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From general to student-specific teacher self-efficacy

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CHAPTER 5

STUDENTS' DISRUPTIVE BEHAVIOR AND THE DEVELOPMENT OF TEACHERS' SELF-EFFICACY: THE ROLE OF TEACHER-PERCEIVED CLOSENESS AND CONFLICT IN THE STUDENT–TEACHER RELATIONSHIP

Data gathered from a short-term longitudinal study within regular upper elementary schools were used to evaluate a theoretical model within which teachers' perceptions of conflict and closeness in the student–teacher relationship were considered as the intermediary mechanisms by which individual students' disruptive behavior may generate changes in teachers' student-specific self-efficacy beliefs (TSE) across teaching domains (instructional strategies, behavior management, student engagement, and emotional support). Surveys were administered among a Dutch sample of 524 third-to-sixth graders and their 69 teachers. Longitudinal mediation models indicated that individual students' disruptive behavior generally predicted higher levels of teacher-perceived conflict which, in turn, resulted in lower student-specific TSE across teaching domains. Teacher-perceived closeness, however, was not found to mediate the link between disruptive student behavior and student-specific TSE. Instead, support was found for an alternative model representing the hypothesis that TSE, irrespective of teaching domain, mediated behavior-related changes in teachers' perceptions of closeness in the student–teacher relationship.

INTRODUCTION

Teachers' self-efficacy beliefs (TSE) have been widely acknowledged to be one of the most basic, yet potent psychological resources of teachers' functioning in the classroom (Bandura, 1997; Klassen, Tze, Betts, & Gordon, 2011; Tschannen-Moran & Woolfolk Hoy, 2001). Accumulating evidence has indicated that teachers with a firm belief in their capabilities may translate their knowledge and abilities into proficient action, whereas those who lack such beliefs will probably not attempt to make things happen in class (e.g., Bandura, 1997; Klassen & Tze, 2014). When teachers live up to their generalized sense of self-efficacy, they are more likely to provide high-quality instruction, adopt proactive approaches to managing disruptive behavior, and convey supports that activate students' motivation and engagement in class (e.g., Dunn & Rakes, 2011; Martin & Sass, 2010; Morris-Rothschild & Brassard, 2006; Reyes et al., 2012; Wertheim & Leyser, 2002). Given the important role TSE might play in students' socioemotional and academic development, it is critical to explore the factors and processes that may account for these beliefs.

One potentially compelling contribution to the corpus of evidence on the sources of TSE has recently been provided by cross-sectional investigations focusing on teachers' sense of self-efficacy in relation to *individual students* (e.g., Zee & Koomen, 2015; Zee, Koomen, Jellesma, Geerlings, & de Jong, 2016). These studies have suggested that teachers are likely to develop differentiated sets of self-beliefs about their ability to deal with individual children in distinct teaching domains, depending on these students' disruptive, or externalizing behaviors in the classroom (ibid.). Relatively little information has been generated, however, about the mechanisms by which individual students' disruptive behavior may generate changes in these student-specific TSE beliefs. Following Bandura (1997), there is a need for research to move away from cross-sectional examinations of TSE and its underlying sources, and explore the role of potential mediating processes through which sources of self-efficacy may become instructive to teachers' self-efficacy beliefs across time. In the present study, therefore, we seek to expand the available information on the sources of student-specific TSE, by evaluating an interpersonal social-cognitive model within which teachers' perceptions of closeness and conflict in the relationships with individual students are hypothesized to form the intermediary mechanisms by which individual students' disruptive behavior may affect teachers' student-specific self-efficacy over time. Theoretical and empirical knowledge in this direction may help educational researchers and practitioners identify levers to increase teachers' self-efficacy

toward disruptive students, and thereby improve these students' classroom experiences and academic adjustment.

