Teacher characteristics, social classroom relationships, and children's social, emotional, and behavioral classroom adjustment in special education ☆

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ABSTRACT

The goal of this study was to explore relations between teacher characteristics (i.e., competence and wellbeing); social classroom relationships (i.e., teacher–child and peer interactions); and children's social, emotional, and behavioral classroom adjustment. These relations were explored at both the individual and classroom levels among 414 children with emotional and behavioral disorders placed in special education. Two models were specified. In the first model, children's classroom adjustment was regressed on social relationships and teacher characteristics. In the second model, reversed links were examined by regressing teacher characteristics on social relationships and children's adjustment. Results of model 1 showed that, at the individual level, better social and emotional adjustment of children was predicted by higher levels of teacher–child closeness and better behavioral adjustment was predicted by both positive teacher–child and peer interactions. At the classroom level, positive social relationships were predicted by higher levels of teacher competence, which in turn were associated with lower classroom levels of social problems. Higher levels of teacher wellbeing were directly associated with classroom adaptive and maladaptive child outcomes. Results of model 2 showed that, at the individual and classroom levels, only the emotional and behavioral problems of children predicted social classroom relationships. At the classroom level, teacher competence was best predicted by positive teacher–child relationships and teacher wellbeing was best predicted by classroom levels of prosocial behavior. We discuss the importance of positive teacher–child and peer interactions for children placed in special education and suggest ways of improving classroom processes by targeting teacher competence.

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1. Introduction

From a developmental systems perspective, information on all dynamic classroom processes is needed to understand children's social, emotional, and behavioral classroom adjustment (Lerner, 2006; Pianta, Hamre, & Stuhlman, 2003). Pianta et al. (2003) stated that next to children's and teachers' demographic attributes and characteristics, children's social, emotional, and behavioral adjustment in the classroom is mainly the result of the reciprocal interplay between social interactions, such as teacher–child and peer interactions. Although it is important to understand this dynamic interplay of classroom processes, most research has focused solely on the impact of teacher characteristics, teacher–child relationships, or peer interactions, when examining children's classroom adjustment. Likewise, although classroom processes may differently impact individual students compared to the class as a whole (Morin, Marsh, Nagengast, & Scalas, 2014), there is not much research examining the impact of classroom processes at both the individual and classroom levels. Finally, although children with severe emotional and behavioral disorders (EBD) placed in special education may have more to gain from positive classroom interactions than children in general education, most research on classroom processes has been conducted in general education. Therefore, the goal of this study was to advance knowledge on classroom processes in special education by examining the associations between teacher characteristics, social classroom relations, and children's adjustment at both the individual and classroom levels in a sample of children with EBD placed in special education.

1.1. Social classroom relations and children's adjustment

It has been widely acknowledged that the teacher–child relationship plays an important role when it comes to children's social, emotional, and behavioral adjustment. From an attachment perspective, it has been proposed that children who develop secure attachments with parents will also develop more positive teacher–child relationships, which may increase their classroom psychosocial adjustment (Verschueren & Koomen, 2012). Empirical studies have indeed shown that a positive teacher–child relationship is associated with a variety of positive child outcomes such as the development of children's social skills (Cornelius-White, 2007), children's psychosocial adjustment in school (Buyse, Verschueren, Verachtert, & Van Damme, 2009), and children's school motivation (Maulana, Opdenakker, den Brok, & Bokser, 2011). In addition, a negative teacher–child relationship is also associated with undesirable outcomes such as peer dislike (Hughes, Cavell, & Willson, 2001), loneliness and depression (Maldonado-Carreño & Votruba-Drzal, 2011), and disruptive student behavior (Hamre, Pianta, Downer, & Mashburn, 2008; Spilt, Koomen, & Thijs, 2011). Next to teacher–child interactions, peer relationships may also impact children's classroom adjustment as these friendships provide children with a social mirror that is used to validate their developing self-image (Gifford-Smith & Brownell, 2003). Studies have demonstrated that especially negative peer interactions impact children's social, emotional, and behavioral classroom adjustment. For example, children's victimization by peers in the classroom has been associated with emotional problems, such as anxiety and depression (Snyder et al., 2003; Vuijk, Van Lier, Crijnen, & Huizink, 2007), behavioral problems, such as antisocial and aggressive behavior (Snyder et al., 2003), and social problems, such as loneliness (Ladd, Kochenderfer, & Coleman, 1997).

However, it is important to note that because classroom processes are dynamic, associations may be bidirectional. Therefore, children's characteristics, such as prosocial and antisocial behaviors, may also impact the development of social relations in the classroom. For example, longitudinal studies suggest that children's aggressive behavior increases future peer rejection and reduces future teacher preference (Mercer & DeRosier, 2008). Similarly, children who show more externalizing behaviors may be less preferred by peers in the next school year (Leflot, Van Lier, Verschueren, Onghena, & Colpin, 2011). It is thus important to study these associations in both directions.

1.2. Teacher characteristics and children's adjustment

Given that social classroom relationships are important for children's classroom adjustment and that teachers can be considered authority figures who have a responsibility in facilitating these positive interactions, it is important to include teacher characteristics when examining classroom processes. For example, a lack of teacher competence may hamper a teacher's attempts to provide necessary care and education, which may directly impact children's classroom adjustment (Sutherland, Lewis-Palmer, Stichter, & Morgan, 2008). A lack of teacher competence may also indirectly affect children's classroom adjustment as teacher's emotional competence may affect the emotional support they provide to their students and thus teacher–child relationship quality (Brown, Jones, LaRusso, & Aber, 2010; Tom, 2012), which in turn may impact children's adjustment (Buyse et al., 2009; Hamre et al., 2008; Hughes et al., 2001; Maldonado-Carreño & Votruba-Drzal, 2011).

Likewise, teacher stress may also be both directly and indirectly related to classroom adjustment of children such as the level of teacher-perceived classroom behavioral problems. Directly because teachers' stress levels may affect teachers' experience of a child's behavior and thus their report on the child's behavior. For example, stress reductions in teachers have shown to heighten tolerance levels for disruptive classroom behavior (Barbaresi & Olson, 1998). With regard to indirect effects, the lower teachers' stress levels and the higher their tolerance levels tend to be, the less critical and punitive they are towards children (Clunies-Ross, Little, & Kienhuis, 2008), which may lead to the formation of close instead of conflictual teacher–child relationships (Yoon, 2002). Close relationships may in turn decrease existing adjustment problems (Leflot et al., 2011; Mercer & DeRosier, 2008).

Thus, teachers' sense of competence and wellbeing may be directly and indirectly associated with children's classroom adjustment through their influence on social classroom relationships and in particular the establishment of a positive teacher–child relationship. Yet, children's classroom behavior, especially in special education, may also impact teachers' outcomes directly. Children with EBD often show out-of-seat behavior, verbal disruptions, and aggressive behavior that disrupts the educational process and which may

increase teachers' stress levels (Greene, Beszterczey, Katzenstein, Park, & Goring, 2002). Both children's externalizing behavior and teacher stress may result in reduced levels of teachers' self-efficacy in teaching (Friedman, 2000) and may also lead to reduced wellbeing because of increased burnout symptoms (Maslach, Schaufeli, & Leiter, 2001). In addition, the impact of children's behavior on teacher outcomes may be mediated by classroom social relations as disrupting the educational process may cause more teacher–child conflict (Hamre et al., 2008) and negative peer interactions (Gifford-Smith & Brownell, 2003), which may lead to lower teacher wellbeing (Spilt et al., 2011; Yoon, 2002) and lower sense of competency in teaching (Spilt et al., 2011; Yeo, Ang, Chong, Huan, & Quek, 2008).

1.3. Advancing research on classroom processes

Although numerous studies have focused on classroom processes and how they affect child outcomes, a number of limitations are present in these studies that may restrict the validity or generalizability of the described results. First, with some positive exceptions, such as studies by Mercer and DeRosier (2008) and Leflot et al. (2011), many studies focus on either the impact of teacher–child interactions in the classroom (e.g., Buyse et al., 2009; Downer, Sabol, & Hamre, 2010; Maldonado-Carreño & Votruba-Drzal, 2011) or on the impact of classroom peer interactions (e.g., Ladd et al., 1997; Snyder et al., 2003) on children's classroom adjustment. However, from a developmental systems perspective, all these processes are interrelated (Pianta et al., 2003) and studies that integrate multiple classroom processes should therefore go beyond testing bivariate associations and focus on possible mediational mechanisms (Downer et al., 2010). On a related matter, many previous studies used solely teacher ratings on both social classroom interactions and children's adjustment (e.g., Buyse et al., 2009), which may have led to shared method variance that may possibly account for some of the effects found in these studies. Therefore, it is recommended to use multiple informants on classroom processes (Mashburn, Hamre, Downer, & Pianta, 2006; Sabol & Pianta, 2012). This study will therefore integrate the analysis of multiple classroom processes (i.e., teacher characteristics, teacher–child and peer interactions, and children's classroom adjustment) to examine the unique direct and indirect contributions of each of these constructs on each other, using both teacher and peer ratings of classroom processes.

