

Developmental Trajectories of Children's Behavioral Engagement in Late Elementary School:  
Both Teachers and Peers Matter

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### Abstract

The present longitudinal study examined how relationships with teachers and peers jointly shape the development of children's behavioral engagement in late elementary school. A sample of 586 children (46% boys,  $M_{\text{age}} = 9.26$  years at Wave 1) was followed throughout Grades 4, 5, and 6. A multidimensional approach was adopted, distinguishing support and conflict as teacher-child relationship dimensions, and acceptance and popularity as peer relationship dimensions. Additive, moderation and mediation models were tested. Latent growth curve modeling showed evidence for an additive model in which high initial and increasing levels of teacher support and high initial levels of peer acceptance independently reduce the normative declines in children's behavioral engagement. This implies that targeting only one relationship in intervention cannot compensate for negative aspects of the other relationship. Teacher conflict only predicted initial levels of behavioral engagement, whereas peer popularity did not predict behavioral engagement (not even in a subsample of children with relatively high levels of relational or physical aggression). However, cross-lagged panel mediation analyses revealed that children who were perceived as more popular in Grade 5 were less engaged in school in Grade 6. Practical implications of these findings are discussed.

*Keywords:* school engagement, peer popularity, peer acceptance, teacher-child relationships, peer-child relationships

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Both Teachers and Peers Matter

Ever since Finn (1989) specified the concept of school engagement, it has drawn interest from numerous researchers in education and psychology (Fredericks, Blumenfeld, & Paris, 2004). School engagement has been defined as a multidimensional construct composed of behavioral engagement (i.e., the extent to which children participate in learning activities and nonacademic activities in school, attend school, and display positive conduct), emotional engagement (i.e., the extent to which children feel connected at school and identify with school) and cognitive engagement (i.e., the extent to which children regulate their own learning and use meta-cognitive learning strategies) (Fredericks et al., 2004).

The present study focuses on behavioral engagement in upper elementary school. The increased importance of peers in this age group raises the question how teacher-child and peer relationships jointly impact children's behavioral engagement. Previous research has defined behavioral engagement in various ways ranging from definitions that solely focus on participation in academics by means of effort, concentration, and asking questions (Birch & Ladd, 1997) to more broad definitions that also include positive conduct (e.g., following classroom rules) and participation in school-related extra-curricular activities (Wang & Eccles, 2011). Behavioral engagement as measured in the present study comprises the aspects on-task behavior, homework attitude, and concentration in the classroom. It has been shown that children's lack of behavioral engagement is associated with increased academic failure in elementary, middle, and high school, respectively (e.g., Connell & Wellborn, 1991; Connell, Spencer, & Aber, 1994; Finn & Rock, 1997; Johnson, McGue, & Iacono, 2006). These associations with achievement were found using both child reports (e.g., Marks, 2000; Wonglorsaichona et al., 2014) and teacher reports of behavioral engagement (e.g., Alexander, Entwisle, & Horsey, 1997). More recently, negative developmental pathways of child-

reported behavioral engagement have also been linked with increased internalizing (e.g., depression) and externalizing (e.g., delinquency, drug abuse) problem behaviors in adolescence (e.g., Li & Lerner, 2011).

When exploring the antecedents of behavioral engagement (Fredericks et al., 2004), researchers have often relied on ecological approaches to human development as a guiding framework, such as Bronfenbrenner's bio-ecological model (Bronfenbrenner & Morris, 2006). These approaches consider development as a result of dynamic processes embedded in multilevel interactions between persons and contexts over time. Many researchers have focused specifically on the *proximal* relationships between children and key social partners in their immediate context (i.e., the micro-system). These relationships are assumed to be bidirectional in nature, and to constitute the 'engine' of development and individual differences in child adjustment (Bronfenbrenner & Morris, 2006). The present study focuses on two proximal relationships within the school context, that is, teacher-child and peer relationships. More specifically, our focus lies on teacher-child support, teacher-child conflict, peer acceptance and popularity as determinants of behavioral engagement. Previous research has rarely considered the simultaneous effects of both types of classroom-based social relationships on behavioral engagement. Moreover, despite the finding that behavioral engagement seems to decline throughout elementary and secondary school (e.g., Li & Lerner, 2011), previous research has rarely investigated how teacher-child relationships and peer relationships might buffer or exacerbate these normative declines (Fredericks et al., 2004). Our study examines the simultaneous effects of the affective quality of teacher-child relationships and peer relationships on children's behavioral engagement in upper elementary school. Both initial levels and developmental trajectories will be considered for all the variables involved.

### **Affective Teacher-Child Relationship as a Precursor of Behavioral Engagement**

In recent years, empirical research has demonstrated the importance of affective teacher-child relationships for children's school adjustment. A meta-analysis by Roorda, Koomen, Spilt, and Oort (2011) examined associations of both positive (e.g., closeness) and negative (e.g., conflict) aspects of affective teacher-child relationships, mostly teacher rated, with an overall measure of school engagement (including behavioral engagement) in a sample of 99 studies. The study revealed that school engagement related positively with positive aspects of teacher-child relationships and negatively with negative aspects of teacher-child relationships from preschool to high school. With regard to behavioral engagement in particular, positive aspects of child-reported affective teacher-child relationships, such as teacher-child support and caring, have been related to higher participation in learning and higher on-task behavior in elementary school (Battistich, Solomon, Watson, & Schaps, 1997). These results are in line with the assumption that children who feel supported by their teacher tend to comply more easily with the teacher's expectations, which, in turn, reduces their involvement in off-task and deviant behaviors (Birch & Ladd, 1997). Relying on attachment theory, it is assumed that if children experience support and affection in the relationship with their teacher, they feel more emotionally secure in the classroom and are more able to cope with stress, which may enhance their behavioral engagement (Verschueren and Koomen, 2012).

Most of these previous studies have been cross-sectional. However, Hughes and colleagues (2008) found significant effects of teacher-reported teacher-child relationship quality on children's subsequent effortful engagement (a subtype of behavioral engagement) in a cross-lagged design. In addition, Wang and Eccles (2012) conducted a latent growth study in middle school and high school and found that teacher social support (as reported by the teacher) played a role in reducing the normative declines in behavioral engagement.

The present study adds to this prior research by including both a positive (i.e., support) and a negative (i.e., conflict) aspect of the teacher-child relationship simultaneously as precursors of children's behavioral engagement in a longitudinal framework. By adopting a multidimensional approach, we take into account multiple aspects of children's interpersonal relationships with their teachers and contribute to a more differentiated knowledge base of teachers' affective role in shaping children's behavioral engagement.

