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The Relative Contribution of Peer Acceptance and Individual and Class-Level Teacher-Child Interactions to Kindergartners' Behavioral Development

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Abstract

The present longitudinal study examined the relative contribution of peer acceptance and individual and class-level teacher-child interactions to the development of externalizing and internalizing behaviors in kindergarten. A sample of 237 children (49% boys, M_{age} =5.19 years) from 36 classrooms was followed during three waves in kindergarten. Individual and class-level teacher-child interactions were observed, while peer ratings were used to assess peer acceptance, and teacher ratings to assess child behavior. Multilevel modelling showed that children's aggressive and anxious-fearful behavior was stable over time. Children who had more negative individual interactions with their teachers at the start of kindergarten displayed higher levels of externalizing behavior. Children whose teacher displayed more sensitive interactions at the class-level had lower levels of internalizing problems. Our study underscores the importance of including both individual and class-level teacher-child interactions and including several dimensions of the emotional component of teacher-child interactions in future research.

Keywords: school-based interactions, teacher-child interactions, peer acceptance, behavioral development, kindergarten

Introduction

According to bio-ecological models, the development of children is affected by the interactions with their proximal environment (Bronfenbrenner & Morris, 2006). When children enter kindergarten, interactions with teachers and peers become an important part of their everyday life. There is evidence that teacher-child interactions play a role in the development of children, and particularly in their behavioral development (e.g., Sabol & Pianta, 2012; Vancraeyveldt et al., 2015; Weyns et al., 2017). Equally, peers have an unmistakable contribution to the social, emotional, and cognitive development of children (e.g., Rubin, Bukowski, & Bowker, 2015; Rubin, Bukowski, & Laursen, 2009). Given the importance of these two social actors in the school context, it is surprising that their relative, simultaneous importance for children's development has received so little attention. Hughes and Chen (2011), for example, noted that few researchers have examined the unique contributions of the two types of social relationships at school, that is peers and teachers, to children's development. This three-wave longitudinal study focuses on the role of peer acceptance and three dimensions of individual and class-level teacher-child interactions (i.e., negativity, positivity, and teacher sensitivity) for children's behavioral development (i.e., externalizing and internalizing behaviors) in kindergarten.

Behavioral development: externalizing and internalizing behavior

Regarding children's behavioral development, we can distinguish between externalizing and internalizing behaviors. Externalizing behaviors refer to behaviors that are annoying and disruptive for the direct environment of the child that displays them (Whitcomb & Merrell, 2013). In kindergarten, externalizing problems such as aggression, hyperactive behavior, and oppositional behavior, form important hurdles for adaptive development. Children who exhibit externalizing problems are at increased risk for a variety of problems at a later age, such as violence, substance use, and mental-health problems (e.g., Englund &

Siebenbruner, 2012; Loeber & Hay, 1997; Moffitt, Caspi, Harrington, & Milne, 2002). Internalizing behaviors are described as behaviors that are directed towards the self (Whitcomb & Merrell, 2013). Internalizing problems such as anxiety and depression have negative effects on children's development. For example, children who display these problems have a higher risk for academic failure in adolescence and for later depressive and anxiety disorders (Kovacs & Devlin, 1998; Prinstein & La Greca, 2009).

Individual and class-level teacher-child interactions

Bio-ecological models state that child development can be considered a function of bi-directional interactions over time between the child and the social partners surrounding him or her (e.g., Bronfenbrenner & Morris, 2006). In this study, we will focus more specifically, on the role of the interactions with teachers and peers for the development of children. In the following paragraphs, we will first discuss the importance of individual teacher-child interactions, then class-level teacher-child interactions, and finally, peer acceptance.

Relying on an attachment perspective, scholars have argued that the affective quality of individual teacher-child interactions may play an important role in shaping children's representations of self and relationships, thus impacting their behavioral development (Bowlby, 1973; Cassidy & Shaver, 2008; Verschueren & Koomen, 2012). On the one hand, positive, warm, and sensitive behavior of teachers toward individual children can cause these children to perceive themselves as worthy and others as dependable and trustworthy (e.g., Verschueren, Doumen, & Buyse, 2012). Insensitive, unresponsive, and rejecting teacher behavior, on the other hand, can lead to maladaptive representations of the self and of relationships, perceiving the self as unworthy and others as unreliable or hostile. These negative mental representations can evoke anxious, internalizing behaviors in children, but also externalizing behaviors to compensate for the feelings of insecurity and rejection

(Fearon, Bakermans-Kranenburg, Van Ijzendoorn, Lapsley, & Roisman, 2010; Milan, Zona, & Snow, 2013).

In addition to the individual interactions between teachers and children, teachers also interact with their students at the class-level. These class-level interactions create a specific climate in classrooms that is important for the development of children. The Teaching Through Interactions Framework contends that emotionally supportive classrooms foster children's social and emotional development, including their behavioral adjustment (Downer, Sabol, & Hamre, 2010; Hamre et al., 2013). Based on attachment theory and other developmental theories, this framework states that when a teacher creates a warm, caring atmosphere in the classroom, this helps the children to develop to a sense of security and safety, that in its turn fosters positive development (Downer et al., 2010). Similarly, Bronfenbrenner's bio-ecological model of development (Bronfenbrenner & Morris, 2006) states that the social interactions surrounding children contribute to their development. Accordingly, children who spend time in a classroom with positive, enthusiastic interactions will have better behavioral outcomes than children who experience a negative, dismissive environment (e.g., Johnson, Seidenfeld, Izard, & Kobak, 2013; Wilson, Pianta, & Stuhlman, 2007).

Peer acceptance

When children enter kindergarten, they become part of a larger peer structure in which they will be evaluated: some children will become liked or accepted, whereas others will be disliked or rejected (e.g., Deater-Deckard, 2011; Rubin et al., 2015). When children are accepted by their peers, they have adequate opportunities to engage in a variety of social interactions. Children who are not accepted, however, miss vital social cues, which may lead to increased problem behavior, such as externalizing behavior (Deater-Deckard, 2011; Leflot, van Lier, Verschueren, Onghena, & Colpin, 2011; Schrepferman, Eby, Snyder, & Stropes,

2006). Further, children who are accepted by others, may feel that they are regarded as worthy by peers, and can infer that they are worthy as a person (Ladd & Troop-Gordon, 2013). Children who are not accepted by peers, however, miss this validation and are at risk for developing a negative self-concept (Rubin et al., 2015), which may in turn lead to increased internalizing problems (Ladd & Troop-Gordon, 2013; Spilt, van Lier, Leflot, Onghena, & Colpin, 2014).

In the following two sections we review the literature regarding the role of teacher-child interactions and peer relationships for child behavioral outcomes, with a focus on longitudinal research in kindergarten. In case such research was not available, we included correlational research or longitudinal research involving children close to our age range.