Second, when integrating multiple classroom processes, it is important to examine these processes both at the individual and classroom levels, because teacher–child and peer interactions may differently impact individual students compared to the class as a whole and associations at the individual level may have a distinct meaning from these associations at the classroom level (Downer et al., 2010; Morin et al., 2014; Pianta et al., 2003). For example, a teacher may affect children individually, through his or her personal relationship with specific children. Yet, it is also possible that a teacher's closeness or friendliness is a more global teacher characteristic or interpersonal style (Wubbels & Brekelman, 2005), which is shared by all children in class and consequently affects classroom level outcomes. Thus, to obtain a proper insight into classroom dynamics, this study will examine classroom processes in a multilevel context.

Third, most studies have focused on classroom processes in general education; however, classroom processes may interact differently in special education where children with EBD are educated. Children with EBD develop more dissatisfaction in their teacher–child relationships (Murray & Greenberg, 2001), collaborate less with their teachers (Toste, Bloom, & Heath, 2014), and encounter more peer victimization (Little & Kobak, 2003) than children without EBD and these negative social experiences may in turn lead to poor classroom adjustment (Sabol & Pianta, 2012). These findings are especially important because children with EBD not only experience more negative interactions, they may also, in line with Belsky's (1997) differential susceptibility hypothesis, be more susceptible to positive and negative social interactions. Many studies have provided evidence for Belsky's theory that children with a difficult temperament are particularly susceptible to the care they receive. Specifically, less emotional support from teachers (Downer et al., 2010) and low quality childcare (Pluess & Belsky, 2009) have been shown to exacerbate social dysfunction in socially and behaviorally at-risk children. Likewise, teacher–child closeness (Baker, 2006; Berry & O'Conner, 2010; Silver, Measelle, Armstrong, & Essex, 2005) and high-quality childcare (Pluess & Belsky, 2009) especially benefited children with social, emotional, and behavioral problems.

1.4. The present study

In this study, we examined associations between teacher characteristics, social relationships, and children's classroom adjustment in a population of children with EBD who have various psychiatric diagnoses and are therefore placed in special education. We aimed to overcome the limitations of previous studies by including measures of both teacher–child and peer interactions, using ratings of multiple informants, and applying multilevel analyses. To identify central associations between these classroom processes, we applied multilevel structural equation modeling using a cross-sectional design. As the associations between the study variables are likely bidirectional and as our design prohibits drawing conclusions on the direction of effects, we examined two models to provide a comprehensive overview of all associations. The first model focuses on predicting child outcomes, and the second model on predicting teacher outcomes. With regard to child outcomes, we tested two hypotheses. First, we expected children's social, emotional, and behavioral adjustment to be predicted by teacher–child and peer interactions (Buyse et al., 2009; Hughes et al., 2001; Ladd et al., 1997; Maldonado-Carreño & Votruba-Drzal, 2011; Snyder et al., 2003) at both the individual and classroom levels. Second, we expected classroom levels of children's adjustment to be predicted by teacher competence and wellbeing (Barbaresi & Olson, 1998; Clunies-Ross et al., 2008; Sutherland et al., 2008). Third, with regard to teacher outcomes, we expected teacher competence and wellbeing to be predicted by classroom levels of children's adjustment (Friedman, 2000; Greene et al., 2002; Maslach et al., 2001). Fourth, we expected teacher competence and wellbeing to be predicted by social classroom relationships (Spilt et al., 2011; Yeo et al., 2008; Yoon, 2002). Fifth, with regard to social classroom relationships, we expected teacher–child and peer interactions to be predicted

by children's classroom adjustment (Leflot et al., 2011; Mercer & DeRosier, 2008) at both the individual and classroom levels. Finally, we expected teacher–child and peer interactions to be predicted by teacher competence and wellbeing (Brown et al., 2010; Chang, 2009; Tom, 2012; Yoon, 2002).

2. Method

2.1. Participants

In the Netherlands, the criteria for a child's inclusion in a segregated setting for special education for children with severe EBD are as follows: a psychiatric diagnosis; behavioral problems at school and at home or in the community; and limited participation in education as a result of the child's emotional and behavioral problems (Landelijke Commissie Toezicht Indicatiestelling, 2006; Meijer, 2003). Participants in this study came from 11 schools for special primary education for children with psychiatric disorders located throughout the Netherlands. All children in grades 1–6 attending one of these segregated settings at the start of the study were eligible for inclusion. The principals of 3 of these schools decided that, in total, six classes should not be able to participate in the study due to problems present in these classes, such as teachers recently having resigned or experiencing burnout problems. After the exclusion of these six classes, 68 teachers gave their written informed consent. As a result, our target population consisted of 492 children taught by 68 teachers. Of those, 56 teachers were selected for this study because they could be considered the main teacher who taught children most days of the week. These teachers (76% women; mean age = 38.0 years [range 23–62 years]; 89.5% working full-time) completed questionnaires about the children and themselves. Written informed parental consent for participation in the study was obtained for 84% of the children, so our final sample consisted of 414 children. These children (87% boys) had a mean age of 10.1 years (range 5–13 years) and a mean IQ of 88 (range 56–143). Upon placement in special education, all children were diagnosed by certified mental health professionals (e.g., psychiatrists and clinical psychologists) not associated with our study. We obtained information on children's psychiatric disorders through their school medical files. All children had at least one psychiatric disorder and many children had comorbid psychiatric disorders (see Table 1). In addition, 47.5% of the children received individual psychiatric treatment outside the classroom and 49.6% of the children were treated with psychiatric medication. This study was approved by the Dutch Medical Ethics Committee for Mental Health Care.

2.2. Measurements

Data were collected 6 to 10 weeks after the start of the 2010–2011 school year. A research protocol was written on the administration of each questionnaire. In addition, approximately one month before the data assessments, research assistants received a group training session offering guidance on administering each questionnaire and dealing with common classroom situations and questions of teachers and children. Questionnaires were completed individually in class by teachers, children, and their classmates. Given their young age, with literacy and writing skills still in development, children in grade 1 (3% of the children) did not provide self-report data. If a child in grade 2 or higher needed help to provide self-report data, separate appointments were made so that research assistants could conduct a face-to-face interview with the child to obtain data.

2.2.1. Teacher personal competence and wellbeing

Two subscales of the Dutch adaptation of the Maslach Burnout Inventory (MBI) for teachers (UBOS-L; Schaufeli & Van Dierendonck, 2000) were used. Teachers rated the items on a 7-point scale, ranging from 0 (*never*) to 6 (*every day*). Teacher personal competence was assessed using the Personal Accomplishment subscale, which has 7 items (e.g., "I feel I'm positively influencing other people's lives through my work"). The sample's Cronbach's alpha was .78. Teacher wellbeing was assessed using the Emotional Exhaustion subscale, which has 8 items (e.g., "I feel emotionally drained from my work"). The sample's Cronbach's alpha was .88. Scores on this subscale were reversed to represent wellbeing. The UBOS-L is a widely used (Schaufeli, Bakker, Hoogduin, Schaap, & Kladler, 2001; Tomic & Tomic, 2008) standardized assessment of burnout symptoms comparable to the original American version the MBI (Schaufeli & Van Dierendonck, 1993). The UBOS-L has reasonable discriminative power as the questionnaire can help discriminate individuals with and without burnout (Schaufeli et al., 2001) and has clinical value as scores can predict teachers' sick leave due to work-related psychological symptoms (Schaufeli & Van Dierendonck, 2000).

Table 1
Children's psychiatric diagnoses.

Diagnoses	N (%)
Autism spectrum disorder	177 (42.8%)
Attention deficit/hyperactivity disorder	165 (39.9%)
Oppositional defiant disorder or conduct disorder	116 (28.0%)
Anxiety disorder	22 (5.3%)
Mood disorder	14 (3.4%)
Other	77 (18.6%)

Note. Children can have comorbid diagnoses.