### **Peer Relationships as a Precursor of Behavioral Engagement**

Compared to teacher-child relationships, peer relationships have received less attention from researchers in relation to behavioral engagement (Gest, Rulison, Davidson, Welsh, & Domitrovich, 2008). Moreover, past research on engagement has mainly focused on one dimension of peer relationships, namely peer acceptance. Peer acceptance refers to perceptions of likeability of a child by his or her peer group (Waas, 2006) and is generally assessed by sociometric nominations or ratings, probing peers' liking and disliking of their classmates (Cillessen, 2009). Hence, peer acceptance describes an individual child's place within the larger peer group on a likeability dimension (Gifford-Smith & Brownell, 2003). Researchers have found that children who are accepted by their peers display higher behavioral engagement in lower elementary school, middle school, and high school, respectively (e.g., French & Conrad, 2001; Ladd, Birch, & Buhs, 1999; Ladd, Kochenderfer, & Coleman, 1997; Wang & Eccles, 2012). These results are in line with the assumption that social acceptance fulfills children's need for relatedness and inclusion, which, in turn, helps them to engage in learning activities (e.g., Buhs, Ladd, & Herald, 2006). Most research on peer acceptance and behavioral engagement has been conducted in a cross-sectional framework. Exceptions are a study by Ladd, Herald-Brown and Reiser (2008), who found that children's peer acceptance in kindergarten predicted increases in classroom participation (an aspect of behavioral engagement) throughout elementary school, and a study by Wang and

Eccles (2012), who found that peer acceptance predicted less steep declines in school engagement throughout middle and high school. In line with this scarce prior research, the present study includes peer acceptance as a precursor of children's developmental trajectories of behavioral engagement in upper elementary school. Moreover, whereas Wang and Eccles (2012) used children's self-reported peer acceptance, our study uses peer perceptions, which is regarded as the most valid and efficient approach to assess a child's level of acceptance within the peer group (Rubin, Bukowski, & Parker, 2006).

Whereas recent research highlighted the linkage of behavioral engagement with peer acceptance, the role of other important peer relationship dimensions for behavioral engagement is less well understood. Recently, developmental psychologists have become interested in another aspect of peer relationships, namely popularity as a function of social visibility or social prominence in the peer group (i.e., peer popularity) (Cillessen, Schwartz, & Mayeux, 2011). Peer popularity is generally assessed by sociometric nominations probing peers' perceptions of their classmates' popularity (Cillessen, 2009). Peer popularity and acceptance are distinct dimensions of peer relationship quality (Parkhurst & Hopmeyer, 1998). Children perceived as 'popular' by their peers are not necessarily accepted or well-liked, presumably because both types of popularity are associated with different child behaviors. Whereas accepted children, on average, display high levels of prosocial, helpful, and cooperative behavior and low levels of aggression (Asher & Coie, 1990; Rubin et al., 2006), associations between peer popularity and child behavior are less clear. Research suggests that peer popularity is associated with prosocial behavior, but also with arrogance, social dominance (Parkhurst & Hopmeyer, 1998), as well as physical and relational aggression (e.g., Vaillancourt, Hymel, & McDougall, 2003). Based on the behavioral heterogeneity within the group of popular children, some researchers have distinguished two subgroups of popular children: (a) below-average aggressive popular children, who often

display cooperative, kind, and assertive behavior, and (b) above-average aggressive popular children, who often display instrumental relationally and/or physically aggressive behavior (e.g., Troop-Gordon, Visconti, & Kuntz, 2011). From middle childhood on, peer popularity becomes more important compared to peer acceptance (LaFontana & Cillessen, 2010). Children want to be more like their popular peers as opposed to being like their accepted peers (Adler & Adler, 1998), as popular children are often powerful, are well known in school, and have social central positions.

Despite prior research on the distinction between acceptance and popularity and several associated child behaviors, no study has investigated associations between peer popularity and behavioral engagement. Yet, high peer popularity in 10<sup>th</sup> grade has been associated with other academic outcomes which are related with a lack of engagement, such as increased absenteeism, low achievement, and disobedience in school (Gorman, Kim, & Schimmelbusch, 2002). Despite the behavioral heterogeneity within the group of popular children, the study of Gorman and colleagues (2002) did not differentiate between subgroups of more and less aggressive popular children. Schwarz and Gorman (2011) postulate that the associations between peer popularity and academic difficulties only hold for popular children who are also concurrently aggressive. In line with this assumption, research has found that more aggressive popular children in elementary school tend to have less favorable attitudes toward school (Lease, Kennedy, & Axelrod, 2002) and tend to show lower academic achievement (Rodkin, Farmer, Pearl, & Van Acker, 2000) than less aggressive popular children. These results seem to suggest that the associations between popularity and academic difficulties found in earlier research might be due to a subgroup of aggressive popular children.

The current study is the first to simultaneously consider peer acceptance and popularity as predictors of behavioral engagement. Moreover, levels of children's physical and relational



aggression are included to investigate whether more popularity relates to less behavioral engagement, but especially for children with high levels of aggression.

### **Bridging the Two Lines of Research**

Although affective teacher-child relationships and peer acceptance have been linked with children's behavioral engagement, both lines of research have evolved largely independently. To our knowledge, only one longitudinal study that investigated engagement has included dimensions of both teacher-child and peer relationships in its design. Wang and Eccles (2012) examined the simultaneous effects of teacher-child support and peer acceptance on trajectories of school engagement from Grade 7 to 11. They found support for an additive model in which teacher-child support and, to a lesser extent, peer acceptance related independently to less steep declines in school engagement.

In line with this study, the present study includes teacher-child support and peer acceptance simultaneously. In addition, we include teacher-child conflict and peer popularity, which allows us to compare how these different aspects of teacher-child and peer relationships relate to changes in behavioral engagement. In line with previous research examining other child outcomes (e.g., Brendgen, Wanner, & Vitaro, 2006; Leflot, van Lier, Verschueren, Onghena, & Colpin, 2011; Mercer & DeRosier, 2008; Verschueren, Doumen, & Buyse, 2012), not only an additive model will be tested, but also a moderated, indirect effects model, and a mediated, indirect effects model.

Moderated indirect effects models will reveal whether the effects of one social relationship on trajectories of behavioral school engagement are enhanced or buffered by the other social relationship. Based on theoretical considerations, previous research on school engagement by Wang and Eccles (2012) has tested for moderation effects in addition to additive effects but did not find evidence for moderation effects. In line with recent theoretical

and empirical work on the buffering role of supportive teacher-child relationships and the exacerbating effects of negative, conflicted teacher-child relationships (e.g., Sabol & Pianta, 2012) we may expect that positive teacher-child relationships predict more behavioral engagement and negative teacher-child relationships predict less behavioral engagement, especially for children who are also less accepted by their classmates.

Mediated, indirect effects models will reveal whether one social relationship shapes the other, and whether this in turn affects children's behavioral engagement (i.e., temporal relationships between predictor, mediator, and outcome). The mediation models including peer acceptance can be linked to prior research and theorizing. For the latter part of these models - indicating direct effects of peer acceptance or teacher support/conflict on engagement - there is evidence as cited above. In addition, there is also evidence and theorizing supporting the first part of these mediation models, namely that both acceptance and teacher-child relationships may impact one another over time (e.g., De Laet et al., 2014; Farmer et al., 2011; Hughes & Chen, 2011). The mediation models including peer popularity are more exploratory in nature due to the lack of a strong prior research base. Regarding the latter part of these models, some studies found negative associations between peer popularity and academic outcomes, but no studies included behavioral engagement as such. Regarding the first part of the models, we may expect that peer popularity relates to more negative teacher-child relationships and vice versa (see De Laet et al., 2014; Hawley, 1999).

### **Current Study Goals and Hypotheses**

In sum, the present study is a three-wave longitudinal study that includes developmental trajectories of behavioral engagement, but also trajectories of teacher-child support, teacher-child conflict, peer acceptance, and peer popularity. In this way, we will be able to investigate the normative development of our study variables and examine the extent

to which initial levels and changes in teacher-child and peer relationships predict changes in children's behavioral engagement. Trajectories are investigated throughout upper elementary school.

