotional Support and Prosocial Behaviours.

Figure 2. MSEM Model for Emotional Support and Antisocial Behaviours.

the context has an effect on the individual (see Figures 1 and 2). In Mplus it is done by subtracting the within-level parameter estimate from the between-level parameter estimate.

The goodness-of-fit of the estimated models was evaluated by the following indicators: χ^2 test, comparative fit index (CFI), Tucker Lewis index (TLI), root mean square error of approximation (RMSEA), and standardized root mean square residual (SRMR). The cut-off values for good-fitting models were as follows: $\chi^2 =$ ns ($p > .05$), CFI and TLI > .95, RMSEA and SRMR < .05 (SRMR for the within- and between-levels respectively, $SRMR_{within}$ and $SRMR_{between}$) (Byrne 2012).

Results

The results of CFA models are presented in Table 1. Measurement invariance analyses of emotional support showed that configural invariance could be established but not metric and scalar invariance, suggesting that factor loadings and mean levels of emotional support varied across time. Thus, the factor loadings of emotional support were not set as equal across time in subsequent analyses. The results of MCFA models concerning social competence variables indicated that presumed measurement models holds at both levels across time. All confirmatory factor analyses met the model fit criteria, indicating that all study variables revealed the presumed factorial structure. In addition, the standardized factor loadings were all significant.

Descriptive statistics and correlations between the study variables are shown in Table 2. Intraclass correlation coefficients (ICCs) were calculated to determine the proportion of variance due to belonging to certain preschool classroom. There were significant differences between preschool classrooms in children's cooperating skills (ICCs = .18 [$p < .01$] and .12 [$p < .05$] in autumn and spring, respectively), empathy (ICCs = .15 [$p < .01$] and .12 [$p < .01$] in autumn and spring, respectively), disruptiveness (ICCs = .16 [$p < .05$] and .15 [$p < .05$] in autumn and spring, respectively), and impulsivity (ICCs = .21 [$p < .01$] and .14 [$p < .05$] in autumn and spring, respectively). The differences between classrooms in prosocial behaviours (ICCs = .15 [$p < .01$] and .15 [$p < .01$] in autumn and spring, respectively) and antisocial behaviours (ICCs = .20 [$p < .05$] and .17 [$p < .05$] in autumn and spring, respectively) were also significant. Thus, proceeding with multilevel modelling was reasonable. Children's age, gender and parental level of vocational education did not show significant variation at the classroom-level. Therefore, they were treated as within-level variables.

Prosocial behaviours and emotional support

First, the MSEM model for cooperating skills and emotional support fit the data well: $\chi^2(162) = 211.19$, $p = .01$; CFI = .98; TLI = .97; RMSEA = .03; $SRMR_{within} = .04$, $SRMR_{between} = .16$, although less well at the between level. The results showed that cooperating skills were highly stable both at the classroom-level ($\beta = .71$, $p < .001$) and at the level of individual children ($\beta = .81$, $p < .001$). Emotional support of

Table 1. Model fit indices of the confirmatory factor analyses.

	χ^2	df	p-value	CFI	RMSEA	$SRMR_{between}$	$SRMR_{within}$
Emotional Support							
Configural invariance over time	8.40	6	.211	.98	.09	.05	–
Metric invariance over time	19.96	9	.018	.92	.16	.62	–
Scalar invariance over time	39.26	16	.000	.80	.21	.70	–
Cooperating Skills[a]	101.77	71	.010	.98	.03	.26	.04
Empathy[a]	21.73	16	.152	.99	.03	.18	.02
Impulsivity[a]	21.79	16	.150	1.00	.03	.07	.02
Disruptiveness[b]	86.54	40	.000	.98	.05	.18	.03
Pro-Social Skills[c]	1.76	1	.185	1.00	.04	.05	.02
Anti-Social Skills[c]	12.91	6	.044	.99	.05	.18	.02

[a]Multilevel CFA model including both time points.
[b]Multilevel CFA model, not including correlated uniqueness of item 3 at T1 and T2 at between-level.
[c]Multi-level CFA model including both time points.

