Reciprocal relations between student-teacher conflict, children`s social skills and

externalizing behavior. A three-wave longitudinal study from preschool to third grade

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Abstract

Research suggests that the relation between student-teacher conflict and children's externalizing behavior might be reciprocal, and possibly also between student-teacher conflict and children`s social skills. Because children with externalizing behavior also tend to display low levels of social skills, we do not know if one or both of these student characteristics are involved in shaping and being shaped by the relationship to the teacher. In this study, we addressed this by means of a three-wave cross-lagged longitudinal study from preschool to third grade, including measures of social skills, externalizing behavior and student-teacher conflict. Bidirectional relations were observed between student-teacher conflict and social skills from first grade to third grade, and between student-teacher conflict and externalizing behavior between preschool and first grade. However, results from a model including both social skills and externalizing behavior suggested that externalizing behavior is a stronger predictor of conflicted student-teacher relationship than children`s social skills. Student-teacher conflict was predictive of externalizing behavior as well as of later social skills. Effect of children's first-grade externalizing behavior on third-grade student-teacher conflict was gender moderated, with stronger effects of externalizing behavior observed in girls, combined with higher stability in first-grade student-teacher conflict in boys.

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According to ecological theoretical framework (Bronfenbrenner & Morris, 1998),

children's development is influenced by the dynamic, mutual interplay between the child and

his or her social context. The notion of bidirectional relations consisting of the impact of the

child to her interpersonal environment and the impact of environment to the child has already

been conceptualized in Bell`s (1968) bidirectional model, which underscored that children

play as active role as adults when engaging in social interactions. Mutual influences between

children and adults were then later described in e.g. models of coercive interaction (Patterson,

Reid, & Dishion, 1992; Sutherland & Oswald, 2005) and in Sameroff`s (1975) transactional

model. According to Sameroff (2009), experiences provided by the social context are viewed

as shaping, but also as being shaped by children`s developmental trajectories.

In respect to preschool and school environments, which is the focus of the current

inquiry, children`s relationship with their teacher seem to be one of the most important

sources of children`s development, including the development of social skills as well as

behavior problems (Sabol & Pianta, 2012). Nevertheless, the fact that children are important

agents in forming their relationships with teachers has previously often been neglected

(Nurmi, 2012). In the current research, we thus aimed to address the possibility of

bidirectional relations between student-teacher conflict and children`s social skills and

externalizing behavior.

Relations between Student-Teacher Conflict, Children`s Social Skills and Externalizing

Behavior

The main body of previous research has focused on how student-teacher relationship impacts on children`s development. Based on the attachment theory, conflicted student-teacher relationship (Pianta, 1999) can lead children to form negative internal working models of themselves and others and, in consequence, develop lower levels of social competence (Howes, Hamilton, & Matheson, 1994), and engage in inappropriate behavior (Howes, 2000). From the social-cognitive perspective, student-teacher conflicts may lead teachers to afford less support for children`s positive behavioral development (O'Connor, Dearing, & Collins, 2011), and to provide children with maladaptive strategies when engaging their social environment (Silver, Measelle, Armstrong, & Essex, 2005).

However, as suggested by the bidirectional view on the developmental processes between child and his or her teacher (Rimm-Kaufman & Pianta, 2000; Sutherland & Oswald, 2005), conflicted student-teacher relationships might not only influence children`s development, but the quality of the relationship itself can also be influenced by children (Birch & Ladd, 1998; Sutherland & Oswald, 2005). Students` characteristics, such as their levels of social skills and externalizing behavior, can evoke responses from teachers, which might in turn lead to student-teacher conflicts (see Nurmi, 2012). For example, teachers expect children to have certain social skills in order to successfully navigate the school environment (Lane, Givner, & Pierson, 2004). Subsequently, children lacking skills to meet the school demands can experience strained teacher-child relationships (Kuklinski & Weinstein, 2000). On the other hand, children with well developed social skills might be more successful in avoiding conflicted student-teacher relationships, because they are able to provide their counterparts with positive rewards (Ladd, Birch, & Buhs, 1999). In respect to externalizing problems, children exhibiting such behavior might disturb the class, thus making teaching difficult (Lapointe, 2003). In addition, aggressive children often respond in a confrontational and hostile manner when challenged by their teachers (Birch & Ladd, 1998;

Burgess, Wojslawowicz, Rubin, Rose-Krasnor, & Booth-LaForce, 2006) and such behavior can adversely affect relationships with teachers (Ladd et al., 1999) and provoke teachers' ineffective response to innappropriate behavior (Myers & Pianta, 2008).

There is a growing evidence documenting effects of student-teacher relationship on children`s development. Conflicted student-teacher relationship has been shown to predict increases in aggressive behavior over time (Birch & Ladd, 1997; Pianta & Stuhlman, 2004; Silver et al., 2005; Silver, Measelle, Armstrong, & Essex, 2010) and low levels of teacher-child conflict predicted children`s social competence in preschool (Ewing & Taylor, 2009; Zhang & Nurmi, 2012) and school (Birch & Ladd, 1998; Howes, 2000). The opposite direction of the relations has been examined to much lesser extent, but some evidence has emerged: Children`s externalizing behavior is indeed an important predictor of conflicted student-teacher relationships, with the reverse being true of lower levels of behavior problems (O'Connor, 2010) and prosociability (Howes, Phillipsen, & Peisner-Feinberg, 2000; Ladd et al., 1999; Nurmi, 2012).

However, research on such *bidirectional* relations between the student-teacher relationship and children`s externalizing behavior or social skills is scarce, with some exceptions (Doumen et al., 2008; Zhang & Nurmi, 2012; Zhang & Sun, 2011). Most previous studies focused only on unidirectional predictors of one of these outcomes (see Nurmi 2012), or examined both directions of the association, but in separate, unidirectional analyses (Birch & Ladd, 1998; Howes et al., 2000). One of the few studies addressing such reciprocal processes showed that children's aggressive behavior at the beginning of the kindergarten year predicted increased teacher-child conflict, which in turn forecast an increase in child aggression by the end of the year (Doumen et al., 2008). Another cross-lagged study on Chinese preschoolers showed that whereas good-quality student-teacher relationship at the

beginning of the preschool year predicted children`s social competence at the end of the year,

children`s social competence was not predictive of student-teacher relationship (Zhang &

Nurmi, 2012). Nevertheless, research on such bidirectional effects between student-teacher

conflict and social skills in a longitudinal perspective is limited.

Thus, the first aim of the current inquiry was to investigate such relations. More

specifically, we aimed to examine, whether early social skills predict later conflict and

whether student-teacher conflict predicts later social skills. We also aimed to examine

whether such bidirectional relations would be present in respect to student-teacher conflict

and externalizing behavior. These reciprocal effects were tested longitudinally from preschool

to first grade and from first grade to third grade.