Regarding *peer relationships*, we expected to find positive associations between peer acceptance and behavioral engagement. Negative associations between peer popularity and behavioral engagement are expected, but especially for more aggressive popular children. Regarding *teacher-child relationships*, we expected to find positive associations between teacher-child support and behavioral engagement, and negative associations between teacher-child conflict and behavioral engagement. Regarding the *relative effects* of peer relationships and teacher-child relationships, it has been found that throughout elementary school, children increase their reliance on peers for social support (e.g., Cole, Maxwell, & Martin, 1997; Wentzel, 2009) and experience decreases in teacher-child closeness (Jerome, Hamre, & Pianta, 2009). Although these mean level changes do not necessarily imply changes in the associations with behavioral engagement, these findings do suggest that support from teachers may play a less important role in older children's psychological world. Hence, we expect stronger associations between behavioral engagement and peer relationships than teacher-child relationships.

We investigated three alternative models of influence: (a) an independent effects model, in which both types of relationships add unique variance to behavioral engagement, (b) a mediated, indirect effects model, in which one social relationship shapes the other, which in turn affects behavioral engagement, and (c) a moderated, indirect effects model, in which the effects of one social relationship on behavioral engagement are enhanced or buffered by the other social relationship. As the available research on these models is scarce, one cannot reliably compare the respective evidence for these proposed modes of influence.

Two additional goals were to explore the role of gender and to investigate the normative development of our study variables. Regarding the normative development of our study variables, we expected a decline in behavioral engagement (e.g., Fredericks et al., 2004; Wang & Eccles, 2012), a decline in teacher-child support (e.g., Jerome et al., 2009), an increase in teacher-child conflict (e.g., Furrer & Skinner, 2003), and stability in peer acceptance and peer popularity (Mayeux, Houser, & Dyches, 2011). Regarding gender, we expected to find mean level differences on our study variables. Boys were expected to be less engaged in school (e.g., Li & Lerner, 2011; Skinner, Kindermann & Furrer, 2009), to experience more conflict (e.g., Koepke & Harkins, 2008) and less support with their teacher, and to be less accepted by their classmates compared to girls. We did not have clear expectations regarding gender differences in the cross-time associations between teacher-child and peer relationships and behavioral engagement. Two contradicting theoretical perspectives have been put forward in this regard. First, according to the gender role socialization perspective, we might expect stronger associations between classroom social relationships and behavioral engagement for girls compared to boys. This perspective suggests that girls may benefit more from positive, supportive relationships and suffer more from conflicted social relationships compared to boys because support-related behaviors such as intimacy and affiliation are more expected for girls (Maccoby, 1998), whereas conflict-related behaviors are generally less accepted for girls (Ewing & Taylor, 2009). Contrary, according to the academic risk perspective we might expect stronger associations between classroom social relationships and behavioral engagement for boys compared to girls because boys are at greater risk of school failure than girls (Hamre & Pianta, 2001). Some studies provide support for the gender role socialization perspective (e.g., Brendgen, Wanner, Vitaro, Bukowski, & Tremblay, 2007), whereas other studies find support for the academic risk perspective (e.g.,

Hamre & Pianta, 2001), and yet other studies report no gender effects (e.g., Wang & Eccles, 2012).

## Method

### Participants and Procedure

A total number of 736 children from 32 classes across 24 elementary schools participated in the study with 79% participating children per classroom on average. According to Cillessen and Marks (2011), participation rates of at least 60 to 70% are recommended to obtain reliable peer nomination data. All schools were located in the Flemish community of Belgium. The children were followed from Grade 4 to Grade 6. They stayed in the same school without a transition to middle school and were educated by one teacher per year. Active parental permission was requested each year. Approval for the procedures for this study was obtained from the Institutional Review Board of the University of Leuven. Child reports of teacher-child relationship quality and behavioral engagement, and peer reports of acceptance, popularity, physical and relational aggression were gathered annually in group during regular classes under supervision of graduate students in psychology. Eighty-five percent of the teachers ( $M_{\text{age}} = 38.24$ ) were female.

For 150 children, questionnaire data were missing on two out of three data waves. These children had only one wave of data and were therefore dropped from the study (further called dropout group). Dropout was mainly due to missing parental permission and changing schools. The dropout group was left out of the study, which resulted in a final longitudinal study sample of 586 children who participated in at least two waves. The children from the drop out group did not differ significantly from our study sample regarding gender,  $t(636) = -.27, ns$ , and two main study variables (i.e., teacher-child support,  $t(434) = -.25, ns$ , teacher-child conflict,  $t(434) = 1.65, ns$ ). Children in the drop out group were generally older,  $t(435) =$

2.69,  $p < .01$ ,  $d = .26$  and generally scored lower for peer acceptance,  $t(425) = -4.00$ ,  $p < .001$ ,  $d = .39$ , peer popularity,  $t(570) = -2.00$ ,  $p < .05$ ,  $d = .17$ , behavioral engagement,  $t(431) = -2.82$ ,  $p < .01$ ,  $d = .27$ , and higher for physical aggression,  $t(563) = 2.55$ ,  $p < .05$ ,  $d = .21$  in Grade 4 than children in our study sample. Effect sizes were generally small (i.e.,  $d < .30$ ) (Cohen, 1988). The mean age of the children in our study sample was 9.26 years ( $SD = .52$ ) at Time 1, 47.1% were boys ( $N = 276$ ).

Sixty-four percent of the parents provided background information. For 87% of the children, at least one parent had the Belgian nationality. Of the families 85% were intact, 10% were single parent families, and 4% were stepfamilies. Most parents completed higher education (67% of mothers, 56% of fathers). The remaining parents finished (some years of) high school (30% of mothers, 31% of fathers) or completed primary school (7 mothers or 0.02%, 8 fathers or 0.02%).

## Measures

**Behavioral Engagement.** Behavioral engagement was assessed by means of the Dutch School Questionnaire (SchoolVragenLijst, SVL, Smits & Vorst, 1990), which has been shown to be both reliable and valid in prior research (Evers et al., 2009). We used the motivation scale which comprises three dimensions of behavioral engagement: on-task behavior (8 items; e.g., “I hate to work hard for school”,  $\alpha = .76-.78$ ), homework attitude (8 items; e.g., “I mostly start doing my homework without being asked”,  $\alpha = .80-.82$ ) and attention in the classroom (8 items; e.g., “I am easily distracted in the classroom”,  $\alpha = .77-.78$ ). Children were asked to respond to the items on a 5-point Likert-type scale ranging from 1 (*almost never*) to 5 (*almost always*). We conducted a second-order CFA in which all items loaded on the three subscales and the subscales loaded on the second-order factor Behavioral Engagement. We ran this CFA for each wave (CFI = .89 - .92; SRMR = .06 - .05; RMSEA =

.05 - .05). CFI values  $\geq .90$  are considered indicative of acceptable fit and CFI values  $\geq .95$  of good fit. SRMR values  $\leq .08$  are indicative of good model fit. RMSEA values  $\leq .06$  are considered indicative of good fit,  $\leq .08$  of fair fit, between .08 and .10 of mediocre fit and  $> .10$  of poor fit (Hu & Bentler, 1999). Thus, the model in which the dimensions of 'on task behavior', 'homework attitude' and 'attention in the classroom' all load on one second-order construct 'behavioral engagement' fitted the data adequately, which justified the use of the scale Behavioral Engagement in our analyses (19 items,  $\alpha = .77-.81$ ).