2.2.2. Teacher–child interactions

Teacher reports of the relationship between teachers and individual children were collected using the Closeness scale of the Dutch Student–Teacher Relationship Scale (STRS; Koomen, Verschueren, & Pianta, 2007). Closeness (i.e., warm and open communication; 11 items) was measured using items such as "I share an affectionate, warm relationship with this child." The sample's Cronbach's alpha was .88. Items are rated on a 5-point scale ranging from 1 (*definitely does not apply*) to 5 (*definitely applies*). Intraclass correlation coefficients (ICC) indicated that 21% of the variance in individual ratings of teacher–child closeness was at the classroom level. The STRS is a frequently used and empirically validated measure of teachers' perceived relationship quality with individual children (Sabol & Pianta, 2012). Previous studies have reported high test–retest reliability coefficients for the original (.83 within a 4-week interval; Pianta, 2001) and the Dutch version of the STRS (between .70 and .83 within a 3–4 month interval; Koomen et al., 2007). In addition, teacher reports of teacher–child closeness, as rated by the STRS, are moderately and positively associated with closeness rated from the child's perspective (Doumen et al., 2009).

2.2.3. Peer interactions

Children's perceptions of classroom peer interactions were assessed using the Climate in the Class subscale of the Dutch Class Climate Scale (DCCS; Donkers & Vermulst, 2014). This subscale generally measures negative events that can occur within the classroom between children (e.g., bullying behavior and children's victimization) and can be used with children in grade 2 onwards. This subscale consists of 8 items and is scored by children on a 4-point scale ranging from 1 (*almost never*) to 4 (*often*). An example item is "In my class, children are bullied." The sample's Cronbach's alpha was .84. Scores were reversed to represent positive peer interactions. ICC values indicated that 21% of the variance in classroom peer interactions was at the classroom level. Donkers and Vermulst (2014) reported good content validity of the measurements as the questionnaire is constructed within the theoretical framework of class pedagogical climate (Moos, 1979) and supplemented with items that reflect the opinions of experts in the educational field. In addition, they reported evidence of internal structure from testing the instrument's factor structure extensively in a large sample of respondents. Finally, they found that the items measure the same construct in various educational settings.

2.2.4. Prosocial behavior and peer dislike

Children's prosocial behavior and peer dislike were evaluated by means of unlimited peer nominations (Coie & Dodge, 1988). Only children who had parental consent participated in the peer nomination procedure. All children in a class could however be nominated by the participating children, in order to not confuse the children by forcing them to nominate "second choices." Children who were nominated but who had no parental consent were afterwards deleted from the scoring sheets. Prosocial behavior was assessed using the question "Which children in your classroom are nice to other children?" Peer dislike was assessed using the question "Which children in your classroom do you like least?" The mean number of children providing peer nomination data in relation to each classmate was 8.92 ($SD = 2.47$, range $= 1$–13). To account for variability in classroom size, scores were adjusted by dividing each individual child's total number of nominations by the number of participating children in the class minus one (self-nominations were not allowed). To achieve percentages of prosocial behavior and peer dislike, scores were multiplied by 100. ICC values indicated that 29% of the variance in prosocial behavior and 13% of the variance in peer dislike was at the classroom level. Peer nominations are considered a valid way of assessing children's social status because the children themselves, rather than parents or teachers, are asked to evaluate the likeability of their classmates (Diamantopoulou, Henricsson, & Rydell, 2005) and can be used with children in grade 1 onwards (Coie & Dodge, 1988). In addition, Zakriski and Prinstein (2001) found that peer nominations were meaningful and related to social adaptation and psychological and behavioral adjustment in a clinical population of children with severe emotional and behavioral problems.

2.2.5. Behavioral and emotional problems

Teacher ratings of children's behavioral and emotional problems were collected using the Problem Behavior at School Interview (PBSI; Erasmus Medical Center, 2000). The PBSI is a 43-item questionnaire in which children's emotional and behavioral problems are rated on a 5-point scale ranging from 1 (*never*) to 5 (*very often*). The Emotional Problems scale is composed of two subscales (Anxiety: 5 items and Depression: 7 items). The correlation between the two subscales was .64 and the sample's Cronbach's alpha of the Emotional Problems scale was .86. The Behavioral Problems scale is composed of three subscales (attention deficit/hyperactivity disorder: 8 items, oppositional defiant disorder: 7 items, and conduct disorder: 12 items). The range of correlations between the subscales was .62 to .79. The sample's Cronbach's alpha of the Behavioral Problems scale was .96. ICC values indicated that 33% of the variance in children's emotional problems and 21% of the variance in children's behavioral problems was at the classroom level. A study by Leflot et al. (2011) reported high test–retest reliability coefficients for the PBSI Behavior Problems scale (range coefficients: .66–.85 in a two-year time interval). In addition, the Emotional Problems scale is positively associated with the broadband internalizing scale ($r = .55$) of the Teacher's Report Form (TRF; Achenbach, 1991; Verhulst, van der Ende, & Koot, 1997), and the Behavioral Problems scale is positively associated with the broadband externalizing scale ($r = .75$) of the TRF (Witvliet, Van Lier, Cuijpers, & Koot, 2010).

2.2.6. Children's demographic data

Children's sex (0 = boy, 1 = girl) and age were included in the analysis as confounders. These data were taken from their school medical files.

2.3. Missing data

Missing data were minimized by having research assistants always check questionnaires when collecting them from participants. With regard to teachers' questionnaires (i.e., the UBOS-L, STRS, and PBSI), missing data ranged from 0% to 2% on the different subscales. With regard to children's questionnaires, 8% of peer interactions data and 5% of the peer nomination data were missing. However, data were mostly missing by design as only children from grade 2 or higher completed questionnaires. The difference in missing data between peer interactions and peer nominations resulted from the youngest children, who did not provide self-report peer interactions data, having older classmates (age > 7 years) that provided peer nominations data for the whole class. We used full information maximum likelihood estimation (FIML) to handle missing data because this procedure produces robust parameter estimates using all of the information available in the data (Muthén & Muthén, 1998–2010). When performing multilevel analyses, the FIML procedure has shown to perform equivalently or even better with regard to producing unbiased estimates for missing data than multiple imputation procedures (Larsen, 2011).
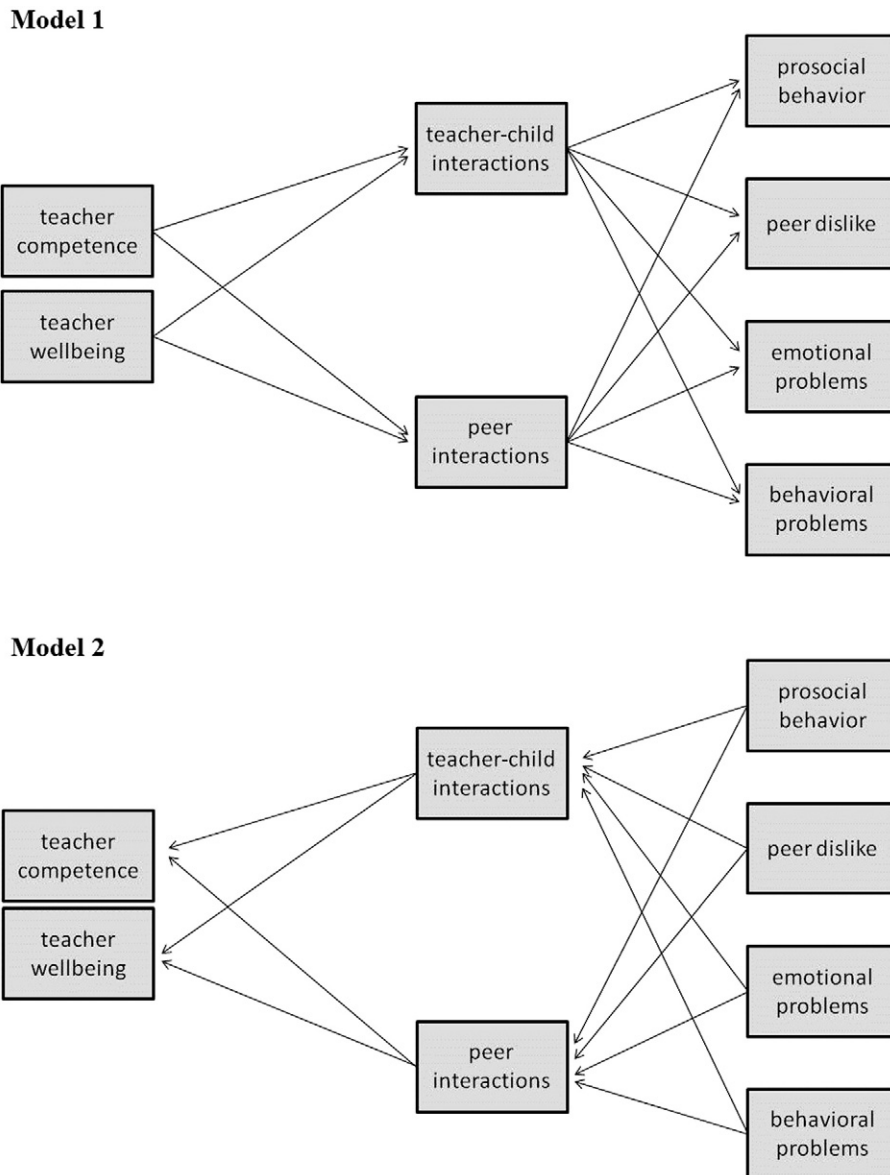

Fig. 1. Theoretical models of classroom processes.