Table 2. Descriptive statistics and correlations between study variables (within-level correlations below the diagonal and between-level correlations above the diagonal).

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
Preschool fall															
1. Emotional support T1	1	.27[†]	.07	−.07	−.06	.39[b]	.43[b]	.33[†]	−.23	−.16	−.17	−.08	−	−	−
2. Cooperating skills T1	−	1	.52[b]	−.11	−.03	.29[†]	.68[a]	.53[b]	−.24	−.08	−.33[†]	.16	−	−	−
3. Empathy T1	−	.64[a]	1	−.34[c]	−.35[†]	.35[c]	.28	.48[c]	−.35[c]	−.32[†]	.02	.06	−	−	−
4. Disruptiveness T1	−	−.25[a]	−.55[a]	1	.85[a]	−.32	.05	−.02	.59[c]	.65[b]	.02	−.04	−	−	−
5. Impulsivity T1	−	−.28[a]	−.51[a]	.71[a]	1	−.34[†]	−.07	−.03	.75[a]	.76[a]	−.36[b]	−.03	−	−	−
Preschool spring													−	−	−
6. Emotional support T2	−	−	−	−	−	1	.49[b]	.44[b]	−.38[†]	−.38[c]	.00	−.21	−	−	−
7. Cooperating skills T2	−	.72[a]	.55[a]	−.23[a]	−.21[a]	−	1	.64[a]	−.32[c]	−.22	−.29[†]	−.03	−	−	−
8. Empathy T2	−	.49[a]	.65[a]	−.52[a]	−.44[a]	−	.67[a]	1	−.16	−.24	−.38[c]	.04	−	−	−
9. Disruptiveness T2	−	−.24[a]	−.46[a]	.79[a]	.63[a]	−	−.26[a]	−.58[a]	1	.77[a]	−.15	−.02	−	−	−
10. Impulsivity T2	−	−.26[a]	−.44[a]	.65[a]	.79[a]	−	−.25[a]	−.54[a]	.85[a]	1	−.24[†]	.12	−	−	−
Control variables															
11. Group size	−	−	−	−	−	−	−	−	−	−	1	.14	−	−	−
12. Work experience[1]	−	−	−	−	−	−	−	−	−	−	−	1	−	−	−
13. Gender[2]	−	−.24[a]	−.26[a]	.40[a]	.29[a]	−	−.22[a]	−.24[a]	.45[a]	31[a]	−	−	1	−	−
14. Age	−	.14[b]	.07	−.05	−.08[†]	−	.08	.08	−.07	−.12[c]	−	−	−.03	1	−
15. Parental education	−	.09	.12[c]	−.17 [c]	−.20 [b]	−	.10	.11[d]	−.21	−.13	−	−	.00	−.03	1
Descriptive statistics															
Mean	5.49	12.26	7.96	4.56	4.16	5.57	12.20	7.89	4.64	4.14	12.26	4.11	1.48	73.51	3.87
Std. deviation	0.50	2.25	1.36	1.82	1.88	0.50	2.25	1.39	1.87	1.90	3.62	1.15	0.50	3.57	
Minimum	3.5	5.56	4.14	2.82	2.57	4.31	4	4.04	2.82	2.57	3	2	1	68	1
Maximum	6.25	16	9.76	10.95	10.28	6.45	16	9.76	11.28	10.28	20	5	2	80	5
ICC	−	.18[b]	.15[b]	.16[c]	.21[b]	−	.12[c]	.12[b]	.15[c]	.14[c]	−	−	.00	.00	.02

Notes: T1 = preschool fall, T2 = preschool spring. [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]gender 1= female, 2 = male.
[a]$p < .001$, [b]$p < .01$, [c]$p < .05$; [†]=$p < .10$.

the autumn was related to subsequent emotional support ($\beta = .31$, $p < .09$), albeit marginally. However, emotional support was not significantly associated to classroom-level cooperating skills or vice versa.