Teacher-child interactions and child behavioral outcomes

Research so far has established contributions of teacher-child interactions[1] to kindergartners' behavioral development. More specifically, studies have examined the association between *individual* and *class-level* teacher-child interactions and the development of *externalizing problems* in kindergarten. Regarding individual teacher-child interactions, several researchers showed that negative individual teacher-child interactions in kindergarten were associated with more externalizing behavior one year later (Silver, Measelle, Armstrong, & Essex, 2005; Pianta, Steinberg, & Rollins, 1995). Also, intervention studies targeting individual teacher-child interactions have been found to reduce kindergarteners' externalizing behavior (e.g., Vancraeyveldt et al., 2015). In addition to individual interactions, class-level teacher-child interactions can also have an effect on externalizing problems. Research showed, for instance, that first grade children displayed less negative and disruptive behavior when they were in classrooms with higher levels of emotional support and evaluative feedback (Wilson et al., 2007). However, this association was not consistently found in other research (e.g., NICHD ECCRN, 2003).

Individual teacher-child interactions have been shown to be associated with *internalizing problems*, as well. A longitudinal study by Pianta and Stuhlman (2004) showed that preschoolers' internalizing behavior was negatively associated with close teacher-child interactions and positively with conflicted teacher-child interactions. Roorda, Verschueren, Vancraeyveldt, Van Craeyevelt, and Colpin (2014) also found, in a sample of behaviorally at-risk boys, that conflicted teacher-child interactions at the beginning of preschool and kindergarten predicted more internalizing problems later in the school year. However, longitudinal research in elementary school has not always revealed a main effect of individual teacher-child interactions on internalizing behavior (O'Connor, Dearing, & Collins, 2011). In addition to individual interactions, evidence is found for an association between class-level teacher-child interactions and internalizing problems in children. For instance, children in emotionally supportive first grade classrooms showed lower levels of internalizing behavior (NICHD ECCRN, 2003).

Despite this growing body of research regarding the role of teacher-child interactions, two important gaps remain. First, even though teacher-child interactions have been found to play a role for behavioral development, the majority of the studies investigating individual teacher-child interactions have used teacher reports for both predictors and outcomes (Sabol & Pianta, 2012). This may have inflated associations between both. Thus, the role of individual teacher-child interactions may have been somewhat overestimated. Second, several studies show that individual teacher-child interactions are important, but they generally do not take class-level interactions into account. When examining the role of teacher-child interactions, both levels of interactions (i.e., individual and class-level) should be considered and their relative contribution should be examined, as they can both uniquely contribute to the development of children (Cadima, Verschueren, Leal, & Guedes, 2016). Research examining both individual and class-level teacher-child interactions and using multi-dimensional

observational assessments for both variables is scarce. So, the question remains whether the importance of individual teacher-child interactions is confirmed when general classroom-level teacher behavior is controlled for and when observational measurements are used.

Peer acceptance and child behavioral outcomes

Several studies have found evidence for the importance of peer acceptance and rejection for children's behavioral development in kindergarten. First, peer acceptance and rejection have been found to be associated with the development of *externalizing behaviors*. Research showed, for example, that more peer rejection in kindergarten is significantly related to more externalizing behaviors one year later (Gooren, van Lier, Stegge, Meerum Terwocht, & Koot, 2011; Ladd, 2006). In addition, the effect of peer rejection on *internalizing problems* has been examined. Keiley, Bates, Dodge, and Pettit (2000) showed that children who were rejected by peers in kindergarten had higher levels of internalizing behaviors, than children who were not rejected. Also, Olson and Rosenblum (1998) found that boys displayed more internalizing behaviors in kindergarten, when they were previously rejected by peers.

The literature thus suggests that being accepted or rejected by peers can have an effect on the development of externalizing and internalizing behavior. However, there is an important gap in the literature concerning the role of peers and teachers on children's behavioral development: there are few studies investigating the role of both social agents in the school context on child development (e.g., Hughes & Chen, 2011; Leflot et al., 2011). Given the fact that children interact with both peers and teacher in the classroom, the question is raised whether these interaction partners have a unique, additive contribution to children's behavioral development. To the best of our knowledge, no study has examined the joint role of individual and class-level teacher-child interactions and peer relationships in the development of externalizing and/or internalizing behavior of kindergartners.

The current study

This longitudinal study aimed at investigating the relative contributions of key school-based interactions to the behavioral development of young children. More specifically, we examined the role of individual and class-level teacher-child interactions and of peer relationships on externalizing behavior and internalizing behavior throughout kindergarten. In this study we focused on aggressive behavior (i.e., behavior likely to harm peers, for example, kicking other children), as an index of externalizing behavior and on anxious-fearful behavior (i.e., manifest distress in social contexts, for example crying) as an index of internalizing behavior (Ladd & Profilet, 1996). We expected that all three contextual antecedents would play a role in the behavioral development of kindergartners, given their demonstrated importance in previous research. However, we had no specific expectations regarding their relative importance, given the limited amount of (longitudinal) research so far in kindergarten and the lack of studies including all these antecedents.

Our study extends previous research by examining the contributions of both individual and class-level teacher-child interactions and of both teachers and peers to the behavioral development of kindergartners. By examining the role of three important antecedents in the school context together, we aimed to provide a more detailed picture of the development of children in kindergarten and the unique contributions of several actors in the classroom. Regarding individual and class-level teacher-child interactions, we also distinguished between several dimensions, more specifically negativity (i.e., the degree of negative teacher behavior, such as anger, disapproval, and sarcasm, towards a child or the class group), positivity (i.e., the enthusiasm, enjoyment, and respect displayed during interactions between the teacher and a child or the class group), and teacher sensitivity (i.e., the teacher's responsiveness, such as the comfort, reassurance, and encouragement provided by the teachers with respect to the academic and emotional needs of an individual child or the children in general; La Paro, Pianta, & Stuhlman, 2002). Further, individual and class-level teacher-child interactions were

measured using observations. This will contribute to the generalizability of earlier findings using teacher reports for individual teacher-child interactions. Also, by using observations for both individual and class-level processes, these levels can be optimally compared. In addition, by using different informants for our predictors (i.e., observations for individual and class-level teacher-child interactions and peer ratings for peer acceptance) and our outcomes (i.e., teacher reports for externalizing and internalizing behavior), we avoided overestimating their association. Finally, the role of the school context was examined in kindergarten, allowing us to identify the unique role of classroom social actors at an early age. If the development of problems is buffered at a young age, problems can be prevented from progressing later on. In sum, by taking the abovementioned factors in account, we aimed to provide a more detailed, differentiated, and objective picture of the role of key actors in the school context for the development of externalizing and internalizing behavior in kindergarten.

Method

Participants

The current study was conducted in Flanders, the Dutch-speaking part of Belgium. In Flanders, schooling starts at 2.5 year. First, there are three years of pre-primary education. There are five domains of developmental objectives in pre-primary education: Dutch, mathematical initiation, physical education, artistic education, and world studies (Vandecandelaere, Schmitt, Vanlaar, De Fraine, & Van Damme, 2016). Kindergarten is the third year of pre-primary education. It is followed by first grade, when formal education starts and children are taught in writing, reading, mathematics, etc. Primary education is more structured, has higher academic demands, and more focus on seatwork activities (Vandecandelaere, 2016). In Flanders, all kindergarten teachers are minimally required to have a Bachelor's degree for preschool teachers, following a three-year program at a university college.

A sample of 237 children from 36 classrooms in 26 schools was followed during kindergarten. Their mean age at kindergarten entry was 5.19 years (*SD* = 0.29) and 49% were boys. Classes in our study comprised 22 children on average (*SD* = 5), with a median number of seven participating children in each class (ranging from 1 to 14). Accordingly, the percentage of participating children per classroom ranged from 3% (in case a child changed to a new school) to 73% (*M* = 32%; *SD* = 20%).

