Teacher– and Parent–Child Relationships and Children's Adjustment Behaviors in Grade 1: The Role of Temperament

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Abstract

This study aimed at investigating the reciprocal longitudinal associations between teacher– and parent–child relationships and children's adjustment behaviors during Grade 1, and the role of the child's temperament in this interplay. The longitudinal study followed Lithuanian children (229 in kindergarten [T0], 337 at the beginning of Grade 1 [T1], 341 at the end of Grade 1 [T2]), their parents, and their Grade 1 teachers (n = 24). The parents and teachers reported on the quality of their relationship with the children during Grade 1. In addition, parents reported on the children's temperament in kindergarten, and the teachers reported on the children's adjustment behaviors during Grade 1. The results showed evocative effects of children's adjustment behaviors at the beginning of Grade 1 on the relationship quality at the end of Grade 1. In particular, prosocial behavior positively predicted teacher–child closeness, and high externalizing problems positively predicted teacher–child and parent–child conflict. In addition, we identified two indirect paths from children's temperamental surgency to closeness with teachers via prosocial behavior and to conflicts with teachers via externalizing problems. The results of the present study suggest that children's characteristics, such as temperament and adjustment behaviors, predict particularly teachers' and, to some extent, parents' perceptions of their relationship quality with the child at the beginning of children's school career.

Keywords: teacher–child relationship, parent–child relationship, externalizing problems, prosocial behavior, temperament

Teacher– and Parent–Child Relationships and Children's Adjustment Behaviors in Grade 1: The Role of Temperament

At the beginning of primary school (Grade 1), children may face not only academic but also adjustment challenges, as they must adapt to a new learning environment and learn to behave in an expected manner at school (Dockett & Perry, 2007). At this stage, support from teachers and parents is crucial to ensure the successful adjustment of children (Kiuru et al., 2016; Pianta & Stuhlman, 2004). One of the indicators of successful adjustment is prosocial behavior, which has been shown to support academic learning and success in social relationships (Coulombe & Yates, 2018; Nurmi et al., 2018). On the other hand, children's externalizing problems can lead to lower task persistence, interest, and academic achievement (Hinshaw, 1992; Metsäpelto et al., 2015). Research has shown that close relationships with teachers and parents can promote children's prosocial behavior (Nurmi et al., 2018; Padilla-Walker et al., 2016), whereas frequent conflicts are associated with externalizing problems (e.g., Acar et al., 2019; Skalická et al., 2015). On the other hand, children's adjustment behaviors can have evocative effects on the reactions of parents and teachers (Coulombe & Yates, 2018; Mejia & Hoglund, 2016; Silinskas et al., 2015). However, most previous studies have focused on children's negative adjustment outcomes such as externalizing (e.g., Mejia & Hoglund, 2016), and less attention has been paid to positive adjustment outcomes such as prosocial behavior (e.g., Coulombe & Yates, 2018). Moreover, little is known about the reciprocal dynamics between parent– and teacher–child relationships and children's adjustment behavior after the critical transition to school (Grade 1). Finally, as far as we know, no previous studies have considered the role of child temperament in the reciprocal dynamics between teacher– and parent–child relationships and children's adjustment behaviors. Consequently, the present study investigated the bidirectional effects of the quality of both teacher– and parent–child relationships and prosocial behavior and externalizing problems during Grade 1 as well as the direct and indirect roles that child temperament plays in these dynamics.

Teacher– and Parent–Child Relationships and Children's Adjustment Behaviors at the Beginning of Their School Career

During the transition to primary school, children face changes in their surroundings, social network, and teaching approaches, as well as new academic and social demands (Kiuru et al., 2016; Dockett & Perry, 2007). These multiple changes can lead to stress and adjustment problems among some children, also affecting their subsequent academic performance (Rende & Plomin, 1992). Thus, to foster positive experiences at the beginning of the school career it is important to increase our understanding of the factors that contribute to the adjustment of children. Most previous studies have concentrated on either the positive or negative aspects of children's adjustment (e.g., Coulombe & Yates, 2018; Nurmi et al., 2018; Pakarinen et al., 2018; Skalicka et al., 2015). Therefore, we considered both prosocial behavior and externalizing problems as indicators of adjustment. Prosocial behavior is a socializing process that encompasses intentional positive behavior, such as being able to control one's behavior, helping, sharing, and comforting or empathizing to increase the well-being of another person (Eisenberg, 1982; Rushton, 1982). Externalizing problems, in turn, encompass antisocial and disruptive childhood behavior that manifests through impulsiveness, attention problems, aggressive behavior, hyperactivity, and conduct problems (Hinshaw, 1992; McMahon, 1994).

Relationships with others can either promote or become detrimental to the adjustment of children at the beginning of school. According to attachment theory (Ainsworth & Bowlby, 1991; Bowlby, 1982), relationships with significant others are crucial for the survival and healthy development of humans. The first attachment relationships are formed with parents, and when children enter educational settings, teachers also influence children's experiences at school (Bowlby, 1982; Hamre & Pianta, 2001). In this study, we examined both closeness and conflict in children's relationships with their parents and teachers (Pianta, 1992a; Pianta, 1992b; Pianta, 2001). Closeness encompasses warm and trustful relationships, while conflict encompasses tension and negativity between children and their parents and teachers. Parents actively observe children at home and teachers observe children in the classroom and can well identify the relationship quality with them. Therefore, the measurements of teacher– and parent–child relationships utilized were based on the perceptions of teachers and parents (Hamre & Pianta, 2001). Previous studies showed that warm and

supportive relationships with teachers (Nurmi et al., 2018; Pakarinen et al., 2020) and parents (Ferreira et al., 2016; Kiuru et al., 2016; Padilla-Walker et al., 2016) promote prosocial behavior. Meanwhile, conflictual relationships with teachers and parents have been shown to predict children's externalizing problems (Leve et al., 2005; Silver et al., 2010; Skalická et al., 2015).

However, children's adjustment behaviors may also evoke close or conflicting relationships with parents and teachers. According to the transactional model (Sameroff & Mackenzie, 2003), there is a bidirectional link between children and their social context. The theory indicates that relationships with parents and teachers predict changes in children's behavior, while the reactions from parents and teachers are dependent on children's adjustment behaviors as well. Previous studies have shown that children's prosocial behavior predicts the positive and close relationships with teachers and parents (Coulombe & Yates, 2018; Newton et al., 2014; Nurmi et al., 2018), whereas children's externalizing problems have been found to predict the higher negative affect of teachers and mothers (Silinskas et al., 2015), conflicts with teachers (Mejia & Hoglund, 2016; Skalická et al., 2015) and overreactive parenting (Awada & Shelleby, 2021). Previous studies have also shown the bidirectional effects between the teacher's positive affect and the prosocial behavior of children (Nurmi et al., 2018), teacher–student conflict and externalizing problems (Skalicka et al., 2015), parental sensitivity and the prosocial behavior of children (Newton et al., 2014), and mother–child conflict and externalizing problems of 7 to 9-year-old children (Georgiou & Fanti, 2014). However, to the best of our knowledge, none of the previous bidirectional studies focused on children during the critical transition to school.

