Revealing the Transactional Associations among Teacher-Child Relationships, Peer Rejection and Peer Victimization in Early Adolescence

Karlien Demol [1] · Geertje Leflot[2] · Karine Verschueren[1] · Hilde Colpin[1]

Abstract

Peer victimization is a persistent problem in early adolescents' peer relationships that is related to various difficulties in the short and long run. Previous studies have investigated whether relationships with peers and teachers predict victimization, but to date, few studies have examined the simultaneous contribution of both classroom-based relationships to victimization over time. Therefore, this study investigated how peer rejection and teacher-child relationships uniquely predict peer victimization over the course of one school year in upper elementary school. The transactional associations among teacher-child relationships, peer rejection, and relational and physical victimization were examined in a sample of 692 children (36 classes; $M_{age} = 10.28$; range: 7.92-13.14; 48.4% female). Teacher-child relationship quality and peer victimization were measured by student self-report, peer rejection by peer-report. Cross-lagged analyses showed that rejection predicted victimization from wave 1 to wave 2. In turn, more victimization predicted more rejection throughout the whole school year. More supportive teacher-child relationships predicted less victimization. Additionally, more victimization (wave 1) predicted less supportive relationships with teachers (wave 2). Peer rejection and teacher-child relationships were found to have unique, additive effects on victimization in early adolescence over time. Therefore, to effectively intervene in victimization processes, relationships with both peers and teachers need to be considered.

Keywords Physical victimization · Relational victimization · Teacher-child relationships · Peer rejection · Longitudinal design

Introduction

Peer victimization, i.e., repeated targeted aggression of peers towards children who have difficulties to defend themselves (Olweus 1993), is a widespread and persistent peer process that can harm development in various domains (Arseneault 2018). A recent UNESCO report (UNESCO 2019) covering 144 countries showed that almost one third of the 9- to 15-year-olds were bullied at school at least once in the last month. These youth are at increased risk of experiencing various short and long term negative consequences concerning their mental and physical health, wealth, and social relationships (e.g., Moore et al. 2017). Hence, research on the risk and protective factors for peer victimization at school is critical. Building on social-ecological models (e.g., Bronfenbrenner and Morris 2006), researchers have demonstrated that interactions with peers (e.g., peer rejection) and teachers (e.g., teacher-child relationships) predict peer victimization over time (e.g., Serdiouk et al. 2015, 2016). However, questions rise on the uniqueness of these longitudinal associations since, in classrooms, children are confronted with peers and teachers at the same time. Only one two-wave longitudinal study has focused on both peer rejection and teacher-child relationships in the prediction of victimization (Elledge et al. 2016). The current study adds to this by using a three-wave design and cross-lagged modeling to examine the transactional associations among teacher-child relationships, peer rejection and, respectively, relational and physical victimization

✉ Karlien Demol
karlien.demol@kuleuven.be

[1] Faculty of Psychology and Educational Sciences, KU Leuven, Tiensestraat 102 Box 3717, 3000 Leuven, Belgium

[2] Applied Psychology, University College Thomas More, Antwerp, Molenstraat 8, 2018 Antwerp, Belgium

across one school year in fourth to sixth grade of elementary school.

Peer Rejection and Peer Victimization

Peer rejection, i.e., the degree to which children are disliked by the peer group, is a peer process that has been linked to victimization (Cillessen 2009). First, longitudinal studies throughout elementary school and at the beginning of secondary school have shown that rejected children were more likely to be victimized at a later moment in time (e.g., Hodges and Perry 1999; Serdiouk et al. 2015). Rejected children can become victimized because they may be less protected by the peer group, less able to benefit from peers' advice on how to handle victimization and more often alone and available as targets for bullies (Hodges and Perry 1999). Also, bullies are more likely to pick children who are rejected because they can demonstrate their power to the group without having to fear a confrontation (Salmivalli and Peets 2009).

Second, as classroom processes are dynamic, the associations may be bidirectional (Bronfenbrenner and Morris 2006) and victimization might also predict rejection over time. For instance, in order to protect or enhance their own status in the group, peers may distance themselves from victims (Salmivalli and Peets 2009). This was supported by longitudinal studies throughout elementary school and at the beginning of secondary school showing bidirectional associations among rejection and victimization (e.g., Hodges and Perry 1999; Ladd and Troop-Gordon 2003). One study with two student cohorts (grades 3–6 and grades 7–9) found these bidirectional associations for girls only (Sentse et al. 2015).

Third, research has not been consistent regarding the links between peer relationships and different forms of victimization. This study differentiates between relational and physical victimization to explore the longitudinal links between these forms of victimization and peer rejection. Previous research has indicated that, in general, early adolescents perceive some forms of relational aggression to be less wrong than physical aggression (Goldstein and Tisak 2010). Also, strong associations between relational aggression and perceived popularity may indicate that, with age, relational aggression is increasingly reinforced in the peer group (Cillessen and Mayeux 2004). Therefore, it is possible that relationally victimized students are less protected by the peer group and even more disliked than physically victimized students. However, a few cross-sectional studies in the upper grades of elementary school have shown similar positive associations of peer rejection with both physical and relational victimization (e.g., Crick and Grotpeter 1998; Putallaz et al. 2007). Moreover, no longitudinal studies examining the associations between

rejection and different forms of victimization in early adolescence were found.

Teacher-Child Relationships and Peer Victimization

Referring to an extended attachment perspective (Verschueren and Koomen 2012), a positive teacher-child relationship is described as the degree to which the interactions between a teacher and a student are warm and high in support. This study investigates this relationship dimension from the child's perspective (i.e., the degree to which children perceive their dyadic relationship with the teacher to be close and supportive). Researchers have argued that teacher-child relationships may shape children's peer relationships, including victimization (e.g., Gest and Rodkin 2011). This may be explained by social learning theory (e.g., Hendrickx et al. 2016), stating that children learn novel social behaviors by observing others (Bandura 1977). In classrooms, social practices and relational skills modeled by teachers set the expectations for students' social behaviors (Farmer et al. 2011). For instance, when teachers show support to students, children learn they should also show warmth to each other and engage in positive peer interactions (Hendrickx et al. 2016).

In addition, the role of teacher-child relationships in peer victimization may be explained by attachment theory (Bowlby 1969). When children have close relationships with teachers, they may perceive that they can rely on them in times of stress (e.g., Serdiouk et al. 2016; Verschueren and Koomen 2012). This may increase their willingness to report victimization (e.g., Eliot et al. 2010) which enables teachers to intervene and support children. Further, close teacher-child relationships may help children to develop better coping and conflict resolution skills to manage victimization (Reavis et al. 2010). Also, when teachers have close relationships with children, they may be more sensitive to children's needs, notice victimization and intervene more quickly (e.g., Reavis et al. 2010). Further, based on teacher's pet phenomenon, children in upper elementary school who have close relationships with teachers could be less victimized because bullies might perceive a threat of reprisal when picking these students (Elledge et al. 2016).

To date, empirical evidence regarding the longitudinal prediction of victimization by dyadic teacher-child relationships is scarce. One longitudinal study has demonstrated that elementary students with whom teachers reported more positive teacher-child relationships, were less victimized later in the school year (Serdiouk et al. 2016). However, another longitudinal study with 4th and 5th grade students also using teacher report of the relationship did not confirm this (Troop-Gordon and Kopp 2011). Besides longitudinal evidence, cross-sectional studies throughout elementary school have shown that more supportive teacher-child

relationships as perceived by children were associated with lower levels of victimization (Lucas-Molina et al. 2015; Murray-Harvey and Slee 2010; Raskauskas et al. 2010).

As for peer rejection, the quality of the teacher-child relationship may differentially impact relational and physical victimization (Troop-Gordon and Kopp 2011). A close teacher-child relationship may be more effective in protecting children from physical victimization as previous research has shown that teachers are less likely to define relational aggression as bullying, feel empathy for relationally victimized children, and intervene in relational victimization (Bauman and Del Rio 2006; Yoon et al. 2016). However, no studies examining the prediction of different forms of victimization by teacher-child relationships were found.

In turn, victimization may also affect teacher-child relationships. However, due to a strong focus on teachers as socializing agents (Farmer et al. 2011), less attention has been given to whether peer processes can predict teacher-child relationships. Accordingly, no studies are available that have investigated whether victimization predicts teacher-child relationship quality. On the one hand, building on attachment theory (Bowlby 1969), teachers can be expected to provide more support to victimized children in their role to function as a safe haven (Verschueren and Koomen 2012). Accordingly, more victimization could predict more supportive teacher-child relationships over time. On the other hand, social stigmas associated with victimization may reduce teachers' sympathy for and support to these students (Juvonen and Graham 2014).

Peer Rejection and Teacher-Child Relationships

As indicated above, teacher-child relationships may affect the relationships that children establish with each other (e.g., Farmer et al. 2011). Compared to victimization which refers to behavior occurring within groups, peer rejection refers to an affective reaction held by the peer group (Rubin et al. 2015). Therefore, social referencing theory (Walden and Ogan 1988) is more suited to explain how teacher-child relationships may affect peer rejection than social learning theory, which was used to explain the associations with victimization. Social referencing theory states that children turn to significant others for cues on how to respond to situations (Walden and Ogan 1988) and applied to the classroom context, teachers can be social referents for students' affective evaluations of peers (Hendrickx et al. 2017a). In classrooms, children typically have many opportunities to observe their teacher's interactions with their classmates. From these observations, children can develop ideas about classmates' academic and social abilities, and desirability as a friend (Hughes and Im 2016). Then, these perceptions guide them in how to relate with this fellow child (Hughes et al. 2001).