The majority of the children (90%) had two parents with the Belgian nationality. Most parents completed higher education (75% of the mothers and 65% of the fathers). The other parents either finished (some years of) high school (24% of the mothers and 34% of the fathers) or elementary school (two mothers and one father). All teachers were female and their mean age was 41.87 years (*SD* = 12.77). They had on average 18.55 years of teaching experience (*SD* = 10.49).

Procedure

Participants were part of a larger longitudinal study in kindergarten and first grade (see XXX). Approval for the procedures of this study was obtained from the institutional ethical committee of XXX. Sample selection took place in the prekindergarten school year. Schools in the neighborhood of XXX, Belgium were contacted by telephone in a random order. In the first 30 schools that agreed to participate, letters with information on our study were sent to the children's parents. Parents could indicate on these letters whether they permitted their child to participate or not. In this way, 237 children with written active parental consent were selected for participation.

The schools were all located in predominantly urban areas (populations ranged from about 9 000 to 90 000) in the Flemish Community of Belgium (Eurostat, 2016).

Data collection occurred at three points in time: at the beginning (October-December, Wave 1), in the middle (January-March, Wave 2), and at the end (April-June, Wave 3) of

kindergarten. On average, teachers and children knew each other for two to three months before the first data collection. Both individual and class-level teacher-child interactions were observed by two trained researchers at Wave 1 (one of these researchers was involved in both types of interactions, i.e., Person A and C observed individual-level interactions and Person B and C observed class-level interactions). The individual and class-level interactions in a certain class were never observed by the same researcher (e.g., observations of individual-level interactions by Person A and observations of class-level interactions by Person C). The observations for class-level teacher-child interactions were conducted live following adapted CLASS guidelines (see below) for at least three hours per classroom. The observations included the teacher's interactions with all students in the classroom regardless of consent status. The observations for individual teacher-child interactions were carried out at a different occasion. The individual observations were also conducted live following adapted CLASS guidelines (see below) and they lasted at least three hours per class. The individual teacher-child interactions with the participating children in the class were observed during these hours, by following the teacher in her/his interactions with the children. A sociometric rating procedure for peer acceptance was conducted at Wave 1. Teachers filled out a questionnaire for each of their participating students regarding externalizing and internalizing behavior at Waves 1, 2, and 3.

Three teachers did not fill out the teacher questionnaire, yielding teacher ratings for a sample of 212 children. For the sociometric procedure, we aimed to include the ratings of all classmates of the 237 participating children. Parents of all the children in the classroom (also the children not participating in the remainder of the study) were asked permission for filling out the sociometric procedure for the participating children. On average 92% of all the children per classroom received permission (range: 78-100%).The sociometric procedure was not conducted for the children who changed schools (N = 7), due to practical reasons.

Observations of class-level teacher-child interactions were obtained for all 237 children. For practical reasons, individual teacher-child interactions were observed for a maximum of six children per classroom, yielding a subsample of 161 children in total (48.4% boys). The selection of children was at random, but stratified for gender, meaning that we aimed at an equal number of boys and girls. Comparison of the children in the subsample with the remaining children in the study showed no differences regarding gender, age, peer acceptance, and aggressive and anxious behavior at the beginning of kindergarten. We did find that the mothers and fathers of the children in the subsample were more highly educated, $t(190) = -2.02$, $p < .05$, $d = .32$ and $t(126.12) = -2.62$, $p = .01$, $d = .41$, respectively. However, these effect sizes can be considered small (Cohen, 1988).

Measures

Class-level teacher-child interactions. The class-level teacher-child interactions were measured at Wave 1 with a slightly adapted version of the Classroom Assessment Scoring System for Kindergarten (CLASS-K; La Paro et al., 2002). The CLASS, consisting of 10 dimensions, provides a framework for observing the global quality of emotional, organizational, and instructional support provided by teachers towards all children in their classroom. Several studies have found support for its inter-rater reliability and validity in different samples (e.g., La Paro et al., 2002; LoCasale-Crouch et al., 2007; Pianta et al., 2005). In our study we used a slightly adapted version of the Negative Climate, Positive Climate, and Teacher Sensitivity dimensions, which all refer to the emotional support domain. They are labeled as ‘Negativity’, ‘Positivity’, and ‘Teacher Sensitivity’, respectively. In contrast to the original CLASS, the adapted dimensions focus on interactions between teachers and children only, and not on interactions among children (Buyse, Verschueren, Doumen, Van Damme, & Maes, 2008). For example, in the original CLASS Positive Climate refers to: “Considers the emotional and social tone of the classroom. The enthusiasm,

enjoyment, and respect displayed during interactions between the teacher and children and among children should be included in this rating" (La Paro et al., 2002, p. 7), whereas in the adapted version Positivity refers to: 'Considers the emotional and social tone of the classroom. The enthusiasm, enjoyment, and respect displayed during interactions between the teacher and children should be included in this rating.' This is analogous for the other two dimensions, and these are the only adaptations we made. The Negativity dimension reflects the degree of teacher negativity (e.g., anger, disapproval, and sarcasm) towards the class. The Teacher Sensitivity dimension measures the teacher's responsiveness, for example, the comfort, reassurance, and encouragement provided by the teachers with respect to the children's academic and emotional functioning (La Paro et al., 2002). Each dimension is rated on a 7-point Likert-type scale, with a score of one or two indicating low quality, a score of three, four, or five indicating mid-range quality, and a score of six or seven indicating high quality (Burchinal, Vandergrift, Pianta, & Mashburn, 2010; La Paro et al., 2002). Research has found support for the criterion and predictive validity of this adapted version of the CLASS, showing for instance, the expected associations with teacher reports of relationship quality in class (e.g., Buyse et al., 2008; Cadima, Doumen, Verschueren, & Leal, 2013; Verschueren, Cadima, & Doumen, 2014).

To assess inter-rater reliability, two observers independently evaluated teacher-child interactions in four classrooms at the beginning of the data collection. The inter-rater reliability, based on the intraclass correlation coefficient (ICC- mixed, absolute agreement, single measures; Shrout & Fleiss, 1979), was good to excellent; $ICC_{Negativity} = .69$, $ICC_{Positivity} = .93$, and $ICC_{Teacher\ Sensitivity} = .91$ (Cicchetti et al., 2006).