The Role of Temperament in the Interplay between Relationship Quality and Adjustment Behaviors

The relationship quality between children and their teachers and parents, as well as children's adjustment behaviors, are also shaped by children's individual characteristics, such as temperament (Gusdorf et al., 2011; Hernandez et al., 2017; Liew et al., 2019; Nurmi, 2012; Rudasill & Rimm-Kaufman, 2009). Temperament is typically understood as basic dispositions of individual differences

in the expression of activity, affectivity, attention, and self-regulation, which are shaped by the interplay between biological and environmental factors (Goldsmith et al., 1987; Shiner et al., 2012). Even though temperament emerges early in life and is relatively stable, also maturation, socialization, and various experiences of situations play a role in the manifestation of temperament (Putnam et al., 2001; Shiner et al., 2012). Some temperament traits, especially self-regulative aspects of temperament become more stable only later in childhood (Posner & Rothbart, 2007). According to Rothbart et al. (2001), there are three major dimensions of temperament: extraversion (surgency), negative affectivity, and effortful control. Extraversion/surgency has been defined as positive emotionality, activeness, and impulsivity (Rothbart et al., 2001). Negative affectivity encompasses discomfort, negative emotionality, sensitivity to negative feelings, and difficulty in recovering from negative experiences. Effortful control refers to self-regulation, the ability to focus attention, and constructively direct behavior and emotions (Rothbart et al., 2001).

Temperament affects the way children behave (Harvey et al., 2022; Liew et al., 2019; Rothbart et al., 2001; Shiner et al., 2012). For instance, negative affectivity increases the fearfulness of children to interact with people, which can negatively affect prosocial behavior. In addition, higher effortful control can prevent children from externalizing problems (Liew et al., 2019). Moreover, higher surgency has been found to predict higher externalizing problems during school entry (Harvey et al., 2022). Hirvonen et al. (2018) have found among adolescents that low effortful control and high negative affectivity are more detrimental characteristics than surgency for adolescents' socioemotional development. Moreover, low effortful control has been found to predict children's increased behavioral problems (Kim et al., 2013). In turn, high experienced stress in Grade 1 has been found to increase the risk of externalizing problems for children who score high in negative emotionality and activity, and those who are low in sociability (Rende & Plomin, 1992). Apart from these exceptions, previous literature on the topic is scarce.

Child temperament also contributes to their social skills, which are critical for the formation of relationships with teachers and parents (Liew et al., 2019; Nurmi, 2012; Rutter, 1997; Scarr &

McCartney, 1983). For instance, children with higher self-regulation (i.e., effortful control) are received more positively by their teachers than children with higher reactivity (i.e., surgency and negative affectivity), thereby forming closer teacher–child relationships (Hernandez et al., 2017; Liew et al., 2019). Rudasill and Rimm-Kaufman (2009) have found that the lower effortful control of children predicted conflict with teachers, while stronger effortful control predicted close relationships with teachers. Rudasill et al. (2010) have also shown the effect of children's higher temperamental activity, aggression, approach, and lower inhibitory control on conflicts with teachers. In addition, children's higher negative affectivity and surgency were linked to higher conflicts with parents and teachers and less close relationships with parents (Acar et al., 2018). Moreover, children with higher effortful control were closer to their teachers and engaged in fewer conflicts with them (Acar et al., 2018). Lengua and Kovacs (2005) have also found that temperament in terms of fearfulness and positive emotionality in middle childhood predicted higher maternal acceptance and irritability predicted more inconsistent discipline from parents. As the beginning of primary school can be a sensitive period, the manifestation of temperamental characteristics can either help (e.g., effortful control) or act as an unfavorable characteristic (e.g., negative affectivity) for the adjustment of children. Therefore, close relationships and absence of conflict with parents and teachers can be crucial in order to promote prosocial behavior and hinder externalizing problems, especially for those who might be more temperamentally susceptible to maladjustment.

Finally, the indirect effects of temperament on relationship quality through adjustment behaviors and of temperament on adjustment behaviors through relationship quality could also be presumed (see also Ezpeleta et al., 2019; Karreman et al., 2010; Rudasill et al., 2010). Among the handful of available studies, the results are nevertheless inconclusive. In one study Karreman et al. (2010) did not find any significant indirect effects of temperament on preschoolers' problem behavior through parenting. In another study, Ezpeleta et al. (2019) found that the lower effortful control of children (age 3) predicted higher affective problems (age 7) through less positive parenting practices (age 6). Similarly, Rudasill et al. (2010) have found that temperament (i.e., higher activity, aggression,

approach, and lower inhibitory control) of 4.5-year-old children predicted the risky behavior of adolescents in Grade 6 through increased conflicts with teachers in Grades 4, 5, and 6. Nevertheless, previous research concerned either very young children or adolescents. Thus, there is a lack of research that analyzes how temperament indirectly evokes relationship quality and adjustment behaviors at the beginning of school, Grade 1.

Research Questions

The following research questions were examined (see Figure 1):

1. To what extent does the quality of teacher– and parent–child relationships (i.e., closeness and conflict) predict children's adjustment behaviors (i.e., prosocial behavior and externalizing problems) in Grade 1? We expected that high teacher– and parent–child closeness would predict children's higher prosocial behavior in Grade 1 (Hypothesis 1a). Moreover, we hypothesized that a high degree of teacher– and parent–child conflict would predict higher externalizing problems in Grade 1 (Hypothesis 1b).

2. To what extent do children's prosocial behavior and externalizing problems predict the quality of teacher– and parent–child relationships in Grade 1? We expected that a high degree of prosocial behavior would predict higher teacher– and parent–child closeness in Grade 1 (Hypothesis 2a). Moreover, we expected that a high degree of externalizing problems would predict higher teacher– and parent–child conflict in Grade 1 (Hypothesis 2b).

3. To what extent do children's temperament (i.e., surgency/extraversion, negative affectivity, and effortful control) directly and indirectly predict children's adjustment behaviors through the quality of teacher– and parent–child relationships? To what extent do children's temperament directly and indirectly through adjustment behaviors predict the quality of teacher– and parent–child relationships? We expected that high surgency, high negative affectivity, and low effortful control in children would directly and indirectly through conflicting and less close relationships with parents and teachers predict higher externalizing problems and lower prosocial behavior (Hypothesis 3a). It was also expected that high surgency, high negative affectivity, and low effortful control would directly

and indirectly through more externalizing problems and less prosocial behavior of children evoke higher conflicts and lower closeness with teachers and parents (Hypothesis 3b).