2.4. Data analyses

To test the associations between the study variables, two multilevel path models (see Fig. 1) were fitted in Mplus 6.1 (Muthén & Muthén, 1998–2010) using the "type = twolevel" command. This multilevel approach in Mplus models the dependence of children within classrooms (between level), which were identified using the "cluster = " command. The variance was thus partitioned into individual and classroom level variance, using data available at both levels (i.e., prosocial behavior, peer dislike, emotional problems, behavioral problems, and teacher–child and peer interactions) as well as data only available at the classroom level (i.e., teacher personal competence and wellbeing, as specified by the "between = " command). Parameter estimates were computed through maximum likelihood estimation with robust standard errors (MLR). An alpha of .05 was used for all other tests of statistical significance. The strength of the pathways were indicated using standardized regression coefficients, which represent change in standard deviation units. Effect sizes of standardized path coefficients with values less than 0.10 indicate small effects, values around 0.30 indicate medium effects, and values around 0.50 indicate large effects (Kline, 2005). However, these guidelines can only be used on the individual level. Standardized regression coefficients on the between level, in our case the classroom level, are usually larger because they reflect aggregate level relations that often have lower measurement error than individual level relations (Muthén, 1994; Robinson, 1950). However, as not many educational studies have yet conducted multilevel structural equation modeling, empirically based general guidelines for interpreting standardized estimates on the between level are unavailable. The fit of the models to the data was assessed with the comparative fit index (CFI), the Tucker–Lewis index (TLI), the root mean squared error of approximation (RMSEA), and the standardized root mean square residual for within ($SRMR_w$) and between ($SRMR_b$) model fit. Fit of the models was considered good for a value of CFI and TLI equal or larger than .95, for RMSEA equal or less than .06, and SRMR equal or less than .08 (Hu & Bentler, 1999).

We analyzed our theoretical models using a two-step procedure. First, we examined the impact of children's sex and age on all outcome variables at the individual and classroom levels. When testing the impact of child demographic data, all outcome variables were allowed to be freely associated with each other. Second, we simultaneously estimated the individual and classroom level pathways in our theoretical models (see Fig. 1). In the first model predicting child outcomes (upper part Fig. 1), individual level child outcomes were regressed on social relations. Classroom level child outcomes were regressed on social relations and teacher characteristics. In the second model predicting teacher outcomes (lower part Fig. 1), individual level social relationships were regressed on children's adjustment. At the classroom level, teacher characteristics were regressed on social classroom relations and children's adjustment. As teacher characteristics, such as teacher competence and wellbeing, are shared by all children in a particular class, the associations between teacher characteristics and children's outcomes can only be examined at the classroom level.

3. Results

3.1. Descriptive statistics

The means and standard deviations of all outcome variables are presented in Table 2 (classroom level variables) and Table 3 (individual level variables). To facilitate the interpretation of these descriptive statistics, we compared the values of our study variables with those previously reported in studies conducted in general education. We used these general education scores (see Appendix A) to establish the extent to which the children and teachers in special education in our study differed from children and teachers in general education. For this purpose, analyses of variance were performed using sample size, scale means and standard deviations of population norms. In contrast to the analysis of teacher characteristics, social classroom relationships and children's adjustment were analyzed separately for boys and girls as these population-based norms are gender specific. Effect sizes were also calculated to determine whether the differences between population norms and our special education sample were clinically relevant. These were computed by dividing the mean difference in scale scores by the pooled standard deviation (Cohen's d), using Cohen's guidelines for interpretation (0.2 = small, 0.5 = medium, and 0.8 = large; Cohen, 1992).

Teachers in special and general education did not differ in wellbeing, but teachers in special education rated their personal competence higher than general education teachers. We found teacher-reported teacher–child closeness to be lower for boys and girls in special education than for boys and girls in general education. Boys and girls in special education rated classroom peer interactions as more negative than children in general education. In contrast, children reported more prosocial behavior in special than in general education. Likewise, boys placed in special education were less often nominated by their classmates as being disliked than were boys attending general education. For girls, however, peer dislike was higher in special education than general education. Finally, boys and girls in special education were found to have more emotional and behavioral problems than boys and girls in general education.

Table 2
Means and standard deviations of teacher characteristics in special and general education.

Measures	Special education			General education			*F*-value	Cohen's *d*
	N	*M*	*SD*	*N*	*M*	*SD*		
Teacher competence	68	4.73	0.71	608	4.38	0.76	**13.11**	+0.46
Teacher wellbeing	68	1.61	0.93	608	1.72	1.08	0.65	−0.10

Note. + = mean score is higher in special education and − = mean score is lower in special education. Statistically significant ($p < .05$) estimates are depicted in bold.

Table 3
Means and standard deviations of social classroom relationships and children's classroom adjustment in special and general education.

Measures	Special education						General education						*F*-value		Cohen's *d*	
	Male			Female			Male			Female			Male	Female	Male	Female
	N	M	SD	N	M	SD	N	M	SD	N	M	SD				
Teacher interactions	355	41.23	7.39	52	43.87	5.63	1140	43.80	7.21	1195	46.44	6.33	**33.99**	**8.29**	− 0.35	− 0.41
Peer interactions	333	23.66	5.15	49	25.41	3.74	6911	X	X	6722	X	X	**89.11**	**2.87**	− 0.49	− 0.26
Prosocial behavior	345	48.1	21.0	49	50.5	22.8	150	29.6	16.3	167	41.6	18.9	**92.15**	**7.55**	+ 0.94	+ 0.45
Peer dislike	345	22.7	18.6	49	24.1	20.5	150	26.2	14.8	167	17.3	12.6	**4.11**	**8.67**	− 0.20	+ 0.46
Emotional problems	357	2.45	0.69	52	2.38	0.58	1805	1.85	0.64	1722	1.78	0.63	**255.13**	**45.99**	+ 0.93	+ 0.95
Behavioral problems	357	2.52	0.74	52	2.17	0.78	1805	2.11	0.81	1722	1.71	0.64	**78.50**	**25.72**	+ 0.51	+ 0.71

Note. X = publisher does not allow scores to be printed. + = mean score is higher in special education and − = mean score is lower in special education. Statistically significant (*p* < .05) estimates are depicted in bold.

3.2. Model fitting

We first tested the impact of sex and age on all study variables in the multilevel model. At this stage, no regression paths between the study variables were imposed, but study variables were allowed to be freely correlated with each other. As can be seen in Table 4, at the individual level, girls had more positive teacher–child ($\beta = 0.11$, $p = .01$) and peer interactions ($\beta = 0.06$, $p = .05$) and fewer behavioral problems ($\beta = -0.15$, $p < .01$) than boys. At the classroom level, older children showed more prosocial behavior than younger children ($\beta = 0.37$, $p = .03$). To control our path estimates for the impact of children's sex and age, we modeled these four statistically significant pathways in our subsequent models.