Longitudinal studies have provided support for the idea of the teacher as a social referent regarding peer rejection (Hughes and Im 2016). For instance, an explicit test of social referencing theory was conducted by Hendrickx et al. (2017b). In their study with 5th grade children, they found that observed negative teacher behavior towards children predicted peer perceived teacher disliking of children and this, in turn, predicted later peer disliking of these children. Other studies have provided implicit support for a social referencing effect by showing that earlier teacher behavior (perceived by both children and teachers) predicted peer social preference later on (e.g., De Laet et al. 2014; Mercer and Derosier 2008).

Vice versa, earlier peer relationships could also predict future teacher-child relationships. As stated above, theories and research regarding the prediction of teacher-child relationships by peer relationships are more limited. However, evidence suggests that teachers form cognitive schemas about children's social status and that teachers look for confirmation of these schemas by behaving in ways consistent with these (often biased) beliefs (Mercer and Derosier 2008; Nesdale and Pickering 2006). Accordingly, teachers may develop negative schemas of rejected children which can result in lower teacher support toward these students. However, it is also possible that more peer rejection could predict more supportive teacher-child relationships later on as children experiencing negative peer relationships may try to achieve close relationships with teachers to satisfy their relational needs (Davidson et al. 2010). Also, building on attachment theory (Bowlby 1969), teachers may increase their support to rejected children in order to protect them from further rejection.

Although, based on theory, peer rejection can be expected to predict both less and more supportive teacher-child relationships over time, evidence is more in favor of the former. A number of longitudinal studies in middle and upper elementary school have found that lower peer social status predicted less teacher support later in time as reported by both students and teachers (De Laet et al. 2014; Hughes and Chen 2011; Mercer and Derosier 2008). For instance, children who were rejected, were less liked by the teacher later on. Additionally, children who were less liked by their teachers in grade 3, were more rejected by their peers in grade 4 (Mercer and Derosier 2008).

Indirect Effects of Peers and Teachers on Peer Victimization

Based on previous theorizing and evidence, it is possible that relationships with teachers and peers not only directly predict victimization over time, but also indirectly. Low supportive teacher-child relationships can increase the risk for low supportive peer relationships, including rejection

(Hendrickx et al. 2017b). This, in turn, could increase the risk for victimization (Serdiouk et al. 2015). Also, peer rejection can increase the risk for low supportive relationships with teachers (Hendrickx et al. 2017a) which could increase the risk for victimization (Serdiouk et al. 2016).

A cross-sectional study in grades 4 to 6 has provided some evidence for an indirect effect of teacher-child relationships on victimization (Thornberg et al. 2018). The quality of teacher-child relationships as reported by children was not directly linked to victimization, but indirectly through its association with the quality of relationships among children. However, the data were analyzed at the classroom level and due to the cross-sectional design, the authors could not pinpoint the direction of effects. No studies testing the effect of rejection, via teacher-child relationships, on victimization were found.

Early Adolescence

Researchers have argued that the relative influences of peers and teachers may depend on children's developmental stage (Bierman 2011). For instance, when entering adolescence, peer relationships become increasingly valued and relied on to guide students' own behavior (Wentzel 2009). Also, teacher-child closeness generally reduces (Jerome et al. 2009) and peer social status becomes more crystallized and stable (Bierman 2011). As a result, the influence of teachers to that of peers on students' psychosocial development may be lower in early adolescence as compared to previous developmental levels.

For instance, in the 4th and 5th grade, the negative association between victimization and supportive peer-perceived teacher-child relationships did not hold when controlling for peer rejection (Elledge et al. 2016). According to the authors, this indicates that early adolescents' relationships with peers are more predictive of victimization than their relationships with teachers. Also, other studies with early adolescents have found more consistent paths from peers to teachers than vice versa. For instance, studies in grades 4 to 6 found that the paths from peer social status to teacher-child support (reported by children) were more consistent than vice versa (De Laet et al. 2014; Weyns et al. 2018). However, De Laet et al. (2014) argued that supportive relationships with teachers may still influence peer relationships in early adolescence as teacher-child support predicted peer social status from grade 5 to 6.

Current Study

To date, few longitudinal studies have examined the prediction of peer victimization by peer and teacher-child relationships together. Further, few studies have investigated the associations for different forms of victimization separately. To provide insight in the simultaneous contribution of peer and teacher-child relationships to victimization over time, this study examines the transactional associations among teacher-child relationships, peer rejection, and relational and physical victimization respectively.

Hypotheses are formulated for six different direct longitudinal links (see Fig. 1). Based on the available research (e.g., Serdiouk et al. 2015), children rejected by peers are expected to be at increased risk of becoming victimized (paths a), and vice versa (b). Due to inconsistencies in the

Fig. 1 Hypothesized associations between peer rejection, peer victimization and teacher-child relationships. Note. *Victim* victimization, *Teacher-Child R.* teacher-child relationships. Path labels refer to the formulated hypotheses in the Current Study section
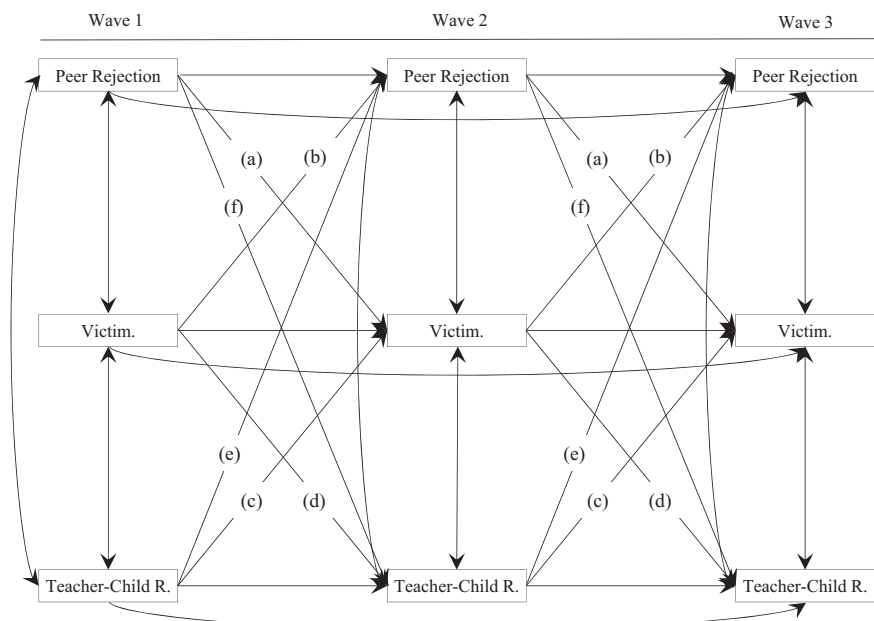
current literature, no hypotheses are formulated regarding the potential differences between relational and physical victimization in relation to peer rejection. Further, based on theory (Bandura 1977; Bowlby 1969) and available evidence (e.g., Serdiouk et al. 2016), more supportive teacher–child relationships are expected to predict a lower risk for being victimized (c). This could be stronger for physical victimization as teachers are more likely to intervene in response to physical than relational victimization (e.g., Yoon et al. 2016). Based on attachment theory (Bowlby 1969), teachers can be expected to provide more support to victimized children. However, teachers' sympathy for and support to victims may be reduced by social stigmas associated with victimization (Juvonen and Graham 2014). Thus, with regard to the prediction of teacher-child relationships by victimization (d), two alternative hypotheses are formulated. Hence, differences between the forms of victimization are also exploratory investigated. Based on social referencing theory (Walden and Ogan 1988) and the available studies (e.g., Mercer and Derosier 2008), less supportive teacher-child relationships are expected to predict more peer rejection (e). Further, even though based on theory (Bowlby 1969; Davidson et al. 2010), peer rejection can be expected to predict both less and more supportive teacher-child relationships, prior evidence (e.g., Mercer and Derosier 2008) leads to the expectation that more rejection would predict less supportive teacher-child relationships (f).

To further enhance knowledge on how relationships with peers and teachers impact victimization, two indirect effects are also explored: whether teacher-child relationships (wave 1) predict victimization (wave 3) via peer rejection (wave 2), and whether peer rejection (wave 1) predicts victimization (wave 3) via teacher-child relationships (wave 2). In light of the developmental period (early adolescence), stronger paths are expected from peer rejection to peer victimization than from teacher-child relationships to peer victimization. Further, more consistent paths are expected from peer rejection and peer victimization to teacher-child relationships than vice versa.

Method

Participants and Procedure

The data of this study are part of a one-year study coordinated by University College Thomas More and KU Leuven, and approved by the Ethical Committee of the first institute. Children of ten primary schools participated at the beginning (September/October), middle (February) and end (May/June) of the school year 2014–2015. Active consent from the parents was obtained for 727 children of grades 4 to 6 (88.6%). The participants completed a set of questionnaires under the supervision of undergraduate students of the Psychology department of both institutes. Four classes with participation rates lower than 60% were excluded from the analyses due to reliability concerns regarding the peer nomination procedure (Cillessen 2009). As a result, the final sample comprised 692 children from 36 classes (48.4% girls, $M_{age} = 10.28$ years, $SD_{age} = 0.94$ years, range: 7.92–13.14, 35.3% in grade 4, 33.1% in grade 5 and 31.6% in grade 6). At wave 1, 2, and 3, questionnaires were obtained from respectively 680, 655 and 671 children (response rates: 98, 95, 97% with resp. 97, 93, 95% full response).

Following wave 1, half of the schools started implementing a Flemish version of the Good Behavior Game (Dolan et al. 1989; Leflot et al. 2017) as part of a quasi-experimental intervention study. The other half of the schools served as controls. The Good Behavior Game is a universal intervention aimed at preventing externalizing behavior and promoting on-task behavior through an improvement of the teacher's behavioral management and peer relations (Leflot et al. 2010). In the present study, intervention status was controlled for in the analyses. In addition, age and gender effects were controlled for.