AN INTERPERSONAL SOCIAL-COGNITIVE MODEL OF TEACHERS' SELF-EFFICACY

In this study, we extended Bandura's (1997) social-cognitive assumptions about self-efficacy by embedding them within an interpersonal framework of student–teacher relationships (Pianta, 1999; Pianta, Hamre, & Stuhlman, 2003). With this integrated model, we aimed to subscribe to the longstanding notion that TSE, rather than being a single-level, trait-like construct, is intrinsically related to the specific students with whom they interact in distinct realms of activity (Tschannen-Moran, Woolfolk Hoy, & Hoy, 1998; Tschannen-Moran & Woolfolk Hoy, 2001; Zee et al., 2016). This conception of TSE as being both *student- and domain-specific* maintains, generally, that features of individual students, such as their background characteristics and behaviors, may serve as key sources of information about whether teachers can muster whatever it takes to adequately instruct, manage, motivate, and emotionally support a particular student (Bandura, 1997; Pianta et al., 2003; Zee et al., 2016). Consistent with this view, a modest body of work on within-teacher predictors of TSE has spawned some evidence that teachers' general efficaciousness can rise or fall according to their students' level of engagement and achievement in class (e.g. Raudenbusch, Rowan, & Cheong, 1992; Ross, Cousins, & Gadalla, 1996). Other studies have marked students' disruptive behaviors as the type of information teachers attend to and use as direct sources of their self-efficacy in domains of behavior management, relationship building, instructional strategies, and student motivation (e.g., Lambert, McCarthy, O'Donnell, & Wang, 2009; Spilt & Koomen, 2009; Tsouloupas, Carson, Matthews, Grawitch, & Barber, 2010; Zee, de Jong, & Koomen, 2016). Relative to other sources of self-efficacy, these disruptive student behaviors have thus far been demonstrated to achieve the highest explanatory and predictive power for both classroom-level and student-specific TSE (*ibid.*).

Further broadening beyond the original social-cognitive paradigm, our framework adheres to the notion that disruptive student behaviors, as sources of student-specific TSE, may not *per se* be enlightening to the formation of these beliefs (*cf.* Bandura, 1982, 1997). Rather, individual students' conduct can be presumed to become instructive to TSE only through teachers' *subjective evaluations* of these behaviors in the context of their daily interactions with individual students. Theory and research on student–teacher interactions (e.g., Pianta et al., 2003; Spilt & Koomen, 2009; Spilt, Koomen, & Thijs, 2011; Stuhlman & Pianta, 2002) has

indicated that teachers' evaluations of student behavior may derive, in part, from previous experiences with individual students, stored in underlying representational models of relationships with these students. This idea is premised on the attachment-based assumption that relationship representations may yield internalized and relatively stable patterns of beliefs, feelings, and expectations about the self as a teacher and the student in the relationship (Pianta et al., 2003; Spilt & Koomen, 2009). Such belief systems can be primarily positive, reflecting experiences of *close* student–relationships, or predominantly negative, incorporating a history of *conflict* in the relationship with a particular child (e.g., Verschueren & Koomen, 2012). Accordingly, teachers' representations, or perceptions, of closeness and conflict in the student–teacher relationship can be considered powerful cognitive tools, as they largely guide their interpretations of individual students' underlying intentions, behaviors, and actions in the relationship, and provide teachers with vital information about their capability to deal with the child (Howes, Hamilton, & Matheson, 1994; Pianta, 1999; Pianta et al., 2003; Spilt et al., 2011).

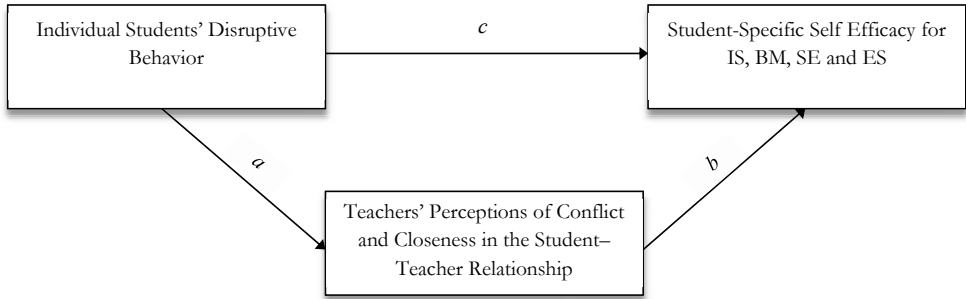
Guided by the interpersonal social-cognitive principles proposed above, we aim to explore a model (see Figure 1a) in which teachers' perceptions of closeness and conflict in the student–teacher relationship are considered to be the intermediary mechanisms that could explain why teachers may develop a positive or negative sense of self-efficacy toward individual disruptive children. Theoretical and empirical justification for the sequence of linkages delineated by our hypotheses are provided in the next sections.