**Teacher-Child Support and Conflict.** Teacher-child relationship quality was assessed by means of the Child Relationship Questionnaire – Revised (Hughes & Villarreal, 2008; Huges, 2011). The questionnaire consists of 22 items selected from Furman and Buhrmester's (1985) Network of Relationships Inventory (NRI). Evidence of convergent and discriminant validity has been reported (Li, Hughes, Kwok, & Hsu, 2012). Children were asked to respond to the items on a 5-point Likert-type scale ranging from 1 (*almost never*) to 5 (*almost always*). We used the global Support scale which consists of six forms of social support (i.e., affection, admiration, intimacy, satisfaction, nurturance, and reliable alliance). One item was dropped because of its low item-total correlation (Field, 2005). The final Social Support scale consisted of 15 items (e.g., "How much does your teacher really care about you?", "How much does your teacher treat you like you are good at many things?";  $\alpha = .90-.92$ ). Additionally, the Conflict scale was used, which consists of 6 items (e.g., "How much do you and your teacher argue with each other?", "How much does your teacher punish you? ";  $\alpha = .83-.88$ ).

**Peer acceptance.** To obtain measures of peer acceptance, peer ratings were used (Putallaz, 1983). Each participating child rated how much he or she liked to play with each participating classmate on a 5-point Likert scale of likeability ranging from 1 (*dislike very much*) to 5 (*like very much*). The mean rating received across participating classmates was

used to obtain an individual child's level of peer acceptance within the group. As stated by Rubin and colleagues (2006), this rating procedure provides a detailed and valid measure of peer acceptance as it allows children to evaluate every member of their peer group and allows them to report their degree of liking or disliking. Acceptance scores in our sample ranged from 1.00 to 5.00.

**Peer Popularity.** To obtain measures of peer popularity, we used peer nominations on the item "*Who is most popular in your class?*" (Cillessen, Schwartz, & Mayeux, 2011). Each participating child received an alphabetic list of names of all class members preceded by a number. Children were asked to write down the numbers of the classmates who best fitted the description and were not allowed to nominate themselves. An unlimited number of nominations could be given. The number of nominations each participating child received was counted. Next, proportion scores were calculated by dividing the number of nominations each child received by the number of nominators in the classroom (e.g., Chang, 2004). Popularity scores in this study ranged from 0.00 to 0.86.

**Physical and Relational Aggression.** To obtain these measures, we used peer nominations from Wave 1 on the items "*Who hits, kicks or pushes other children at school?*" and "*Who tries to make classmates not being liked by others by spreading rumors about them or talking behind their backs?*" (e.g., Sturaro, van Lier, Cuijpers, & Koot, 2011). The number of nominations each participating child received was counted and standardized within classrooms. Based on prior research (e.g., Bellanti et al., 2000; Leflot, van Lier, Onghena, & Colpin, 2013), we assigned children with a physical (or relational) aggression score of 1 standard deviation above the mean to the high physical (or relational) aggression group (dummy coded as 1). All other children were assigned to the low/moderate physical (or relational) aggression group (dummy coded 0). This resulted into 73 and 513 children being assigned to the high physical aggression group and low/moderate physical aggression group,



respectively. The high versus low/moderate relational aggression groups consisted of 100 and 486 children, respectively<sup>1</sup>.

### Statistical Analyses

Three alternative models were tested: (a) an independent effects model, (b) a moderated, indirect effects model, and (c) a mediated, indirect effects model.

(a) An independent effects model will reveal how initial levels and trajectories of teacher-child and peer relationships add unique variance to initial levels and trajectories of behavioral engagement throughout late childhood. To examine this model, latent growth curve analysis (Duncan, Duncan, & Strycker, 2006) was conducted. First, an unconditional growth model for behavioral engagement with an intercept (i.e., the initial level) and a linear slope (i.e., the rate of change) was fitted. Because there were only three time points, non-linear change was not estimated. The variability in the intercept and linear slope was also modeled. Second, an independent effects model was fitted with teacher-child support, teacher-child conflict, peer acceptance, and peer popularity as time-varying predictors of initial levels and longitudinal change in behavioral engagement. In addition, to control for relevant child behaviors, we added children's baseline levels of physical and relational aggression as predictors of initial levels and slopes of teacher-child support, teacher-child conflict, peer acceptance, peer popularity, and behavioral engagement. Third, the model was trimmed by removing the non-significant paths to obtain the most parsimonious model (Bentler & Mooijaart, 1989).

(b) To examine whether the effects of one social relationship on trajectories of behavioral school engagement are enhanced or buffered by the other social relationship, several moderated, indirect effects models were tested within the framework of latent growth

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<sup>1</sup> We also used an alternative way to split up our sample by assigning the 33% highest scoring children to the 'high aggression' group but this approach yielded the same results.

curve analysis (Duncan, et al., 2006). We created four interaction terms between the *intercepts* of the predictors and four interaction terms between the *slopes* of the predictors (i.e., teacher-child support x peer acceptance, teacher-child support x peer popularity, teacher-child conflict x peer acceptance, teacher-child conflict x peer popularity,) and added them, in turn, to the independent effects model (Li, Duncan, & Acock, 2000). With the slope interactions, we were able to examine the extent to which the changes in teacher-child and peer relationships jointly predicted changes in behavioral engagement. Improvement in model fit was assessed with the S-B $\chi^2$  difference test (Satorra & Bentler, 2001). An interaction term was retained when the term was significant and the overall model fit was improved (significant S-B $\chi^2$  difference test).

(c) To test whether one social relationship shapes the other, which in turn affects children's behavioral engagement (i.e., temporal relationships between predictor, mediator, and outcome), we followed the recommendations by von Soest and Hagtvet (2011). They suggested cross-lagged panel mediation modelling to test for mediated effects in longitudinal designs with fewer than five time points. Figure 1 depicts the conceptual model of these mediation models with an independent variable X, a mediator M, and an outcome Y occurring in sequential time points. A particular path of influence for mediation was imposed so that the direction of causal flow begins with X, extends to M, and ends with Y. All constructs are only affected by constructs that are measured one wave earlier with the exception of the outcome Y in Wave 3 that is predicted by predictor X measured at Wave 1. In this way, the *direct* effect from X to Y and the *indirect* effect from X to Y through M are modeled. We tested eight different mediation models by switching the function of teacher-child conflict, teacher-child support, peer popularity, and peer acceptance as independent variable or mediator (e.g., less peer acceptance in Grade 4 (X) predicts less behavioral engagement in Grade 6 (Y) through more teacher-child conflict in Grade 5 (M)).

An additional aim was to test whether the paths of peer popularity to behavioral engagement differ between subgroups of high vs. moderate/low physical and relational aggressive children. To this end, multi-group analyses were conducted. Group differences were tested by comparing a constrained model (in which a path was set to be equal across two groups) with an unconstrained model (in which this path was allowed to vary across two groups). We used the  $\Delta S-B\chi^2$  (Satorra & Bentler, 2001) to compare the fit of the constrained versus unconstrained model. A significant  $\Delta S-B\chi^2$  indicates subgroup differences in the path of interest. A similar approach was used to test for gender differences. We conducted an omnibus multi-group analysis and more stringent analyses by testing for gender differences for each path separately.