Individual teacher-child interactions. In order to observe individual teacher-child interactions analogously to class-level teacher-child interactions, three CLASS-dimensions were adapted, more specifically, Negative Climate, Positive Climate, and Teacher Sensitivity

(Doumen, Koomen, Buyse, Wouters, & Verschueren, 2012). For this adaptation, one of the authors of the original instrument was consulted (R.C. Pianta, personal communication, January 2004). These three adapted dimensions were labeled 'Negativity', 'Positivity', and 'Teacher Sensitivity', respectively. The adapted dimensions take into account interactions between the teacher and a specific child only, and not interactions with other children or interactions among children. It results in a specific score that differs for each observed child in the classroom. For example, in the original CLASS Positive Climate refers to: "Considers the emotional and social tone of the classroom. The enthusiasm, enjoyment, and respect displayed during interactions between the teacher and children and among children should be included in this rating"(La Paro et al., 2002, p. 7), whereas in the adapted individual version Positivity refers to: 'Considers the emotional and social tone of interactions between the teacher and the individual child. The enthusiasm, enjoyment, and respect displayed during these interactions should be included in this rating.' The other two dimensions are adapted similarly and these are the only changes we made. Negativity measures the teacher's negativity (e.g., anger, disapproval, and sarcasm) towards an individual child. Teacher Sensitivity refers to the teacher's responsiveness to an individual child. Several studies found evidence for the reliability and for the convergent and predictive validity of the individual teacher-child observations. For example, associations were found between the observed dimensions and teacher reports of similar dimensions (Doumen et al., 2012; Spilt, Koomen, Thijs, & van der Leij, 2012; Spilt, Vervoort, Koenen, Bosmans, & Verschueren, 2016). The scores also appeared to be stable from the beginning to the end of kindergarten (Doumen et al., 2012). In the current study, two observers independently observed the individual teacher-child interactions of 19 out of 161 children (11.8%) at the beginning of the data collection for inter-rater reliability. The ICC's (mixed, absolute agreement, single measures; Shrout &

Fleiss, 1979) for Negativity, Positivity, and Teacher Sensitivity were .72, .79., and .85, respectively, which can be considered as good to excellent (Cicchetti et al., 2006).

Peer acceptance. A sociometric rating procedure adapted from Asher, Singleton, Tinsley, and Hymel (1979) was used to measure peer acceptance (Bossaert, Doumen, Buyse, & Verschueren, 2011) at Wave 1. All children were presented with pictures of their classmates. After identifying their classmates from the pictures, they were asked to put every picture in one of three boxes, according to the classmate's likeability as a playmate. The red box had a sad face (for 'do not like to play with' answers), the yellow box had a neutral face (for 'kind of like to play with' answers), and the green box had a happy face (for 'like to play with' answers). These answers were scored 1, 2 and 3, respectively. To assess peer acceptance, an average score was computed for each child, by summing up the scores and dividing this sum by the number of participating children in the classroom minus one. This sociometric procedure has shown adequate reliability and validity (e.g., Boivin & Bégin, 1986; Ladd, Birch, & Buhs, 1999; Ladd & Coleman, 1997).

Externalizing and internalizing behavior. Externalizing and internalizing behavior in kindergarten were assessed at each wave with the Child Behavior Scale (CBS; Ladd & Profilet, 1996). The CBS is a teacher questionnaire that measures the behavior of young children between four and six years in peer contexts, such as classrooms. Teachers respond on a 3-point Likert scale, ranging from 1 (*does not apply*) to 3 (*certainly applies*). Several studies showed adequate psychometric properties for the CBS-scales (e.g., Birch & Ladd, 1998; Ladd, 2006; Ladd & Profilet, 1996), providing evidence for its reliability and its convergent, discriminant, and predictive validity (Ladd & Profilet, 1996; Ladd & Troop-Gordon, 2003). The subscale 'Aggressive with peers' was used to measure externalizing behavior. This subscale consists of seven items (e.g. 'Kicks, bites, or hits other children.'). Cronbach's alpha ranged from .88 to .90 over the three waves. Internalizing behavior was measured with the

subscale ‘Anxious-fearful’. The subscale consists of four items (e.g., ‘Is worried. Worries about many things.‘). Cronbach’s alpha ranged from .62 to .73 over the three waves.

Data-analysis

Given the nested structure of the data, multilevel latent growth curve modelling (MLGC) was used to examine the role of both individual and classroom factors for children’s aggressive and anxious-fearful behavior in our sample (N = 237). Our multilevel latent growth curve model consisted of a three-level random coefficients model with repeated observations nested within children (Level 1), nested within classrooms (Level 2). The specification of the MLGC models was based on multiple steps. The first model estimated was the fully unconditional model, which contains only the outcome measure without any explanatory variables at either the child-level or classroom-level. Based on the unconditional models, intra-class correlations were computed, which reflect the proportion of the total outcome variation explained by differences between the children (Level 1) and between the classes (Level 2), respectively (Singer & Willett, 2003). The second model introduced a series of child-level and class-level predictors to the model and controlled for sex, age, and SES (i.e., education of mother and father). These models were specified separately for aggressive and anxious-fearful behavior. The slope was fixed to 0 at Time 1, to 1 at Time 2, and to 2 at Time 3, with one unit being approximately 3 months in time. The slope is interpreted as the increase or decrease in the outcome variable when the time score increases one unit. The descriptive statistics were calculated in SPSS 23 and the MLGC models were specified using Mplus 7.4 software (Muthén & Muthén, 1998-2015). The maximum likelihood with robust standard errors (MLR) estimator was used to handle non-normality of the data (Enders, 2010).

Missing data was handled with multiple imputation (Schafer & Graham, 2002; Yuan, 2000). Before we conducted the multiple imputation procedure, we checked the pattern of missingness in our data. Missing values on the predictor variables were not significantly

related to aggressive or anxious-fearful behavior, $p > .05$. Multiple imputation was based on all predictor and outcome variables (e.g., Yuan, 2000) and was conducted in Mplus (Rubin, 1987; Schafer, 1997). For each of the aggression and anxious-fearful MLGC models, a total of 15 imputed data sets were created (default is 5 data sets, Muthén & Muthén, 1998-2015).

Results

Descriptive Statistics

Means and standard deviations of the seven independent variables (i.e., Peer acceptance, Individual Negativity, Positivity, and Teacher Sensitivity, and Class-level Negativity, Positivity, and Teacher Sensitivity) and control variables (i.e., Age and SES) at Wave 1 are reported in Table 1. Positivity and Teacher Sensitivity were rated significantly higher than Negativity, both for individual ($t(160) = 21.39$, $p < .001$, $d = 1.69$; $t(160) = 20.93$, $p < .001$, $d = 1.65$, respectively) and class-level interactions ($t(236) = 14.17$, $p < .001$, $d = 0.92$; $t(236) = 13.43$, $p < .001$, $d = 0.87$, respectively). Table 1 also contains the means and standard deviations of Aggressive with peers and Anxious-Fearful at each wave. It shows that the average scores remained stable over time. This descriptive finding was tested for significance in the multilevel analyses and is reported below.

The Pearson correlations of all variables are also presented in Table 1[2]. The measurements of Individual Negativity and Teacher Sensitivity showed no significant correlations with their class-level counterparts. Individual Positivity had a small positive correlation with Class-level Positivity. Most other variables showed intercorrelations in the expected direction.

[Insert Table 1 about here]

Multilevel Latent Growth Curve Analysis

Two unconditional linear growth models were tested, with Aggressive with peers and Anxious-Fearful as dependent variables, respectively. For Aggressive with peers, the

Level 1 ICC was .69 and the Level 2 ICC was .11.The unconditional model for Anxious-Fearful resulted in a Level 1 ICC of .68 and a Level 2 ICC of .20. The aforementioned ICC's indicate the proportion of the total outcome variation explained by differences among the children (Level 1) and among the classes (Level 2), respectively (Singer & Willett, 2003).