Previous research has shown that boys engage in more conflicts and externalizing behaviors than girls do (Baker, 2006; Hamre & Pianta, 2001). In addition, the relationship quality and adjustment behaviors of children relate to children's early literacy skills (Lippard et al., 2018; Pianta et al., 1997) and the parents' education (Mattison et al., 2018; Pakarinen et al., 2018). Consequently, the effects of children's gender, early literacy skills, and the highest level of parent education were controlled for.

Method

Participants and Procedures

The current study is based on longitudinal data (Silinskas & Raiziene, 2017–2018) that followed Lithuanian children during three time points across the transition from kindergarten to primary school. The participants were children (229 in kindergarten [T0], 337 at the beginning of Grade 1 [T1], 341 at the end of Grade 1 [T2]), their parents (245 in kindergarten [T0], 347 at the beginning of Grade 1 [T1], 323 at the end of Grade 1 [T2]) and Grade 1 teachers (24 at the beginning of Grade 1 [T1], 25 at the end of Grade 1 [T2]). Each teacher reported about their classroom children (M = 14 [1, 21]). The study protocol was approved by the Ethical Committee of the University of Jyväskylä (3.5.2017).

The study included participants from six schools in Lithuania that were selected according to the distribution of urban and rural localities: 65% urban and 35% rural. Each school was contacted and informed about the goals of the data collection. Meetings were organized at the schools to introduce the study and its procedures to the school administration, school psychologists, and teachers. School psychologists were introduced to the instructions and were trained to perform the children's tests. Consent to participate in the data collection process was collected from the parents regarding their own and their children's participation.

In the current study, the children (53.8% girls and 46.2% boys), their parents, and their Grade 1 teachers across the time points (kindergarten, T0; the beginning of Grade 1, T1; end of Grade 1, T2)

participated. Kindergarten education is compulsory in Lithuania since 2016. Primary education lasts from Grade 1 to Grade 4 and begins when children are around seven years old. The mean age of the children in our sample at the end of kindergarten was 6.83 years (*SD* = 0.30). The majority of children lived together with both of their parents (80.4%), 10.6% lived only with their mother, 4.2% lived with their mother and stepfather, and the remaining children lived either with only their father, father and stepmother, guardian, grandparent, or other. It was mostly the mothers who answered the questionnaires: 92.2%, 91.1%, and 88.7% at T0, T1, and T2, respectively. Most of the parents had a university degree (63% of mothers and 52.5% of fathers) or graduated from college or polytechnic school (18.8% of mothers and 26.9% of fathers); 12.1% of mothers and 15.3% of fathers had finished 12 or fewer grades. All children attended Lithuanian-speaking schools. Most of them spoke Lithuanian at home, except for 2% of the children who spoke only Russian, and 1% who spoke only Polish at home.

Measures

The psychometric properties of all study variables are presented in Table 1.

Teacher–Child Relationship (T1, T2). The primary school teachers answered questions about the perceived quality of their relationship with each child individually, both in Grade 1 Fall (T1) and Grade 1 Spring (T2). The teachers rated 15 items on a five-point Likert scale (1 = *Completely disagree*; 5 = *Completely agree*) of the short form of the Student–Teacher Relationship Scale (STRS; Pianta, 1992a; Pianta, 2001). The scale consists of two subscales: Closeness (8 items; e.g., “I share an affectionate, warm relationship with this child”) and Conflict (7 items; e.g., “This child easily becomes angry with me”). The Cronbach’s α in Grade 1 Fall was as follows: closeness .74, conflict .91; in Grade 1 Spring: closeness .80, conflict .94.

Parent–Child Relationship (T1, T2). The parents answered questions about the perceived close or conflicting relationships with their children both in Grade 1 Fall (T1) and Grade 1 Spring (T2). The parents rated 15 items on a five-point Likert scale (1 = *Completely disagree*; 5 = *Completely agree*) of the short form of the Child–Parent Relationship Scale (CPRS; Pianta, 1992b). The scale

consists of two subscales: Closeness (8 items; e.g., “If upset, my child will seek comfort from me”) and Conflict (7 items; e.g., “My child and I always seem to be struggling with each other”). The Cronbach’s α for each in Grade 1 Fall was as follows: closeness .71, conflict .80; in Grade 1 Spring: closeness .73, conflict .85.

Adjustment Behaviors (T1, T2). The teachers answered the Lithuanian version of the Strengths and Difficulties Questionnaire (SDQ-Lit; Goodman, 1997; for psychometric properties and validity in the Lithuanian sample, see Gintilienė et al., 2004) in Grade 1 Fall (T1) and Grade 1 Spring (T2). The teachers rated each question on a 3-point Likert scale (from 1 = *Not True* to 3 = *Certainly True*). Externalizing problems were measured by 10 items: 5 items from the hyperactivity scale (e.g., “Constantly fidgeting or squirming”) and 5 items from the conduct problems scale (e.g., “Often fights with other children or bullies them”). Prosocial behavior was measured by 5 items, such as “Shares readily with other children (treats, toys, pencils, etc.)”. To estimate the externalizing problems of the children, the mean score of the standardized hyperactivity and conduct problems scales was calculated. In Grade 1 Fall, the Cronbach’s α for each was as follows: hyperactivity scale .84 and conduct problems scale .72 (externalizing problems .86), prosocial behavior scale .85. In Grade 1 Spring, these were: hyperactivity scale .85 and conduct problems scale .77 (externalizing problems .88), prosocial behavior scale .89.

Child Temperament (T0). The parents reported on their children’s temperament in kindergarten (T0) and at the beginning of Grade 1 (for children who joined the study in T1) by filling in the Children’s Behavior Questionnaire–Very Short Form (CBQ-VSF; Putnam & Rothbart, 2006; Rothbart et al., 2001; for psychometric properties and validity in the Lithuanian sample, see Breidokienė & Jusienė, 2014). The scale includes 36 items that were rated on a scale from 1 to 7 (1 = *Does not fit at all*, 7 = *Fits me very well*). The questionnaire includes three scales, each representing a different dimension of temperament: surgency/extraversion (e.g., “Seems always in a big hurry to get from one place to another”), negative affectivity (e.g., “Tends to become sad if the family’s plans don’t work out”), and effortful control (e.g., “Is good at following instructions”). The Cronbach’s α for the

temperament scales were as follows: surgency/extraversion scale .75, negative affectivity scale .70, effortful control scale .75.