Next, a MSEM model for empathy and emotional support fit the data well: $\chi^2(75) = 99.24$, $p = .03$; CFI = .98; TLI = .98; RMSEA = .03; SRMR$_{within}$ = .02, SRMR$_{between}$ = .12. The results showed that empathy was highly stable at the level of individual children ($\beta = .74$, $p < .001$). Emotional support of the autumn was related to emotional support in spring ($\beta = .39$, $p < .05$), indicating moderate stability. There was also a reciprocal association between emotional support and empathy: empathy was related to higher emotional support ($\beta = .46$, $p < .05$) and vice versa ($\beta = .41$, $p < .05$).

As a next step, a MSEM model for prosocial behaviours (consisting of cooperating skills and empathy) and emotional support was constructed. The uniquenesses of cooperating skills and empathy were fixed at (1 minus reliability) x variance at both levels to help the model convergence. The model fit the data well: $\chi^2(57) = 75.59$, $p = .05$; CFI = .98; TLI = .98; RMSEA = .03; SRMR$_{within}$ = .04, SRMR$_{between}$ = .10. The results (Table 3) indicated that prosocial behaviours were highly stable both at the classroom-level (standardized estimate = .62, $p < .01$) and at the

Table 3. Standardized estimates (standard errors in parenthesis) of multilevel sem models for emotional support and children's prosocial and antisocial behaviours.

MSEM model for emotional support and prosocial behaviours		MSEM model for emotional support and antisocial behaviours	
Within-level (individual level)	Est (s.e)	*Within-level (individual level)*	Est (s.e)
Regression coefficients		Regression coefficients	
Regression coefficient from T1 prosocial behaviours to T2 prosocial behaviours	0.82(0.06)***	Regression coefficient from T1 antisocial behaviours to T2 antisocial behaviours	0.90(0.05)***
Residual variances		Residual variances	
Prosocial behaviours (T2)	0.21(.03)***	Antisocial behaviours (T2)	0.20(0.04)***
R^2_{within}: model explained 62% of individual level variance of T2 prosocial behaviours		R^2_{within}: model explained 76% of individual level variance of T2 antisocial behaviours	
Between-level (preschool classroom level)		*Between-level (classroom level)*	
Intercepts		Intercepts	
Positive Climate (T1)	−0.04(0.16)	Positive Climate (T1)	−0.04(0.16)
Negative Climate (T1)	−0.04(0.17)	Negative Climate (T1)	−0.04(0.17)
Teacher Sensitivity (T1)	−0.02(0.14)	Teacher Sensitivity (T1)	−0.02(0.14)
Regard for Student Perspectives (T1)	−0.06(0.15)	Regard for Student Perspectives (T1)	−0.06(0.15)
Positive Climate (T2)	−0.07(0.14)	Positive Climate (T2)	−0.07(0.14)
Negative Climate (T2)	−0.00(0.15)	Negative Climate (T2)	−0.00(0.15)
Teacher Sensitivity (T2)	−0.06(0.15)	Teacher Sensitivity (T2)	−0.06(0.15)
Regard for Student Perspectives (T2)	0.07(0.14)	Regard for Student Perspectives (T2)	0.07(0.14)
Cooperating Skills (T1)	0.01(0.08)	Impulsivity (T1)	0.03(0.09)
Empathy (T1)	−0.00(0.07)	Disruptiveness (T1)	0.02(0.08)
Cooperating Skills (T2)	0.02(0.08)	Impulsivity (T12)	0.04(0.08)
Empathy (T2)	0.02(0.07)	Disruptiveness (T2)	0.02(0.08)
Regression coefficients		Regression coefficients	
Regression coefficient from T1 prosocial behaviours to T2 prosocial behaviours	0.62(0.24)*	Regression coefficient from T1 antisocial behaviours to T2 antisocial behaviours	0.69(0.19)***
Regression coefficient from T1 emotional support to T2 emotional support	0.33(0.16)*	Regression coefficient from T1 emotional support to T2 emotional support	0.37(0.16)***
Regression coefficient from T1 emotional support to T2 prosocial behaviours	0.10(0.05)+	Regression coefficient from T1 emotional support to T2 antisocial behaviours	−0.04(0.04)
Regression coefficient from T1 prosocial behaviours to T2 emotional support	1.05(0.65)	Regression coefficient from T1 antisocial behaviours to T2 emotional support	−0.93(0.61)
Residual variances		Residual variances	
Prosocial behaviours (T2)	0.05 (0.02)*	Antisocial behaviours (T2)	0.06(0.02)***
Emotional support (T2)	1.00(0.00)	Emotional support (T2)	1.00(0.00)
$R^2_{between}$: model explained 22% of the classroom level variance in T2 emotional support and 56% of variance in T2 prosocial behaviours		$R^2_{between}$: model explained 26% of the classroom level variance in emotional support and 63% in T2 antisocial behaviours.	
R^2 overall: model explained 37% of the total variance in T2 prosocial behaviours		R^2 overall: model explained 57% of the total variance in T2 antisocial behaviours	