The intercept in the unconditional model for Aggressive with peers was significantly different from zero (M_I = 1.252, p < .001). The slope was not significantly different from zero (M_s = -0.017, p = .309), which indicates that aggressive behavior remained stable over time. Furthermore, variance around the intercept at individual-level was also significant (D_i = 0.073, p < .001), but not for the slope (D_s = 0.001, p = .845). This suggests that there is variation in the intercept of aggressive behavior at individual-level. At the class-level variances around the intercept (D_i = 0.015, p = .125) and slope (D_s = 0.003, p = .067) were not significant. For Anxious-Fearful, the unconditional model revealed a significant intercept (M_I = 1.2268, p < .001) and a non-significant slope (M_s = -0.003, p = .832), which indicates that anxious-fearful behavior of students remained stable over time. Additionally, variance around the intercept at individual level was significant (D_i = 0.089, p < .01), but not for the slope (D_s = 0.003, p = .518). At the class-level, there was significant intercept variance (D_i = 0.024, p < .01) and non-significant variance around the slope (D_s = 0.002, p = .222). This indicates that there is variation in the intercept of anxious-fearful behavior at both student- and class-level.

[Insert Table 2 about here]

Aggressive Behavior.

In the next step, predictor models were specified by including Peer acceptance, Individual and Class-level Negativity, Individual and Class-level Positivity, and Individual and Class-level Teacher Sensitivity as predictors of the intercept and slope of aggressive behavior and Sex, Age, and SES as control variables. As reported in Table 3, we found a

significant effect of Individual Teacher Negativity on children's aggressive behavior. This suggests that when teachers would display negativity at the individual-level one standard deviation more than average, and all other variables remained equal, children would score 0.337 points higher on aggression at the start of kindergarten, which is 93.6% of a standard deviation more (e.g., Van Den Noortgate, Pustjens, & Onghena, 2004; Wouters, De Fraine, Colpin, Van Damme, & Verschueren, 2012). Additionally, we found a significant effect of Sex, indicating that boys displayed more externalizing behavior throughout kindergarten. The results showed no significant effects of Peer acceptance, Individual Teacher Positivity, Individual Teacher Sensitivity, or class-level teacher child interactions on aggressive behavior.

In sum, the results showed that children displayed more externalizing behaviors throughout kindergarten when they had more negative individual interactions with their teachers at the start of kindergarten. They also displayed these behaviors more when they were boys.

Anxious-Fearful Behavior.

Predictor models were also specified for anxious-fearful behavior using the same set of predictors. As reported in Table 3, Class-level Teacher Sensitivity had a significant negative effect on children's anxious-fearful behavior. This denotes that when teachers would display class-level teacher sensitivity one standard deviation more than average, and all other variables remained equal, children would score 1.50 points lower on anxious-fearful behavior at the start of kindergarten. This indicates a score in anxious-fearful behavior that is 3.84 standard deviations lower. The results showed that Peer acceptance, individual teacher-child interactions, Class-level Negativity and Class-level Positivity had no significant effects on anxious-fearful behavior.

Overall, the analyses indicate that children who have a teacher that displays more sensitivity in class-level interactions with their students at the start of kindergarten, display less anxious-fearful behavior.

Discussion

Our study aimed at examining the simultaneous contributions of peer acceptance and individual and class-level teacher-child interactions to externalizing and internalizing behaviors throughout kindergarten. Research so far has established the importance of these three contextual antecedents separately, but no single study has investigated their joint contributions to the behavioral development of kindergartners. Our analyses showed that externalizing and internalizing behaviors have distinct associations with social interactions in class, when individual and class-level teacher-child interactions and peer acceptance are all taken into account.

First, children who had negative individual interactions with their teachers at the start of kindergarten displayed higher levels of externalizing behavior throughout kindergarten. Second, boys displayed higher levels of aggressive behavior. Third, children whose teacher displayed sensitive interactions at the class-level at the start of kindergarten had lower levels of internalizing problems. Our analyses also showed that the mean levels of aggressive and anxious-fearful behavior of the children remained stable over time. Previous research shows that aggressive and anxious behaviors, in general, are stable or slowly decrease at the age range used in our study (e.g., Bongers, Koot, Van Der Ende, & Verhulst, 2004; Côté, Vaillancourt, LeBlanc, Nagin, & Tremblay, 2006; Gazelle & Ladd, 2003). The relative short time frame of our study (i.e., nine months) might have limited us in finding significant changes in the development of internalizing and externalizing behavior. This may also explain why we found no effects of teacher interactions and peer acceptance on their change over time (i.e., their slope).

Further, in our study, we took both the individual and class-level teacher-child interactions into account. The mean levels of these variables showed that the observed quality at both levels was in general in the mid-range. Individual and class-level positivity had a mid-range quality at the mean level, indicating that the teachers showed positive regard in general and that interactions were usually pleasant, although sometimes there could be constrained elements in them. Individual and class-level negativity were displayed less (between the low end and mid-range). So, at the mean level, teachers displayed rather few instances of negative affect, although sometimes they could have shown harshness or sarcasm in their interactions with a child/the children. Finally, individual and class-level teacher-child sensitivity was characterized by a mid-range quality, showing that the teachers were aware of the children's needs, although there also could have been occasions where the teachers ignored these or missed opportunities to address them. The variance in quality of individual teacher-child interactions and the low to nonexistent correlations between individual and class-level interactions also underscore the different experiences children can encounter with their teachers, even when class-level interactions are similar. For example, while children can have a classroom characterized by positive, sensitive class-level teacher-child interactions, they can still experience negative individual teacher-child interactions themselves.

Externalizing behavior

When all variables were taken into account, children displayed more aggressive behaviors throughout kindergarten when they had more negative individual interactions with their teachers. First, externalizing behaviors were predicted by negative individual teacher-child interactions, but not by positive or sensitive individual teacher-child interactions. Similar findings were reported by Howes and colleagues (2011) and Roorda and colleagues (2014) who found that negative teacher-child interactions were significantly related to externalizing behaviors in preschool, whereas positive interactions were not. Silver and

colleagues (2005) equally found evidence for the importance of individual negative teacher-child interactions in kindergarten for externalizing behaviors in first grade. However, they also reported an, albeit smaller, association of positive individual teacher-child interactions in kindergarten with first grade externalizing behaviors. A possible explanation for our findings is the attachment theory based assumption that when children have negative individual interactions with their teacher, they can view themselves as unworthy and others as hostile (Verschueren et al., 2012). These representations can lead to externalizing behaviors to compensate for the feelings of insecurity and rejection (Fearon et al., 2010). Positive or sensitive individual teacher-child interactions do not seem to play a role. Perhaps because positive or sensitive individual teacher-child interactions were displayed more often than negative individual teacher-child interactions, positive and sensitive interactions were experienced by students as more common and were therefore less striking and less influential than the relatively rare negative interactions addressed towards their person. Further research, however, is needed to examine this hypothesis.

Second, our results showed that the class-level teacher-child interactions did not contribute to externalizing behaviors in kindergarten, when individual teacher-child interactions and peer acceptance were taken into account. Other research did not consistently find associations between class-level teacher-child interactions and externalizing behaviors either (e.g., NICHD ECCRN, 2003). The question remains why some studies do find an association between externalizing behaviors and class-level teacher-child interactions and others do not. Perhaps the operationalization of the class-level interactions is key here. For example, one study that showed an association between class-level interactions and externalizing behavior took both emotional support and evaluative feedback into account (Wilson et al., 2007), whereas we only looked at dimensions of emotional support. Further

research can examine the role of specific components of classroom teacher-child interactions on externalizing behaviors and shed light on this topic.