Externalizing Behavior and Social Skills

Prior research has mostly focused on the relation between student-teacher relationship

and the development of externalizing behavior and the development of social skills in children

in isolation. Although these two concepts are related and overlap (Burt, Obradović, Long, &

Masten, 2008; Dubow, Tisak, Causey, Hryshko, & Reid, 1991; Eisenberg et al., 2001), they

have distinct theoretical meanings (Ladd, Herald, & Kochel, 2006). Whereas social skills

refer to socially acceptable learned behaviors enabling effective and positive interaction with

others (e.g. sharing, helping, giving compliments) (Gresham & Elliott, 1990), externalizing

behavior denotes hyperactive, impulsive and aggressive behavior (e.g. O'Connor et al., 2011).

Children with behavior problems, in particular aggressive children, tend to be rated as having

lower levels of social competence (Gresham & Elliott, 1990). However, factor analyses of

these related phenomena (Bates, Bayles, Bennett, Ridge, & Brown, 1991) as well as the

moderate size of correlations between social skills and problem behavior (e.g. Dubow et al.,

1991) both suggest that these two constructs are not identical. In addition, several studies have

reported that even aggressive children are able to show prosocial behavior (see Berry &

O`Connor, 2010), and that children`s prosocial behavior is uniquely predictive of positive

peer relationships, controlling for negative behavioral characteristics (Bukowski & Newcomb,

1984; Vitaro, Gagnon, & Tremblay, 1990). All this evidence indicates that social skills are not

reducible to mere absence of externalizing behavior. In the current study, externalizing

behavior was conceptualized as aggressive and rule-breaking behavior, whereas the construct

of social skills included prosocial skills such as cooperation and relationships initiation.

The direction of relations between social skills and externalizing behavior is likely to

be mutual (Blandon, Calkins, Grimm, Keane, & O'Brien, 2010; Bornstein, Hahn, & Haynes,

2010), with a mounting evidence supporting the hypothesis that early externalizing behavior

influences subsequent development of social skills (Burt & Roisman, 2010; Chen, Huang,

Chang, Wang, & Li, 2010; Keane & Calkins, 2004; Mesman, Bongers, & Koot, 2001).

However, knowledge about the exact functioning of externalizing behavior and social skills in

developing student-teacher relationship, and vice versa, is limited, because these to

interrelated phenomena have previously been studied separately (Zhang & Nurmi, 2012).

Therefore, in the current inquiry, we aimed to include both externalizing behavior and

social skills simultaneously in one model, in order to compare effects of externalizing

behavior and social skills in teacher-child conflict prediction. Based on the bidirectional

perspective of the current inquiry, we also aimed to examine which developmental pathways

emerge as a result of conflictual relationhips with the teacher. As mentioned above, conflicts

with teacher might decrease children`s social skills and promote inappropriate behavioral

responses. In addition to the presumably direct effects of children`s functioning on later

conflict and vice versa, it is also possible, that other pathways of development can emerge as

well. More specifically, children with externalizing behavior tend to engage in maladaptive

interactions with adults and peers (Patterson, 1986; Rubin & Coplan, 2004) and such

processes possibly make it difficult for these children to learn adaptive social skills over time

(Berry & O'Connor, 2010). In addition, children evidencing externalizing behavior may

eventually be rejected by other children (Stenseng, Belsky, Skalicka, & Wichstrøm, 2014),

which in turn will imply less practise in socializing in effective ways with peers, which might

be detrimental to the learning processes involved in social skills acquisition. Conversely,

lacking social skills, e.g. demonstrating poor abilities in conflict resolution, may promote

solving conflict by aggressive means.

In sum, the second goal of the present study was thus to explore the hypothesized

bidirectional effects between social skills, externalizing behavior and conflict. More

specifically, we intended to investigate 1) whether social skills and externalizing behavior

predict later student-teacher conflict, 2) whether student-teacher conflict predicts later social

skills and externalizing behavior and 3) whether externalizing behavior predicts later social

skills and 4) whether social skills predict later externalizing behavior. These relations were

examined from preschool to first grade and from first grade to third grade.

Furthermore, the bidirectional design of the current study makes it possible to test the

proposition of transactional relations. The transactional model describes development as a

result of the ongoing interaction between the child and the experiences provided by the social

context (Sameroff 2009). In this model, not only is child shaped by the social environment

(e.g. student-teacher relationship), but the child also affects the social environment, and is in

turn impacted by those environmental effects (Sutherland & Oswald, 2005). In our case,

teachers with conflicted relationships provide presumably less support for development of

children`s social skills and they also try to control children`s behavior (Hamre & Pianta,

2001), thereby fostering the development of maladaptive strategies of emotion regulation or

conflict resolution, and subsequently, increased levels of externalizing behavior and social skills deficits. As a consequence, children with such characteristics might continue in cycles of coercive interaction (Patterson, Reid, & Dishion, 1992; Sutherland & Oswald, 2005) with their teachers and hence contribute to further development of more conflicted student-teacher relationships. In addition, a complementary developmental pathway of child-teacher transactions might also be engaged – starting from children`s preschool functioning affecting first grade student-teacher conflict, with further effects on third grade children`s functioning. In the current inquiry, we thus aimed to test the hypothesis of transactional relations between children`s characteristics and student-teacher conflict from preschool through third grade by assessing 1) whether student-teacher conflict affects children`s functioning, which in turn influences levels of student-teacher conflict and 2) whether children`s functioning affects student-teacher conflict, with further impacts on children`s functioniong.

Gender Moderation

In addition, previous research has suggested that the effects of student-teacher relationship on children`s development might vary by gender. More specifically, girls were reported to profit more from positive student-teacher relationship effects on positive school adapation than boys (Baker, 2006; Ewing & Taylor, 2009) and boys profited more than girls from low levels of conflict with teacher (Hamre & Pianta, 2001). Teacher-child conflict has been found to be a stronger predictor of aggressive behavior for boys than girls (Ewing & Taylor, 2009). Boys are also more prone than girls to develop more conflicted relationships with teachers (Jerome, Hamre, & Pianta, 2009). Therefore, the magnitude of the reciprocal conflict - child`s adjustment relations might differ by gender. It is for example possible that boys' externalizing behavior might be a stronger predictor for conflicted relationships than girls' externalizing behavior. However, the evidence for gender moderating the student-

teacher relationship - social competence association is mixed, including no gender moderating

effects (see Zhang & Nurmi, 2012). Thus, in the present study we aimed to examine the

moderating effect of gender on the respective reciprocal relations between student-teacher

conflict, and externalizing behavior and social skills.

Teachers`and Parents` Reports

Another important issue related to the present inquiry is that previous research

investigating predictors or effects of student-teacher relationship has mainly utilized teacher

reports on children`s externalizing behavior and social competence. Even though such

measurements make it possible to draw conclusions about the developmental processes as

perceived by the teachers, research utilizing multiple informants can provide knowledge

whether effects of mutual student-teacher interaction may also apply to behaviors observed in

another environment and vice versa. Although children`s externalizing behavior or social

skills as observed by parents at home are hypothesized to translate into subsequent

interactions with teachers in school and thereby influence the quality of student-teacher

relationship (Myers & Pianta, 2008), the evidence on such effects is limited (Zhang & Nurmi,

2012). Similarly, it is not fully established whether effects of student-teacher relationship on

children`s social skills also translate to interactions in other contexts apart from school (Zhang

& Nurmi, 2012), although there is some evidence showing that student- teacher relationship

can indeed affect children`s externalizing behavior (O'Connor et al., 2011) and social skills

development (Berry & O'Connor, 2010), as reported by parents. Therefore, in the present

study we utilized both parent and teacher raters in order to provide better understanding of the

processes affecting children`s development.