Mplus version 6 (Muthén & Muthén, 1998-2010) was used to conduct the analyses. To take into account the nesting of children in classes, we used the “complex analysis” feature, which adjusts the standard errors of the estimated path coefficients for clustering (Williams, 2000). In case data from one out of the three waves were missing, we used the full information maximum likelihood (FIML) algorithm recommended by Jelicic, Phelps, and Lerner (2009) to address this missingness. To take into account the non-normality of peer popularity (skewness range 1.64 – 1.86), we used maximum likelihood estimation with robust standard errors (MLR). The fit of each model was evaluated by means of the robust Satorra-Bentler scaled chi-square statistic (S-B  $\chi^2$ ; Satorra & Bentler, 2001), the Standardized Root Mean Square Residual (SRMR), the average Comparative Fit Index (CFI; Hu & Bentler, 1999), and the Root Mean Square Error of Approximation (RMSEA; Steiger, 1990). Generally, S-B  $\chi^2$  values as small as possible are considered indicative of good fit (Kline, 2005). CFI values  $\geq .90$  are considered indicative of acceptable fit and CFI values  $\geq .95$  of good fit. SRMR values  $\leq .08$  are indicative of good model fit. RMSEA values  $\leq .06$  are

considered indicative of good fit,  $\leq .08$  of fair fit, between  $.08$  and  $.10$  of mediocre fit and  $> .10$  of poor fit (Hu & Bentler, 1999).

## Results

### Correlations, Means, and Standard Deviations

Correlations among the study variables are reported in Table 1. The correlations indicated cross-year stability of individual differences in peer acceptance ( $r_s = .63 - .71$ ) and peer popularity ( $r_s = .53 - .70$ ). Teacher-child support ( $r_s = .21 - .47$ ), teacher-child conflict ( $r_s = .42 - .53$ ), and behavioral engagement ( $r_s = .50 - .62$ ) were less stable (small to medium correlations; Cohen, 1988). Significant concurrent and longitudinal correlations were found in which behavioral engagement was positively associated with peer acceptance and teacher-child support, and negatively associated with peer popularity and teacher-child conflict. Physical and relational aggression were moderately positively correlated and were negatively associated with peer acceptance, teacher-child support (in Grade 6) and behavioral engagement, and positively associated with peer popularity and teacher-child conflict.

Table 2 represents means and standard deviations of the study variables at the three measurement waves for girls ( $N = 310$ ) and boys ( $N = 276$ ). Significant gender differences were found. Compared to girls, boys had significantly higher mean levels of conflict with their teacher at each measurement wave (Grade 4  $t(434) = 5.65, p < .001$ ; Grade 5  $t(420) = 2.94, p < .01$ ; Grade 6  $t(460) = 4.69, p < .001$ ). Girls were, on average, more accepted by their classmates than boys in Grade 5 ( $t(519) = -3.84, p < .001$ ) and Grade 6 ( $t(549) = -2.40, p < .001$ ). Boys had significantly lower levels of behavioral engagement in Grade 4 ( $t(414) = -2.44, p < .05$ ), compared to girls. Boys were, on average, more physically aggressive than girls in Grade 4 ( $t(540) = 9.75, p < .001$ ) whereas girls were, on average, more relationally aggressive than boys ( $t(540) = -5.22, p < .001$ ).

### Latent Growth Curve Analysis

The unconditional growth model for behavioral engagement with an intercept (i.e., the initial level) and a linear slope (i.e., the rate of change) had good model fit, CFI = 1.00; RMSEA = .00; SRMR = .01; S-B  $\chi^2$  (1) = 0.98,  $p > .05$ . The variability in the intercept and trajectory shape was also modeled. Both the intercept ( $M = 3.79$ ,  $p < .001$ ) and the slope ( $M = -.13$ ,  $p < .001$ ) differed from zero and had significant variability (for intercept,  $Var = .30$ ,  $p < .001$ , for slope,  $Var = .06$ ,  $p < .001$ ). Slope and intercept were negatively correlated ( $r = -.63$ ), indicating that children with higher initial levels of behavioral school engagement generally have more negative slopes.

The *independent effects model* (a), includes teacher-child support, teacher-child conflict, peer acceptance, and peer popularity as time-varying predictors of initial levels and longitudinal change in behavioral engagement. In addition, to control for relevant child behaviors, baseline levels of children's physical and relational aggression were added as predictors of initial levels and slopes of teacher-child support, teacher-child conflict, peer acceptance, peer popularity, and behavioral engagement. The independent effects model had good model fit, CFI = .934; RMSEA = .060; SRMR = .041; S-B  $\chi^2$  (59) = 188.467,  $p < .00$ , and is presented in Figure 2.

The intercepts of all predictors differed significantly from zero and showed significant variability. The slopes of peer acceptance and peer popularity did not differ significantly from zero, indicating a lack of linear change on average (i.e., cross-wave stability). Yet, there was significant variability in the slope of peer acceptance, indicating that some children's acceptance in the peer group is more stable than that of other children. The slopes of peer popularity and teacher-child conflict did not show significant variability.

The initial level of children's behavioral engagement was positively predicted by initial levels of teacher-child support and negatively predicted by initial levels of teacher-child conflict. The slope of behavioral engagement was positively predicted by the initial level and slope of teacher-child support and by the initial level of peer acceptance. Hence, children who experienced more teacher-child support in Grade 4 or who experienced increasing levels of teacher support from Grades 4 to 6 generally showed less steep declines in behavioral engagement. In addition, being more liked by classroom peers in Grade 4 predicted less steep declines in behavioral engagement. Teacher conflict predicted initial levels but not the slope of behavioral engagement. Neither the intercept nor the slope of peer popularity predicted behavioral engagement. These results did not differ between subgroups of low/moderate and high physically and relationally aggressive children. The trimmed model, in which the non-significant paths were removed, had equally good model fit, CFI = .947; RMSEA = .054; SRMR = .040; S-B  $\chi^2$  (66) = 177.493,  $p < .001$ .

Regarding gender, multi-group analyses indicated no significant gender differences in the independent effects model,  $\Delta$  S-B  $\chi^2$  (6) = 13.49, *ns*. More stringent analyses were also conducted by testing for gender differences on each cross-lagged path separately, but none of these tests were significant.

Additional significant effects were found of aggression on several initial levels and slopes of our study variables. More physical aggression predicted less initial teacher-child support (-.17\*), more initial teacher-child conflict (.52\*\*), less initial peer acceptance (-.38\*\*\*), more initial peer popularity (.12\*), and a more negative slope of behavioral engagement (-.41\*). The same pattern of effects was found for relational aggression.

To examine *moderated, indirect effects* (b), four interaction terms between the intercepts and four interaction terms between the slopes of teacher-child support, teacher-

child conflict, peer acceptance, and peer popularity were added one by one to the independent effects model. None of the interactions terms was significant and the fit of the independent effects model dropped significantly each time an interaction term was added (CFI = .48 - .67).

### **Cross-Lagged Panel Mediation Analysis**

To examine *mediated, indirect effects* (c), cross-lagged panel mediation analysis was used. As recommended by Fairchild and McQuillin (2010), we present the overall model fit and relevant path estimates (including indirect effect estimates) of the eight mediation models that were tested (Table 3). Model fit of the different models was adequate (e.g., CFI = .94 - .97). None of the models showed a significant indirect effect. Hence, no mediation effects were found within the framework of cross-lagged panel mediation modeling. However, we did find a significant negative effect from peer popularity in Grade 5 to behavioral engagement in Grade 6 (Model 1). This effect did not differ between subgroups of low/moderate and high physically and relationally aggressive children (i.e.,  $\Delta$  S-B  $\chi^2$  (1) = 2.16, *ns*;  $\Delta$  S-B  $\chi^2$  (1) = 2.72, *ns*, respectively). In addition, we found a significant positive direct effect from peer acceptance in Grade 4 to behavioral engagement in Grade 6 (Model 7), and a significant positive effect from teacher-child support in Grade 5 to behavioral engagement in Grade 6 (Model 5).