Control Variables (T0). The effects of three control variables, measured in kindergarten (T0), were controlled for (gender, highest parent education, and early literacy skills). *Gender* was coded as 1 (for girls) or 2 (for boys). The parents reported on the *education* of both fathers and mothers, and the higher of the two was chosen for further analysis (1 = *have finished 0–8 years*; 2 = *9–10 years*; 3 = *11–12 years*, 4 = *college or polytechnics*, 5 = *university*). To measure *early literacy skills* in kindergarten, the children completed vocabulary, phonological awareness, letter knowledge, reading, and spelling tasks. The tests were adapted from the First Steps Study (Lerkkanen et al., 2006–2016), the ARMI test battery (Lerkkanen et al., 2006), and the doctoral dissertation of Gedutienė (2008). During the *vocabulary* test (PPVT-R, Form L; Dunn & Dunn, 1981), school psychologists presented 30 words that children had to recognize in pictures (4 pictures for each word). *Phonological awareness* included phoneme identification (identification of the first phoneme of 12 words) and phoneme deletion (deletion of the first phoneme of 12 words). To measure *letter knowledge*, the children were presented with all 32 letters from the Lithuanian alphabet. The *reading* test included 16 words that children were asked to read within 45 seconds in total. During the *spelling* test, psychologists asked children to write down eight words. For all the tests, children received one point if they pointed to or pronounced the correct answer aloud. The only exception was the spelling test, where the words were scored from 0 to 4 (e.g., 0 – incorrectly spelled word; 4 – correctly spelled word). The final score of the early literacy skills was calculated by averaging the standardized scores (*z* scores) of all the tests.

Data Analysis Strategy

This study was not preregistered. We report how we determined our sample size, all data exclusions, all manipulations, and all measures in the study. We included all the available data in the current study, and the sample sizes of each variable (*n*) are presented in Table 1. The percentage of missing data of the main study variables ranged from 1.5% to 21.5% (M = 13.8%, SD = 6.9%). In all the analyses, we used full information maximum likelihood estimation (FIML) with robust standard

errors (MLR). Teachers mostly rated more than one child from their classrooms (M = 14.12, SD = 5.94, ranging from 1 to 21), therefore the nested nature of the data within classrooms was considered. For this reason, the intra-class correlations (ICC) were estimated for the main study variables. The range of ICCs varied from .002 to .327 ($.05 < p < .001$). Due to some significant ICCs, the COMPLEX approach was applied to the study analyses.

To answer the research questions about the interplay between relationship quality, adjustment behaviors, and temperament, cross-lagged path models in Mplus Version 8.6 (Muthén & Muthén, 1998-2017) were constructed. The chosen method used all available data when estimating associations. Two separate models were estimated (1) for relationship closeness and children's prosocial behavior across Grade 1, and (2) for the relationship conflict and children's externalizing problems across Grade 1. In both models, temperament was added to predict relationship quality and adjustment behaviors in Grade 1 fall and spring. Control variables (i.e., early literacy skills, gender, and the highest parent education) were controlled for by estimating direct paths from them to all variables presented in both models. The non-significant paths were trimmed from the final models.

In addition, the indirect effects of temperament on prosocial behavior at the end of Grade 1 through relationship closeness at the beginning of Grade 1, and the indirect effect of temperament on relationship closeness at the end of Grade 1 through prosocial behavior at the beginning of Grade 1, were calculated. The same procedure was applied in the model of conflict and externalizing problems. The materials and analysis code for this study are available by emailing the corresponding author.

Five model-fit statistics: chi-square test of model fit, root mean square error of approximation (RMSEA), comparative fit index (CFI), Tucker-Lewis index (TLI), and standardized root mean square residual (SRMR). For a good model fit, we expected to find the p value for the chi-square test to be higher than 0.05, RMSEA smaller than 0.06, CFI and TLI higher than 0.95, and SRMR lower than 0.08 (Hu & Bentler, 1999).

Results

Cross-lagged Longitudinal Associations between Children's Adjustment Behaviors and Relationship Quality with Parents and Teachers

The descriptive statistics are presented in Table 1, and correlations are presented in Table 2. To answer our research questions, two models were built: (1) for relationship closeness and prosocial behavior, and (2) for relationship conflict and externalizing problems. In both models, first temperament and then control variables were entered to predict all study variables. First, the relationship closeness and prosocial behavior model showed a good model fit, $\chi^2[40] = 39.556$, $p = 0.490$, *CFI* = 1.000, *TLI* = 1.000, *RMSEA* = 0.000, *SRMR* = 0.047 (see Figure 2). The results showed the stability of relationship closeness and prosocial behavior across Grade 1. Out of the estimated cross-lagged paths, prosocial behavior at the beginning of Grade 1 predicted teacher–child closeness at the end of Grade 1: The more prosocial behavior the children showed, the closer relationships with teachers they had. Other cross-lagged effects were not significant.

Second, the relationship conflict and externalizing model showed a good fit to the data as well, $\chi^2[41] = 49.244$, $p = 0.177$, *CFI* = 0.985, *TLI* = 0.976, *RMSEA* = 0.030, *SRMR* = 0.060 (see Figure 3). The results showed the stability of relationship conflict and externalizing problems across Grade 1. Two cross-lagged paths were significant. The evocative effects of externalizing problems at the beginning of Grade 1 on teacher–child conflict and parent–child conflict at the end of Grade 1 were found: The more externalizing problems children had the more both teachers and parents perceived a conflicting relationship with the children. None of the other cross-lagged paths were significant.

The Indirect and Direct Effects of Temperament on Children's Adjustment Behaviors and Teacher– and Parent–Child Relationships

To answer the third research question, direct and indirect effects of children's temperament on the relationship quality and children's adjustment behaviors were estimated. First, the results showed that the higher surgency predicted lower prosocial behavior in Grade 1 Fall. Higher negative affectivity predicted less close teacher–child and parent–child relationships and less prosocial behavior in children at the beginning of Grade 1 (see Figure 2). In addition, higher effortful control of children

predicted closer parent–child relationships in both the fall and spring of Grade 1. In addition to direct effects, one indirect effect was found from surgency to teacher–child closeness. The results indicate that the higher surgency children had, the less prosocial behavior they expressed in Grade 1 Fall and the less close relationships they formed with their teachers in Grade 1 Spring (β = -.024, *SE* = .012, *p* = .042).

Second, for relationship conflict and externalizing model results showed that the higher surgency in children predicted more externalizing problems at the beginning of Grade 1 (see Figure 3). In addition, higher negative affectivity predicted more conflicting parent–child relationships at the beginning of Grade 1, and higher effortful control in children predicted less conflicting parent–child relationships at the beginning of Grade 1. In terms of indirect effects, one of the indirect paths was statistically significant: The higher the children's temperamental surgency was, the higher externalizing problems they had at the beginning of Grade 1, and the more conflicts with teachers children had at the end of Grade 1 (β = .038, *SE* = .018, *p* = .028).