DISRUPTIVE STUDENT BEHAVIOR AND TEACHERS' RELATIONSHIP PERCEPTIONS

Multiple sources of evidence have increasingly indicated that disruptive student behavior matters for teachers' perceptions of conflict and closeness in the student–teacher relationship (e.g., Mejia & Hoglund, 2016; Roorda, Verschueren, Vancraeyveldt, van Craeyveldt, & Colpin, 2014). Drawing on both attachment and developmental systems frameworks, these studies have postulated that teachers generally have more difficulty forming relationships with disruptive students that are marked by warmth, trust, and affection (i.e., *closeness*), and instead develop relationships that reflect high levels of negativity, discordance, and distrust (i.e., *conflict*; Pianta, 1999). In line with this assumption, both cross-sectional and longitudinal studies have convincingly disclosed the negative effect of disruptive, aggressive, or antisocial student behavior on teachers' experiences of student–teacher conflict (Birch & Ladd, 1998; Henricsson & Rydell, 2004; Jerome et al., 2009; Ladd & Burgess, 1999; Murray & Murray, 2004; Murray & Zvoch, 2011; O'Connor, 2010).

FIGURE 1A

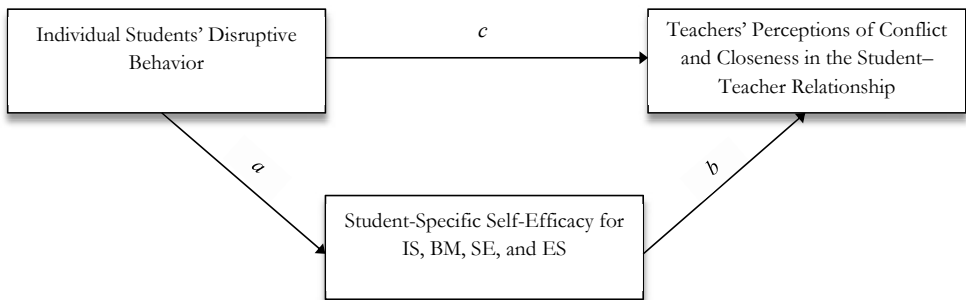
Hypothesized Mediation Model



Note. IS = Instructional Strategies, BM = Behavior Management, SE = Student Engagement, ES = Emotional Support. Coefficients *a* and *b* reflect associations between predictor and mediators, and mediators and outcome measures, respectively. The product *ab* reflects the hypothesized indirect effect of individual students' disruptive behavior on domains of student-specific self-efficacy, through teachers' perceptions of conflict and closeness. Coefficient *c* reflects the direct association between predictor (disruptive student behavior) and outcome variables (domains of student-specific self-efficacy).

FIGURE 1B

Alternative Mediation Model



Note. IS = Instructional Strategies, BM = Behavior Management, SE = Student Engagement, ES = Emotional Support. Coefficients *a* and *b* reflect associations between predictor and mediators, and mediators and outcome measures, respectively. The product *ab* reflects the hypothesized indirect effect of individual students' disruptive behavior on teachers' perceptions of conflict and closeness, through domains of student-specific self-efficacy. Coefficient *c* reflects the direct association between predictor (disruptive student behavior) and outcome variables (teachers' perceptions of conflict and closeness).

Furthermore, some studies (Doumen et al., 2008; Roorda et al., 2014) have even acknowledged that students' displays of externalizing behavior may be sufficient to commence a vicious cycle of disharmonious relationships and escalating problem behaviors. These outcomes are consistent with the idea that student behavior and teachers' perceptions of the student–teacher relationship are reciprocally related to one another. Hence, it can be suggested that disruptive student behavior may generate negative changes in teachers' perceptions of conflict in the student–teacher relationship.