### **Discussion**

Children's lack of behavioral engagement has been associated with increased academic failure, higher drop-out rates, and increased internalizing and externalizing problem behaviors (e.g., Li & Lerner, 2011). The main goal of this study was to examine the simultaneous effects of initial levels and changes in teacher-child support, conflict, peer acceptance, and popularity on initial levels and trajectories of behavioral engagement throughout upper elementary school. We found support for an additive model in which

teacher-child and peer relationships add unique variance to the development of behavioral engagement while taking into account the nesting of children in classrooms.

Regarding teacher-child relationships, we found that children who experienced more conflict with their teacher in Grade 4, were less engaged in school in Grade 4. In addition, children who experienced more support from their teacher in Grade 4, were not only more engaged in Grade 4, but also had less steep declines in behavioral engagement throughout Grade 6. Moreover, children with less steep declines in teacher-child support, also had less steep declines in behavioral engagement. The finding that perceived support from teachers protects children from the general decrease in behavioral school engagement throughout upper elementary school is in line with recent research by Wang and Eccles (2012), who found similar effects across Grades 7 to 11 using advisory teachers instead of classroom teachers. In addition, by including teacher-child conflict, our study revealed that teacher-child support had a more robust and prolonged effect on children's behavioral engagement in late childhood compared to teacher-child conflict. This finding seems to contradict the previous meta-analysis by Roorda and colleagues (2011) who found stronger effects for negative aspects of teacher-child relationships compared to positive aspects. However, most studies included in the meta-analysis used teachers' perspectives on teacher-child relationships, whereas our study included children's perspectives.

Above and beyond the effect of teacher-child relationships, our results indicate that peer relationships matter as well. Specifically, children who were more accepted by their classroom peers in Grade 4, had less steep declines in behavioral engagement. Hence, support from peers protects children from the general decrease in behavioral school engagement throughout upper elementary school. This confirms and extends previous findings of Wang and Eccles (2012) who used self-reports of peer acceptance instead of peer nominations. In addition, we found that whether children were perceived as popular or not in Grade 4 did not



seem to affect their initial levels or growth of behavioral engagement, not even when children had relatively high levels of relational or physical aggression. However, the cross-lagged analyses revealed that children who were perceived as more popular in Grade 5 were less engaged in school in Grade 6, even when children had low to moderate levels of relational or physical aggression. These differential results seem to be in line with previous research by Galván, Spatzier and Juvonen (2011). They found that children who were nominated as “cool” by peers (a construct related to peer popularity) were more likely to be nominated as engaged in school in Grade 4 and 5, but more likely to be nominated as disengaged in Grade 6 and 7. These results seem to suggest that only from a certain age (Grade 6 and 7) cool children tend to become less engaged in school. Hence, we may assume that because of this turning point, we did not find a main effect of peer popularity on trajectories of behavioral engagement but only an effect from Grade 5 to Grade 6. Contrary to our expectations, we did not find evidence for the moderating role of aggression in the paths of popularity on engagement (neither in the latent growth analyses nor the cross-lagged analyses). Hence, our study indicates that, in late elementary school, the negative effect of popularity on behavioral engagement is not driven by a subgroup of more aggressive popular children. This seems to suggest that there is something about peer popularity in general (aside from aggression) that relates to less engagement. Being engaged in school (e.g., doing homework, being attentive) is behavior that complies with the norms and expectations of teachers and parents, the so-called adult authority figures. However, from a certain age, complying with teachers’ and parents’ norms and expectations by overtly engaging in school may interfere with efforts to achieve status in the peer group. In other words, asking questions in class and focusing on homework may no longer be regarded as ‘cool’. The opposite behavior - not engaging in school - can be regarded as behavior that opposes the norms and expectations of authority figures. Such behaviors may help to achieve a central social position in the classroom (Galván

et al., 2001). Although this process can be mainly expected in middle and secondary school, our results suggest that it may already start at the end of elementary school.

An additional goal was to examine the normative development of our study variables throughout late elementary school. In line with previous research, we found a general decline in behavioral engagement (e.g., Fredericks et al., 2004), a decline in teacher-child support (e.g., Jerome et al., 2009), and an increase in teacher-child conflict (e.g., Furrer & Skinner, 2003). Decreasing teacher-child relationship quality may further contribute to the trend of decreasing academic engagement throughout schooling, as shown in the current study. A second additional goal was to explore gender differences in our study variables and in the statistical models. In line with prior research (e.g., Li & Lerner, 2011; Skinner, Kindermann & Furrer, 2009), boys were less engaged in school as compared with girls, but only in Grade 4. Moreover, compared with girls, boys experienced more conflict with their teacher in each grade, which is in line with previous research including teacher reports of teacher-child conflict (e.g., Koepke & Harkins, 2008). Finally, boys were less accepted by their classmates in Grades 5 and 6. Despite these mean level differences between boys and girls, no gender differences were found in the cross-time associations between classroom-based social relationships and behavioral engagement. Hence, experiencing support from teachers and being accepted by classroom peers reduces the declines in behavioral engagement throughout upper elementary school equally for both boys and girls. This finding is in line with previous longitudinal research by Wang and Eccles (2012). A meta-analysis from Roorda and colleagues (2011) showed somewhat different results. They found that associations between teacher-child support (or conflict) and behavioral engagement were stronger for boys as compared with girls and explain these gender differences from an academic risk perspective (i.e., boys are more susceptible to environmental influences such as support from teachers) (Hamre & Pianta, 2001). Several factors may explain these different results. Whereas the

meta-analysis by Roorda and colleagues (2011) included different dimensions of school engagement and samples from kindergarten to Grade 12, our specific focus lies on behavioral engagement in late childhood. Also, the studies included in the meta-analysis were mostly cross-sectional, whereas we tested for gender differences within a longitudinal framework.

### **Limitations and Future Directions**

It is important to consider some limitations when interpreting these findings. *First*, measures of behavioral engagement and teacher-child relationships were self-rated. As we might expect that children who are less engaged in school, also report less support and more conflict with their teacher, this may lead to an overestimation of the effects teacher-child relationships have on children's engagement. On the one hand, same source effects alone can hardly explain the differential effects of teacher-child support and conflict, respectively, on slopes of engagement over time. Moreover, it should be noted that research among younger children has also supported the predictive effect of teacher-child relationship quality for children's behavioral engagement, using teacher and observer reports of teacher-child relationships (Doumen et al., 2012). On the other hand, we strongly encourage future research to include other informants of teacher-child relationships and/or school engagement to test the robustness of our findings. For example, more objective indicators of engagement (e.g., attendance records, disciplinary records, and enrollment in extracurricular activities) or teacher perceptions of teacher-child relationships could be included. Yet, as child reports have been proven to have educational and clinical value as well (Hughes and colleagues, 2012), it seems that including multiple perceptions into the study design is recommended. *Second*, the present study focused on peer acceptance (i.e., an individual child's level of acceptance within the larger peer group). However, from late childhood on, peer groups become more defined and cliques emerge in children's social world (with cliques defined as voluntary, friendship-based groups) (Kindermann & Gest, 2009). As children report that their interactions with