Measures

Relational and physical peer victimization

Peer victimization was assessed with two scales of the validated Social Experiences Questionnaire (SEQ) (Crick and Grotpeter 1998). For relational victimization, participants had to indicate how often their relationships with others are harmed or threatened to be harmed (e.g., "How often do your peers leave you out on purpose when it is time to do an activity?"). For physical victimization, participants had to indicate how often they are harmed or threatened to be harmed physically (e.g., "How often do you get hit?"). Each item was measured on a 5-point Likert scale ranging from "never" to "always".

The original scales measured respectively relational victimization (5 items) and overt victimization, of which physical (3 items) and verbal (2 items). However, Crick and Grotpeter (1998) dropped the verbal victimization items as they cross-loaded on the scales. A confirmatory factor analysis (CFA) in Mplus 8 was conducted to assess the factor structure of the original SEQ with the 10 items in this sample. In line with the findings of previous studies (Crick and Grotpeter 1998; Desjardins et al. 2013; Storch et al. 2005), a two-factor structure for victimization was hypothesized. To deal with item-level missingness (<1%) and non-normality, maximum likelihood estimation with robust standard errors was used (Muthén and Muthén 1998–2017; Newman 2014). Following current guidelines, model fit was

Table 1 CFA standardized factor loadings and model fit statistics

SEQ item	Latent construct	Original model	New model
Hit	Overt	0.67	0.71
Push/Shove	Overt	0.72	0.76
Kick/Pull	Overt	0.72	0.79
Mean Names	Overt	0.75	/
Beat Up	Overt	0.70	/
Leave Out	Relational	0.62	0.61
Get Back	Relational	0.67	0.66
Tell Lies	Relational	0.75	0.76
Won't Like	Relational	0.69	0.68
Say Mean	Relational	0.81	0.82
Model fit statistics			
RMSEA (90% CI)		0.08 (0.07–0.9)	0.06 (0.05–0.08)
SRMR		0.04	0.03
CFI		0.94	0.97
TLI		0.92	0.95

evaluated by the Root Mean Square Error of Approximation (RMSEA) (including the associated 90% confidence interval), which should be less than 0.08, and preferably 0.06; the Standardized Root Mean Square Residual (SRMR), which should be less than 0.10, and preferably 0.08; the Comparative Fit Index (CFI) and the Tucker-Lewis index (TLI), which should exceed 0.90, and preferably 0.95 (Hu and Bentler 1999; Kline 2005; Weston and Gore 2006).

The two-factor model had a mediocre fit and factor loadings were high (see Table 1). The latent factor correlation was large ($r = 0.89$) (Cohen 1988). As in the study of Crick and Grotpeter (1998), modification indices indicated that a better fit could be obtained when the verbal victimization items were allowed to cross-load on the factors. In line with the authors of the scale and the purpose of this study to investigate physical and relational forms of victimization separately, the verbal victimization items were dropped. The fit of this model with dropped verbal victimization items was good, the factor loadings high (see Table 1) and the latent factor correlation large ($r = 0.77$) (Cohen 1988). Over the waves, Cronbach's alphas for relational victimization ranged from 0.83–0.85, and for physical victimization from 0.79–0.82. Mean scores on the scales were calculated and used in the subsequent analyses.

Peer rejection

Peer rejection or the degree to which children are disliked by the peer group was measured by one peer nomination item ("Which classmates do you like the least?") (Coie et al. 1982) that has been shown to be a valid and reliable measure of this construct (Cillessen 2009). An unlimited number of nominations was allowed (Terry 2000), but self-nomination was not allowed. To ensure reliability, in each class the participation rate was at least 60% (Cillessen 2009).

Proportion scores were calculated by dividing the number of received nominations by the total number of possible nominations, and used in the subsequent analyses.

Teacher-child relationship quality

The quality of the teacher-child relationship or the degree to which children perceive their relationship with the teacher to be close and supportive was assessed by the Teacher-Child Interaction Quality scale of the Dutch Class Climate Scale (DCCS) (Donkers and Vermulst 2011). The authors reported evidence for the content and construct validity (e.g., confirmed factor structure, measurement invariance for educational level and gender), and reliability of the scale (Cronbach's alpha: 0.88, test-retest Pearson correlation: 0.78) (Donkers and Vermulst 2011). The scale consisted of 11 items (e.g., "I like the teacher", "This teacher helps you if you cannot do something.") measured on a 4-point Likert scale ranging from "never" to "always". Over the waves, Cronbach's alphas ranged from 0.87–0.91. Mean scores were calculated and used in the subsequent analyses.

Statistical Analyses

Descriptive and correlational analyses were executed in IBM SPSS Statistics 25 and Mplus 8 (Muthén and Muthén 1998–2017). Mplus was also used to perform the confirmatory factor analysis for the SEQ and the cross-lagged analyses. Cross-lagged analyses (Jöreskog 1970) were used to investigate the hypothesized longitudinal links between peer rejection, teacher-child relationships and peer victimization. The analyses allow the investigation of longitudinal bidirectional associations between peer rejection, teacher-child relationships and peer victimization while taking into account previous levels of each variable and within-time associations between variables. Thus, three types of associations were estimated: (1) autoregressive, (2) concurrent and (3) cross-lagged associations (see Fig. 2). Further, by including peer rejection and teacher-child relationships together in the cross-lagged model, their unique or additive effects on victimization were investigated. For instance, the effect of rejection on victimization was examined on top of the effect of teacher-child relationships on victimization. To explore the possible indirect effects of rejection and teacher-child relationships on victimization, these paths were specified using the "model indirect" command.

Given the nested structure of the data, Intraclass Correlation Coefficients (ICC's) and design effects were computed at the level of the classroom (Peugh 2010) (see Table 2). As several variables had medium to large ICC's (Hox 2002) and design effect values above 2 (Peugh 2010), the "complex analysis" feature was applied, which uses models with robust standard errors (Williams 2000). Classroom was

Fig. 2 Estimated associations between peer rejection, peer victimization and teacher-child relationships. Note. *Victim.* victimization, *Teacher-Child R.* teacher-child relationships. Only the autoregressive associations of peer rejection (1), the wave 1 concurrent associations (2), and the wave 1–wave 2 cross-lagged associations (3) are numbered for clarity
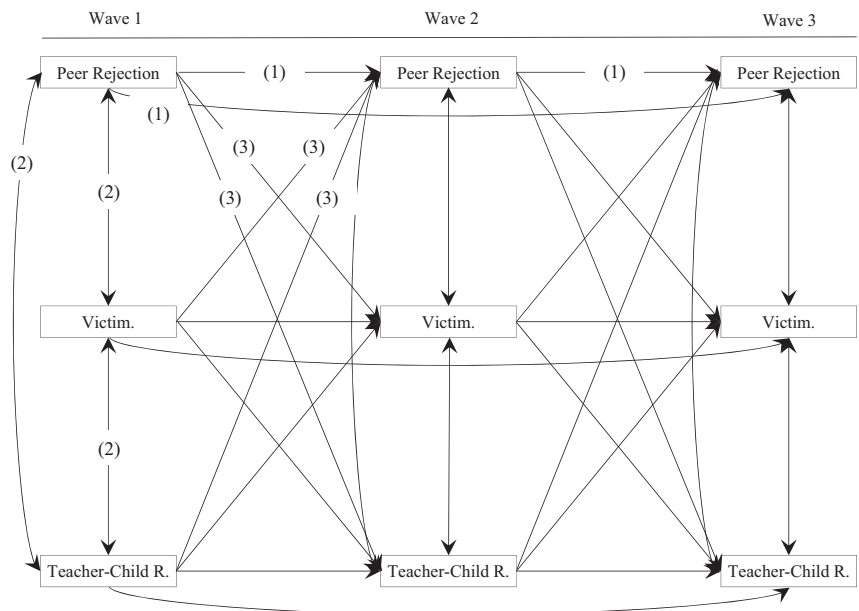

Table 2 Descriptive statistics

Variable	N	ML Mean (SD)	Range	ICC	Design effect
Relational Victimization W1	672	0.89 (0.78)	0.00–4.00	0.03	1.55
Relational Victimization W2	642	0.94 (0.82)	0.00–3.80	0.08	2.46
Relational Victimization W3	657	0.92 (0.78)	0.00–4.00	0.11	3.00
Physical Victimization W1	672	0.74 (0.75)	0.00–4.00	0.09	2.64
Physical Victimization W2	642	0.77 (0.77)	0.00–4.00	0.10	2.82
Physical Victimization W3	657	0.75 (0.78)	0.00–4.00	0.11	3.00
Peer Rejection W1	672	0.16 (0.15)	0.00–0.82	0.07	2.28
Peer Rejection W2	690	0.17 (0.17)	0.00–0.93	0.05	1.91
Peer Rejection W3	681	0.16 (0.16)	0.00–0.95	0.03	1.55
Teacher-Child R. W1	679	2.27 (0.54)	0.00–3.00	0.23	5.19
Teacher-Child R. W2	654	2.24 (0.55)	0.00–3.00	0.24	5.37
Teacher-Child R. W3	671	2.13 (0.64)	0.00–3.00	0.25	5.56

N number of participants, *ML* maximum likelihood, *SD* standard deviation, *Range* observed range, *W1* wave 1, *W2* wave 2, *W3* wave 3, *Teacher-Child R.* teacher-child relationships

taken as the cluster variable. Model estimation terminated normally when running these analyses; however, as the models contained more parameters than the number of clusters, a warning appeared concerning the trustworthiness of the standard errors of the model parameters. Therefore, in a supplementary analysis, the results of these models with robust standard errors were checked against the results of the models without robust standard errors. To deal with missing data, the models were analyzed using the full information maximum likelihood (FIML) algorithm, which uses all available data instead of imputing scores and has been shown to be effective and less biased than traditional missing data techniques (Newman 2014). To control for non-normality, the MLR estimator (maximum likelihood

with robust standard errors) which is robust for skewness was used.