Far less consistent are the findings regarding the linkage between disruptive student behavior and teachers' perceptions of closeness in the student–teacher relationship. Specifically, several primarily *cross-sectional* studies have identified disruptive student behavior as a negative predictor of teachers' perceptions of relational closeness (Birch & Ladd, 1998; Buyse et al., 2008; Mejia & Hoglund, 2016; Thijs, Westhof, & Koomen, 2012). Following these investigations, teachers may thus experience lower, concurrent levels of closeness in the relationship with students who display disruptive behavior in the classroom. The handful of prior *longitudinal* studies, in addition, has generally indicated that the modest association between individual students' disruptive behaviors and teacher-reported degrees of closeness may remain relatively stable over time (Baker, Grant, & Morlock, 2008; Henricsson & Rydell, 2004; Jerome, Hamre, & Pianta, 2009; Mejia & Hoglund, 2016; Roorda et al., 2014; Zhang & Sun, 2011). For example, some cross-lagged panel studies (Mejia & Hoglund, 2016; Roorda et al., 2014) have revealed significant within-time correlations between individual students' disruptive behavior and teacher-reported closeness, but no additional effects of these behaviors on prospective levels of relational closeness, after accounting for the stability in both constructs. Whether the link between students' disruptive behavior and teachers' subsequent student-specific self-efficacy beliefs can be explained by changes in teachers' perceptions of closeness thus remains to be explored.

TEACHERS' RELATIONSHIP PERCEPTIONS AND SELF-EFFICACY BELIEFS

To date, only a scant amount of literature has provided empirical illustrations of our hypothesis that teachers' experiences in relationships with individual students may generate changes in their student-specific self-efficacy beliefs. In part, this lack of research may stem from the fact that TSE, in contrast to the dyadic constructs of closeness and conflict, is usually defined at the classroom-level of analysis, thereby reflecting the collective valence of teachers' sense of self-efficacy toward their students in the classroom. Yet, the results of these studies seem to yield a

fairly consistent picture across dimensions of the student–teacher relationship, pointing to student–teacher conflict as the strongest predictor of general, classroom-level TSE (e.g., O’Connor 2008; Spilt et al., 2011). In a sample of secondary school teachers, for instance, Yeo, Ang, Chong, Huan, and Quek (2008) indicated that teachers who experience high levels of conflict in the relationships with their students are likely to develop unhealthy, classroom-level self-efficacy beliefs in the teaching domains of classroom management and instructional strategies. Other research explicates that poor relationships with students may lead to increases in emotional vulnerability in teachers, and result in feelings of professional and personal failure (Hargreaves 1998, 2000; Newberry & Davis, 2008; O’Connor, 2008; Spilt et al., 2011). Together, these findings lend credence to the idea that teachers, through their perceptions of conflict in the student–teacher relationship, come to see the task of teaching disruptive students as more difficult and consequently adjust their self-percepts of self-efficacy toward these students downward.

Counter to student–teacher conflict, high levels of relational closeness can be assumed to provide teachers with the affective cues, performance successes, and persuasive boosts that convince them they have whatever it takes to succeed with a child. In the study of Yeo et al. (2008), however, this hypothesized association could not be confirmed. Their findings revealed that positive aspects of student–teacher relationships, including teachers’ instrumental help and satisfaction, were not associated with teachers’ general sense of self-efficacy for instructional strategies, classroom management, and student engagement. Patterns of bivariate correlations from a study of Spilt, Koomen, Thijs, and van der Leij (2012) largely mirror these findings. Their results indicated that the linkage between teachers’ reports of closeness in the relationships with disruptive kindergartners and general TSE was not significant.

Several empirical studies have also spawned some evidence for the *alternative hypothesis* that teachers’ self-efficacy beliefs may affect their perceptions of student–teacher relationships, although the results are a bit mixed (e.g., Chung, Marvin, & Churchill, 2005; Spilt et al., 2011; Yoon, 2002). Specifically, Mashburn, Hamre, Downer, and Pianta (2006) indicated that generally self-efficacious teachers were likely to experience more close, but not less conflictuous relationships with individual, regular preschool students. When explicitly focusing on problematic students, Hamre, Pianta, Downer, and Mashburn (2008) even found that preschool teachers with generally low self-efficacy judgments at the classroom-level tended to experience higher degrees of conflict with individual students than would be expected based

on their judgments of these students' problem behaviors. For this reason, we also aimed to explore an alternative model, in which teachers' sense of self-efficacy in relation to individual students' disruptive behavior may feedback on their perceptions of the student–teacher relationship in confirming or disconfirming ways.

PRESENT STUDY

The present study aims to broaden the purview of primarily cross-sectional research on teachers' general sense of self-efficacy at the classroom-level by testing a theoretical model describing teachers' student–teacher relationship perceptions (i.e., closeness and conflict) as the processes through which individual students' disruptive behavior may contribute to teachers' subsequent student-specific self-efficacy beliefs across domains of teaching and learning (i.e., instructional strategies, behavior management, student engagement, and emotional support).