Next, we fitted both models in which we assumed paths from teacher characteristics to child adjustment (model 1) and from child adjustment to teacher characteristics (model 2). The fit indices of model 1, $\chi^2(16) = 19.340$, $p = .25$; CFI = .99; TLI = .96; RMSEA = .02; SRMR$_w$ = .02; and SRMR$_b$ = .09, and of model 2, $\chi^2(16) = 23.749$, $p = .10$; CFI = .98; TLI = .91; RMSEA = .03; SRMR$_w$ = .02; and SRMR$_b$ = .09, suggested that the fit to the data was adequate. As models 1 and 2 were non-nested, we used three information criterion indices to compare the models: the Akaike information criteria (AIC), the Bayesian information criteria (BIC), and the sample-size adjusted BIC (corBIC), with lower values suggesting a better fit of the model to the data. The values of model 1 (AIC = 14,658, BIC = 14,935, and corBIC = 14,716) and model 2 (AIC = 14,660, BIC = 14,937, and corBIC = 14,718) were approximately the same (ΔAIC = 2, ΔBIC = 2, and ΔcorBIC = 2), suggesting that associations between the study variables are likely bidirectional. We therefore present results from both models.

3.3. Model 1: associations between teacher characteristics and child adjustment

Results of path estimates can be found in Table 5. At the individual level (upper part of Fig. 2), higher levels of teacher–child closeness were associated with higher levels of prosocial behavior, less peer dislike, and fewer emotional and behavioral problems in children and these path estimates were in the small to medium range. More positive peer interactions were only associated with fewer behavioral problems in children and these estimates could be interpreted as small. The classroom level model (lower part of

Table 4
Impact of sex and age on the outcome measures.

Demographic parameters	IL		CL	
	Est.	SE	Est.	SE
Sex to teacher interactions	**0.11**	**0.04**	0.28	0.36
Sex to peer interactions	**0.06**	**0.03**	0.66	0.35
Sex to prosocial behavior	− 0.01	0.06	0.31	0.59
Sex to peer dislike	0.09	0.06	− 0.67	0.72
Sex to emotional problems	− 0.08	0.05	0.28	0.35
Sex to behavioral problems	**− 0.15**	**0.05**	− 0.21	0.35
Sex to teacher competence	–	–	0.25	0.36
Sex to teacher wellbeing	–	–	0.11	0.33
Age to teacher interactions	0.00	0.05	− 0.19	0.17
Age to peer interactions	− 0.00	0.05	− 0.35	0.19
Age to prosocial behavior	0.03	0.06	**0.37**	**0.16**
Age to peer dislike	− 0.03	0.06	0.29	0.28
Age to emotional problems	− 0.04	0.05	− 0.14	0.17
Age to behavioral problems	0.03	0.05	− 0.26	0.16
Age to teacher competence	–	–	0.05	0.16
Age to teacher wellbeing	–	–	0.26	0.15

Note. All estimates are standardized estimates (β). Statistically significant (*p* < .05) estimates are depicted in bold. – = parameters not estimated; IL = individual level; CL = classroom level; sex (0 = boys, 1 = girls).

Table 5
Model 1: estimates of children's classroom adjustment regressed on teacher characteristics.

Model parameters	IL		CL	
	Est.	SE	Est.	SE
Teacher competence to teacher interactions	–	–	**0.46**	**0.16**
Teacher competence to peer interactions	–	–	**0.37**	**0.16**
Teacher wellbeing to teacher interactions	–	–	0.01	0.23
Teacher wellbeing to peer interactions	–	–	−0.23	0.19
Teacher interactions to prosocial behavior	**0.19**	**0.06**	0.01	0.22
Teacher interactions to peer dislike	**−0.13**	**0.05**	−0.24	0.30
Teacher interactions to emotional problems	**−0.30**	**0.06**	−0.19	0.23
Teacher interactions to behavioral problems	**−0.26**	**0.05**	−0.05	0.29
Peer interactions to prosocial behavior	0.06	0.06	**0.42**	**0.19**
Peer interactions to peer dislike	0.04	0.06	**−0.59**	**0.29**
Peer interactions to emotional problems	0.05	0.05	0.14	0.22
Peer interactions behavioral problems	**−0.10**	**0.05**	−0.46	0.30
Teacher competence to prosocial behavior	–	–	−0.17	0.19
Teacher competence to peer dislike	–	–	−0.12	0.29
Teacher competence to emotional problems	–	–	−0.06	0.20
Teacher competence to behavioral problems	–	–	−0.04	0.26
Teacher wellbeing to prosocial behavior	–	–	**0.55**	**0.17**
Teacher wellbeing to peer dislike	–	–	0.13	0.20
Teacher wellbeing to emotional problems	–	–	**−0.39**	**0.13**
Teacher wellbeing to behavioral problems	–	–	**−0.29**	**0.14**
Teacher competence with teacher wellbeing	–	–	0.23	0.13
Teacher interactions with peer interactions	0.06	0.07	**−0.39**	**0.20**
Prosocial behavior with peer dislike	**−0.52**	**0.05**	0.73	0.49
Prosocial behavior with emotional problems	−0.07	0.04	−0.16	0.24
Prosocial behavior with behavioral problems	**−0.39**	**0.04**	0.09	0.31
Peer dislike with emotional problems	**0.15**	**0.05**	−0.08	0.32
Peer dislike with behavioral problems	**0.25**	**0.06**	−0.02	0.30
Emotional problems with behavioral problems	**0.16**	**0.07**	**0.81**	**0.13**
Sex to teacher interactions	**0.12**	**0.04**	–	–
Sex to peer interactions	**0.07**	**0.03**	–	–
Sex to behavioral problems	**−0.13**	**0.04**	–	–
Age to prosocial behavior	–	–	**0.34**	**0.17**

Note. All estimates are standardized estimates (β). Statistically significant (*p* < .05) estimates are depicted in bold. – = parameters not estimated; IL = individual level; CL = classroom level.

Fig. 2) represents the teacher characteristics and aggregated classroom means of individual scores. Higher levels of positive classroom peer interactions were associated with classes in which children showed more prosocial behavior and less peer dislike. No associations between teachers' closeness and classroom level differences in children's social, emotional, and behavioral adjustment were found. Teacher wellbeing was directly associated with higher classroom levels of prosocial behavior and lower classroom levels of children's emotional and behavioral problems. Although teacher-rated personal competence was not directly associated with classroom level differences in children's social, emotional, and behavioral adjustment, higher levels of teacher personal competence were associated with higher classroom levels of positive teacher–child and peer interactions. Therefore, we estimated the statistical significance of indirect associations between teacher personal competence and classroom differences in children's social adjustment outcomes. Although the direct links between teacher competence and peer interactions and between peer interactions and prosocial behavior and peer dislike were statistically significant, the indirect links between teacher personal competence and prosocial behavior (β = 0.16, *p* = .35) and peer dislike (β = −0.33, *p* = .15) were not statistically significant.