Discussion

This study broadens our understanding of the reciprocal effects of adjustment behaviors on relationship quality during the critical transition to school, as well as the role of temperament in this interplay. First, the results revealed evocative effects of adjustment behaviors on the relationship quality. In particular, prosocial behavior at the beginning of Grade 1 evoked increased teacher–child closeness during Grade 1, whereas externalizing problems at the beginning of Grade 1 evoked increased teacher–child and parent–child conflict during Grade 1. Second, we found two indirect effects of children's higher surgency on their lower closeness with teachers through less prosocial behavior and children's higher surgency on their conflicts with teachers via the higher externalizing problems.

Children's Adjustment Behaviors and their Relationship Quality with Parents and Teachers

In contrast to our Hypotheses 1a and 1b (see also Kiuru et al., 2016; Silver et al., 2010), our study did not find any effects of teacher–child or parent–child relationship on any of the subsequent

adjustment behaviors during Grade 1. In the current study, we measured teacher–child relationship quality at the beginning of primary school. Hence, one possible explanation for the lacking effect of teacher–child relationships on children's subsequent adjustment behaviors is that the quality of relationships with new teachers was not well defined yet at the beginning of Grade 1. In addition, both parents and teachers tend to rate their conflicts with children as lower than average, which might not become a strong predictor for children's externalizing later in Grade 1.

The second research question investigated the effects of children's adjustment behaviors on their relationship quality with parents and teachers. In line with our expectations (Hypothesis 2) and previous studies (e.g., Coulombe & Yates, 2018; Mejia & Hoglund, 2016; Newton et al., 2014), we found that prosocial behavior evoked teacher–child closeness, whereas externalizing behavior evoked the relationship conflict with both teachers and parents. As expected, the positive adjustment behaviors of children evoked positive responses from teachers (Nurmi, 2012; Rutter, 1997, Scarr & McCartney, 1983). One possible explanation for this result is that the children's prosocial behaviors have increased teachers' positive affect towards the children, which was expressed through teaching and expressions of warmth (Nurmi et al., 2018). This, in turn, led to closer relationships between children and their teachers. On the other hand, children with externalizing problems avoid completing tasks, have lower self-regulatory abilities, and display lower academic performance (Metsäpelto et al., 2015), which can trigger teachers' negative perceptions of a child and increase teacher–child conflicts. Children with externalizing problems can also show higher levels of aggressive and disruptive behavior in classroom situations (Hinshaw, 1992; McMahon, 1994) and also at home which can cause conflicting relationships with both teachers and parents (Georgiou & Fanti, 2014; Mejia & Hoglund, 2016).

In contrast to our Hypotheses 2 and previous studies (Newton et al., 2014; Silinskas et al., 2015), we did not find an evocative effect of the teacher–rated prosocial behavior on parent–child closeness. One possible explanation is that closeness between parents and children is somewhat stable no matter which level of prosociality their children have. Overall, our results suggest children's externalizing problems evoke stronger reactions than prosocial behavior from both parents and

teachers. These are interesting findings, which confirm that adjustment behaviors of children evoke reactions from interpersonal environments (e.g., Newton et al., 2014; Nurmi, 2012; Silinskas et al., 2015). Attachment theory (Ainsworth & Bowlby, 1991; Bowlby, 1982) emphasizes the importance of relationships with parents and teachers. Our study, however, confirmed that at the start of schooling (Grade 1) the behavioral characteristics that children bring to their new environment (school) may have a greater effect on their relationships with parents and teachers than the other way around.

The Role of Temperament in Relationship Quality and Adjustment Behaviors

First, in line with Hypothesis 3a, the results indicated further that the high temperamental surgency of children predicted lower prosocial behavior and higher externalizing problems in Grade 1 Fall. These results are in line with the previous studies that have shown that temperament affects the way children behave (e.g., Karreman et al., 2009; Nurmi, 2012). The more impulsive children with higher temperamental surgency were shown to engage in more externalizing behaviors (Harvey et al., 2022; Karreman et al., 2009). Therefore, the current results showed that children, who were more temperamentally active and impulsive engaged in more disruptive behaviors and were less concerned about controlling their behavior or helping others. Even though contrary to the previous studies (e.g., Liew et al., 2019; Rudasill et al., 2010), we did not find the direct effects of surgency on relationship quality, we did find two indirect effects on relationships with teachers via adjustment behaviors. This finding is in line with our Hypothesis 3b and adds additional value to the previous research, as only a few studies have analyzed the indirect effects of temperament on relationship quality and adjustment behaviors (Ezpeleta et al., 2019; Karreman et al., 2010; Rudasill et al., 2010). Rudasill et al. (2010) found an indirect effect of difficult temperament on the risky behavior of adolescents as manifested through conflicts with teachers. However, in the current study, we found that the lower surgency children had, the more engaged in prosocial behavior towards others they were, and teachers felt more affectionate towards them. In contrast, the higher surgency children had, the more disruptive behaviors they expressed which lead to more conflicting situations with teachers at school.

Second, in line with Hypothesis 3b, the lower the negative affectivity children expressed, the closer relationship with teachers and parents and fewer conflicts with parents they had in Grade 1 fall. Possibly, the negative affectivity of these children encourages parents to use psychological or behavioral control (Laukkanen et al., 2014), which can lead to greater resistance and less close and more conflicting situations between parents and their children. Results indicate that both parents and teachers felt less closeness with the children if they required more attention by their negative emotionality and irritability. In addition, higher negative affectivity predicted lower prosocial behavior in Grade 1 Fall. These results are in line with Hypothesis 3a and the previous studies (Laible et al., 2014; Rende & Plomin, 1992), which suggest that children with higher negative affectivity, emotionality, or activity can be more overwhelmed by their negative emotions and personal distress. For this reason, it becomes harder to concentrate on cooperation and social skills, which leads to low prosocial behavior at school (Laible et al., 2014; Liew et al., 2019). However, to our surprise, negative affectivity did not predict externalizing problems. This finding indicates that temperamental activity and impulsivity are more detrimental to externalizing problems than negative emotionality.