Cross-lagged models were estimated separately for relational and physical victimization. As the associations were not expected to be different over time, three different nested models for each type of victimization were planned to be tested: (1) a fully unconstrained model, (2) a model with autoregressive paths constrained to be equal over time and (3) a model with both autoregressive and cross-lagged paths constrained to be equal over time. To compare the relative fit of the nested models, the Satorra-Bentler (S-B) scaled χ^2 difference test was used (Satorra and Bentler 2010). Further, the fit of the models to the data was evaluated by the RMSEA (with 90% confidence interval),

SRMR, CFI and TLI (Hu and Bentler 1999; Kline 2005; Weston and Gore 2006).

Results

Descriptive and Correlational Analyses

As maximum likelihood missing treatment was used, the maximum likelihood means, standard deviations (Table 2) and correlations were computed (Table 3) (Newman 2014). As can be seen in Table 2, mean scores on victimization and peer rejection were low and standard deviations small. Regarding teacher-child relationships, mean scores were higher and standard deviations small. As can be seen in Table 3, relational and physical victimization were modestly positively correlated with peer rejection and moderately negatively with the quality of the teacher-child relationship (Cohen 1988). Further, teacher-child relationships were modestly negatively correlated with peer rejection (Cohen 1988). Correlations also revealed that older children reported less victimization ($-0.18 < r < -0.26$, $p < 0.001$), except for relational victimization at wave 1. Gender significantly correlated with peer rejection throughout the school year with higher chances to be rejected for boys ($0.22 < r < 0.23$, $p < 0.001$). Further, boys reported significantly less close relationships with their teachers at the end of the school year ($r = -0.14$, $p < 0.010$). Intervention condition was not significantly related with any of the study variables.

Cross-lagged Analyses

Relational victimization

Cross-lagged analyses for relational victimization, peer rejection and teacher-child relationship quality were conducted following the procedure described above. The Satorra-Bentler scaled χ^2 difference test indicated that the fit of the model with time-constrained autoregressive paths was significantly worse than the fully unconstrained model (ΔS-B χ^2 (3) = 13.200, $p = 0.004$). The fit of the fully unconstrained model was good (RMSEA = 0.000, RMSEA 90% CI = [0.000–0.023], SRMR = 0.008, CFI = 1.000, TLI = 1.023) and this model was used to interpret the results.

Figure 3 displays the significant results. To begin with, the autoregressive associations were explored and indicated that peer rejection, relational victimization and teacher-child relationships were stable over time. With regard to peer rejection and relational victimization, first, the concurrent associations were explored and showed that more rejection was associated with more victimization at each wave.

Table 3 Maximum likelihood correlations between relational victimization, physical victimization, peer rejection and teacher-child relationships

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Relational Victimization W1	1														
2. Relational Victimization W2	0.48**	1													
3. Relational Victimization W3	0.49**	0.66**	1												
4. Physical Victimization W1	0.63**	0.39**	0.39**	1											
5. Physical Victimization W2	0.35**	0.67**	0.49**	0.48**	1										
6. Physical Victimization W3	0.35**	0.44**	0.65**	0.41**	0.54**	1									
7. Peer Rejection W1	0.14**	0.15**	0.08	0.06	0.12*	0.11*	1								
8. Peer Rejection W2	0.18**	0.20**	0.17**	0.11**	0.17**	0.13**	0.68**	1							
9. Peer Rejection W3	0.19**	0.23**	0.23**	0.14**	0.20**	0.18**	0.60**	0.74**	1						
10. Teacher-Child R. W1	-0.25**	-0.21**	-0.26**	-0.22**	-0.23**	-0.26**	-0.12*	-0.10	-0.08	1					
11. Teacher-Child R. W2	-0.20**	-0.25**	-0.25**	-0.22**	-0.23**	-0.21**	-0.13*	-0.14**	-0.12*	0.61**	1				
12. Teacher-Child R. W3	-0.12*	-0.16**	-0.25**	-0.14**	-0.16**	-0.22**	-0.13*	-0.16**	-0.12*	0.53**	0.68**	1			
13. Gender[a]	0.04	-0.07	-0.07	0.12	0.11	0.11	0.23**	0.23**	0.22**	-0.11	-0.08	-0.14*	1		
14. Age	-0.09	-0.18**	-0.21**	-0.20**	-0.21**	-0.26**	0.05	0.06	-0.00	-0.09	0.04	0.04	0.00	1	
15. Condition[b]	-0.03	-0.06	-0.11	0.07	-0.00	-0.11	0.01	-0.01	-0.04	0.11	0.08	0.09	0.10	-0.00	1

W1 wave 1, *W2* wave 2, *W3* wave 3, *Teacher-Child R.* teacher-child relationships

$*p < 0.010$; $**p < 0.001$. Two-tailed testing of significance

[a]Girl = 0; boy = 1
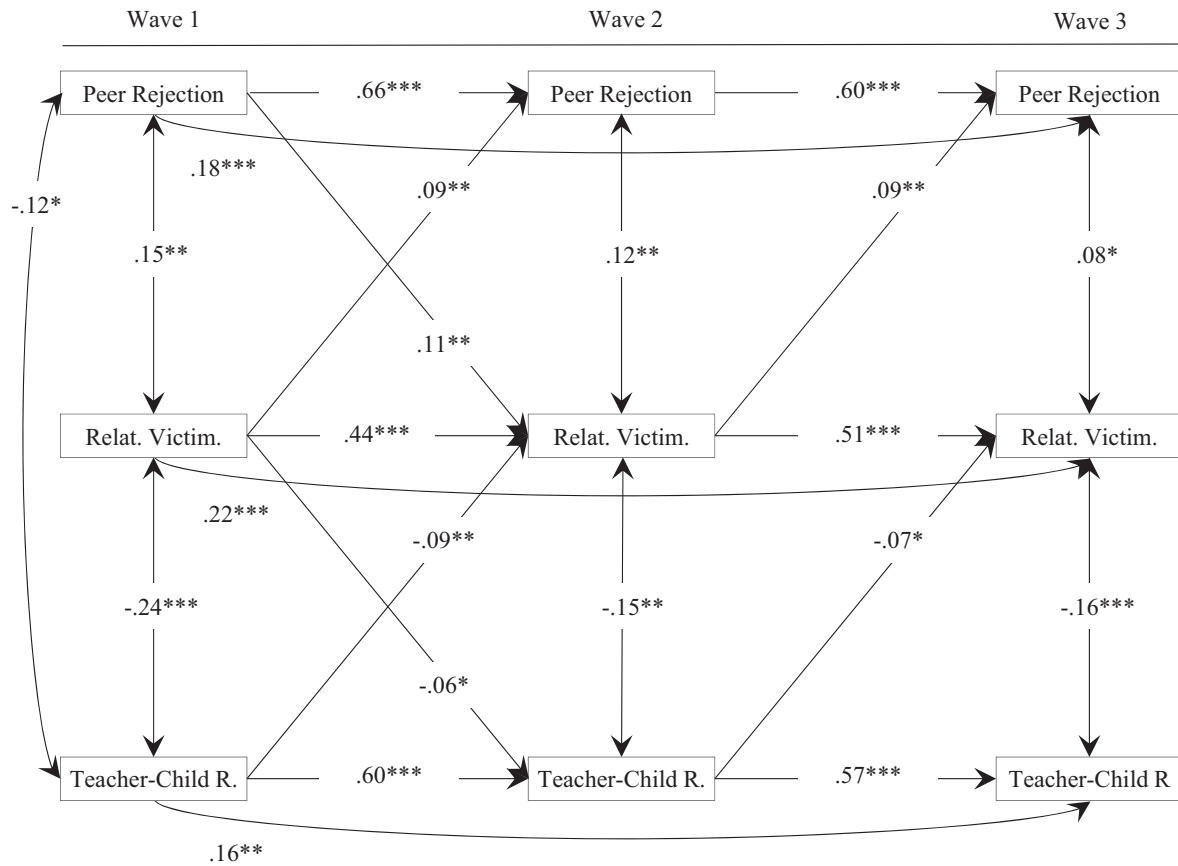
[b]Control group = 0; intervention group = 1

Fig. 3 Cross-lagged model of peer rejection, relational victimization and teacher-child relationships. Note. *Relat. Victim.* relational victimization, *Teacher-Child R.* teacher-child relationships. Significant paths with standardized coefficients are displayed. *$p < 0.050$; **$p < 0.010$; ***$p < 0.001$

Second, the cross-lagged associations indicated that relational victimization positively predicted peer rejection over time. Additionally, rejection positively predicted relational victimization from wave 1 to wave 2. Regarding teacher-child relationships and relational victimization, first, the explored concurrent associations showed that less supportive teacher-child relationships were related with more victimization at each wave. Second, the cross-lagged associations indicated that less supportive relationships with the teacher predicted more relational victimization over time. In turn, more relational victimization at wave 1 predicted less supportive teacher-child relationships at wave 2. With regard to peer rejection and teacher-child relationships, first, the explored concurrent associations showed that less supportive teacher-child relationships were associated with more rejection at wave 1. Second, the cross-lagged associations between rejection and teacher-child relationships were not significant. As a result, neither the explored indirect paths (prediction of relational victimization by teacher-child relationships via peer rejection, and by peer rejection via teacher-child relationships) were significant.