Third, our analyses showed that peer acceptance at the beginning of kindergarten did not contribute to externalizing behaviors throughout kindergarten. This was surprising, given the fact that peer acceptance was significantly negatively correlated with aggressive behavior at all waves and that previous literature showed that peer rejection in kindergarten was related to aggressive behavior in first grade (e.g., Gooren et al., 2011; Ladd, 2006). However, in our models we controlled both for teacher-child interactions and for sex, and our results showed that boys displayed more aggressive behavior throughout kindergarten. This is in accordance with previous research, showing that boys have higher levels of aggression (e.g., Moffitt, Caspi, Rutter, & Silva, 2001; Phillipsen, Bridges, McLemore, & Saponaro, 1999). It seems that when these other variables are taken into account, the impact of peer acceptance on aggressive behavior diminishes. Previous studies usually did not control for individual or class-level teacher-child interactions (e.g., Gooren et al., 2011; Ladd, 2006) and/or sex (e.g., Ladd, 2006). Alternatively, peer acceptance may become relatively more important for children's behavioral adjustment at later ages. For example, intervention research showed that decreases in peer rejection can reduce aggressive behavior in an at-risk sample in middle childhood (Leflot, van Lier, Onghena, & Colpin, 2013). Also, peer rejection is possibly related more strongly to behavioral problems than peer acceptance (Danneel et al., in press). In the current study we used a peer rating scale that does not distinguish between both dimensions, but treats them as opposite poles of one continuum. Finally, age and SES had no impact on externalizing behavior in our study.

Internalizing behavior

Children who had a teacher displaying more sensitivity at the class-level, showed less anxious-fearful behavior throughout kindergarten, when individual teacher-child

interactions and peer acceptance were controlled for. First, the role of teacher sensitivity at the class-level is in accordance with Bronfenbrenner's bio-ecological model of development (Bronfenbrenner & Morris, 2006) and the Teaching Through Interactions Framework (Downer et al., 2010; Hamre et al., 2013), as well as with previous research showing an association between emotionally supportive classrooms and internalizing behaviors (e.g., Gazelle, 2006; NICHD ECCRN, 2003). So, children who are surrounded by warm, sensitive interactions, are at lower risk for developing anxious-fearful feelings. At the class-level, teacher sensitivity appeared to be more important for reducing internalizing problems than positivity or negativity. Given that sensitivity refers to the responsiveness, comfort, reassurance, and encouragement provided by the teachers and the awareness of and response to children's emotional and academic needs (La Paro et al., 2002), it seems logical that sensitivity is key in creating a safe climate in which children feel less anxious or fearful. This is in accordance with attachment theory, which identifies sensitivity as crucial for an environment in which children can feel safe and secure (Ainsworth, Blehar, Waters, & Wall, 2015).

Second, our analyses showed no associations between individual teacher-child interactions and internalizing behaviors, when class-level teacher-child interactions and peer acceptance were taken into account. Although this is somewhat surprising, it should be acknowledged that past research regarding individual teacher-child interactions often used teacher reports to measure both teacher-child interactions and internalizing behavior of the child (Pianta & Stuhlman, 2004; Roorda, et al., 2014). This may have overestimated the association between these two variables. Another possible explanation is that teacher-child interaction questionnaires can assess certain interactive behaviors that are key for the development of internalizing behaviors, but that can be missed during observations. For example, whether or not a child can turn to the teacher in times of stress is hard to observe

during a short time period. More longitudinal research is needed to compare the use of questionnaires versus observations for this specific association.

Third, our research also showed that peer acceptance did not play a significant role in the development of internalizing behavior, when individual and class-level teacher-child interactions were controlled for. Previous research found effects of peer acceptance on internalizing behavior, however, it did not control for individual and class-level teacher child interactions. It could be that when teacher sensitivity at the class-level is taken into account, peer acceptance does not make a unique, additional contribution to anxious-fearful behavior in kindergarten. Further research is necessary to examine this hypothesis. Finally, our analyses showed that none of the control variables (i.e., gender, age, SES) contributed to internalizing behaviors in kindergarten.

Individual versus class-level teacher-child interactions

Our study investigated both individual and class-level teacher child interactions, whereas previous research usually included only one of these levels. By examining the role of both levels, we investigated whether they were indeed distinct and whether they had different associations with children's behavioral development. Our analyses showed that two dimensions of individual teacher-child interactions (negativity and teacher sensitivity) were not related to their class-level counterpart. Individual positivity had a small positive association with class-level positivity. Previous studies have found that the individual and class-level teacher-child interactions were not or weakly correlated (Cadima et al., 2016; Lee & Bierman, 2015), however, other research has shown more mixed results (Cadima et al. , 2013). Our results are in accordance with these first studies (Cadima et al., 2016; Lee & Bierman, 2015) and contributes to the notion that individual and class-level teacher-child interactions are two distinct variables. However, the absence of a link between the two levels in previous studies could also be explained by different assessment methods: individual

teacher-child interactions are usually measured with teacher reports and class-level interactions are often observed (Lee & Bierman, 2015). Our study can contribute to refuting this hypothesis, given that we used observations for both levels. In that way, our study adds to the idea that individual and class-level teacher-child interactions are two distinct concepts with specific correlates and a unique importance in the development of children. It is interesting to notice how both levels of interactions differentially relate to externalizing and internalizing problems. It seems that for externalizing problems individual teacher-child interactions may be more important, whereas for internalizing behaviors, the overall climate in the class may be more crucial. One could argue that feeling individually and negatively targeted by the teacher is an important aspect in the development of externalizing behavior and that children act out in order to cope with this feeling of being 'singled out' by the teacher. According to attachment theory, this feeling of being individually 'singled out' can lead to a negative view of the self and others, and in turn, to externalizing coping behavior (Fearon et al., 2010; Verschueren et al., 2012). A negative climate in the class, appeared to have no effect on externalizing behavior, perhaps because these teacher-child interactions at the class-level are not directed to the child personally. We also know from literature, that externalizing behavior of children is crucial for shaping negative individual teacher-child interactions (Buyse et al., 2008; Doumen et al., 2008; Hamre, Pianta, Downer, & Mashburn, 2008). An important, bi-directional association between externalizing behavior and individual teacher-child interactions may therefore exist. In the development of internalizing problems, on the other hand, sensitive interactions in their environment seem key for children to feel safe and secure. As suggested by the Teaching Through Interactions Framework (Downer et al., 2010; Hamre et al., 2013), children who experience warm, sensitive interactions around them, in their classroom, which could promote feelings of security and safety, display less internalizing behavior. The fact that we did not find similar positive contributions of sensitive

individual teacher-child interactions to the development of internalizing behavior is intriguing and seems in line with the suggestion that high levels of direct teacher affiliation may be too direct and threatening for internalizing children (Roorda, Koomen, Spilt, Thijs, & Oort, 2013). Providing them with a safe social surrounding may be a more effective way to address their emotional needs. Further research is, however, needed to investigate these post-hoc hypotheses. Future research could also look into the possible reciprocal links between child behavior and teacher-child interactions over time.