Notes: T1 = preschool fall, T2 = preschool spring, ***$p < .001$, **$p < .01$, *$p < .05$, +$p < .05$.

level of individual children (standardized estimate = .82, $p < .001$). The results also showed that there was no significant contextual effect for this path (−.19, $p = .45$), that is, the path was not significantly different at the level of individual children and at the level of preschool classrooms. Emotional support of the initial time point (autumn) was related to subsequent emotional support in spring of the preschool year (standardized estimate = .33, $p < .05$), indicating moderate stability. In addition, emotional support was associated to classroom-level prosocial behaviours (standardized estimate = .10, $p = .06$), albeit marginally significantly. The control variables could only be added one by one to the model. When controlling for class size or teacher experience, emotional support was significantly related to subsequent prosocial behaviours (standardized estimate = .10, $p < .05$). At the level of individual children (within-level), prosocial behaviours at the beginning of preschool year were negatively predicted by child gender (standardized estimate = −.23, $p < .001$), and positively by child age (standardized estimate = .10, $p < .01$) and parental education (standardized estimate = .09, $p < .05$), indicating that boys were rated as having less prosocial behaviours and older children and children with higher parental level of education were rated as showing more prosocial behaviours when entering preschool.

Antisocial behaviours and emotional support

Next, a MSEM model for disruptiveness and emotional support was specified. The model fit the data well: $\chi^2(116) = 253.44$, $p = .00$; CFI = .95; TLI = .94; RMSEA = .05; SRMR$_{within}$ = .06, SRMR$_{between}$ = .13. The results showed that disruptiveness was highly stable both at the classroom-level ($\beta = .67$, $p < .01$) and at the level of individual children ($\beta = .84$, $p < .001$). Emotional support of the autumn was related to emotional support in spring ($\beta = .32$, $p < .05$), indicating moderate stability. There was also a marginally significant reciprocal association between emotional support and disruptiveness: disruptiveness was related to lower subsequent emotional support ($\beta = -.42$, $p < .06$) and vice versa ($\beta = -.20$, $p < .07$).

A MSEM model for impulsivity and emotional support fit the data well $\chi^2(73) = 110.57$, $p = .00$; CFI = .98; TLI = .98; RMSEA = .03; SRMR$_{within}$ = .01, SRMR$_{between}$ = .11. The results showed that impulsivity was highly stable both at the classroom-level ($\beta = .81$, $p < .001$) and at the level of individual children ($\beta = .86$, $p < .001$). Emotional support of the autumn was related to emotional support in spring ($\beta = .31$, $p < .08$), albeit marginally. In addition, impulsivity was related to lower subsequent emotional support ($\beta = -.45$, $p < .05$).