Physical victimization

The Satorra-Bentler scaled χ^2 difference test indicated that the fit of the model with time-constrained autoregressive paths was significantly worse than the fully unconstrained model (ΔS-B χ^2 (3) = 11.077, $p = 0.011$). The fit of the fully unconstrained model was good (RMSEA < 0.001, RMSEA 90% CI = [0.000–0.000], SRMR = 0.007, CFI = 1.000, TLI = 1.032) and this model was used to interpret the results.

Figure 4 displays the significant results. To begin with, the autoregressive associations were explored and indicated that peer rejection, physical victimization and teacher-child relationships were stable over time. With regard to peer rejection and physical victimization, first, the concurrent associations were explored and showed that more rejection was associated with more physical victimization only at wave 2. Second, the cross-lagged associations indicated that physical victimization positively predicted peer rejection over time. Additionally, rejection positively predicted physical victimization from wave 1 to wave 2. Regarding teacher-child relationships and physical victimization, first,
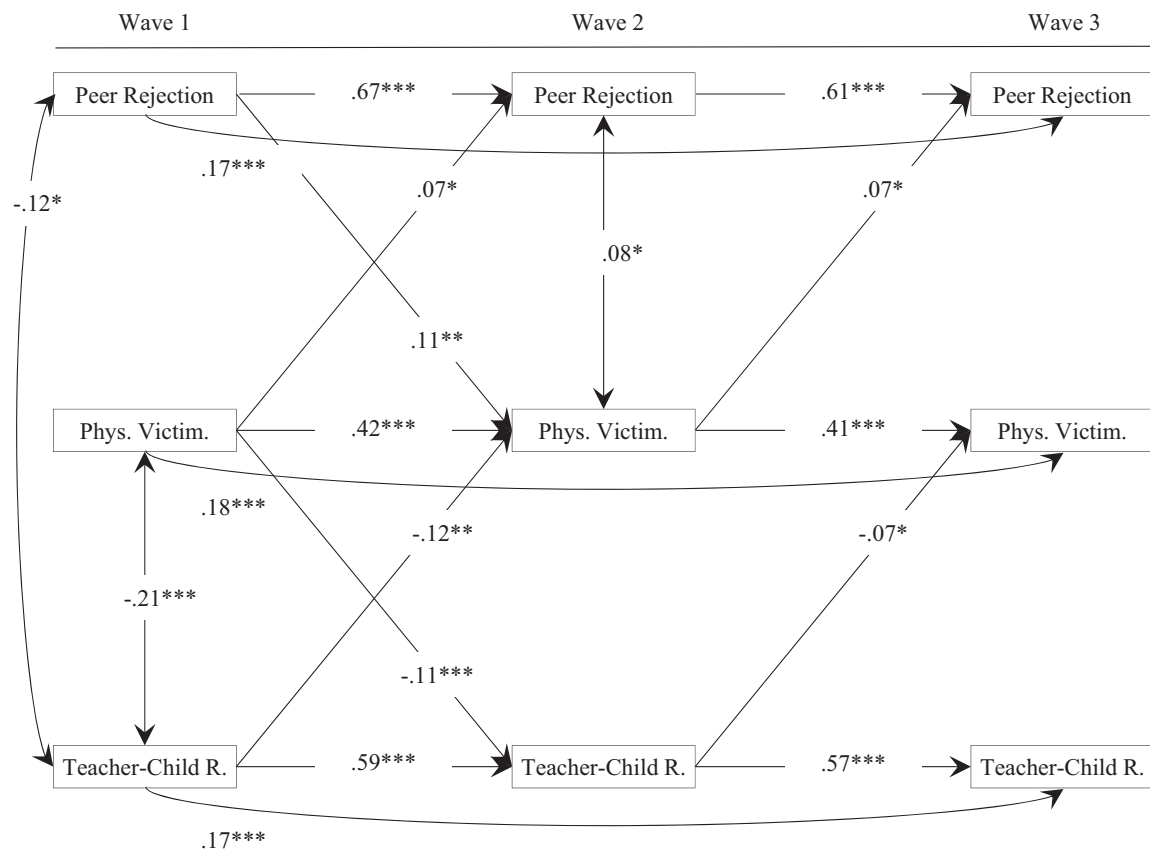
Fig. 4 Cross-lagged model of peer rejection, physical victimization and teacher-child relationships. Note. *Phys. Victim.* physical victimization, *Teacher-Child R.* teacher-child relationships. Significant paths with standardized coefficients are displayed. *$p < 0.050$; **$p < 0.010$; ***$p < 0.001$

the explored concurrent associations showed that less supportive teacher-child relationships were related with more victimization at wave 1. Second, the cross-lagged associations indicated that less supportive relationships with the teacher predicted more physical victimization over time. In turn, more physical victimization at wave 1 predicted less supportive teacher-child relationships at wave 2. With regard to peer rejection and teacher-child relationships, first, the explored concurrent associations showed that less supportive teacher-child relationships were associated with more rejection at wave 1. Second, the cross-lagged associations between rejection and teacher-child relationships were not significant. As a result, neither the explored indirect paths (prediction of physical victimization by teacher-child relationships via peer rejection, and by peer rejection via teacher-child relationships) were significant.

Alternate Model Analyses

As a warning appeared when using the "complex analysis" feature, the results of these models were checked against the results of models without robust standard errors. In line with

the analyses with robust standard errors, the Satorra-Bentler scaled χ^2 difference test indicated that, for both relational and physical victimization, the fit of the model with time-constrained autoregressive paths was significantly worse than the fully unconstrained model (resp. ΔS-B χ^2 (3) = 15.989, $p = 0.001$; ΔS-B χ^2 (3) = 14.479, $p = 0.002$). The fit of the fully unconstrained model for respectively relational and physical victimization was good (RMSEA = 0.046, RMSEA 90% CI = [0.024–0.068], SRMR = 0.018, CFI = 0.993, TLI = 0.959; RMSEA < 0.001, RMSEA 90% CI = [0.000–0.041], SRMR = 0.007, CFI = 1.000, TLI = 1.004) and these models were used to verify the results. All significant paths remained significant, except for one. More relational victimization at wave 1 did not significantly predict less supportive teacher-child relationships at wave 2 ($\beta = -0.06$, $p = 0.07$).

Discussion

Peer victimization at school is a widespread and persistent problem related to various detrimental consequences in the short and long run (Arseneault 2018). In their search for risk

and protective factors, researchers have demonstrated associations of peer victimization with peer rejection and teacher-child relationships. However, although children are simultaneously confronted with peers and teachers in classrooms, to date, only one longitudinal study has investigated the links of victimization with peer rejection and teacher-child relationships together (Elledge et al. 2016). In addition, few studies have differentiated between forms of victimization even though research indicated that teachers' and peers' beliefs regarding relational and physical victimization differ, as well as their responses to them (Bauman and Del Rio 2006; Goldstein and Tisak 2010). By including both peer rejection and teacher-child relationships into one model, the current study provides insight in the additive, unique effects of peers and teachers on relational and physical victimization over time. The transactional associations among teacher-child relationships, peer rejection and, respectively, relational and physical victimization were investigated in three waves over the course of one school year in upper elementary school.

Role of Peers and Teachers in Peer Victimization

First, the longitudinal links between peer rejection and peer victimization were explored. With regard to the victimization forms, similar associations were found. From wave 1 to wave 2, peer rejection was positively bidirectionally associated with relational and physical victimization. From wave 2 to wave 3, higher levels of relational and physical victimization predicted more rejection, but not the other way around. Thus, in general, children who were more rejected earlier in the school year, were more relationally and physically victimized in the middle of the school year and the other way around. Also, generally, children who were more victimized in the middle of the school year, were more rejected at the end of the school year. Although, as expected, rejection and victimization predicted each other in the first half of the school year, the results are more in line with, for instance, the idea that peers may distance themselves from victims (Salmivalli and Peets 2009; Sentse et al. 2015). However, in the first half of the school year, support was also found for the idea that rejected children may be less protected by the peer group (Hodges and Perry 1999). Besides the similar longitudinal findings, differences between the victimization forms appeared concerning their concurrent associations with rejection. Relational victimization was positively associated with peer rejection at each wave, but for physical victimization, this was only found at the second wave. A possible explanation for the more consistent concurrent associations between relational victimization and peer rejection is that these are two forms of peer adversity that are more similar to each other. Peer rejection describes the degree to which children are disliked by the

peer group. Relational victimization includes aggressive behavior aimed at making peers stop liking the victim (e.g., "How often are lies told about you to make sure other children don't like you anymore?"). Contrarily, physical victimization includes physical aggressive behavior that is not specifically aimed at making peers stop liking the victim. However, as these findings pertain concurrent associations that were only explored, further research is recommended.

Second, evidence was found for the hypothesis that more supportive teacher-child relationships predict less victimization over time. Thus, generally, children reporting greater support in the relationship with their teacher earlier in the school year, were less relationally and physically victimized later in the school year. This finding adds to the available cross-sectional evidence (e.g., Lucas-Molina et al. 2015; Raskauskas et al. 2010) and is in line with previous longitudinal evidence (Serdiouk et al. 2016). Contrary to expectations, the association with physical victimization was not stronger (Yoon et al. 2016). These results show that in the context of supportive teacher-child relationships, teachers may model positive relational skills (Hendrickx et al. 2016) and may be better able to notice victimization and intervene more quickly (e.g., Reavis et al. 2010). Also, when children enjoy more supportive relationships with their teachers, they may develop better skills to manage victimization and may be more willing to report it (e.g., Eliot et al. 2010; Reavis et al. 2010; Serdiouk et al. 2016). In turn, effects of relational and physical victimization on teacher-child relationships were explored as teachers could be expected to provide more but also less support to victims (Bowlby 1969; Juvonen and Graham 2014). Evidence was limited, but more in line with the latter. More victimization at the beginning of the school year was found to predict less supportive relationships with teachers at the middle of the school year. This finding is unfortunate as supportive relationships with teachers can protect victimized children from later difficulties, such as internalizing problems (for a review, see Ttofi et al. 2014). For relational victimization, this association was less strong and careful interpretation is recommended as it was not confirmed in the analysis in which was not controlled for the clustering of participants in classrooms. A possible explanation for this difference between physical and relational victimization is that teachers are generally more aware of physical victimization (Yoon et al. 2008) and that this may cause greater classroom management challenges to them. Nonetheless, victimization only predicted teacher-child relationships from the beginning to the middle of the school year. Thus, evidence for the prediction of victimization by teacher-child relationships was more consistent. Also, as stated earlier, due to a strong focus on teachers as socializing agents, less attention has been given to whether peer relationships predict teacher-child relationships (Farmer et al. 2011). Therefore, more research is needed.