peers mostly take place in the context of these cliques (Rubin et al., 2006), we encourage future research on group-based peer interactions and peer relationships to investigate how characteristics of children's cliques (e.g., behaviors and attitudes aggregated across clique members) relate to behavioral engagement. In addition, other aspects of teacher-child relationships are also worth investigating. Prior research has approached teacher-child relationships from diverse theoretical perspectives. These point out additional/complementary relationship dimensions relevant to consider, for example, secure base and safe haven dimensions (drawn from attachment theory) or autonomy support (drawn from social motivational theory) (see review by Davis, 2003). Further research including a broad range of relationship dimensions may bring about a more comprehensive view on how social contexts shape behavioral engagement. *Third*, the present study focused on peer popularity. As peer popularity becomes even more important during early adolescence (Cillessen & Mayeux, 2004) and we expect the negative association with behavioral engagement to become stronger and more consistent, we recommend future research to examine these associations in samples of older children as well. *Fourth*, whereas the focus of the present study lies on effects of classroom relationships on behavioral engagement, we would like to point out that prior research by Hughes and Kwok (2006) has found reverse effects – with behavioral engagement predicting social relationships –as well. Hence, we recommend future researchers to investigate possible transactional effects between classroom relationships and engagement over time as well. *Fifth*, in longitudinal research drop-out is often higher among the less well-adjusted children. This was also the case in our study: children who dropped out of the study - mainly because of changing schools - differed on some study variables from the children in the study sample. Specifically, drop-out children were more physically aggressive, less accepted, less popular and less engaged compared to the students in our study sample. However, the significant differences between the drop-out group and the study sample were

generally small (i.e.,  $d < .30$ ) (Cohen, 1988) and sufficient variability was left in the sociometric scores of the children in the study sample. On several other study variables, there were no significant differences (e.g., gender, teacher-child support, and teacher-child conflict). Nevertheless, we recommend that future research replicates our findings in samples including high risk children. *Sixth*, the present study used latent growth curve modelling and cross-lagged panel mediation modelling. Both approaches are technically and conceptually different, which makes the comparison of the results obtained by both approaches more complex. When using latent growth models, researchers assume that psychological processes being studied develop gradually and researchers are able to estimate certain aspects of this gradual development (i.e., intercept and slope) and relate these aspects to other variables. Given the present study's limited number of data collection waves (i.e., less than 5 data waves), latent growth curve modelling does not adequately estimate mediation (von Soest & Hagtvet, 2011), which is why we used cross-lagged panel mediation modelling, as recommended (MacKinnon, 2008). When using cross-lagged panel mediation modelling, researchers assume that certain psychological processes at a certain moment in time (T-1) predict psychological processes at a subsequent moment in time (T) (MacKinnon, 2008). We found more significant effects using latent growth modelling compared to cross-lagged panel mediation modelling, which seems to indicate that the processes investigated in the present study mostly take place in the long term. *Seventh*, although we established the predictive value of teacher-child and peer relationships, controlling for children's initial levels of physical and relational aggression, it may be interesting to control for other child characteristics (e.g., academic achievement) in future research as well.

### **Implications for Practice**

The present study provided evidence for an additive model in which teacher-child and peer relationships each contribute to the development of behavioral engagement in a unique

way. This implies that practitioners can promote behavioral engagement or buffer the declines of behavioral engagement via two independent ways, that is, by targeting teacher-child relationships or peer relationships. Also, the lack of evidence for mediation and moderation models implies that (a) targeting only one relationship cannot compensate for negative aspects of the other relationship, and (b) targeting one relationship does not automatically lead to improvement in the other relationship which in turn increases academic engagement.

The present study may help practitioners to set up their interventions. First, children who experience more support and less conflict in the relationship with their teacher are more engaged in school and children who have a supportive relationship with their teacher even experience less steep declines of behavioral engagement throughout upper elementary school. Hence, interventions should promote positive, supportive teacher-child relationships. Banking Time (Pianta & Hamre, 2001) is exactly such an intervention aimed at preschoolers and draws its working principles from teacher-child interaction therapy (McIntosh, Rizza, & Bliss, 2000). As its principles are difficult to simply implement in upper elementary school, we recommend future researchers to elaborate further on this program (or a similar evidence-based program) and create a version that is tailored to the specific social world and characteristics of older children. An alternative intervention program that has been applied in elementary and secondary school, is My Teaching Partner (Allen, Pianta, Gregory, Mikami, & Lun, 2011). Although this program is focused more on improving classroom-based teacher behavior, we assume that it will affect perceived teacher support in dyadic relationships as well. Second, children who are accepted by their classroom peers experience less steep declines of behavioral engagement. Hence, interventions should promote acceptance among children within classrooms. Evidence-based interventions for children in late childhood are scarce. Yet, the Good Behavior Game (Barrish, Saunders, & Wolf, 1969) has been proven effective in increasing peer acceptance by classroom peers and can be used from Grade 2 till

Grade 6 (Leflot, van Lier, Onghena, & Colpin, 2013; Witvliet, van Lier, Cuijpers, & Koot, 2009). In addition, the Good Behavior Game has been found to improve teachers' classroom management strategies and in turn increase children's on-task behavior (Leflot, van Lier, Onghena, & Colpin, 2010)

## Conclusions

The current study contributes to developmental research by providing a unique and differentiated insight into whether and how teachers and peer impact developmental trajectories of behavioral engagement in late elementary school. We found support for an additive model in which teacher-child and peer relationships add unique variance to the development of behavioral engagement. The general decline in children's behavioral engagement could be reduced by high initial or increasing levels of teacher support, as well as by high initial levels of peer acceptance. Teacher-child support had a more robust and prolonged effect on children's behavioral engagement in late childhood compared to teacher-child conflict. In addition, children who were perceived as more popular by their peers in Grade 5, were less engaged in school in Grade 6, irrespective of their level of aggressive behavior. These results suggest that only from a certain age, children who are nominated as "popular" by peers are more likely to be academically disengaged. In sum, the present study provides a model of classroom processes and how they impact behavioral engagement.

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Table 1

*Correlations Among Study Variables*

Scale	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1.PA_W1	1																
2.PA_W2	.67**	1															
3.PA_W3	.63**	.71**	1														
4.PP_W1	.38**	.29**	.29**	1													
5.PP_W2	.29**	.34**	.32**	.60**	1												
6.PP_W3	.22**	.27**	.32**	.53**	.70**	1											
7.TCS_W1	.16**	.02	.05	.03	-.01	-.08	1										
8.TCS_W2	.16**	-.03	.04	.02	-.09	-.06	.47**	1									
9.TCS_W3	.15*	.13*	.15**	.11*	.10	.01	.21**	.30**	1								
10.TCC_W1	-.19**	-.16**	-.08	.06	.16**	.17*\$	-.26**	-.09	-.04	1							
11.TCC_W2	-.18**	-.04	.02	.12*	.29**	.31**	-.17**	-.32**	-.04	.42**	1						
12.TCC_W3	-.16**	-.11*	-.01	.08	.13*	.20**	-.14*	-.17**	-.33**	.42**	.53**	1					
13.BSE_W1	.12*	.02	.02	.00	-.10*	-.10*	.37**	.29**	.12*	-.38**	-.36**	-.26**	1				
14.BSE_W2	.13*	.06	.08	-.01	-.12*	-.07	.25**	.46**	.13*	-.16**	-.43**	-.28**	.59**	1			
15.BSE_W3	.20**	.14**	.18**	.00	-.10*	-.10	.28**	.37**	.44**	-.17**	-.33**	-.40**	.50**	.62**	1		
16.PHYSAG_W1	-.31**	-.32**	-.26**	.13**	.12**	.16**	-.10	-.08	-.15**	.44**	.29**	.36**	-.11*	-.09	-.21**	1	
17.RELAG_W1	-.24**	-.13**	-.12**	.22**	.20**	.19**	-.04	-.04	-.12*	.22**	.20**	.20**	-.10*	-.13*	-.16**	.27**	1

*Note:* PA = peer acceptance; PP = peer popularity; TCS = teacher-child support; TCC = teacher-child conflict; BSE = behavioral school engagement; PHYSAG = physical aggression; RELAG = relational aggression; W1 = Wave 1; W2 = Wave 2; W3 = Wave 3.  $N = 586$ . \*  $p < .05$ . \*\*  $p < .01$ .