Strengths and limitations

Our study has several strengths, including its longitudinal design, the use of multi-dimensional observational measurements that were parallel for the class and individual level, the use of independent observers for individual-level versus class-level interactions, and the inclusion of two key actors in the school context in early childhood. However, there are also some limitations which further research could take into account. First, we examined only one direction of the link between social environment and child behavior: the role of the school context for child behavioral development. However, according to bio-ecological models, it is plausible that children's behavior in kindergarten also affects their teacher-child interactions and peer relationships or that bi-directional relations exist (Bronfenbrenner & Morris, 2006). For individual teacher-child interactions and for peer acceptance, bidirectional associations with behavioral problems have indeed been found in previous studies (e.g., Doumen et al., 2008; Roorda et al., 2014; Sturaro, Van Lier, Cuijpers, & Koot, 2011). Further research with multiple assessments of all variables at all time points is needed to test the possibility of such bi-directional associations over time. Second, even though observations have the benefit of providing a more objective picture than teacher reports (e.g., Pianta, Hamre, & Stuhlman, 2003), they also have limitations. They usually comprise a short time frame and they do not permit to capture the feelings, representations or expectations that people hold in relationships

(Rudasill & Rimm-Kaufman, 2009). These feelings, representations, and expectations could also be important for child development, even though they are less noticeable for observers. Third, our sample was rather homogeneous regarding ethnicity and was highly educated. Given that different processes may take place in more heterogeneous samples (e.g., Gallagher, Kainz, Vernon-Feagans, & White, 2013), our findings should be replicated in a more diverse sample. Also, our sample was recruited from schools that agreed to participate in this study and were therefore not necessarily representative for the school population. The schools that agreed to participate possibly had a higher motivation for participation in research and/or a particular interest in the topic of this study. This should be taken into account when considering the external validity of the results. Fourth, we chose to follow children during one school year. This has benefits, such as, there is only one teacher who reports about the children and the children have the same teacher and peer group for the duration of the study. However, further research could also examine the relative role of individual and class-level teacher-child interactions and peer acceptance for the behavioral development of children over a longer time frame. This would allow to examine changes in the outcome measure over several years and to study the possible predictors of this change over time. Fifth, while we found the inter-rater reliabilities of the individual and class-level teacher-child interactions to be good to excellent, we only used a relatively small percentage of observations to assess them, due to practical reasons. Sixth, further research could also examine the relative contributions of both peer acceptance and dyadic friendships to the behavioral development of children, given the potential differential effects of both levels of peer relations (Rubin et al., 2015). Finally, we focused on the emotional support domain of teacher-child interaction, in line with and extending previous attachment-based research. It could also be interesting for further research to examine the role of other domains of individual and class-level teacher-child interactions, such as behavioral management. They can also be of importance, for

example, by stating clear behavior expectations, teachers could create a more predictable and safe classroom context, leading to less behavioral problems.

Implications and future directions

Our study has several implications for further research and practice. Regarding research, it calls for the inclusion of both individual and class-level teacher-child interactions in future research. Given the different associations of these two levels (i.e., their importance for externalizing versus internalizing behavior), it is vital that they are both included in analyses to draw valid conclusions regarding the role of interactions with teachers or that researchers explicitly acknowledge the focus of their study. In addition, our findings confirm the importance of including several dimensions when measuring the emotional component of teacher-child interactions in future research. By including different dimensions, research may be more sensitive to the real-life processes that take place in the classroom. Regarding practice, our results may provide some directions for prioritizing preventative efforts in general, although they do not necessarily apply for all individual children. When aiming to reduce externalizing problems, our results suggest that decreasing the negative individual teacher-child interactions may be helpful. For the reduction of internalizing problems, our study suggests that it would be beneficial to help the teacher to be more sensitive at the class-level. However, although our results showed that negative individual teacher-child interactions can predict aggressive behavior and sensitive class-level teacher-child interactions can predict anxious-fearful behavior, further research is needed to experimentally test whether improvements in these variables lead to decreases in aggression and anxious-fearful behavior, respectively. Interventions such as Banking Time, Playing-2-gether and the Relationship-Focused Reflection Program, all based on attachment theory, could help teachers to be more sensitive and positive and to display less negative interactions with the children in their classroom (Driscoll & Pianta, 2010; Spilt et al., 2012; Vancraeyveldt, Verschueren, Van

Craeyevelt, Wouters, & Colpin, 2015). The first two interventions help teachers, through several techniques, to convey acceptance to the child and take the child's relational needs into account (Driscoll & Pianta, 2010; Vancraeyveldt et al., 2015). The third intervention focuses on teachers' mental representations of relationships with specific children and on becoming more sensitive to their needs (Spilt et al., 2012). Although these interventions have shown positive effects on teacher-student relationships, their longer-term effects remain to be investigated in future research.

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Footnotes

[1] In this study, we refer to "teacher-child interactions", which is closely linked, albeit not completely overlapping, with the construct of "teacher-child relationships" (e.g., Birch and Ladd, 1997). Teacher-child relationships comprise three main components: teacher-child interactions, which are conceptualized as observable exchanges of information between interaction partners, features of the individuals in the relationship and their representation of this relationship, and external influences of the context (Hamre & Pianta, 2006). In accordance with Sabol and Pianta (2012), we conceptualize teacher-child interactions as an important aspect of teacher-child relationships, and as such, we consider teacher-child interactions as the basis for the formation of teacher-child relationships. In our study, we chose to use observational measurements of teacher-child interactions. When referring to literature, we consequently use "teacher-child interactions", given that some researchers use the terms of teacher-child interactions and relationships as interchangeable, and that the cited work always gives indications on the importance of teacher-child interactions, both in itself or as an important aspect of teacher-child relationships.

[2] Given the correlations between the class-level variables, possible multicollinearity was examined. Linear regression analyses were conducted in SPSS, in which predictors were alternately regressed on each other. In the first model, Class-level Positivity was predicted by Class-level Negativity and Class-level Teacher Sensitivity which resulted in VIF = 2.208 and Tolerance = .453. In the second model, Class-level Negativity was predicted by Class-level Positivity and Class-level Teacher Sensitivity, which resulted in VIF = 2.972 and Tolerance = .336. The last model, with Class-level Teacher Sensitivity predicted by Class-level Positivity and Class-level Negativity showed VIF = 4.796 and Tolerance = .209. In all models, VIF values are below 5 and Tolerance values are above .20, suggesting that multicollinearity is not a problem in our analysis (Field, 2009, p. 224; Myers, 1990)

Table 1

Means (M), Standard Deviations (SD), and Correlation Matrix of the Predictor Variables and Control Variables at Wave 1 and of the Outcome Variables at all Three Waves for the Overall Sample, for Boys, and for Girls