Ecological models posit that children are embedded in a nested system of different

settings (Bronfenbrenner & Morris, 1998). According to the Contextual Systems Model

(Pianta & Walsh, 1996), children`s development can be influenced by child, family and

school factors beyond the immediate context. Therefore, associations between the student-

teacher conflict and levels of externalizing behavior and social skills might be influenced by a

variety of potentially confounding factors. Based on previous research (O'Connor, 2010), we

thus controlled for covariates, which have been reported to be related to one or more of the

student-teacher conflict/problem behavior/social skills constructs central to this inquiry. With

regard to children`s characteristics we included gender (Birch & Ladd, 1997; Koepke &

Harkins, 2008), language ability (O'Connor et al., 2011) and temperament (Rudasill, Reio Jr,

Stipanovic, & Taylor, 2010; Rudasill & Rimm-Kaufman, 2009). On the family level, we

included maternal education and parental depression (McCartney et al., 2010). Finally, we

also controlled for teacher`s background characteristics which could possibly influence

children`s ratings, including years of teaching experience (O'Connor & McCartney, 2006) and

teacher education (O'Connor, 2010).

The Present Study

In this research we set out to examine reciprocal relations between student-teacher

conflict and children`s social skills and externalizing behavior by following children over four

years from preschool to third grade. First, we aimed to examine cross-lagged relations

between student-teacher conflict, children`s social skills and externalizing behavior from

preschool to first grade, and from first grade to third grade. Second, we aimed to investigate

whether the examined relations differed by gender.

Methods

Participants

The Trondheim Early Secure Study (TESS) includes participants from two birth cohorts (born 2003 or 2004) of children and their parents living in the city of Trondheim, Norway. Only a brief outline is provided here as details about the procedure and recruitment have been presented previously (Wichstrøm et al., 2012). The Strengths and Difficulties Questionnaire (SDQ) 4-16 version (Goodman, 1997), together with an invitation letter, were mailed to parents (N=3,456). The SDQ was administered due to a plan to over sample children with behavior problems in order to increase the statistical power. Completed SDQs were brought to a subsequent community health checkup; all 4-year olds in Norway are encouraged to attend the well-child clinic and 3,358 did so. At the well-child clinic eligible parents (*n*=3,016) were informed about the study using procedures approved by the Regional Committee for Medical and Health Research Ethics. Written consent was obtained from parents of 2,475 children (71.6 % of all contacted). Parents with inadequate proficiency in Norwegian were excluded (*n* = 176). The health nurse missed asking 166 parents about their interest in participating in the study.

In order to increase power, oversampling according to emotional and behavioral problems was conducted. Children's SDQ total difficulties score was divided into four strata (cut offs: 0-4, 5-8, 9-11, 12-40). Using a random number generator, defined proportions of parents in each stratum, ranging from few to many problems (i.e. 0.37, 0.48, 0.70, 0.89) were drawn to participate in a further study (*n* = 1,250). Of the 1,250 parents invited to participate, 997 (77.8 %) parents appeared at the university for further study, where parents provided information about child behavior, social competence, and child and family factors, and children's language comprehension (*n* = 935) was examined. Drop-out rate did not vary by SDQ strata ($\chi^2 = 5.70$, *df* = 3, *p* = .13) or gender ($\chi^2 = 0.23$, d*f* = 1, *p* = .63). 795 parents participated in follow-up assessment two years later, when the child had started in first grade (T2) (mean age of the children = 6.7), and 699 parents attended when the child was in third

grade (T3) (mean age of the children = 8.8). Almost as many girls (49.5 %, 51.3 %) as boys

(50.5 %, 48.7 %) participated at T2 and T3 respectively. Attrition analyses revealed that

teacher-rated social competence (SSRS-T) at T1 predicted drop-out at T2 (odds ratio (OR) =

0.98, 95 % confidence interval (CI) = 0.97 – 1.00). Children`s language ability at T1

(PPVTIII) predicted drop-out at T3 (OR = 0.99, 95 % CI = 0.98 – 1.00) and level of teacher`s

education at T2 predicted drop-out at T3 (OR = 1.22, 95 % CI = 1.04 – 1.41). The Cox and

Snell R^2 was 0.02. Nearly all parents were the child`s biological parent (98.2 %), and a large

majority of the interviewed parents were mothers (84.5 % mothers, 15.5 % fathers). Both

mothers (96.4 %) and fathers (94.8 %) were mainly of Norwegian ethnicity. The majority of

parents was married (54.8 %) or had lived together for more than 6 months (34.3 %). With

regard to marital status, 8.5 % were divorced or separated, 0.3 % widowed, 1.2 % had lived

together for less than six months and 0.9 % of the parents had never lived together.

The parents consented to having their child-care provider and/or teacher complete

questionnaires regarding teacher-child relationship quality, behavior problems and social

competence, which were sent to day-care centers at T1 and to primary schools at T2 and T3.

Day-care centers and schools were requested to select the teacher who knew the child best to

respond to the questionnaire. Children in Norway start school at the age of 6, and all children

at T2 had started school before T2 assessment. Response rates among teachers were 90.6 % at

T1, 92.2 % at T2 and 85.8 % at T3. Between T2 and T3, 41.1 % of the teachers remained the

same. Preschool teachers had known the child for an average of 13 months whereas school

teachers had known the child for an average of 6 months at T2 and 2.5 years at T3. On

average, there were only 3 children from each classroom participating in the current study.

The resulting size of the design effect for teacher reported measures was small (ranging from

1.2 to 1.6), suggesting that clustering of children within classrooms did not warrant a multilevel

analysis.

Design and Measures

Teacher rated externalizing behavior. The externalizing scale of the Teacher Report

Form (TRF) from the Achenbach System of Empirically Based Assessment (ASEBA)

(Achenbach & Rescorla, 2000), 32 items, was used to assess externalizing problems. For each

item, e.g. "Disturbs others.", the teacher is asked to determine how well the item describes the

child now or within the past 2 months: 0 = not true, 1 = somewhat or sometimes true, 2 = very

true or often true. Cronbach's alphas were .95, .93 and .93 at T1 through T3, respectively.

Parent rated externalizing behavior. The externalizing scale of the parent version of the

Child Behavior Checklist (CBCL) was used to asses externalizing problems (Achenbach &

Rescorla, 2000). At T1 the 1.5-5 year version was applied (25 items) whereas at T2 and T3

the 6-18 year version (35 items) was administered. For each item, e.g. "Argues a lot.",the

parent is asked to determine how well the item describes the child now or within the past 6

months: 0 = not true, 1 = or sometimes true, 2 = very true or often true. Higher scores indicate

more problems. The CBCL has excellent concurrent and predictive validity and is the most

widely used screening instrument for behavior problems in children (O'Connor, 2010).