Table 2

*Means and Standard Deviations at the Three Measurement Waves for Girls (N = 310 ) and Boys (N= 276)*

Variable	Grade 4				Grade 5				Grade 6			
	Girls		Boys		Girls		Boys		Girls		Boys	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Peer Acceptance	3.32	.66	3.22	.68	3.31	.62	3.08	.71	3.28	.62	3.14	.71
Peer Popularity	.021	1.02	.076	.99	.04	.94	.06	1.08	-.01	.77	.09	.96
Teacher -Child Support	2.99	.74	2.81	.73	3.00	.77	2.91	.73	2.73	.68	2.67	.70
Teacher -Child Conflict	1.28	.39	1.57	.65	1.32	.54	1.48	.56	1.37	.57	1.64	.69
Behavioral Engagement	3.88	.61	3.73	.65	3.71	.71	3.62	.64	3.60	.69	3.51	.64

Table 3

*Results of the Cross-Lagged Panel Mediation Analysis*

Model	Model Fit				Path estimates			
	(df) S-B $\chi^2$	SRMR	RMSEA	CFI	$\beta_{xm}$	$\beta_{my}$	$\beta_{xy}$ (Model direct)	Model indirect
1.TCS_G4 → PP_G5 → BE_G6	(16) 50.81***	.05	.06	.97	-.02	-.09*	.09	.00
2.TCS_G4 → PA_G5 → BE_G6	(16) 55.28***	.06	.07	.97	-.07	.02	.08	-.00
3.TCC_G4 → PP_G5 → BE_G6	(16) 70.68***	.06	.08	.95	.10*	-.05	-.04	-.01
4.TCC_G4 → PA_G5 → BE_G6	(16) 79.95***	.07	.08	.94	-.04	.06	-.03	-.00
5.PP_G4 → TCS_G5 → BE_G6	(16) 48.34***	.04	.06	.97	-.00	.10*	-.05	.00
6.PP_G4 → TCC_G5 → BE_G6	(16) 78.05***	.07	.08	.94	.07	-.06	-.02	-.00
7.PA_G4 → TCS_G5 → BE_G6	(16) 52.64***	.05	.06	.97	.04	.08	.10*	.00
8.PA_G4 → TCC_G5 → BE_G6	(16) 79.22***	.06	.08	.94	-.08	-.06	.08	.01

*Note:* TCS = teacher-child support; TCC = teacher-child conflict; PA = peer acceptance; PP = peer popularity; BE = behavioral engagement; G4 = Grade 4; G5 = Grade 5; G6 = Grade 6.  $N = 586$ . \*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ . Standardized parameter estimates are reported.

Figure Caption

Figure 1. Conceptual model of the cross-lagged panel mediation analysis.

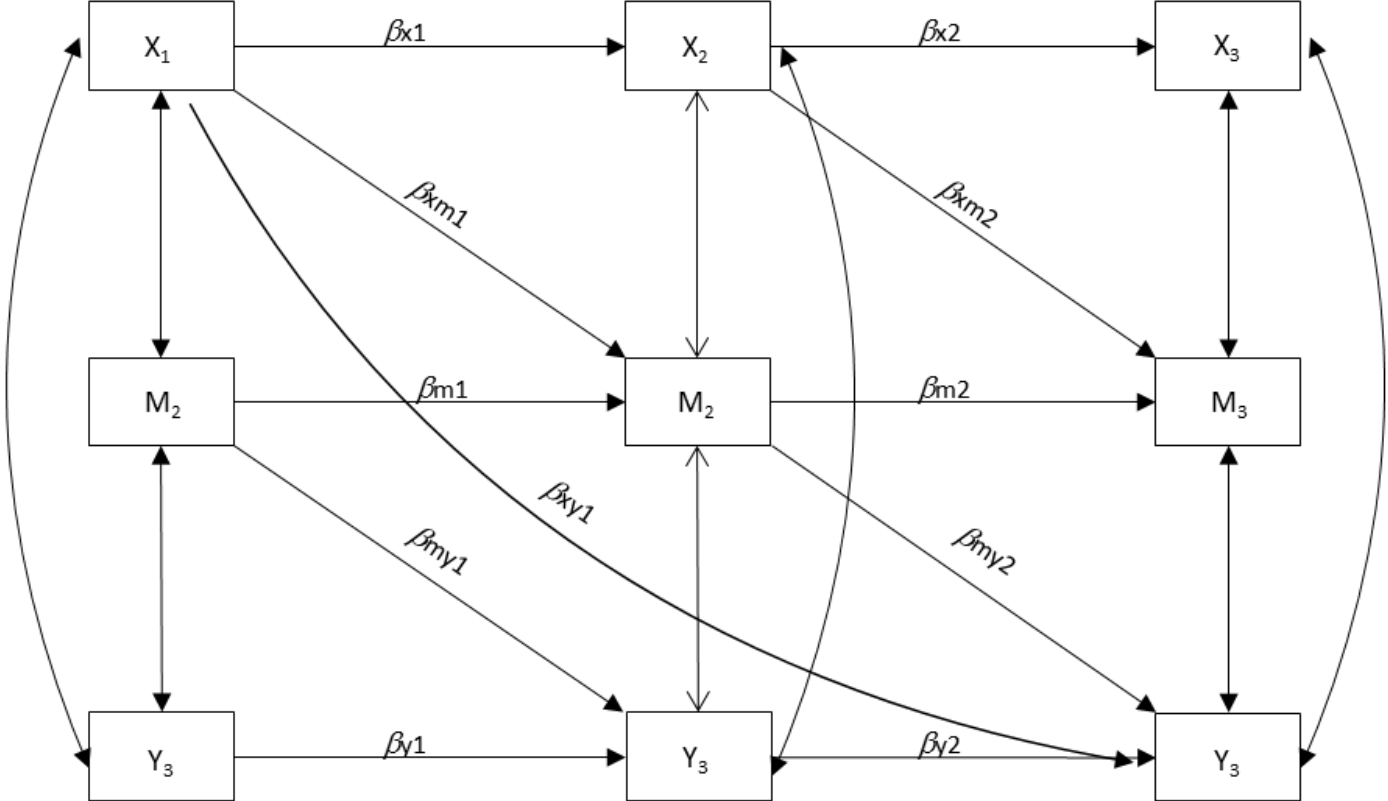


Figure 2. Independent effects model while controlling for baseline levels of children’s physical and relational aggression. TC-S = teacher-child support; TC-C = teacher-child conflict; SP = peer acceptance; PP = peer popularity; ENG = behavioral engagement. \*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ . Standardized parameter estimates are depicted.