As a next step, a MSEM model for antisocial behaviours (consisting of disruptiveness and impulsivity) and emotional support was constructed. The uniquenesses of impulsivity were fixed at (1 minus reliability) x variance and uniquenesses of disruptiveness as non-zero at both levels to help the model convergence. The model fit the data well: $\chi^2(54) = 71.53$, $p = .06$; CFI = .99; TLI = .99; RMSEA = .03; SRMR$_{within}$ = .02, SRMR$_{between}$ = .14, albeit less well at the between-level. The results (Table 3) indicated that antisocial behaviours were highly stable both at the classroom-level (standardized estimate = .69, $p < .001$) and at the level of individual children (standardized estimate = .90, $p < .001$). The results also showed that there was no significant contextual effect for this path (estimate = -.22, $p = .30$), that is, the path was not significantly different at the level of individual children and at the level of preschool classrooms. Emotional support of the initial time point (autumn) was related to subsequent emotional support in spring of the preschool year (standardized estimate = .37, $p < .05$), indicating moderate stability. Emotional support was not significantly related to subsequent antisocial behaviours or vice versa. The control variables could only be added one by one to the model. At the level of individual children (within-level), antisocial behaviours at the beginning of preschool year were positively predicted by child gender (standardized estimate = .27, $p < .001$) and negatively by parental level of education (standardized estimate = -.17, $p < .05$), indicating that boys were rated as having more antisocial behaviours and older and children with higher parental level of education were rated as showing less antisocial behaviours when entering preschool.

Discussion

Children's social competence, such as the ability to cooperate with peers, regulate behaviours and emotions, and adapt to new social situations allows them to develop positive relationships with peers and teacher as well as to get the most out of the learning opportunities in the classroom (Ladd, Birch, and Buhs 1999; McClelland et al. 2007). Drawing from studies suggesting that responsive and stimulating teacher–child interactions are significant predictors of young children's social-emotional functioning (Burchinal et al. 2008; La Paro, Pianta, and Stuhlman 2004; Mashburn et al. 2008; Vandell 2004), the present study aimed to examine the associations between teacher-provided emotional support and children's social competence during the preschool year. Consistent with the transactional theory (Sameroff 2009), we specified reciprocal effects model with auto-regressive and cross-lagged paths between emotional support and social competence scales at the between level. The results of MSEM demonstrated that higher emotional support from the teacher was related to more prosocial behaviours in spring of the preschool year when accounting for previous level of the behaviours and teacher experience/class size.

Prosocial behaviours and emotional support

The results showed first in line with the previous literature (Burchinal et al. 2008; Curby et al. 2009; La Paro, Pianta, and Stuhlman 2004; Mashburn et al. 2008; Vandell 2004), that emotional support was related to subsequent prosocial behaviours, albeit marginally. It should be noted, however, that only small proportion of the overall variance of prosocial skills was explained by classroom-level emotional support. The results of the present study imply that emotionally supportive and sensitive interactions increase children's subsequent socially desirable behaviours in the classroom. More responsive and sensitive teacher–child interactions are reflected in children taking into account others' feelings and being empathetic and cooperative towards their peers across the preschool year. It can be suggested that the teacher acts as an invisible hand in classroom by orchestrating social behaviours and peer interactions (Farmer, Lines, and Hamm 2011). Thus, it is important that teachers become aware of the formation of emotionally supportive and caring practices in the classroom and of how interactions can support socially desirable behaviours. In classrooms with high interactional quality, teachers typically recognize and respond to children's individual needs, form warm and respectful connections, encourage autonomy, praise desired behaviours, and establish clear rules and expectations. It should be noted that the results could also reflect teacher perceptions of child behaviours rather than actual child behaviours. Thus, it is possible that teachers who are sensitive and responsive in their interactions, typically rate children as showing more cooperating skills and being more empathetic towards their peers.

The results of the present study are in line with theoretical underpinnings of attachment theory (Ainsworth et al. 1978; Verschueren and Koomen 2012) and theoretical model on social competence at different levels, including individual level and classroom level (Rose-Krasnor 1997). Altogether, this supports the notion that children's social competence in the classroom is at least in part a situated skill that is shaped by the environment. In turn, the link from prosocial behaviours to subsequent emotional support was not significant, in contrast to our expectations (H2) and suggestions by Nurmi (2012) and Sameroff (2009) who proposed that children's characteristics and behaviours have an evocative effect on teacher behaviours in the classroom. Although it has been shown that teachers are more likely to be responsive to socially competent children and, as a result, these children receive more support for their learning and more positive feedback (Denham 2006; Raver and Knitzer 2002), this was not confirmed in the present study.