Guided by our interpersonal social-cognitive model, we first examined whether teachers' perceived levels of closeness and conflict in the student–teacher relationship mediates the longitudinal association between individual students' disruptive behavior and student-specific TSE in various domains of teaching and learning (see Figure 1a). Based on the idea that disruptive behavior is more likely to be perceived as a threat to TSE when teachers have internalized negative feelings about the student–teacher relationship, we expected teacher-perceived conflict to mediate the negative association between disruptive student behavior and student-specific TSE. In addition, due to mixed results in previous studies, we did not have clear expectations about the mediating role of closeness in the association between disruptive student behavior and student-specific TSE.

As an additional test of validity for the hypothesized model, we secondly tested an alternative model in which student-specific TSE mediates the association between disruptive behavior and teachers' perceptions of closeness and conflict in the student–teacher relationship (see Figure 1b). Support for these alternative models would consist of evidence indicating that individual students' disruptive behavior leads to changes in teachers' sense of self-efficacy in relation to individual students across teaching domains, which, in turn, leads to changes in their perceptions of conflict and closeness.

METHOD

PARTICIPANTS

The present study contained Dutch elementary school teachers and third- to sixth-grade students who participated in a short-term, two-wave longitudinal study on teachers' dealings with diversity. Sample selection proceeded in three phases. First, 350 randomly selected schools across the Netherlands were contacted by telephone and e-mail, after obtaining ethical approval from the Ethics Review Board of the Faculty of Social and Behavioral Sciences, University of Amsterdam (project no. 2013-CDE-3188). Of these schools, 24 were inclined to participate in the study. Second, all upper elementary teachers from participating schools received a letter about the study's purposes and an informed consent form, which was ultimately signed by 70 teachers. Information letters describing the nature and purposes of the research project were also sent to students' homes. After parental consent was obtained, we randomly selected four boys and four girls from participating teachers' classrooms in the last phase, resulting in an initial sample of 550 students.

Within the dataset, however, data were both missing cross-sectionally and longitudinally due to teacher and student non-response, long-term absence or sickness during data collection, or students moving to another school. Of all teachers assessed, 4.4% had missing data during the first wave, and 10.6% during the second wave. Whereas cases with incomplete data for the main study variables at both waves were excluded, we decided to retain participants with incomplete data at only one time point. These missing data were treated using full information maximum likelihood estimation. This resulted in a final sample of 69 teachers in relation to 524 students.

Participating teachers were predominantly female (72.6%), having a mean age of 41.42 years ($SD = 12.34$, range = 23 – 63 years). Most teachers could be considered veteran teachers, with an average professional teaching experience of 16.67 years ($SD = 11.87$, range = 1.5 – 44 years). The average tenure in teachers' current job ranged from only half a year to 36 years ($M = 10.64$, $SD = 9.09$). For four teachers, demographic data were not available.

At the time of data collection, students attended third ($n = 53$), fourth ($n = 157$), fifth ($n = 165$), and sixth grade ($n = 149$), respectively. Children ranged from 7.71 to 13.04 years of age ($M = 10.57$, $SD = 1.11$) and the gender composition was evenly distributed with 262 boys

(50.0%) and 262 girls (50.0%). Based on their parents' working status and educational level, the vast majority of students were considered to have an average to high socioeconomic status: both parents were employed in 76.8% of the families, 20.4% had at least one employed parent, and 2.5% of the families included two unemployed parents. Additionally, teachers indicated the majority of the parents to have finished senior vocational education (49.0%) or higher education (46.2%), leaving less than 5% of the parents to have finished only primary education.