Cronbach's alphas were .89, .88 and .83 at T1 through T3.

Teacher rated social competence. Teachers completed the 30-item Social Skills Rating

System (SSRS-T) (Gresham & Elliott, 1990). Ratings are given on a 4-point scale ranging

from 0 (never) to 4 (very often). The SSRS-T consists of three subscales: Cooperation (a

sample item is: "Follows your direction."), Assertion ("Invites other to join in activities.") and

Self-control ("Responds appropriately when pushed or hit by other children.") The SSRS is a

widely used instrument with good reliability and validity across different samples (Gresham

& Elliott, 1990; Merrell, 2001). Cronbach's alphas were .93, .94 and .93 at T1 through T3,

respectively.

Parent rated social competence. Parents completed the 39-item Social Skills Rating

System (SSRS-P) (Gresham & Elliott, 1990). Ratings are given on a 4-point scale ranging

from 0 (never) to 4 (very often). The SSRS-P consists of four subscales: Cooperation (a

sample item is: "Helps you with household without being asked."), Assertion ("Starts

conversation without rather than waiting for others to talk first."), Self-control ("Ends

disagreements with you calmly.") and Responsibility ("Requests permission before leaving

the house.") The SSRS is a widely used instrument with good reliability and validity across

different samples (Gresham & Elliott, 1990; Merrell, 2001). Cronbach's alphas were .89, .93

and .93 at T1 through T3, respectively.

Student-Teacher Relationship. The conflict subscale of the Student-Teacher

Relationship Scale (STRS) (Pianta, 2001) was used to measure child-teacher relationships at

preschool, at first and at third grade on a 5-point Likert-type scale ranging from 1 "definitely

does not aplly" to 5 "definitely applies". Conflict scale (12 items) provides teacher perceived

negativity within the relationship with the child (Jerome et al., 2008). A sample item is: "This

child and I always seem to be struggling with each other." Cronbach's alphas were .77, .82

and .80 at T1 through T3, respectively.

Child, family and teacher covariates. For children's characteristics, we included gender

and language ability at T1 using a Norwegian adaptation of The Peabody Picture Vocabulary

Test (10 items) (PPVTIII) ((Dunn & Dunn, 1997) with Cronbach's alpha = .98. We also

controlled for temperament, including measures of *negative affectivity, effortfull control* and

surgency. These measures were reported by parents at both T1 and T2 using the Children`s

Behaviour Questionnaire (CBQ) for children 3-7 years of age (Rothbart, Ahadi, Hershey, &

Fisher, 2001), with Cronbach's alpha = .88, .85 and .92, respectively, at T1, and .82, .85 and

.78, respectively, at T2. On the family level, covariates included level of T1 maternal

education in 5 categories (lower secondary, upper secondary, vocational school, college,

university) and parental depression, assessed at both T1 and T2 using the Beck Depression

Inventory –II (21 items) (BDI-II) (Beck, Steer, & Brown, 1996; McCartney et al., 2010) with

Cronbach's alpha = .89 at T1 and .90 at T2. Teacher related variables were controlled for

from T1 through T3 and included years of teaching experience and level of education in 5

categories.

Statistics

We applied structural equations modelling (SEM) using Mplus (Muthén & Muthén,

2008), employing maximum likelihood estimation with robust standard errors. Since the

sample was stratified at screening, analyses were weighted proportionally to the inverse of the

probability of selection of each participating child. Missing data were handled with full

information maximum likelihood estimation (FIML). In sum, this provided unbiased

population estimates.

Analytically, we first assessed reciprocal relations between observed variables (student-

teacher conflict and social skills, and student-teacher conflict and externalizing behavior) and

stability in these variables at T1, T2 and T3 in two separate auto-regressive cross-lagged

models, while controlling for covariates. A schematic model is presented in Figure 1. Second,

we employed all three measures (student-teacher conflict, children`s externalizing behavior

and social skills) at T1 through T3 in one auto-regressive cross-lagged model. A schema of

this theoretical model is presented in Figure 2. Comparison of the magnitude of effects

between parent and teacher reports was tested by corrected chi-square difference test (Satorra

& Bentler, 2001) comparing model fit with or without equality constraints in regression

estimates. Indirect effects were computed using the delta method. Furthermore, we tested

whether the bidirectional associations between the measures were moderated by gender by

means of a multi-group analysis, with significance levels of differences in paths tested by

constraining one path at a time. Comparison of the differences between models was based on

the corrected chi-square difference test (Satorra & Bentler, 2001).

Adjustment for control variables in the models was done by including covariates as a

set of mutually correlated variables, which influenced components of all paths from T1 to T2

and from T2 to T3. More specifically, all T2 outcomes were regressed on following covariates

measured at T1: gender, language ability, negative affectivity, effortful control, surgency,

maternal education, parental depression. In addition, all three T2 teacher reported outcomes

were also regressed on years of teaching and teacher`s level of education – both of these

covariates were assessed at T1 as well as at T2. T3 outcomes were regressed on T1 covariates

(gender, language ability, maternal education) and T2 covariates (negative affectivity,

effortful control, surgency, parental depression). In addition, all three T3 teacher reported

outcomes were also regressed on years of teaching and teacher`s level of education – assessed

at T2 as well as at T3. All three T1 teacher reported measures were also regressed on T1 years

of teaching and teacher`s education. The respective "teacher" covariates were also regressed

on each other (T2 on T1 and T3 on T2).

Results

Descriptive statistics and correlations between the variables

Descriptive statistics for all main variables is presented in Table 1 and correlations

between the study variables are reported in Table 2. All variables were significantly correlated

with each other, except for parent reported social skills at T1 and student- teacher conflict at

T3. Stability coefficients for T1- T2 and for T2-T3 were .29 and .53, respectively, for conflict,

.32 and .60, respectively, for teacher-rated social skills, .64 and .69, respectively, for parent-

rated social skills, .47 and .62, respectively, for teacher-rated externalizing behavior and .60

and .64, respectively, for parent-rated externalizing behavior.

Conflict and social skills

In the first model (Figure 3), we observed small, but significant negative effects of

conflict on later social skills (both parent and teacher reported). These associations were in

effect from preschool to first grade as well as from first grade to third grade. Social skills in

first grade (teacher reported) were also negatively associated with third grade conflict.

Therefore, the model provided evidence for reciprocal relations between student-teacher

conflict and (teacher reported) social skills from first to third grade, although the size of the

associations was small. The fit of the model was good, with χ^2 (129) = 228.10, p = .00,

RMSEA = .03, SRMR = .04, CFI = .95, TLI = .91.

Conflict and externalizing behavior

In the second model (Figure 4), student-teacher conflict predicted externalizing

behavior in first grade age (both parent and teacher reported), but no significant associations

were observed between first grade conflict and third grade externalizing behavior. Teacher

reported externalizing behavior (but not parent reported) was predictive of later student-

teacher conflict, both from preschool to first grade as well as from first grade to third grade.