Third, regarding peer rejection and teacher-child relationships, apart from a negative concurrent association at the beginning of the school year, no consistent links were found. Thus, over the school year, teacher-child relationships did not predict peer rejection, neither did peer rejection predict teacher-child relationships. As a result, neither support was found for the hypothesized indirect prediction of victimization by teacher-child relationships via peer rejection, and by peer rejection via teacher-child relationships. A first possible explanation for these findings is that, in contrast with previous studies (e.g., Hendrickx et al. 2017b; Mercer and Derosier 2008), the tested models included victimization. Therefore, when looking at the unique effects of teachers, their relationships with children seem to be even more important in the prediction of peer victimization than of peer rejection. It is possible that teachers have stronger effects on victimization as victimization refers to behavior occurring within groups whereas rejection refers to an affective reaction held by the peer group (Rubin et al. 2015). Accordingly, it is also possible that support from teachers is more determined by victimization than rejection. Victimization may cause greater classroom management challenges than rejection. A second possible explanation is that peer rejection is more strongly predicted by negative teacher behavior than positive. For instance, Hendrickx et al. (2017b) found evidence for a social reference effect but only through negative teacher behavior. Contrary to high conflict in the teacher-child relationship, low support in the relationship may not give peers the impression that the teacher dislikes the child and may, therefore, not guide peers in disliking the child themselves. In turn, peer rejection may be more predictive of negative dimensions of teacher-child relationships than positive dimensions. Third, teacher-child relationships may not be predictive for peer rejection as early adolescents may turn less to their teachers for social information about peers than younger children. However, more research focusing together on peer victimization, peer rejection and teacher-child relationships is needed.

Based on the findings, some conclusions can be formulated. To begin with, peer rejection and teacher-child relationships uniquely predict victimization (positively and negatively respectively) when they are both taken into account and while all previous and concurrent levels of the variables are controlled for. Therefore, to explain victimization processes in early adolescence, relationships with both peers and teachers need to be considered. Further, in light of the developmental period of early adolescence, stronger effects were expected from peers to teachers than vice versa. This was not confirmed. Only in the first half of the school year, more rejection predicted more victimization, but more supportive teacher-child relationships predicted less victimization throughout the whole school year.

Thus, in contrast with Elledge et al. (2016), children's relationships with teachers were more predictive of victimization than their relationships with peers. Consequently, the findings reflect that for early adolescents, relationships with teachers play an important role in victimization processes. Finally, the associations of physical and relational victimization with peer rejection and teacher-child relationships were almost similar. Therefore, overall, the results of this study do not reflect differences within peers' and teachers' beliefs and responses regarding relational and physical victimization (Bauman and Del Rio 2006; Goldstein and Tisak 2010).

Strengths, Limitations and Suggestions for Future Research

The purpose of this study was to explore the role of relationships with peers and teachers in the development of relational and physical victimization during one school year. The longitudinal design made it possible to determine the direction of effects, unlike most previous research. Further, the design permitted to study the relationships of children with peers and teachers within the same classroom context over one school year, which is particularly suitable to investigate within-class dynamics. Also, as the study distinguished between relational and physical victimization, more insight in these different forms was provided. Despite these strengths, the study also had some limitations.

First, a student self-report questionnaire was used to measure supportiveness in teacher-child relationships. A positive relationship dimension was measured, even though different studies found (direct) effects of negative teacher-child relationship dimensions such as stressful relationships (Murray-Harvey and Slee 2010) and teacher-to-student aggression (Lucas-Molina et al. 2015) on victimization. Also, as both teacher-child relationships and victimization were measured by self-report, the results should be interpreted with caution because of the possibility of shared method variance that could have increased the effects. Another limitation related to the measures is that students from 3 out of the 36 classrooms had two teachers and reported about their relationship with these two teachers in general. Students from the other classes had one teacher which is typical for elementary classrooms in Flanders. Future studies could include multiple dimensions of teacher-child relationships as well as perceptions of students, peers and teachers.

Second, this study provided information on the temporal order of effects, but future studies are needed to provide further insight in the possible explanatory mechanisms to deepen understanding of how classroom social relationships predict victimization and each other. For instance, it could be investigated whether mechanisms based on social

learning and attachment theory (e.g., modeling, teacher's sensitivity, children's emotional security, their willingness to report bullying) mediate in the association between earlier teacher-child relationships and victimization. Also, future studies could include teachers' interventions in bullying to better understand how perceived teacher support predicts victimization and vice versa. Further, participants in this study were entering early adolescence. It would be interesting to investigate in future research whether similar associations are found later on in early adolescence, for instance at the beginning of secondary school.

Third, although the cross-lagged analyses provide information on the temporal order of effects, they do not permit to draw causal conclusions. Also, the cross-lagged models do not disentangle between- and within-person variance (Keijsers 2016). Therefore, no conclusions regarding within-person change can be drawn from these results.

Practical Implications

Establishing and maintaining positive relationships with peers and teachers are important for children's adjustment (e.g., Bukowski et al. 2018). This study showed that peer rejection and teacher-child relationships have unique, additive effects on victimization over time, meaning that each contribute to the development of peer victimization on top of the other. Thus, relationships with both peers and teachers matter, indicating two possible ways for intervention. Further, the lack of significant associations between peer rejection and teacher-child relationships may imply that targeting one relationship does not automatically lead to improvement in the other. Therefore, to decrease victimization, both relationships should be focused on.

First, victimization can be reduced by promoting positive peer relationships and by using interventions aimed at decreasing peer rejection (for an overview, see Bierman 2004). It is important that teachers are aware of the connection between peer social dynamics and victimization and that they know how to manage these dynamics such that rejection is reduced and opportunities for positive peer interactions are promoted (Farmer et al. 2018). For instance, when teachers are attuned to the peer social system, they may better identify functions of behavior and better match interventions (Lee 2018).

Second, efforts to maintain support between students and teachers are encouraged as well as interventions promoting teacher-student closeness and support. For instance, Sabol and Pianta (2012) give an overview of training programs for teachers that take a relational perspective. In line with this, a relationship-focused reflection program to promote teachers' relationships with behaviorally at-risk children was developed and evaluated (Spilt et al. 2012). In addition,

interventions focused on improving school climate can be used (Smith 2019). Further, meta-analyses on the effectivity of anti-bullying programs found that teacher training was an important component to reduce bullying (e.g., Ttofi and Farrington 2011). Based on the findings of the current study, it is encouraged that attention is paid to teacher-student relationships in these trainings.

Besides their effects on the levels of victimization, positive peer and teacher relationships are also important in protecting victims' quality of life. Evidence shows that victims highly value support from peers and teachers, but that they perceive that they are not receiving it (Demaray and Malecki 2003). Also, peer social support in combination with teacher support has been found to be the strongest buffer against the negative effects of victimization (Flaspohler et al. 2009). Next, by focusing interventions on more than one classroom interaction partner, the effectiveness might improve. As in classrooms, relationships with peers and teachers may function together as a system, changes in one relationship may contribute to changes in the other and, in turn, influence students' functioning (Farmer et al. 2018). Person-in-context interventions responsive to the social ecology, students' individual social experiences, and their interplay, are needed (Farmer et al. 2018).

Conclusion

The current study investigated how relationships with peers and teachers uniquely contribute to the prediction of peer victimization over the course of one school year in upper elementary school. Prior research was extended by taking these two classroom-based relationships simultaneously into account and by differentiating between two forms of victimization. The transactional links between teacher-child relationships, peer rejection and respectively relational and physical victimization were investigated. Findings were similar for relational and physical victimization. Support was found for an additive model in which peer and teacher-child relationships add unique variance to the development of peer victimization in early adolescence. On the one hand, peer victimization can be reduced by decreasing peer rejection and, on the other, by increasing supportiveness in teacher-child relationships. Additionally, victimization positively predicted peer rejection throughout the school year and negatively predicted teacher-child support from the beginning to the middle of the school year. It is important that teachers are aware of these classroom social dynamics and try to manage them to increase students' chances of positive interactions in the classroom.

Compliance with Ethical Standards

References

Arseneault, L. (2018). Annual research review: the persistent and pervasive impact of being bullied in childhood and adolescence: implications for policy and practice. *Journal of Child Psychology and Psychiatry*, 59(4), 405–421. https://doi.org/10.1111/jcpp.12841.

Bandura, A. (1977). *Social learning theory*. Englewood Cliffs, NJ: Prentice Hall.

Bauman, S., & Del Rio, A. (2006). Preservice teachers' responses to bullying scenarios: comparing physical, verbal, and relational bullying. *Journal of Educational Psychology*, 98(1), 219–231. https://doi.org/10.1037/0022-0663.98.1.219.

Bierman, K. L. (2004). *Peer rejection: developmental processes and intervention strategies*. New York, NY: Guilford Press.