3.4. Model 2: associations between child adjustment and teacher characteristics

Results are depicted in Table 6 and in Fig. 3. At the individual level (upper part of Fig. 3), more emotional and behavioral problems of children were associated with less teacher–child closeness, and these path estimates were in the small to medium range. More behavioral problems of children were also associated with more negative classroom peer interactions and these estimates could be interpreted as small. At the classroom level (lower part of Fig. 3), it was found that only higher classroom levels of children's prosocial behavior were directly associated with more teacher wellbeing. Higher classroom levels of children's emotional problems were only associated with more positive peer interactions. More positive teacher–child interactions were associated with only higher levels of teacher competence. Classroom levels of peer dislike and behavioral problems were not statistically significantly associated with teacher personal competence, wellbeing, or classroom interactions with teachers and peers and therefore, no statistically significant indirect links between children's classroom adjustment and teacher characteristics were found.
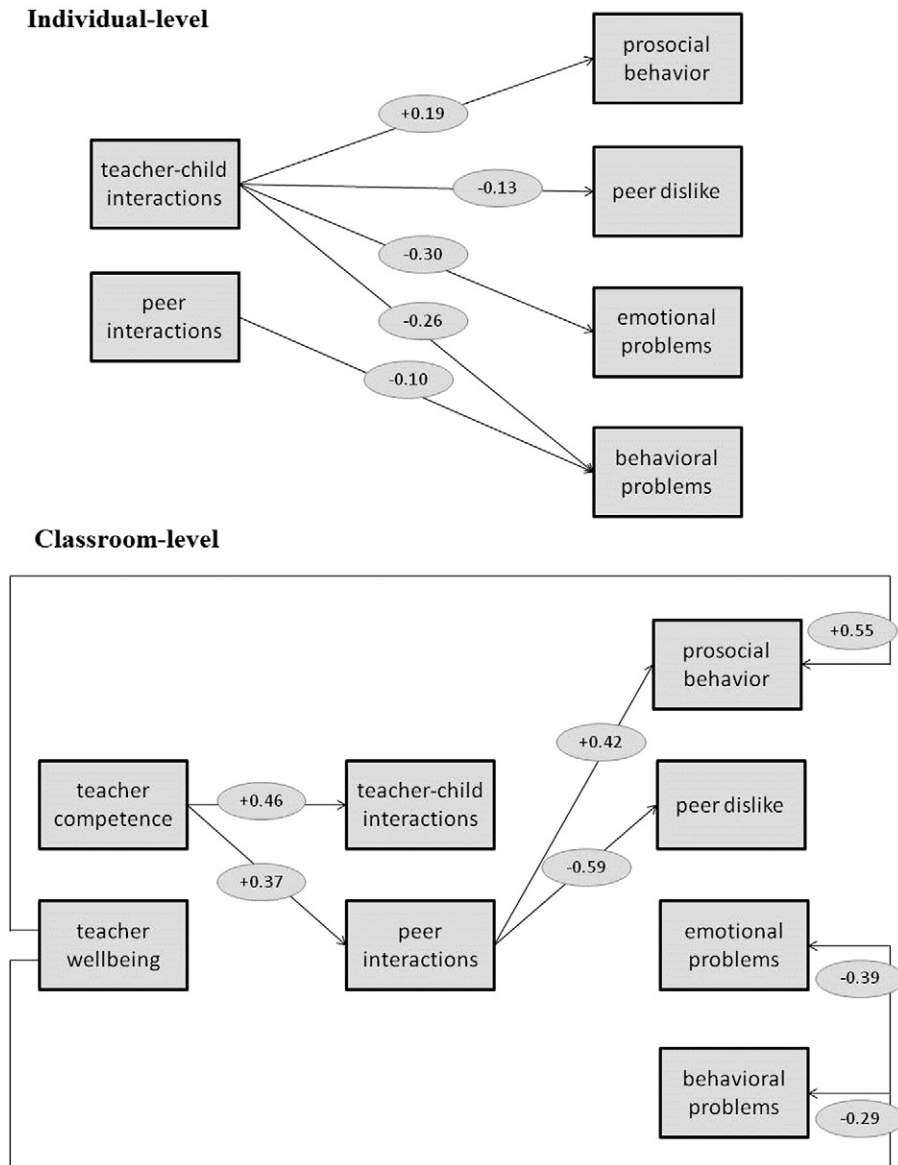
Fig. 2. Multilevel path model 1: children's classroom adjustment regressed on teacher characteristics. *Note.* Associations shown are standardized regression weights. Only statistically significant (*p* < .05) pathways are shown.

4. Discussion

The goal of the current study was to apply a developmental systems framework to obtain more insight into the dynamics of classroom processes for children with EBD in segregated settings for special education. The differences that we found between children with EBD in our sample and children in general education underscore the relevance of studying associations among classroom processes in this particular population. Specifically, as could be expected, children in our special education sample displayed substantially higher levels of emotional and behavioral problems. Teachers experienced less teacher–child closeness and children experienced fewer positive peer interactions than children in general education settings, which is in line with previous research (Buyse, Verschueren, Doumen, Van Damme, & Maes, 2008; Hoza et al., 2005). In addition, girls in special education were relatively more disliked than girls in general education. However, children in our sample did not score worse on all measures when compared to children in general education. Specifically, student-perceived prosocial behavior of classmates was rated higher in special than in general education and boys in special education were, in general, less disliked than boys in general education. As peer nominations were used to assess children's prosocial behavior and peer dislike, these findings may be explained by the fact that general education classes consist of at least 2 to 3 times as many students than special education classes. Despite the fact that we adjusted our outcomes for class size, in such small classrooms, children most likely know each other quite well, which may explain a relatively high percentage of

Table 6
Model 2: estimates of teacher characteristics regressed on children's classroom adjustment.

| Model parameters	IL		CL	
	Est.	SE	Est.	SE
Prosocial behavior to teacher interactions	0.10	0.08	−0.13	0.28
Prosocial behavior to peer interactions	0.08	0.06	0.30	0.26
Peer dislike to teacher interactions	0.01	0.06	−0.28	0.34
Peer dislike to peer interactions	0.08	0.08	−0.40	0.37
Emotional problems to teacher interactions	**−0.24**	**0.06**	−0.61	0.34
Emotional problems to peer interactions	0.06	0.05	**0.71**	**0.31**
Behavioral problems to teacher interactions	**−0.18**	**0.07**	0.40	0.42
Behavioral problems to peer interactions	**−0.12**	**0.06**	−0.73	0.41
Teacher interactions to teacher competence	–	–	**0.48**	**0.17**
Teacher interactions to teacher wellbeing	–	–	0.03	0.21
Peer interactions to teacher competence	–	–	0.33	0.78
Peer interactions to teacher wellbeing	–	–	−0.42	0.79
Prosocial behavior to teacher competence	–	–	0.16	0.33
Prosocial behavior to teacher wellbeing	–	–	**0.66**	**0.32**
Peer dislike to teacher competence	–	–	−0.22	0.51
Peer dislike to teacher wellbeing	–	–	−0.33	0.47
Emotional problems to teacher competence	–	–	−0.18	0.76
Emotional problems to teacher wellbeing	–	–	−0.20	0.74
Behavioral problems to teacher competence	–	–	0.10	0.81
Behavioral problems to teacher wellbeing	–	–	−0.02	0.77
Teacher competence with teacher wellbeing	–	–	0.17	0.26
Teacher interactions with peer interactions	0.05	0.06	−0.07	0.52
Prosocial behavior with peer dislike	**−0.52**	**0.05**	0.23	0.25
Prosocial behavior with emotional problems	**−0.12**	**0.04**	−0.23	0.15
Prosocial behavior with behavioral problems	**−0.42**	**0.04**	−0.25	0.19
Peer dislike with emotional problems	**0.18**	**0.05**	−0.12	0.27
Peer dislike with behavioral problems	**0.26**	**0.06**	0.26	0.21
Emotional problems with behavioral problems	**0.22**	**0.07**	**0.65**	**0.13**
Sex to teacher interactions	0.08	0.04	–	–
Sex to peer interactions	0.05	0.04	–	–
Sex to behavioral problems	**−0.15**	**0.04**	–	–
Age to prosocial behavior	–	–	0.33	0.20

Note. All estimates are standardized estimates (β). Statistically significant ($p < .05$) estimates are depicted in bold. − = parameters not estimated; IL = individual level; CL = classroom level.

nominations. At the same time, the fact that boys are largely overrepresented in special education classrooms whereas friendships at this age are more often with same gender peers (Östberg, 2003) may explain why boys are more socially preferred by their classmates in special than in general education, whereas girls are not.

In contrast to often-stated observations of high levels of teacher burnout in United State special education (Fore, Martin, & Bender, 2002), teachers in our special education sample did not differ from teachers in general education with regard to their reported wellbeing. Moreover, teachers rated their personal competence higher than teachers in general education. This finding is remarkable as teaching children with psychiatric problems is often regarded as a challenging task (Greene et al., 2002) and research has shown that children's misbehavior is related to higher levels of burnout and lower levels of perceived competence (Tsouloupas, Carson, Matthews, Grawitch, & Barber, 2010). However, classroom adaptations that are available in segregated settings for special education, such as additional resources for teachers, special teacher training, and smaller class size (Albrecht, Johns, Mounsteven, & Olorunda, 2009; Meijer, 2003), may support teachers to meet their needs and the needs of students with psychiatric problems.