Thus, this model demonstrated reciprocal relations between student-teacher conflict and

teacher reported externalizing behavior, this time from preschool to third grade. The fit of the

model was good, with χ^2 (129) = 334.18, p = .00, RMSEA = .04, SRMR = .04, CFI = .93, TLI

= .86.

Conflict, social skills and externalizing behavior

When including both externalizing behavior and social skills in the final model (Figure 5), social skills were not significantly predictive of student-teacher conflict, whereas teacher reported externalizing behavior predicted increased levels conflict in first grade and in third grade. All paths from conflict to social skills were non-significant, except from the small effect of first grade conflict on parent reported social skills in third grade age. Preschool conflict predicted first grade externalizing behavior, both parent and teacher reported.

With regard to mutual relations between externalizing behavior and social skills: Parent rated externalizing behavior was a significant predictor of parent reported social skills across both time periods. First grade teacher reported extrenalizing behavior also predicted third grade teacher reported social skills. The only significant effect of social skills was observed from preschool teacher reported skills to parent reported externalizing behavior in first grade age. The fit of the model was good, with χ^2 (193) = 462.28, p = .00, RMSEA = .04, SRMR = .04, CFI = .94, TLI = .88.

In respect to our hypothesis of transactional relations, indirect effect for the only emerging pathway including significant paths from preschool conflict through T2 teacher reported externalizing behavior on third grade conflict was computed (β = .05, 95 % CI [.00, .10]).

Gender moderation

In the final model, effect of teacher-rated externalizing behavior at T2 and the effect of T2 conflict on subsequent conflict with teacher was moderated by gender (χ^2 = 10 (2), $p <$ .01). The standardized path coefficient of T2 externalizing behavior on T3 conflict was β = .44, 95 % CI [.24, .63] for girls and β = .19, 95 % CI [.00, .38] for boys. The standardized path coefficient of T2 conflict on T3 conflict was β = .15, 95 % CI [-.00, .31] for girls and β = .43, 95 % CI [.25, .61] for boys. The fit of the constrained model was: χ^2 (380) =717.11, p

= .00, RMSEA = .04, SRMR = .05, CFI = .93, TLI = .86. The fit of the unconstrained model

was: χ^2 (378) =707.66, p = .00, RMSEA = .04, SRMR = .05, CFI = .93, TLI = .86.

Discussion

In two separate models, bidirectional relations were revealed between student-teacher

conflict and teacher-reported children`s social skills from first grade to third grade, and

between student-teacher conflict and teacher reported externalizing behavior between

preschool and first grade, respectively. However, findings from model including both social

skills and externalizing behavior suggest that the effects of children`s characteristics on

teacher-child conflict are mainly driven by children`s externalizing behavior, and not by

social skills. In other words, aggression and rule-breaking behavior seem to be more

important contributors to forming conflicted teacher-student relationships rather than the lack

of cooperation or sociability. Our findings are consistent with previous research, in which

children`s antisocial, but not prosocial behavior predicted student-teacher conflict (Birch &

Ladd, 1998; Hamre, Pianta, Downer, & Mashburn, 2008; Howes, 2000). Possibly,

externalizing behavior disrupts teaching and may affect the whole class and thereby lead to

more conflicts with teacher who may resort to ineffective disciplining. To speculate, lack of

social competence may have detrimental consequences for peer and teacher-relationships, but

not necessarily lead to more conflict, especially when covarying externalizing behavior is

taken into account. However, since the current measurements were conducted at only three

time points, we cannot fully preclude the possibility that social skills might prove an

important predictor of student-teacher relationship later on. Our findings also correspond with

previous research ascertaining that children`s externalizing behavior affects the quality of

student-teacher relationships (Nurmi, 2012), whilst they also provide evidence that this

process of influence happens repeatedly at two different time points. Adjustment for a range

of control variables which could have possibly distorted the examined associations suggest

that our findings were robust to other alternative explanations.

Our finding of student-teacher conflict predicting parent rated externalizing behavior

in first grade and parent rated social skills in third grade contributes to prior evidence on

student-teacher relationship impacting on children`s competence outside of school (Zhang &

Nurmi, 2012). The finding of student-teacher conflict predicting first grade externalizing

behavior complies with previous research (e.g. Doumen et al., 2008; Silver et al., 2005;

Silver, Measelle, Armstrong, & Essex, 2010). Moreover, the results showed that in the

transition from preschool to school, student –teacher conflict was a more important predictor

of externalizing behavior than social skills. However, the fact that conflict in first grade did

not predict third grade externalizing behavior, but was a significant predictor of third grade

social skills was unexpected. We can only speculate about the possibility that the effect of

conflict on third grade behavior could be non-significant due to higher stability of teacher-

rated externalizing behavior from first to third grade, than across the transition from preschool

to school. The diverse effects of conflict observed across two time periods might also suggest

that children of school age involved in conflicted interactions with their teachers might be

more prone to translate such experience into maladaptive social interactions when dealing

with their parents, - by for example being less cooperative -, but not necessarily resort to

aggression or other forms of externalizing behavior, as was the case in younger ages.

Regarding relations between externalizing behavior and social skills, we found support

for pathways of both directions. Parent rated externalizing behavior predicted parent rated

social skills from preschool to first grade and from first grade to third grade, while this type of

relation (externalizing behavior – later social skills link) in respect to teacher reports proved

significant only with regard to first grade externalizing behavior and third grade social skills.

Conversely, the only effect in the opposite direction was observed in preschool teacher-rated social skills predicting parent-rated externalizing behavior in first grade age. Taken together, it seems that the pathway from externalizing behavior to later social skills is more likely to be observed than the other way round – a finding which is in compliance with previous research (Burt & Roisman , 2010; Chen et al., 2010; Keane & Calkins, 2004; Mesman et al., 2001). Children`s externalizing behavior may be met with negative responses from peers and adults, such as aggression, coercion (Patterson, 1986) or rejection (Stenseng et al., 2014).Thus, children high in externalizing behavior will have less oportunities to practise social skills and to learn by modelling from socially approriate interactions, leading to a less favorable development of social skills. For example, less socially competent children may retaliate against aggressive children , thus modelling aggressive behavior as a means to cope with conflictual situations, and not more socially competent means such as by negotiating or being assertive in a non-aggressive manner. Irrespective of being met with coercion or rejection, children high in externalizing behavior may be deprived of the neccessary learning and practising of socially competent behavior.

Our hypotheses of transactional relations between student-teacher conflict and children`s functioning was not confirmed. Although bidirectional relations between teacher rated externalizing behavior and conflict were observed, the indirect effect of preschool conflict on third grade conflict through first grade externalizing behavior was bordering significance.