Bierman, K. L. (2011). The promise and potential of studying the "invisible hand" of teacher influence on peer relations and student outcomes: a commentary. *Journal of Applied Developmental Psychology*, 32(5), 297–303. https://doi.org/10.1016/j.appdev.2011.04.004.

Bowlby, J. (1969). The child's tie to his mother: attachment behavior. In J. Bowlby (Ed.), *Attachment and loss: Vol. 1. Attachment* (pp. 177–209). New York, NY: Basic Books.

Bronfenbrenner, U., & Morris, P. A. (2006). The bioecological model of human development. In R. M. Lerner & W. Damon (Eds.), *Handbook of child psychology* (6th ed., Vol. 1, pp. 793–828). Hoboken, NJ: Wiley.

Bukowski, W. M., Laursen, B., & Rubin, K. H. (2018). *Handbook of peer interactions, relationships, and groups*. 2nd ed. New York, NY: Guilford Press.

Cillessen, A. H. N. (2009). Sociometric methods. In K. H. Rubin, W. M. Bukowski & B. Laursen (Eds.), *Handbook of peer interactions, relationships, and groups* (pp. 82–99). New York, NY: Guilford Press.

Cillessen, A. H. N., & Mayeux, L. (2004). From censure to reinforcement: developmental changes in the association between aggression and social status. *Child Development*, 75(1), 147–163. https://doi.org/10.1111/j.1467-8624.2004.00660.x.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. 2nd ed. Hillsdale: Erlbaum.

Coie, J. D., Dodge, K. A., & Coppotelli, H. (1982). Dimensions and types of social status: a cross-age perspective. *Developmental Psychology*, 18(4), 557–570. https://doi.org/10.1037/0012-1649.18.4.557.

Crick, N. R., & Grotpeter, J. K. (1998). Children's treatment by peers: victims of relational and overt aggression. In M. E. Hertzig & E. A. Farber (Eds.), *Annual progress in child psychiatry and child development 1997* (pp. 79–92). Philadelphia: Brunner/Mazel.

Davidson, A. J., Gest, S. D., & Welsh, J. A. (2010). Relatedness with teachers and peers during early adolescence: an integrated variable-oriented and person-oriented approach. *Journal of School Psychology*, 48(6), 483–510. https://doi.org/10.1016/j.jsp.2010.08.002.

De Laet, S., Doumen, S., Vervoort, E., Colpin, H., Van Leeuwen, K., & Goossens, L. et al. (2014). Transactional links between teacher–child relationship quality and perceived versus sociometric popularity: a three-wave longitudinal study. *Child Development*, 85(4), 1647–1662. https://doi.org/10.1111/cdev.12216.

Demaray, M. K., & Malecki, C. K. (2003). Perceptions of the frequency and importance of social support by students classified as victims, bullies, and bully/victims in an urban middle school. *School Psychology Review*, 32(3), 471–489. https://doi.org/10.1080/02796015.2003.12086213.

Desjardins, T., Yeung Thompson, R. S., Sukhawathanakul, P., Leadbeater, B. J., & Macdonald, S. W. S. (2013). Factor structure of the Social Experience Questionnaire across time, sex, and grade among early elementary school children. *Psychological Assessment*, 25(4), 1058–1068. https://doi.org/10.1037/a0033006.

Dolan, L., Jaylan, T., Werthamer, L., & Kellam, S. (1989). *The good behavior game manual*. City of Baltimore: Department of Education and the Prevention Centre, The John Hopkins University.

Donkers, A., & Vermulst, A. (2011). *Klimaatschaal. [Climate Scale. Manual]*. Uden: Orthopraktijk.

Eliot, M., Cornell, D., Gregory, A., & Fan, X. (2010). Supportive school climate and student willingness to seek help for bullying and threats of violence. *Journal of School Psychology*, 48(6), 533–553. https://doi.org/10.1016/j.jsp.2010.07.001.

Elledge, L., Elledge, A., Newgent, R., & Cavell, T. (2016). Social risk and peer victimization in elementary school children: the protective role of teacher-student relationships. *Journal of Abnormal Child Psychology*, 44(4), 691–703. https://doi.org/10.1007/s10802-015-0074-z.

Farmer, T. W., Lines, M. M., & Hamm, J. V. (2011). Revealing the invisible hand: the role of teachers in children's peer experiences. *Journal of Applied Developmental Psychology*, 32(5), 247–256. https://doi.org/10.1016/j.appdev.2011.04.006.

Farmer, T. W., Talbott, B., Dawes, M., Huber, H. B., Brooks, D. S., & Powers, E. E. (2018). Social dynamics management: what is it and why is it important for intervention? *Journal of Emotional and Behavioral Disorders*, 26(1), 3–10. https://doi.org/10.1177/1063426617752139.

Flaspohler, P. D., Elfstrom, J. L., Vanderzee, K. L., Sink, H. E., & Birchmeier, Z. (2009). Stand by me: the effects of peer and teacher support in mitigating the impact of bullying on quality of life. *Psychology in the Schools*, 46(7), 636–649. https://doi.org/10.1002/pits.20404.

Gest, S. D., & Rodkin, P. C. (2011). Teaching practices and elementary classroom peer ecologies. *Journal of Applied*

Developmental Psychology, *32*(5), 288–296. https://doi.org/10.1016/j.appdev.2011.02.004.

Goldstein, S., & Tisak, M. (2010). Adolescents' social reasoning about relational aggression. *Journal of Child and Family Studies*, *19*(4), 471–482. https://doi.org/10.1007/s10826-009-9319-1.

Hendrickx, M. M. H. G., Mainhard, M. T., Boor-Klip, H. J., & Brekelmans, M. (2017a). Our teacher likes you, so I like you: a social network approach to social referencing. *Journal of School Psychology*, *63*, 35–48. https://doi.org/10.1016/j.jsp.2017.02.004.

Hendrickx, M. M. H. G., Mainhard, M. T., Boor-Klip, H. J., Cillessen, A. H. M., & Brekelmans, M. (2016). Social dynamics in the classroom: teacher support and conflict and the peer ecology. *Teaching and Teacher Education*, *53*, 30–40. https://doi.org/10.1016/j.tate.2015.10.004.

Hendrickx, M. M. H. G., Mainhard, M. T., Oudman, S., Boor-Klip, H. J., & Brekelmans, M. (2017b). Teacher behavior and peer liking and disliking: the teacher as a social referent for peer status. *Journal of Educational Psychology*, *109*(4), 546–558. https://doi.org/10.1037/edu0000157.

Hodges, E. V. E., & Perry, D. G. (1999). Personal and interpersonal antecedents and consequences of victimization by peers. *Journal of Personality and Social Psychology*, *76*(4), 677–685. https://doi.org/10.1037/0022-3514.76.4.677.

Hox, J. J. (2002). *Multilevel analysis: techniques and applications*. 2nd ed. Mahwah, NJ: Lawrence Erlbaum Associates, Publishers.

Hu, L.-T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, *6*(1), 1–55. https://doi.org/10.1080/10705519909540118.

Hughes, J. N., Cavell, T. A., & Willson, V. (2001). Further support for the developmental significance of the quality of the teacher–student relationship. *Journal of School Psychology*, *39*(4), 289–301. https://doi.org/10.1016/S0022-4405(01)00074-7.

Hughes, J. N., & Chen, Q. (2011). Reciprocal effects of student–teacher and student–peer relatedness: effects on academic self efficacy. *Journal of Applied Developmental Psychology*, *32*(5), 278–287. https://doi.org/10.1016/j.appdev.2010.03.005.

Hughes, J. N., & Im, M. H. (2016). Teacher–student relationship and peer disliking and liking across grades 1–4. *Child Development*, *87*(2), 593–611. https://doi.org/10.1111/cdev.12477.

Jerome, E. M., Hamre, B. K., & Pianta, R. C. (2009). Teacher–child relationships from kindergarten to sixth grade: early childhood predictors of teacher-perceived conflict and closeness. *Social Development*, *18*(4), 915–945. https://doi.org/10.1111/j.1467-9507.2008.00508.x.

Jöreskog, K. G. (1970). A general method for analysis of covariance structures. *Biometrika*, *57*(2), 239–251. https://doi.org/10.2307/2334833.

Juvonen, J., & Graham, S. (2014). Bullying in schools: the power of bullies and the plight of victims. *Annual Review of Psychology*, *65*(1), 159–185. https://doi.org/10.1146/annurev-psych-010213-115030.

Keijsers, L. (2016). Parental monitoring and adolescent problem behaviors: how much do we really know? *International Journal of Behavioral Development*, *40*(3), 271–281. https://doi.org/10.1177/0165025415592515.

Kline, R. B. (2005). *Principles and practice of structural equation modeling*. 2nd ed. New York: The Guilford Press.

Ladd, G. W., & Troop-Gordon, W. (2003). The role of chronic peer difficulties in the development of children's psychological adjustment problems. *Child Development*, *74*(5), 1344–1367. https://doi.org/10.1111/1467-8624.00611.

Lee, D. L. (2018). Social dynamics management and functional behavioral assessment. *Journal of Emotional and Behavioral Disorders*, *26*(1), 62–64. https://doi.org/10.1177/1063426617750142.

Leflot, G., Liekens, I., & Colpin, H. (2017). TOPspel. Effectief omgaan met grensoverschrijdend gedrag in de klas (Topspel.

Dealing effectively with externalizing behavior in class). *Caleidoscoop*, *29*(5), 6–14.

Leflot, G., Van Lier, P. A. C., Onghena, P., & Colpin, H. (2010). The role of teacher behavior management in the development of disruptive behaviors: an intervention study with the Good Behavior Game. *Journal of Abnormal Child Psychology*, *38*(6), 869–882. https://doi.org/10.1007/s10802-010-9411-4.