4.1. Results regarding child outcomes

As stated in our first hypothesis, we expected social classroom relations, such as teacher–child and peer relationships, to be related to children's classroom adjustment at the individual and classroom levels. Results of our first model showed that, congruent with previous studies in general education (Buyse et al., 2009; Hughes et al., 2001; Mercer & DeRosier, 2008; Spilt et al., 2011), children who form more positive relationships with their teachers also show more positive social, emotional, and behavioral classroom adjustment. Similar to our study, in previous studies in general education, reported effect sizes regarding associations between teacher–child closeness or teacher support and children's social, emotional, and behavioral adjustment were in the small to medium range (Buyse et al., 2009; Hughes et al., 2001; Mercer & DeRosier, 2008). Although we must keep in mind that our results come from a cross-sectional study, these findings do further support the notion suggested in previous studies that teacher–child closeness is important for the emotional and behavioral adjustment of children, especially for those who are coping with numerous behavioral problems (Buyse et al., 2008; Hamre et al., 2008), as was the case in our sample. It is important to note that we found such associations only at the individual level. Differences between classes in aggregated levels of teacher–child closeness were not associated with classroom
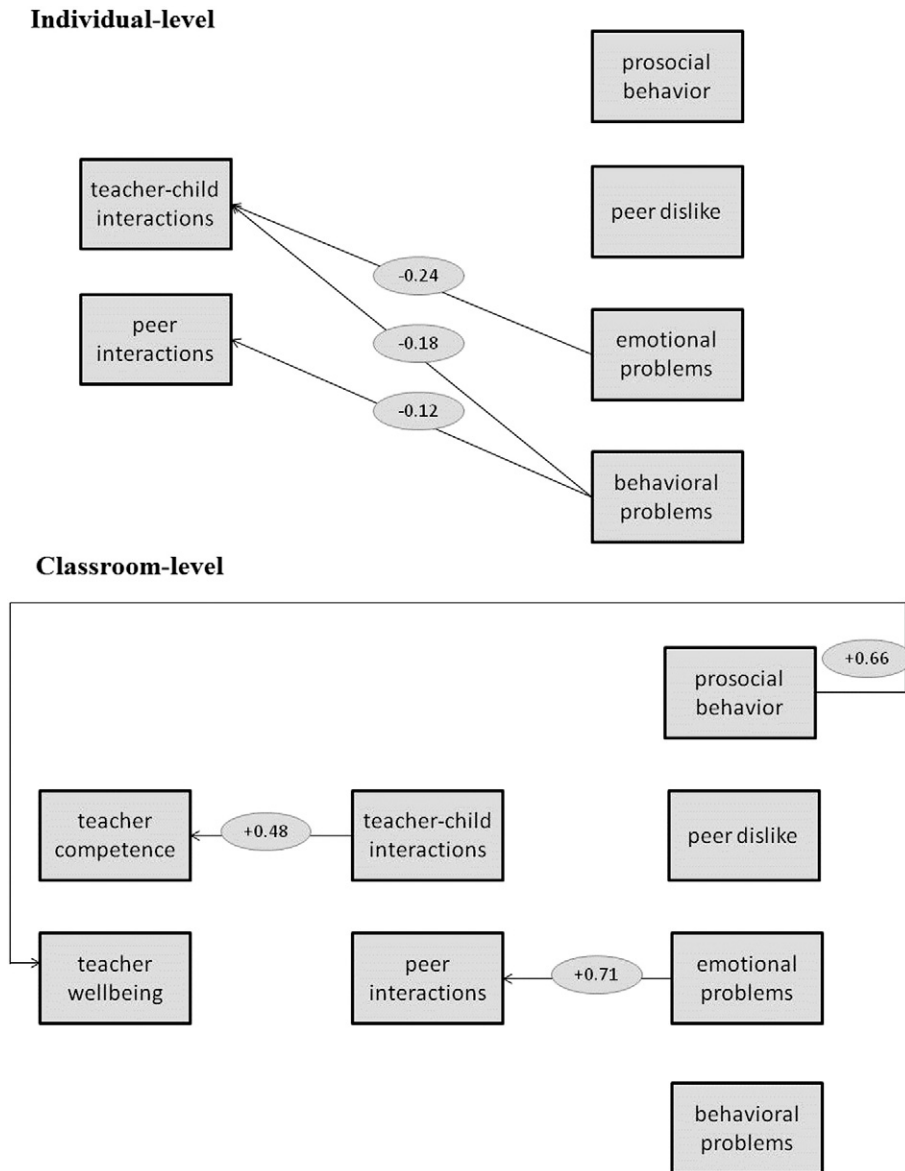
Fig. 3. Multilevel path model 2: teacher characteristics regressed on children's classroom adjustment. *Note.* Associations shown are standardized regression weights. Only statistically significant ($p \leq .05$) pathways are shown.

level differences in children's adjustment. Thus, the individual relationship that a teacher has with a student seems more important for a child's outcomes than teachers' general friendliness or general positive attitude towards the children in the class.

Next, the fact that we found children's individual perceptions of peer interactions to be related only to behavioral problems but not to other adjustment aspects suggests that at the individual level, children who show more behavioral problems experience their classroom peer environment as more hostile. Future studies will have to investigate whether these children victimize other children or are being victimized themselves. However, aggregated scores of classroom peer interactions (i.e., mean classroom peer interactions), as rated by the whole class, were not associated with classroom levels of children's behavioral adjustment but were only related to their social adjustment such as prosocial behavior and the presence or absence of peer dislike. Because peer interactions at the classroom level, in contrast to the individual level, were one of the strongest predictors of children's adjustment problems, peer interactions probably may be best regarded as a typical classroom characteristic. Our results suggest that, consistent with studies conducted with children in general education (e.g., Vuijk et al., 2007), interventions aimed at improving peer interactions in the classroom may impact the social adjustment of the classroom as a whole.

With regard to our second hypothesis, the fact that teacher competence was not directly related to classroom levels of children's social, emotional, and behavioral problems indicates that targeting teacher competence may improve classroom levels of social interactions but will not be directly beneficial for children. In contrast, teacher wellbeing showed direct associations with higher classroom

levels of prosocial behavior and lower classroom levels of children's emotional and behavioral problems. A possible pathway to target classroom levels of children's social, emotional, and behavioral adjustment may thus be by enhancing teacher wellbeing, for example, by implementing school-wide positive behavior support strategies (Ross, Romer, & Horner, 2012).

4.2. Results regarding teacher outcomes

As stated in our third and fourth hypotheses, we expected teacher characteristics to be predicted by children's adaptive and maladaptive classroom adjustment and by social classroom relationships. Findings from our second model show that teacher wellbeing was best predicted by classroom levels of children's prosocial behavior. This finding is important because many studies focus on negative instead of positive dimensions of children's classroom adjustment, such as children's social, emotional, and behavioral problems, when examining teacher wellbeing (Greene et al., 2002; Maslach et al., 2001). In addition, results from models 1 and 2 indicate that low levels of teacher wellbeing may both predict and result from dealing with classes with children showing higher levels of adjustment problems. However, because we used a cross-sectional design, examining the causal dynamics remains a topic for future longitudinal studies. Consistent with findings by Spilt et al. (2011), results in model 2 show that teacher competence was best predicted by positive teacher–child interactions. Although expected, no mediating mechanisms were found in predicting teacher outcomes. As not many facets of classroom social relationships and children's classroom adjustment predicted teacher wellbeing and competence, other factors, such as teacher's workload and administrative duties (Kokkinos, 2007; Male & May, 1997) and personality characteristics such as neuroticism (Cano-García, Padilla-Muñoz, & Carrasco-Ortiz, 2005; Kokkinos, 2007), should be taken into account when focusing on teacher outcomes in special education in future studies.

4.3. Results regarding social classroom relationships

Our fifth hypothesis stated that social relationships in the classroom would be predicted by children's adjustment. Congruent with the results of several studies conducted with children in general education settings (Buyse et al., 2008; Mercer & DeRosier, 2008; Nurmi, 2012) at the individual level, we found close teacher–child relationships to be most strongly associated with better behavioral and emotional adjustment rather than with a child's prosocial behavior or being disliked by peers. The fact that our findings highlighted that emotional problems were also clearly associated with classroom social relationships may be important for future research as most of the previous studies in general education have primarily focused on the impact of behavioral problems on the formation of teacher–child relationships (e.g., Doumen, Verschueren, Buyse, Germeijs, & Luyckx, 2008; Greene et al., 2002; Hamre et al., 2008). Moreover, although some studies in general education examined the impact of teacher–child closeness on children with internalizing problems (e.g. Baker, 2006), with some exceptions (Buyse et al., 2008; Mercer & DeRosier, 2008), few studies have taken the other direction into account (e.g., the impact of symptoms of depression and anxiety in children on the formation and development of the teacher–child relationship). Yet, our results suggest that emotional problems may play a role in this development, as we found that teacher–child closeness was predicted by both emotional and behavioral problems. It was however surprising that, at the classroom level, we did not find children's emotional and behavioral problems to be associated with general teacher's friendliness towards the class. In sum, it seems that teacher–child closeness is more indicative of the classroom adjustment of individual children than of general problem-levels in the classroom. It is possible that this result is specific to special education for children with highly varying levels of social, emotional, and behavioral problems. Future research will have to further examine this possibility by replicating research in both special and general education settings.