Gender Moderation

We also examined whether the reported associations were different for boys and girls. The effect of children`s externalizing behavior in first grade on third grade student-teacher conflict was stronger for girls than for boys, combined with higher stability in conflict for

boys. We had no other research to compare the results with, other than that boys often experience more conflict with teachers than girls (Jerome et al., 2009; Stipek & Miles, 2008) and that boys are reported to have higher levels of externalizing behavior (Silver et al., 2005; Stipek & Miles, 2008). In light of these observations, our finding for first grade girls is a little bit puzzling. Scholars have previously suggested, and found support for, a gender paradox with respect to mental health problems, including behavioral problems, stating that the sex least frequently afflicted by a disorder is the one relatively more severely affected (Storvoll & Wichstrøm, 2002; Taylor & Ounsted, 1972). We can speculate that externalizing behavior in first grade girls is much less expected and perhaps tolerated by teachers than in boys. It is viable that teachers may want to control such behavior in girls to a greater extent, thereby running the risk of becoming entrenched on coercive cycles leading teachers to perceive the relationship as more conflictual.

Limitations and Theoretical Implications

Although the present study had many strengths including a large sample and availability of both teacher and parent reports and measures of externalizing behavior as well as social skills, the results should be interpreted in light of several limitations. Selective drop-out could have somewhat distorted the results. All measures were assessed through self-reports, however, observed interactions (at school and at home) or student reports might yield different results. Although we adjusted for several likely candidates for producing spurious relationship, we cannot of course rule out that unmeasured third variables could have influenced the results. These factors include family, preschool as well as school based factors (O'Connor, 2010), e.g. teacher self-efficacy (O'Connor, 2010), classroom size and child care and classroom environment (O'Connor, 2010; Pianta, 1999; Sabol & Pianta, 2012). Future research could explore such possibilities.

Our findings supported the hypothesis of bidirectional relations between child teacher-conflict and children`s adjustment. However, there is limited evidence about reciprocal effects between student-teacher closeness and children`s development (Zhang & Nurmi, 2012). Future research might examine such bidirectional effects in respect to closeness, but could also extend the inquiry onto other developmental domains, such as school achievement.

Conclusion

This study provided evidence for reciprocal relations between student-teacher conflict and externalizing behavior between preschool and first grade. Furthermore, findings of the present study suggested that externalizing behavior is a stronger predictor of conflicted student-teacher relationship than children`s social skills. Student-teacher conflict, on the other hand, affected first grade externalizing behavior as well as third grade social skills. Relations between externalizing behavior and social skills were observed in both directions, however more support was found for externalizing behavior impacts on later social skills. Altogether, our findings underscore the prominent role which externalizing behavior plays in forming low quality relationships and social skills deficits.

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Table 1

Descriptive statistics

	Theoretical min &max	MIN	MAX	M	SD
Conflict T1	12-60	12	45	17.88	4.70
Conflict T2	12-60	12	46	18.02	4.86
Conflict T3	12-60	12	49	17.68	4.53
Social skills Teacher T1	0-120	17	88	56.62	12.45
Social skills Teacher T2	0-120	18	87	56.94	13.41
Social skills Teacher T3	0-120	24	90	60.08	13.91
Social skills Parent T1	0-156	24	73	48.75	8.26
Social skills Parent T2	0-156	28	113	71.93	13.13
Social skills Parent T3	0-156	29	120	76.56	13.97
Behavioral problems Teacher T1	0-64	0	50	6.68	9.07
Behavioral problems Teacher T2	0-64	0	34	2.93	5.58
Behavioral problems Teacher T3	0-64	0	38	2.38	5.14
Behavioral problems Parent T1	0-50	0	35	7.12	6.17
Behavioral problems Parent T2	0-70	0	30	3.93	4.54
Behavioral problems Parent T3	0-70	0	24	3.15	3.91

Table 2 *Correlations between the main variables*

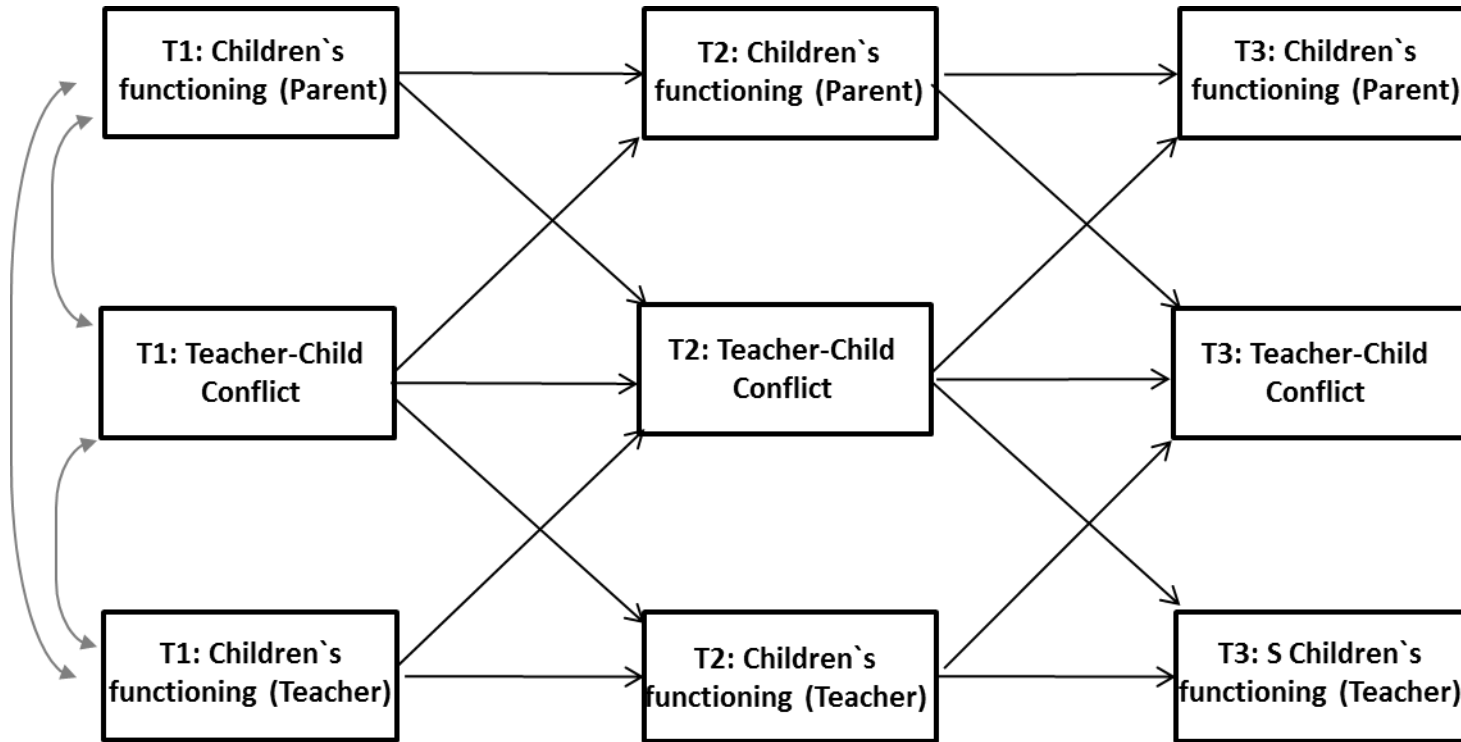|	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Conflict T1														
2. Conflict T2	0.29**													
3. Conflict T3	0.27**	0.53**												
4. Social skills Teacher T1	-0.47**	-0.22**	-0.24**											
5. Social skills Teacher T2	-0.22**	-0.40**	-0.30**	0.32**										
6. Social skills Teacher T3	-0.23**	-0.40**	-0.49**	0.34**	0.60**									
7. Externalizing behavior Teacher T1	0.66**	0.33**	0.29**	-0.61**	-0.33**	-0.36**								
8. Externalizing behavior Teacher T2	0.36**	0.75**	0.54**	-0.32**	-0.52**	-0.48**	0.47**							
9. Externalizing behavior Teacher T3	0.36**	0.52**	0.73**	-0.33**	-0.32**	-0.53**	0.44**	0.62**						
10. Social skills Parent T1	0.10**	0.11**	0.06	.21**	0.18**	0.13**	-0.18**	-0.14**	-0.09*					
11. Social skills Parent T2	0.14**	0.13**	0.10**	0.24**	0.26**	0.22**	-0.21**	-0.19**	-0.13**	0.64**				
12. Social skills Parent T3	0.13**	0.19**	0.17**	0.20**	0.23**	0.26**	-0.20**	-0.20**	-0.19**	0.53**	0.69**			
13. Externalizing behavior Parent T1	0.21**	0.15**	0.19**	-0.19**	-0.18**	-0.20**	0.29**	0.23**	0.23**	-0.42**	-0.38**	-0.38**		
14. Externalizing behavior Parent T2	0.25**	0.32**	0.28**	-0.28**	-0.30**	-0.29**	0.31**	0.45**	0.36**	-0.27**	-0.42**	-0.41**	0.60**	
15. Externalizing behavior Parent T3	0.30**	0.24**	0.29**	-0.26**	-0.21**	-0.26**	0.27**	0.32**	0.41**	-0.23**	-0.29**	-0.40**	0.49**	0.64**