Lucas-Molina, B., Williamson, A. A., Pulido, R., & Pérez-Albéniz, A. (2015). Effects of teacher-student relationships on peer harassment: a multilevel study. *Psychology in the Schools*, *52*(3), 298–315. https://doi.org/10.1002/pits.21822.

Mercer, S. H., & Derosier, M. E. (2008). Teacher preference, peer rejection, and student aggression: a prospective study of transactional influence and independent contributions to emotional adjustment and grades. *Journal of School Psychology*, *46*(6), 661–685. https://doi.org/10.1016/j.jsp.2008.06.006.

Moore, S. E., Norman, R. E., Suetani, S., Thomas, H. J., Sly, P. D., & Scott, J. G. (2017). Consequences of bullying victimization in childhood and adolescence: a systematic review and meta-analysis. *World Journal of Psychiatry*, *7*(1), 60–72. https://doi.org/10.5498/wjp.v7.i1.60.

Murray-Harvey, R., & Slee, P. T. (2010). School and home relationships and their impact on school bullying. *School Psychology International*, *31*(3), 271–295. https://doi.org/10.1177/0143034310366206.

Muthén, L. K., & Muthén, B. O. (1998–2017). *Mplus User's Guide*. 8th ed. Los Angeles, CA: Muthén & Muthén.

Nesdale, D., & Pickering, K. (2006). Teachers' reactions to children's aggression. *Social Development*, *15*(1), 109–127. https://doi.org/10.1111/j.1467-9507.2006.00332.x.

Newman, D. A. (2014). Missing data: five practical guidelines. *Organizational Research Methods*, *17*(4), 372–411. https://doi.org/10.1177/1094428114548590.

Olweus, D. (1993). *Bullying at school: what we know and what we can do*. Oxford: Blackwell Publishing.

Peugh, J. L. (2010). A practical guide to multilevel modeling. *Journal of School Psychology*, *48*(1), 85–112. https://doi.org/10.1016/j.jsp.2009.09.002.

Putallaz, M., Grimes, C. L., Foster, K. J., Kupersmidt, J. B., Coie, J. D., & Dearing, K. (2007). Overt and relational aggression and victimization: multiple perspectives within the school setting. *Journal of School Psychology*, *45*(5), 523–547. https://doi.org/10.1016/j.jsp.2007.05.003.

Raskauskas, J. L., Gregory, J., Harvey, S. T., Rifshana, F., & Evans, I. M. (2010). Bullying among primary school children in New Zealand: relationships with prosocial behaviour and classroom climate. *Educational Research*, *52*(1), 1–13. https://doi.org/10.1080/00131881003588097.

Reavis, R. D., Keane, S. P., & Calkins, S. D. (2010). Trajectories of peer victimization: the role of multiple relationships. *Merrill-Palmer Quarterly (Wayne State University Press)*, *56*(3), 303–332. https://doi.org/10.1353/mpq.0.0055.

Rubin, K. H., Bukowski, W. M., & Bowker, J. C. (2015). Children in peer groups. In R. M. Lerner (Ed.), *Handbook of child psychology and developmental science* (Vol 4, pp. 175–222). Hoboken, New Jersey: Wiley.

Sabol, T. J., & Pianta, R. C. (2012). Recent trends in research on teacher–child relationships. *Attachment & Human Development*, *14*(3), 213–231. https://doi.org/10.1080/14616734.2012.672262.

Salmivalli, C., & Peets, K. (2009). Bullies, victims, and bully-victim relationships in middle childhood and early adolescence. In W. M. Bukowski, B. Laursen, & K. H. Rubin (Eds.), *Handbook of peer interactions, relationships, and groups* (pp. 322–340). New York, NY: Guilford Press.

Satorra, A., & Bentler, P. (2010). Ensuring positiveness of the scaled difference chi-square test statistic. *Psychometrika*, *75*(2), 243–248. https://doi.org/10.1007/s11336-009-9135-y.

Sentse, M., Kretschmer, T., & Salmivalli, C. (2015). The longitudinal interplay between bullying, victimization, and social status: age-related and gender differences. *Social Development*, *24*(3), 659–677. https://doi.org/10.1111/sode.12115.

Serdiouk, M., Berry, D., & Gest, S. D. (2016). Teacher-child relationships and friendships and peer victimization across the school year. *Journal of Applied Developmental Psychology*, *46*, 63–72. https://doi.org/10.1016/j.appdev.2016.08.001.

Serdiouk, M., Rodkin, P., Madill, R., Logis, H., & Gest, S. (2015). Rejection and victimization among elementary school children: the buffering role of classroom-level predictors. *Journal of Abnormal Child Psychology*, *43*(1), 5–17. https://doi.org/10.1007/s10802-013-9826-9.

Smith, P. K. (2019). *Making an impact on school bullying: interventions and recommendations.* New York, NY: Routledge.

Spilt, J. L., Koomen, H. M. Y., Thijs, J. T., & van Der Leij, A. (2012). Supporting teachers' relationships with disruptive children: the potential of relationship-focused reflection. *Attachment & Human Development*, *14*(3), 305–318. https://doi.org/10.1080/14616734.2012.672286.

Storch, E. A., Crisp, H., Roberti, J. W., Bagner, D. M., & Masia-Warner, C. (2005). Psychometric evaluation of the Social Experience Questionnaire in adolescents: descriptive data, reliability, and factorial validity. *Child Psychiatry and Human Development*, *36*(2), 167–176. https://doi.org/10.1007/s10578-005-3495-z.

Terry, R. (2000). Recent advances in measurement theory and the use of sociometric techniques. In A. H. N. Cillessen, & W. M. Bukowski (Eds.), *Recent advances in the measurement of acceptance and rejection in the peer system. New Directions for Child and Adolescent Development* (Vol. 88, pp. 27–53). San Francisco: Jossey-Bass.

Thornberg, R., Wänström, L., Pozzoli, T., & Gini, G. (2018). Victim prevalence in bullying and its association with teacher-student and student-student relationships and class moral disengagement: a class-level path analysis. *Research Papers in Education*, *33*(3), 320–335. https://doi.org/10.1080/02671522.2017.1302499.

Troop-Gordon, W., & Kopp, J. (2011). Teacher-child relationship quality and children's peer victimization and aggressive behavior in late childhood. *Social Development*, *20*(3), 536–561. https://doi.org/10.1111/j.1467-9507.2011.00604.x.

Ttofi, M., & Farrington, D. (2011). Effectiveness of school-based programs to reduce bullying: a systematic and meta-analytic review. *Journal of Experimental Criminology*, *7*(1), 27–56. https://doi.org/10.1007/s11292-010-9109-1.

Ttofi, M. M., Bowes, L., Farrington, D. P., & Losel, F. (2014). Protective factors interrupting the continuity from school bullying to later internalizing and externalizing problems: a systematic review of prospective longitudinal studies. *Journal of School Violence*, *13*(1), 5–38. https://doi.org/10.1080/15388220.2013.857345.

UNESCO. (2019). *Behind the numbers: ending school violence and bullying.* Paris: UNESCO.

Verschueren, K., & Koomen, H. Y. (2012). Teacher–child relationships from an attachment perspective. *Attachment & Human Development*, *14*(3), 205–211. https://doi.org/10.1080/14616734.2012.672260.

Walden, T. A., & Ogan, T. A. (1988). The development of social referencing. *Child Development*, *59*(5), 1230–1240. https://doi.org/10.2307/1130486.

Wentzel, K. R. (2009). Peers and academic functioning at school. In W. M. Bukowski, B. Laursen & K. H. Rubin (Eds.), *Handbook of peer interactions, relationships, and groups*. New York, NY: Guilford Press.

Weston, R., & Gore, P. A. (2006). A brief guide to structural equation modeling. *The Counseling Psychologist*, *34*(5), 719–751. https://doi.org/10.1177/0011000006286345.

Weyns, T., Colpin, H., De Laet, S., Engels, M., & Verschueren, K. (2018). Teacher support, peer acceptance, and engagement in the classroom: a three-wave longitudinal study in late childhood. *A Multidisciplinary Research Publication*, *47*(6), 1139–1150. https://doi.org/10.1007/s10964-017-0774-5.

Williams, R. L. (2000). A note on robust variance estimation for cluster-correlated data. *Biometrics*, *56*(2), 645–646. https://doi.org/10.1111/j.0006-341X.2000.00645.x.

Yoon, J. S., & Barton, E. (2008). The role of teachers in school violence and bullying prevention. In T. W. Miller (Ed.), *School violence and primary prevention* (pp. 249–275). New York, NY: Springer New York.

Yoon, J. S., Sulkowski, M. L., & Bauman, S. A. (2016). Teachers' responses to bullying incidents: Effects of teacher characteristics and contexts. *Journal of School Violence*, *15*, 91–113. https://doi.org/10.1080/15388220.2014.963592.

Karlien Demol is a PhD student at the Faculty of Psychology and Educational Sciences at KU Leuven. Her major research interests include school psychology, and more specifically, the effects of interactions with peers and teachers on bullying and victimization processes at school.

Geertje Leflot is a lecturer and researcher in Applied Psychology at University College Thomas More in Antwerp. Her research focuses on the role of interactions with peers and teachers in shaping elementary school children's behavioral development.

Karine Verschueren is a Full Professor at the Faculty of Psychology and Educational Sciences at KU Leuven. Her research addresses the academic and psychosocial development of children and adolescents in schools and the role of classroom-based social relationships (i.e., teacher-child and peer relationships).

Hilde Colpin is a Full Professor at the Faculty of Psychology and Educational Sciences at KU Leuven. She conducts longitudinal and intervention research regarding the effect of the social context on students' social-emotional and academic development. She has a special interest in the role of teacher-student interactions in bullying and victimization processes at school.