Finally, in line with our expectations (Hypothesis 3b), the higher effortful control children had, the closer relationships in Grade 1 Fall and spring and fewer conflicts with their parents in Grade 1 Fall were reported. These results are in line with the theory of the evocative effect, which states that children's individual characteristics evoke reactions from parents (Nurmi, 2012; Rutter, 1997; Scarr & McCartney, 1983). However, the results surprisingly contradicted the previous research concerning the role of effortful control on the teacher–child relationship (e.g., Hernandez et al., 2017; Liew et al., 2019; Rudasill & Rimm-Kaufman, 2009). Children who had higher or lower effortful control evoked more reactions from parents than from teachers. These results can indicate that teachers recognize that children are still learning to regulate their behavior, which does not lead to conflicts at school entry. However, as the beginning of primary school can bring a lot of changes and challenges (Dockett & Perry, 2007), some parents have higher expectations of how their children should behave and how much effort they should put into their learning. Therefore, children who had higher temperamental

effortful control were able to better focus their attention and regulate their behavior and emotions, which had led to better learning and meeting the expectations of parents. In contrast, lower self-regulation and attention do not meet the expected behavior, which can lead to more conflicts with parents. In addition, in contrary to the previous studies (Gusdorf et al., 2011; Hirvonen et al., 2018; Karreman et al., 2009) and our expectations (Hypothesis 3a), the effortful control did not predict the adjustment behaviors of children at the beginning of Grade 1. Negative affectivity and surgency in the current study were more detrimental for the adjustment of children in Grade 1 than low effortful control. Children with more reactive types of temperament were found to be more sensitive to the changes after the transition, which, in turn, affected their behavior.

Limitations and Practical Applications

The current study is not without its limitations. First, despite the cross-lagged longitudinal design, our results should be interpreted carefully, as only experimental studies can determine the direction of effects. Second, the teacher–student relationship and adjustment behaviors of the children were rated only by their teachers, which may have influenced the related associations due to the common method bias. This means that reports from children themselves or observational data could be important for future research to better understand the associations between teacher–child relationships and adjustment behaviors. The behavior of children at school can be different from that at home. In addition, children's reports on relationship quality with parents and teachers could add additional value in analyzing the interplay between relationship quality and adjustment behaviors. Third, even though our longitudinal study utilized data from multiple respondents (i.e., parents, teachers, and children), common method bias might have also affected the associations between parent–child relationships and temperament as both constructs were measured by parents. Forth, it is possible that some aspects of temperament, such as effortful control, can change due to the environment that children are exposed to. For this reason, more extensive research could address the issue of temperamental stability and its links to relationships with parents and teachers and adjustment behaviors. Finally, future studies could

benefit from applying the person-oriented approach to the data to more extensively investigate the interplay of the individual interpersonal contexts in the child's adjustment in Grade 1.

Aside from these limitations, the current study adds understanding about the interplay between relationship quality with parents and teachers, children's adjustment behaviors, and the role of child temperament in these associations. Based on our results, it is important to acknowledge that the experiences that children bring to Grade 1 and the adjustment behaviors that are formed throughout the critical transition to primary school are very important for the development of relationship quality between children and their teachers and parents across Grade 1. Thus, to avoid conflicting situations at the beginning of primary school, Grade 1 teachers, as well as parents, should be aware of how children's behavior affects their feelings towards children.

Not only children's adjustment behavior but also their temperament may relate to the experiences they will undergo across Grade 1. In particular, as we know that children with higher surgency can engage in more externalizing problems and that higher surgency and negative affectivity can lead to lower prosocial behavior at the beginning of Grade 1, it is important to consider interventions already in kindergarten, especially targeted for children with higher surgency and negative affectivity, to promote more prosocial behavior and reduce externalizing problems upon school entrance in Grade 1. Moreover, the indirect effects of surgency on the teacher–child relationship through adjustment behaviors show that acknowledging the individual temperament of children is important due to its role in the adjustment of children at the beginning of Grade 1. If children develop more externalizing problems and engage in less prosocial behavior, they evoke negative reactions from teachers that lead to less close or conflicting relationships. It, therefore, becomes important to identify children with a temperament that can be more detrimental to the manifestation of externalizing problems, so as to provide successful adjustment in Grade 1 and avoid conflicts with teachers at the end of Grade 1.

Conclusions

The results of the current study suggest that children's adjustment behaviors have an evocative effect on relationship quality with teachers and parents. In particular, if children express more prosocial behavior at the beginning of Grade 1, they develop closer relationships with teachers. On the contrary, if children engage in more externalizing problems at the beginning of Grade 1, they have more conflicts with not only teachers but also parents at the end of Grade 1. Moreover, teachers and parents should be aware that children with higher surgency have a higher risk of developing externalizing problems and less prosocial behavior while children with higher negative affectivity are at risk of less close and more conflicting relationships with parents and lower prosocial behavior. On the other hand, temperamental effortful control only promotes closer relationships and lessens conflicts with parents. Consequently, parents and educators should be informed about the manifestations of child temperamental and behavioral characteristics and the effects those may have on their relationship quality.

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Table 1

Descriptive Statistics of Study Variables

	n	*M*	*SD*	*Potential range*	*Actual range*	*Skewness*
Teacher–child closeness T1	342	3.97	0.54	1-5	2-5	-0.38
Teacher–child closeness T2	335	3.84	0.60	1-5	2-5	-0.56
Teacher–child conflict T1	342	1.57	0.70	1-5	1-4.71	1.62
Teacher–child conflict T2	335	1.64	0.78	1-5	1-4.71	1.47
Parent–child closeness T1	341	4.28	0.45	1-5	2.88-5	-0.53
Parent–child closeness T2	323	4.22	0.47	1-5	2.75-5	-0.39
Parent–child conflict T1	341	2.45	0.73	1-5	1-5	0.60
Parent–child conflict T2	321	2.51	0.75	1-5	1-5	0.54
SDQ prosocial behavior T1	342	2.53	0.47	1-3	1-3	-0.76
SDQ prosocial behavior T2	341	2.48	0.52	1-3	1-3	-0.73
Externalizing problems						
SDQ hyperactivity T1	342	1.64	0.58	1-3	1-3	0.69
SDQ hyperactivity T2	341	1.65	0.58	1-3	1-3	0.64
SDQ conduct problems T1	342	1.20	0.32	1-3	1-2.6	1.91
SDQ conduct problems T2	341	1.22	0.35	1-3	1-2.6	1.87
Temperament						
Surgency	403	4.21	0.88	1-7	1.83-7	0.04
Negative affectivity	403	4.34	0.82	1-7	1.25-7	-0.04
Effortful control	403	5.36	0.75	1-7	2.5-7	-0.56
Covariates						
Vocabulary T0	229	18.03	3.93	0-30	7-26	-0.46
Letter knowledge T0	229	26.92	7.31	0-32	1-32	-2.07
Initial phoneme identification T0	229	9.99	3.04	0-12	0-12	-2.30
Initial phoneme deletion T0	229	3.53	4.67	0-12	0-12	0.77
Reading T0	229	6.71	5.94	0-16	0-16	0.32
Writing T0	229	18.66	10.24	0-32	0-32	-0.54
Gender	409	1.46	0.50	1-2	1-2	0.15
Highest education in a family	400	4.61	0.72	1-5	1-5	-1.96

Note. T0 = Kindergarten; T1 = Grade 1 Fall; T2 = Grade 1 Spring.