Figure 1.Theoretical model representing the cross-lagged effects between student-teacher conflict and parent- and teacher-rated children`s functioning (representing either externalizing behavior or social skills), and correlations between the measures. From preschool (T1) to first grade (T2) and from first grade to third grade (T3). Paths depicting correlations between variables at T2 and T3 were left out for sake of simplicity.
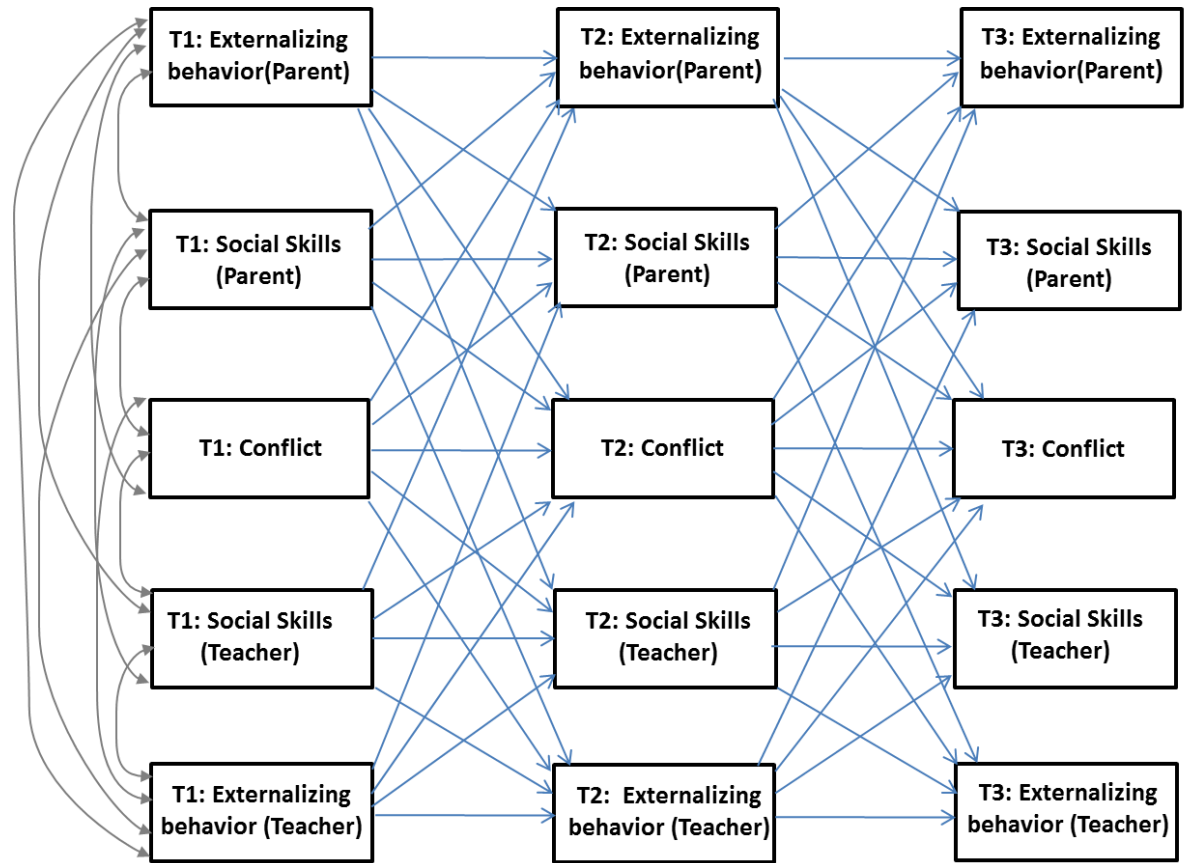
*Figure 2.*Theoretical model representing the cross-lagged effects between student-teacher conflict and parent- and teacher-rated externalizing behavior and social skills, and correlations between the measures. From preschool (T1) to first grade (T2) and from first grade to third grade (T3). Paths depicting correlations between variables at T2 and T3 were left out for sake of simplicity.
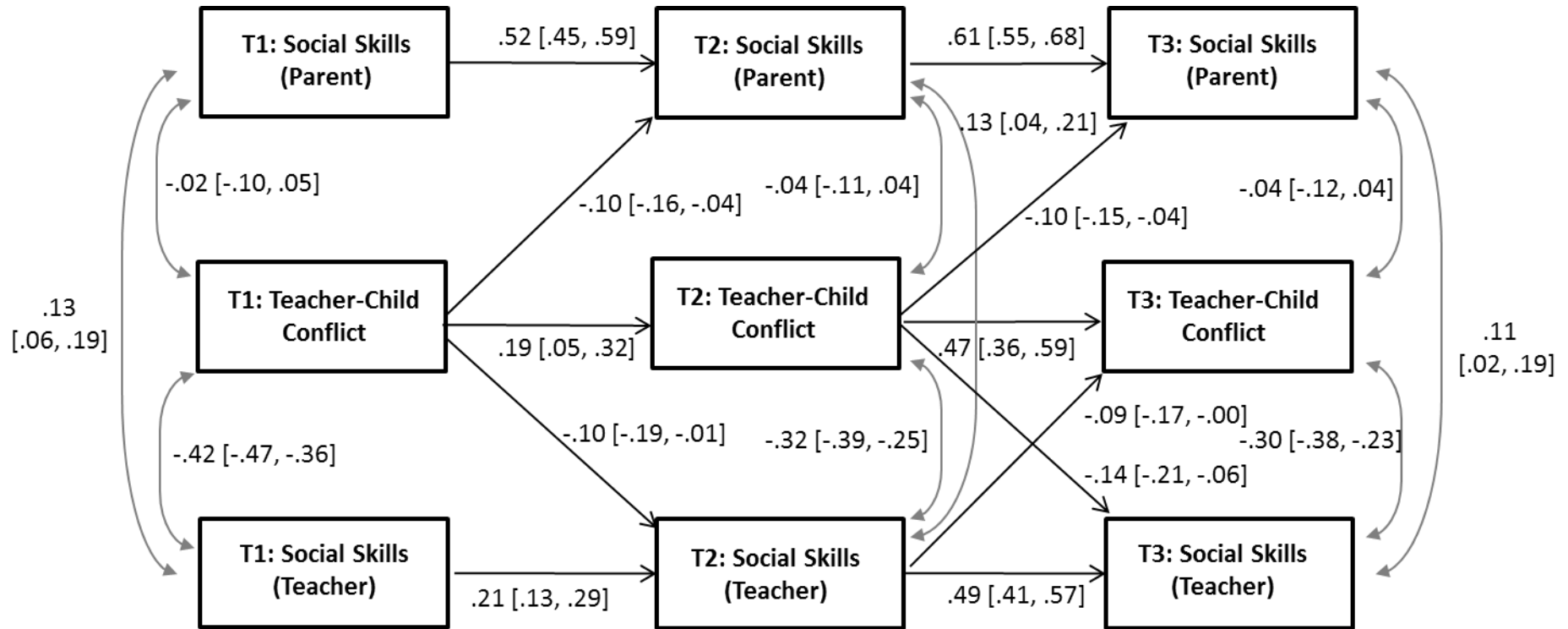
*Figure 3.*Reciprocal relations between student-teacher conflict and parent- and teacher-rated social skills from preschool (T1) to first grade (T2) and from first grade to third grade (T3), adjusted for covariates. *Note.* Standardized coefficients with 95 % confidence intervals. Only significant predicative paths are depicted.