Overall Sample	*M*	*SD*	*N*	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
1. Peer acceptance	2.20	0.36	230	1														
2. Individual Negativity	2.20	1.08	161	-.19*	1													
3. Individual Positivity	4.86	0.90	161	.02	-.27**	1												
4. Individual Teacher Sensitivity	4.81	0.90	161	.07	-.29**	.63**	1											
5. Class-level Negativity	2.53	1.39	237	.16*	.03	-.08	-.03	1										
6. Class-level Positivity	4.99	1.36	237	-.19**	-.13	.16*	.14	-.89**	1									
7. Class-level Teacher Sensitivity	4.74	1.33	237	-.14*	-.10	.19*	.13	-.74**	.82**	1								
8. Aggressive with peers Wave 1	1.26	0.36	195	-.32**	.29**	.02	-.02	-.05	.09	-.03	1							
9. Aggressive with peers Wave 2	1.22	0.33	182	-.35**	.15	.09	.03	-.12	.11	.02	.75**	1						
10. Aggressive with peers Wave 3	1.24	0.38	178	-.45**	.28**	-.07	-.06	-.12	.18*	.03	.71**	.74**	1					
11. Anxious-Fearful Wave 1	1.26	0.39	195	-.11	.02	.05	.14	.10	-.08	-.22**	.03	-.05	.03	1				
12. Anxious-Fearful Wave 2	1.30	0.39	182	-.13	-.02	-.02	-.01	.16*	-.13	-.28**	-.05	-.07	.09	.75**	1			
13. Anxious-Fearful Wave 3	1.26	0.36	178	-.14	.06	-.08	-.03	.14	-.14	-.33**	.04	-.05	.07	.65**	.70**	1		
14. Age	5.19	0.29	226	-.06	.06	.01	.02	-.12	.11	-.12	.13	.04	.11	-.05	-.03	-.04	1	
15. SES	4.31	1.15	177	.11	-.02	.05	.15	.20**	-.15	.19*	-.03	-.13	.02	.05	.08	.07	-.11	1

Boys	*M*	*SD*	*N*	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
1. Peer acceptance	2,09	0.38	112	1														
2. Individual Negativity	2,46	1.21	78	-.16	1													
3. Individual Positivity	4,95	0.94	78	.06	-.39**	1												
4. Individual Teacher Sensitivity	4,92	0.96	78	.08	-.44**	.63**	1											
5. Class-level Negativity	2,43	1.26	115	.13	.09	-.18	-.18	1										

6. Class-level Positivity	5,10	1.33	115	-.21*	-.18	.30**	.27*	-.86**	1									
7. Class-level Teacher Sensitivity	4,83	1.31	115	-.15	-.12	.23*	.22	-.73**	.82**	1								
8. Aggressive with peers Wave 1	1.41	0.43	93	-.30**	.28**	-.06	-.02	.04	.04	-.08	1							
9. Aggressive with peers Wave 2	1.35	0.40	83	-.35**	.12	.11	.06	-.06	.07	.01	.69**	1						
10. Aggressive with peers Wave 3	1.40	0.47	84	-.43**	.20	-.10	-.09	-.08	.16	.00	.69**	.75**	1					
11. Anxious-Fearful Wave 1	1.30	0.44	93	.02	-.05	.16	.20	.08	-.01	-.21*	.03	-.12	-.07	1				
12. Anxious-Fearful Wave 2	1.31	0.39	83	-.05	-.04	.05	.06	.14	-.08	-.31**	-.05	-.08	.03	.83**	1			
13. Anxious-Fearful Wave 3	1.24	0.38	84	-.15	.08	-.06	.00	.14	-.07	-.30**	.15	.04	.06	.70**	.76**	1		
14. Age	5.21	0.29	111	-.11	-.05	.05	-.02	.11	-.14	-.16	.15	.07	.12	-.13	-.13	-.07	1	
15. SES	4.27	1.19	94	.12	-.04	.07	.18	-.16	.27**	.17	.05	-.01	.07	.09	.08	.00	-.26**	1

Girls	*M*	*SD*	*N*	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
1. Peer acceptance	2,31	0.29	118	1														
2. Individual Negativity	1,94	0.87	83	-.04	1													
3. Individual Positivity	4,77	0.86	83	.06	-.18	1												
4. Individual Teacher Sensitivity	4,71	0.82	83	.18	-.16	.61**	1											
5. Class-level Negativity	2,64	1.50	122	.18	-.03	.03	.12	1										
6. Class-level Positivity	4,90	1.39	122	-.15	-.08	.01	-.02	-.91**	1									
7. Class-level Teacher Sensitivity	4,66	1.34	122	-.12	-.13	.13	.02	-.75**	.81**	1								
8. Aggressive with peers Wave 1	1.13	0.21	102	-.02	.09	.05	-.14	-.12	.10	-.07	1							
9. Aggressive with peers Wave 2	1.11	0.22	99	-.05	.01	.00	-.09	-.13	.07	-.04	.81	1						
10. Aggressive with peers Wave 3	1.11	0.19	94	-.26**	.22	-.14	-.16	-.10	.12	-.06	.50	.54**	1					
11. Anxious-Fearful Wave 1	1.23	0.33	102	-.22*	.10	-.12	.02	.15	-.18	-.26	-.06	-.03	.22*	1				
12. Anxious-Fearful Wave 2	1.30	0.39	99	-.21*	-.01	-.08	-.08	.17	-.18	-.26	-.10	-.09	.28*	.67**	1			
13. Anxious-Fearful Wave 3	1.27	0.35	94	-.16	.11	-.08	-.04	.13	-.20	-.35	-.04	-.10	.18	.62**	.65**	1		
14. Age	5.18	0.30	115	.02	.09	.07	.05	.12	-.12	-.09	.09	-.06	.07	.04	.05	-.01	1	
15. SES	4.37	1.13	83	.08	.29*	-.14	.09	-.14	.12	.21	-.14	-.27*	-.07	-.01	.08	.16	.06	1

Note. * $p < .05$, ** $p < .01$ (2-tailed).

Table 2

Multilevel Latent Growth Curve Models regarding the effect of Peer Acceptance, Individual- and Class-level Teacher-Child Interactions on Aggressive and Anxious-Fearful Behavior (N = 237)

Parameter	Model 1: Aggression		Model 2: Anxious-Fearful	
	B	*SE*	*B*	*SE*
Intercept	0.727	0.518	1.446*	0.576
Peer acceptance	-0.089	0.109	-0.065	0.136
Individual Positivity	-0.080	0.152	-0.091	0.143
Individual Negativity	0.312**	0.119	-0.011	0.104
Individual Teacher sensitivity	0.111	0.140	0.218	0.157
Class-level Positivity	0.865	0.516	0.614	0.602
Class-level Negativity	0.329	0.503	-0.043	0.547
Class-level Teacher sensitivity	-0.257	0.428	-1.126**	0.361
Sex	-0.269*	0.111	-0.116	0.096
Age	0.152	0.112	-0.046	0.098
SES	-0.134	0.111	0.087	0.100
Slope	-0.170	0.242	0.152	0.272
Peer acceptance	-0.453	0.812	-0.714	47.913
Individual Positivity	0.344	0.991	0.356	46.248
Individual Negativity	-0.015	0.426	-0.406	29.993
Individual Teacher sensitivity	-0.092	0.375	-0.987	61.803
Class-level Positivity	0.212	0.613	0.290	0.707
Class-level Negativity	0.122	0.561	0.210	0.750
Class-level Teacher sensitivity	-0.139	0.422	-0.357	0.519
Sex	0.164	0.489	0.858	59.462

Age	0.097	0.460	-0.382	18.352
SES	0.294	0.598	0.456	29.130
Deviance	-14.870		170.08	
Parameters	29		29	

Note. * $p < .05$, ** $p < .01$, ***$p < .001$.