Table 2

Correlations between Observed Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. Teacher–child closeness T1	—																
2. Teacher–child closeness T2	.553**	—															
3. Teacher–child conflict T1	-.420**	-.403**	—														
4. Teacher–child conflict T2	-.195**	-.476**	.727**	—													
5. Parent–child closeness T1	.104	.112*	-.155**	-.101	—												
6. Parent–child closeness T2	.064	.172**	-.093	-.129*	.634**	—											
7. Parent–child conflict T1	-.005	-.126*	.133*	.132*	-.385**	-.320**	—										
8. Parent–child conflict T2	-.028	-.096	.133*	.113*	-.342**	-.385**	.747**	—									
9. SDQ prosocial behavior T1	.625**	.455**	-.441**	-.245**	.192**	.128*	-.114*	-.106	—								
10. SDQ prosocial behavior T2	.523**	.652**	-.479**	-.455**	.174**	.173**	-.166**	-.109	.739**	—							
11. SDQ externalizing problems T1	-.272**	-.394**	.697**	.573**	-.214**	-.097	.230**	.191**	-.499**	-.512**	—						
12. SDQ externalizing problems T2	-.268**	-.498**	.587**	.707**	-.210**	-.222**	.251**	.217**	-.486**	-.651**	.762**	—					
13. Temperament (Surgency)	.006	.006	.130*	.107	-.006	-.018	.041	.117*	-.122*	-.135*	.285**	.266**	—				
14. Temperament (Negative affectivity)	-.136*	-.128*	.137*	.045	-.073	-.074	.392**	.295**	-.104	-.095	.086	.083	-.140**	—			
15. Temperament (Effortful control)	.078	.169**	-.072	-.102	.349**	.332**	-.164**	-.232**	.136*	.170**	-.215**	-.233**	-.212**	.048	—		
16. Early literacy skills	.214**	.201**	-.304**	-.251**	.013	-.026	-.037	.021	.213**	.212**	-.336**	-.315**	-.008	-.048	.003	—	
17. Gender	-.231**	-.258**	.231**	.234**	-.101	-.036	.003	-.05	-.250**	-.338**	.282**	.345**	.117*	-.017	-.235**	-.210**	—
18. Highest education in a family	.201**	.110*	-.153**	-.092	.028	-.063	-.101	-.097	.172**	.178**	-.154**	-.253**	-.045	-.137**	-.046	.385**	-.06

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

Figure 1

Theoretical Model of Longitudinal Associations between Relationship Quality, Adjustment Behaviors, and Temperament of Children across Grade 1

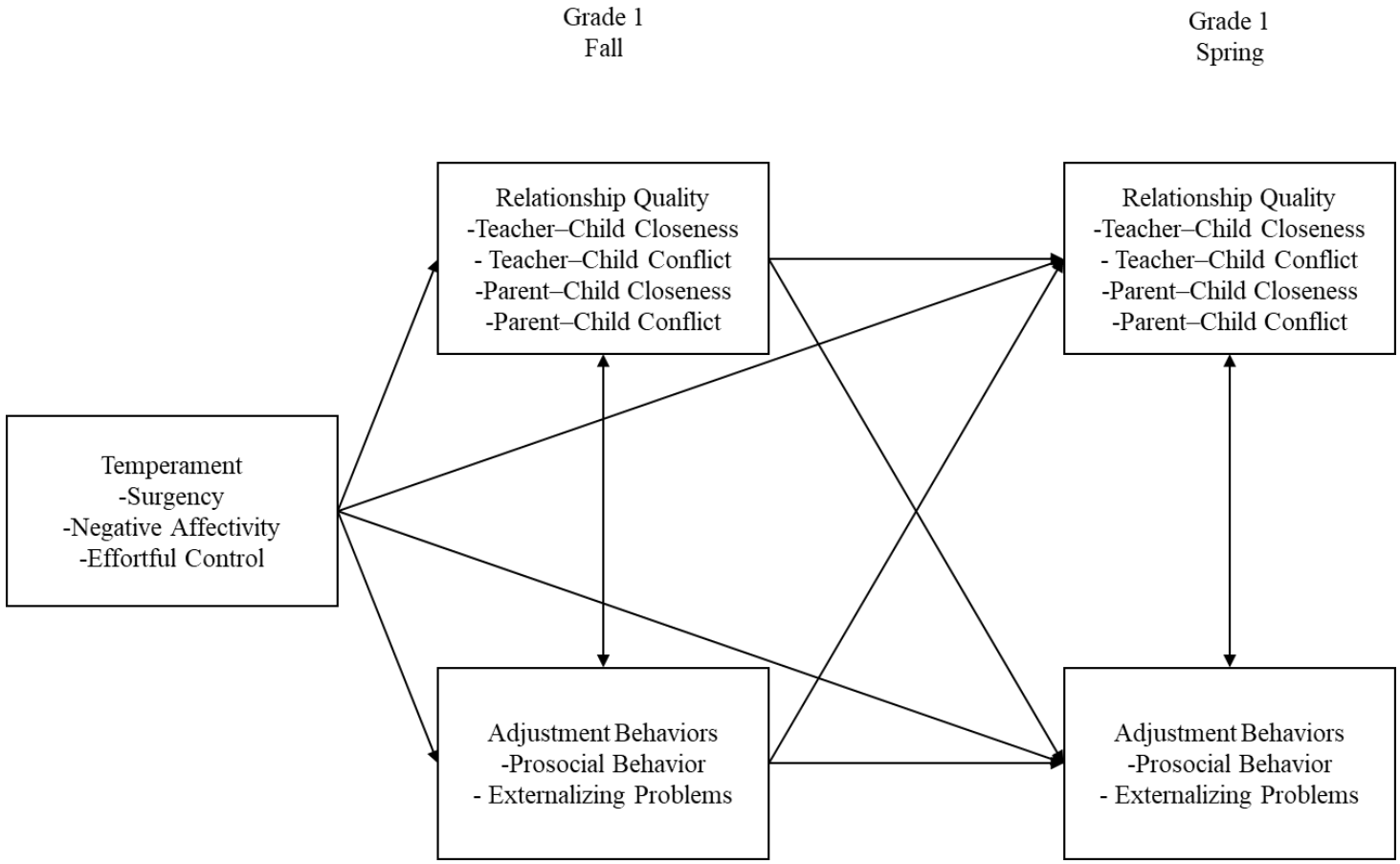
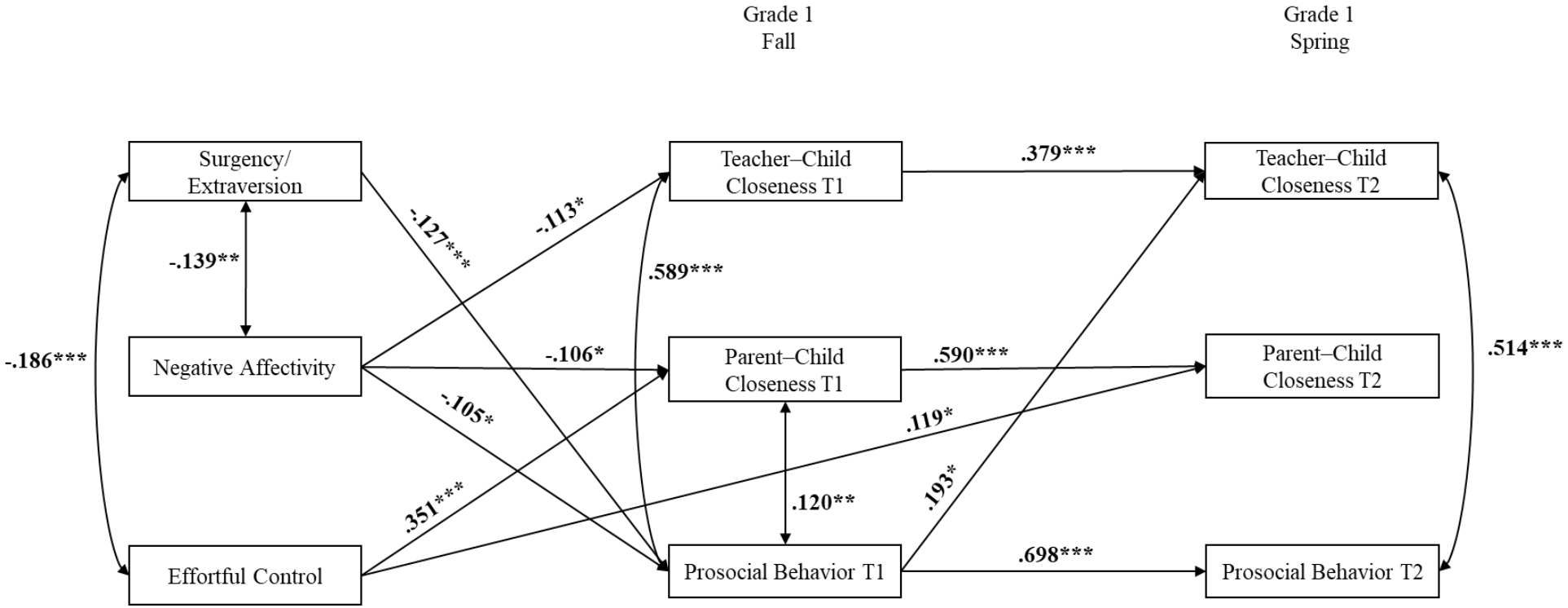