*Figure 4.*Reciprocal relations between student-teacher conflict and parent- and teacher-rated externalizing behavior from preschool (T1) to first grade (T2) and from first grade to third grade (T3), adjusted for covariates. *Note.* Standardized coefficients with 95 % confidence intervals. Only significant paths are depicted.
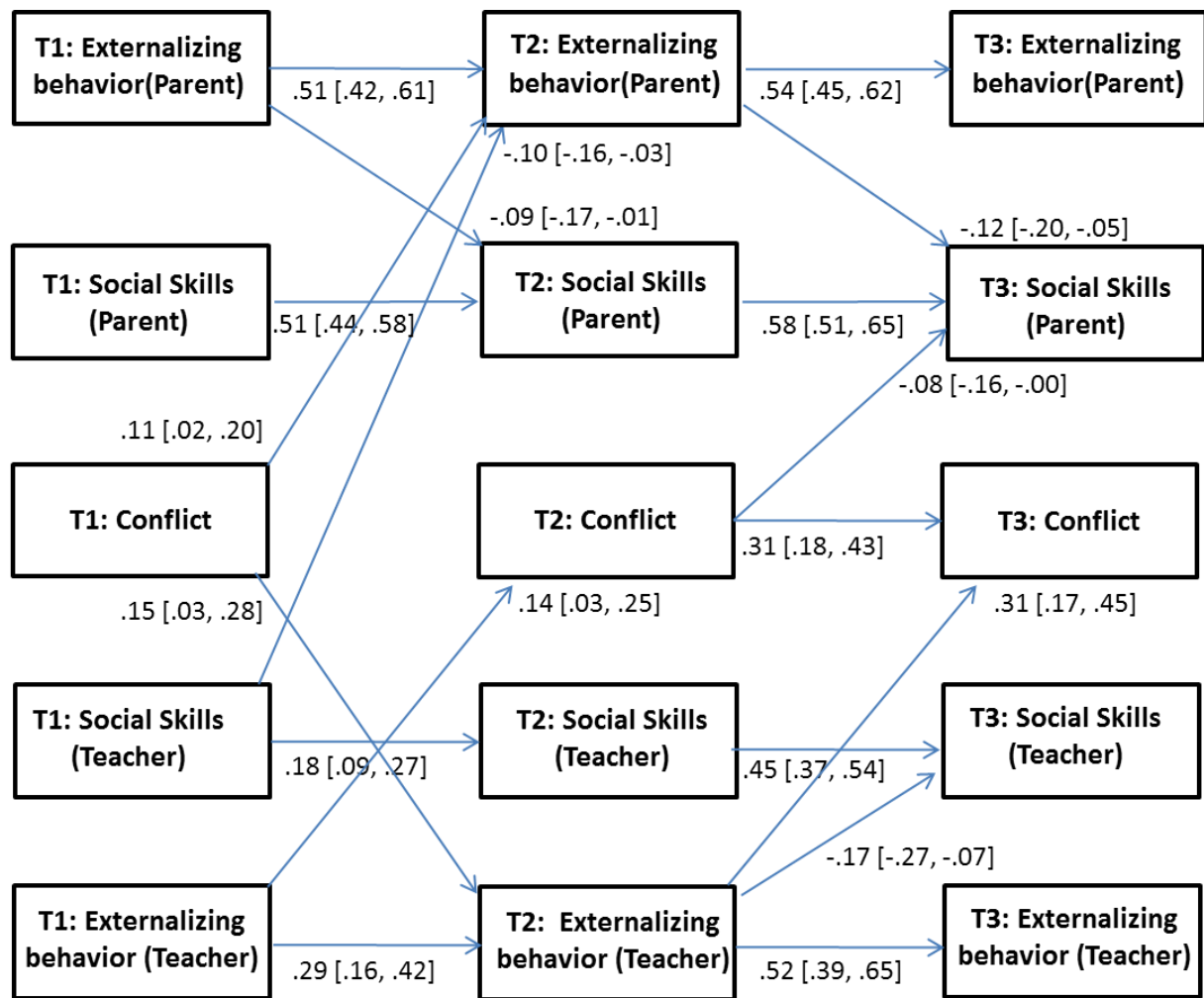
*Figure 5.*Reciprocal relations between student-teacher conflict and parent- and teacher-rated

social skills and parent-and teacher-rated externalizing behavior from preschool (T1) to first

grade (T2) and from first grade to third grade (T3), adjusted for covariates. *Note.* Standardized

coefficients with 95 % confidence intervals. Only significant paths are depicted. Pathways

depicting correlations between variables were left out for sake of simplicity.