Likewise, in line with studies conducted in general and special education (Little & Kobak, 2003; Snyder et al., 2003; Vuijk et al., 2007) model 2 shows that individual negative peer interactions were best predicted by children's emotional problems. In contrast to previous findings, we found no association between behavioral problems and peer interactions; however, this association just fell short on reaching the $p < .05$ criterion. Although it was expected that higher levels of children's emotional problems would lead to more negative peer interactions, the findings from the current study suggest that higher classroom levels of emotional problems were associated with more positive peer interactions. This result indicates that although emotional problems are undesirable for individual children as they are associated with more peer victimization, in classrooms with children with high levels of depression and anxiety, it appears that classroom levels of peer victimization are lower. Although this finding may seem somewhat puzzling at first, it indicates that an individual child with emotional problems may be more likely to get victimized in the classroom than a child with fewer emotional problems. However, when more children in the classroom show emotional problems, peer victimization is less likely to occur. The results of our study thus suggest that children who cope with high levels of emotional problems may feel safer in special educational settings among children who also cope with emotional problems.

The finding in model 1 that both closer teacher–child and peer relationships were predicted by higher levels of teacher competence partially supports our sixth hypothesis. This finding is important because it indicates that teachers' self rating of their competence is related not only to their experience of social classroom relationships but also to children's experience of the peer dynamics in their classroom as indicated by peer-rated peer interactions. These results are consistent with the findings of Hastings and Bham (2003) that showed that higher levels of teacher competence are associated with more sociable classroom behavior in general education. Teacher competence may improve classroom social relations because competent teachers assign more value to close and personal relationship with their students (Cano-García et al., 2005) and because competent teachers actively manage peer networks in the classroom (Gest & Rodkin, 2011).

Our finding that teacher wellbeing was not associated with social classroom relationships contrasts with results from studies in general education. Findings from these studies suggest that higher levels of burnout problems in teachers are associated with a

more negative teacher evaluation of children (Mashburn et al., 2006) and attributing little value to their relationships with students (Cano-García et al., 2005). We expected such a relationship because teachers who experience low levels of wellbeing because they feel emotionally exhausted may feel incompetent about their teaching and therefore tend to withdraw from investing in the relationship with their students (Chang, 2009). However, perhaps in special education, the psychiatric problems of children, such as a diagnosis of autism spectrum disorder, attention deficit/hyperactivity disorder, and oppositional defiant disorder, indicate an inherent problem in maintaining and developing social relationships (Bellini, Peters, Benner, & Hopf, 2007; Rich, Loo, Yang, Dang, & Smalley, 2009). Such relationships may therefore be less influenced by other factors such as teacher wellbeing. Our finding is, however, congruent with the study by Brown et al. (2010) that showed that teachers' burnout experiences were not related to observed classroom quality such as the emotional support teachers gave their students. In sum, regardless whether the absence of an association between teachers' wellbeing and social relationships in class is limited to children with EBD or may also extend to children in regular education (Brown et al., 2010), our findings suggest that the quality of the social relationships of children with EBD greatly depend on their own adjustment and on the competence of the teacher in emotionally supporting these students. Yet, the wellbeing of the teacher may be less influential in establishing positive classroom relationships.

4.4. Limitations

This study had some limitations regarding the interpretation and generalization of our results that must be considered. First, the developmental systems perspective focuses on children's development over time. However, our cross-sectional data do not allow us to draw conclusions regarding the development of children and the direction of effects. As the tested models were also statistically equivalent, evidence on the direction of effects will require further research using longitudinal designs. However, because classroom processes may reciprocally influence each other (Leflot et al., 2011; Mercer & DeRosier, 2008; Pianta et al., 2003), we examined all associations bidirectionally. Second, it is unclear to what extent our results can be generalized directly to special education for children with psychiatric problems in other countries as special education policies for children with psychiatric disorders and additional special educational needs vary worldwide (European Agency for Development in Special Needs Education, 2010; Meijer, 2003). Third, the fact that six teachers did not participate in our study merits some attention because some of these teachers were not included as a result of serious burnout problems. Given that teacher wellbeing was a construct of interest, the fact that these teachers did not participate may have influenced our results.

In addition, this study had some methodological and analytical limitations. First, demographic attributes may serve as facilitators or impediments to social classroom relations (Downer et al., 2010), however the complexity of the analyses in combination with the limited number of teachers in this study prohibited including many demographic confounders in our model. As other demographic variables, such as teachers' sex and classroom experience, may also have an impact on classroom processes, future studies using larger samples of children and teachers in special education may be necessary to assess more possible confounders. Similarly, the complexity of the analyses and the number of teachers limited us with regard to the inclusion of other variables of interest. For example, we assessed associations with teacher–child closeness but not teacher–child conflict. Also, we assessed only teacher emotional exhaustion as the sole indicator for teacher wellbeing. Second, information on teacher personal competence was assessed with self-ratings that may differ from observed competence ratings. However, it is likely that teachers' sense of their own competence is important for their sense of wellbeing and thereby also for the formation and development of social relations and children's adjustment. However, socially desirable responses may have affected our outcomes; for example, it is possible that the high levels of reported teacher competence impacted the four indicators of child adjustment. It is therefore advisable to include both self-ratings and observations of teacher competence in future research. Third, due to the relatively small number of teachers in our sample, the only fit statistic reflecting between model fit (the SRMR$_b$; Hsu, 2009), indicated only acceptable model fit. For this reason, we caution not to overinterpret effects at the classroom level. Future studies should include replications of these findings in larger samples of children and teacher in general and special education to examine the robustness of our findings.

4.5. Practical implications and recommendations

Findings from this study provided a comprehensive overview of associations between teacher characteristics, social relations in the classroom, and children's adjustment and additionally showed the advantage of examining classroom processes not only at the individual level but also at the classroom level. In line with a developmental systems perspective, our results suggest that some of the associations examined may be bidirectional. Therefore, a first and foremost implication of this study is the need for longitudinal studies to explore the true developmental links between the studied variables—both at the individual and at the classroom levels.

Although many of the examined associations may be bidirectional, given teachers' responsibility for children's classroom adjustment, they are important targets for implementing interventions. Such interventions should focus on the social dynamics in a classroom—between teachers and children but also between peers—to reduce negative experiences in the classroom and to create a classroom context in which children feel safe and comfortable. Practically, the results of our study suggest avenues for prevention at both the classroom and individual levels. Regarding classroom level interventions, the results suggest that improving classroom peer interactions may improve social adjustment in children. An example of a classroom-based intervention program that has shown to be effective in this area is the Good Behavior Game (Barrish, Saunders, & Wolf, 1969). This intervention focuses on promoting positive behaviors and children working together to achieve goals. Studies have shown that this program can be effective in improving peer relationships (Witvliet, Van Lier, Cuijpers, & Koot, 2009) and altering children's behavioral problems (Petras et al., 2008; Van Lier, Muthén, Van der Sar, & Crijnen, 2004). An additional advantage of the GBG may be that by reducing children's behavioral and

emotional problems, the GBG may improve the social relations these children have with teachers and peers. Because teachers focus on supporting desired behavior, their relationships with their students may improve (Leflot, Van Lier, Onghena, & Colpin, 2010). Research is needed to establish whether this intervention can also play a part in improving social interactions in the context of special education.

Regarding the individual level, results of our study suggest that in special education settings, it is important to focus on the dyadic relationship between children and their teachers in order to advance children's social, emotional, and behavioral adjustment. A teacher intervention that focuses on positive dyadic relationships, such as "Banking Time" (Driscoll & Pianta, 2010), may be suitable to enhance children's classroom adjustment. Banking Time entails creating time and opportunities for teachers' positive interactions with a specific child on a daily basis and has been shown to reduce children's conduct problems (Driscoll & Pianta, 2010). This intervention may thereby breach a negative reciprocal pattern of deteriorating teacher–child interactions and increasing maladaptive classroom adjustment of children that are fueled by reactive teacher strategies, such as punishment, instead of proactive teacher strategies, such as positive reinforcement (Clunies-Ross et al., 2008). This strategy in turn may increase teacher wellbeing directly and improve teacher competence indirectly by promoting the development of positive social relationships. A potential by-product of interventions such as Banking Time and the Good Behavior Game might be their positive contribution to teachers' competence by offering them guidance on handling disruptive behaviors in class and engaging in positive interactions. Taken together, classwide and individual interventions that provide teachers with practical training in improving social classroom relationships may both contribute to teacher wellbeing and competence and social, emotional, and behavioral adjustment in vulnerable children.

Acknowledgments

Appendix A. Supplementary data

Supplementary data to this article can be found online at http://dx.doi.org/10.1016/j.jsp.2014.11.005.

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