Figure 2

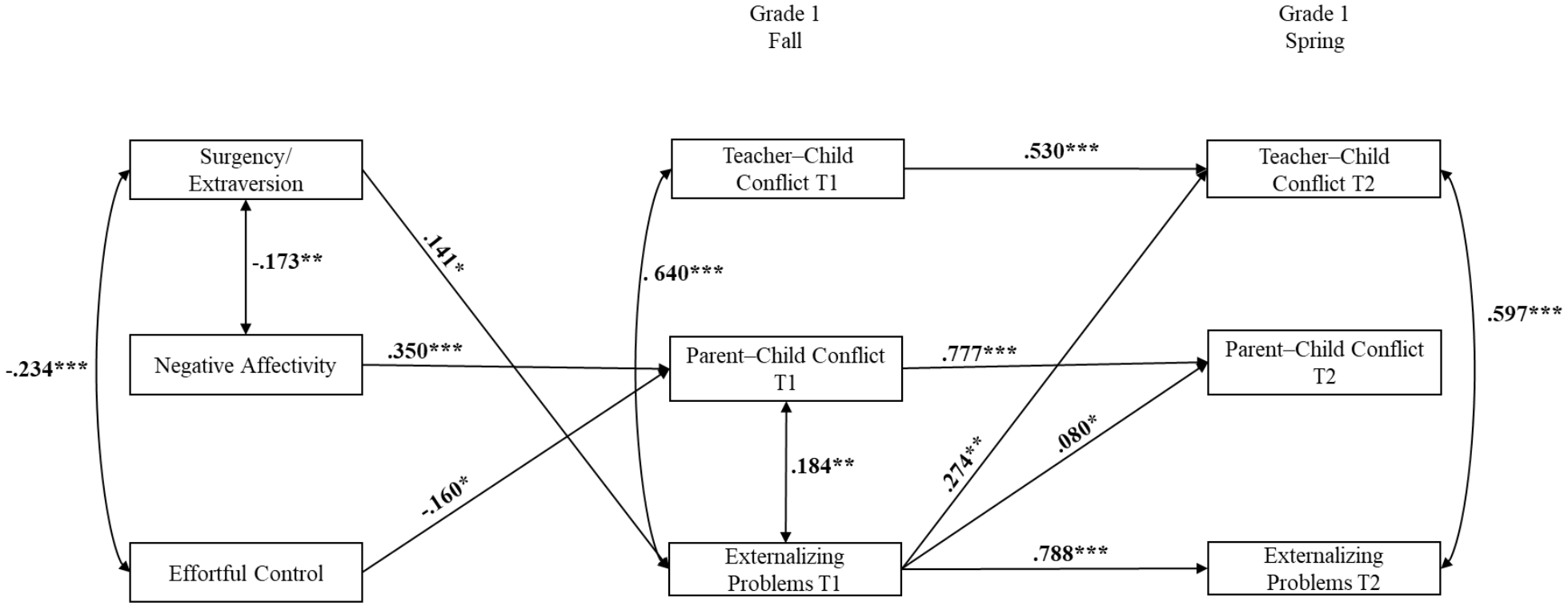
Longitudinal Associations of Temperament Dimensions, Teacher– and Parent–Child Closeness, and Prosocial Behavior across Grade 1



Note. The effects of covariates were included in the analysis. Covariates were allowed to predict all the variables. The effects of temperament on both T1 and T2 were included in the model. * $p < .05$, ** $p < .01$, *** $p < .001$.

Figure 3

Longitudinal Associations of Temperament Dimensions, Teacher– and Parent–Child Conflict, and Externalizing Problems across Grade 1



Note. The effects of covariates were included in the analysis. Covariates were allowed to predict all the variables. The effects of temperament on both T1 and T2 were included in the model. * $p < .05$, ** $p < .01$, *** $p < .001$.