Antisocial behaviours and emotional support

The results concerning emotionally supportive interactions and antisocial behaviours showed that there was a marginally significant reciprocal association between emotional support and disruptiveness: Disruptiveness was related to lower subsequent emotional support and vice versa. In addition, impulsivity typical of the preschool classroom was related to lower subsequent emotional support. However, when considering antisocial behaviours as a combination of impulsivity and disruptiveness, emotional support was not significantly linked to subsequent antisocial behaviours or vice versa. The results imply that disruptive behaviours may diminish sensitive and responsive interactions in the classroom. In the present study, the expectations (H4) concerning evocative effect of children's antisocial behaviours on teacher emotional support proved to be only tentative (Nurmi 2012). However, teachers need to be aware of the possibility that child antisocial behaviours may partly drive the lower observed quality of interactions in the preschool classroom.

The results were partly in line with previous literature showing that teacher's emotional support of high quality may diminish children's antisocial behaviours (Hamre and Pianta 2005). The possible mechanism explaining the link of emotional support on child antisocial behaviours may, for example, be through children's stress response system. It has been shown that stress typically increases throughout the day for children in out-of-home settings, but not when children are in classrooms in which teachers offer warm, supportive care (Hatfield et al. 2013). Children with difficulties to regulate their emotions may show disruptiveness and impulsivity in classroom settings. Therefore, teachers need to understand how emotion regulation develops and find effective ways to support the development of child's self-regulation skills. It has been shown, for example, that emotionally supportive, warm and sensitive interactions in a classroom can help children to focus on tasks at hand (Pakarinen et al. 2014). Again, it would be important for teachers to become aware of the formation of supportive, sensitive and responsive patterns of interactions in the classroom and of how classroom interactions could diminish less appropriate behaviours. Although the previous findings have indicated that a positive classroom emotional climate and a supportive relationship with the teacher may act as a compensatory resource in relation to the social adjustment of aggressive (Meehan, Hughes, and Cavell 2003) and anxious-withdrawn (Gazelle 2006) children, this was not fully confirmed in the current study as the results were only marginally significant.

Limitations

The present study also has some limitations that need to be considered in any attempts to interpret the results. First, although we had rich two-wave longitudinal data, the number of level-2 units limited some of the estimations of model fit. To accommodate this, we for the substantive models relied on MSEM using scale-scores. Further replications using Bayesian estimators or the factor-score procedure implemented in Lavaan (Rosseel 2012) might facilitate estimation of the full models. The current results should be interpreted with caution. Moreover, it should be noted that only a small proportion of the overall variance of outcome variables was explained. Second, the study used teacher-ratings in the assessment of children's social competence in their classroom. Although teacher-ratings have been used in many studies, caution should be warranted in interpreting the results. Teacher-ratings of children's social skills can reflect many other issues such as teacher stress and well-being and, thus, should be combined with observer- peer-, or parental-ratings of children's behaviours in further studies to gain a complete picture of the phenomenon. Moreover, it should be noted that teachers might think preschool classroom as a frame of reference when rating children's behaviours. Third, although we controlled for child age, gender and parental level of education, there might be some other variables that might be relevant to account. For example, parenting styles have been shown to be related to child problem behaviours (Aunola and Nurmi 2005). Finally, as there is a substantial amount of variation in how preschool education is organized and in the kind of instruction provided for 6-year-old children, there is an evident need to replicate these findings in other educational settings besides Finland.

Theoretical and educational significance

The present study contributes to our understanding on the role of emotionally supportive interactions between teacher and child to support children's social competence at preschool age. These findings suggest an intricate interplay between the development of children's social competencies and high-quality learning interactions. Further studies are needed to better understand the developmental dynamics between teacher–child interactions and children's social competence before school entry and also longitudinally. The results call for teachers' pre- and in-service training for better understanding the development of social competence during early school years and for enhancing engaging and supportive interactions in classrooms.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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