INSTRUMENTS

TEACHERS' PERCEPTIONS OF THE STUDENT–TEACHER RELATIONSHIP

Teachers' perceptions of the quality of their relationships with individual students were measured using a short form of the authorized translated Dutch version of the Student–Teacher Relationship Scale (STRS; Koomen, Verschueren, van Schooten, Jak, & Pianta, 2012; Koomen, Verschueren, & Pianta, 2007; Pianta, 2001). Similar to the original STRS, the short form estimates specific, teacher-perceived student–teacher relationship patterns of Closeness, Conflict, and Dependency, using a 5-point Likert-type scale (1 = *definitely does not apply*; 5 = *definitely applies*). In the present study, we made use of the Closeness and Conflict dimensions of the STRS. The Closeness dimension (5 items) evaluates the extent to which teachers perceive the student–teacher relationship to be warm, open, and secure, with items such as “I share an affectionate and warm relationship with this child”. The Conflict dimension (5 items) generally concentrates on negative aspects of the student–teacher relationship, including tension, anger, and mistrust in the relationship. An example item is “This child and I always seem to be struggling”. In a previous study, the psychometric properties of the short form of the STRS have been demonstrated to be adequate (Zee, Koomen, & van der Veen, 2013). In the present investigation, alpha coefficients at the first and second wave of measurement were satisfactory, .85 and .86 for Closeness, and .89 and .88 for Conflict, respectively.

DISRUPTIVE STUDENT BEHAVIOR

Teachers completed the Dutch version of the Strengths and Difficulties Questionnaire (SDQ; van Widenfelt, Goedhart, Treffers, & Goodman, 2003) to judge selected students' disruptive behaviors in the classroom. This behavioral screening questionnaire originally yields positive and negative student attributes that together represent five factors reflecting strengths (Prosocial Behavior) and difficulties (Emotional Symptoms, Conduct Problems, Hyperactivity-Inattention, and Peer Problems). For purposes of the present study, however, we only used the

broader Externalizing Behavior domain proposed by Goodman, Lamping, and Ploubidis (2010), which combines the Conduct Problems (5 items) and Hyperactivity-Inattention (5 items) subscales. This more comprehensive domain has been shown to have more adequate psychometric properties than the original SDQ factors in low-risk samples (Dickey & Blumberg, 2004; Goodman et al., 2010; van Leeuwen, Meerschaert, Bosmans, de Medts, & Braet, 2006). Teachers responded on the SDQ-items on a 5-point Likert scale, ranging from 1 (*not true*) to 5 (*certainly true*). Example items are “Restless, hyperactive, cannot sit still for long” and “Often has temper tantrums or hot tempers”. The internal consistency of the Externalizing Subscale of the SDQ was satisfactory, $\alpha = .87$. Moreover, several researchers (Goodman et al., 2010; van Leeuwen et al., 2006) have provided sufficient evidence for the construct validity of the scale.

DOMAIN- AND STUDENT-SPECIFIC TEACHER SELF-EFFICACY

Teachers rated their self-efficacy beliefs toward each of the selected students using the Student-Specific Teacher Self-Efficacy Scale (Zee & Koomen, 2015; Zee et al., 2016). This 24-item self-report instrument, adapted from Tschannen-Moran and Woolfolk Hoy's (2001) original measure, has been shown to represent teachers' capability beliefs in relation to individual students across four comprehensive domains of teaching and learning, including Instructional Strategies (IS), Student Engagement (SE), Behavior Management (BM), and Emotional Support (ES). Of these domains, the former two mainly focus on aspects of instructional delivery. The IS subscale (6 items) captures the extent to which teachers feel capable of using various instructional methods that enable and enhance individual students' learning, including items such as “How well can you respond to difficult questions from this student?”. The SE domain (6 items), in addition, reflects items that tap into teachers' perceived ability to activate the interest of a particular student in his or her schoolwork. A sample item of this domain is “How much can you do to get this student to believe he/she can do well in schoolwork?”. Next to these instruction-oriented subscales, the BM domain (5 items) encompasses teachers' judgments of their ability to organize and guide the behaviors of a particular student, with items such as “How much can you do to get this child to follow classroom rules?”. Lastly, inspired by the CLASS-framework (for an overview, see Hamre et al., 2013 and Pianta, La Paro, & Hamre, 2008), the domain of ES (7 items) is related to how well teachers can establish caring relationships with students, acknowledge students' opinions and feelings, and create settings in which students feel free to explore and learn (e.g., “How well can you establish a safe and secure environment for this student?”).

All items were rated by teachers on a seven-point Likert-type scale, ranging from 1 (*nothing*) to 7 (*a great deal*). Support for the construct validity of the student-specific TSES has been provided by Zee and colleagues (Zee et al., 2016; Zee & Koomen, 2015). Internal consistency scores of the student-specific TSES domains across waves were .89 and .92 for IS, .94 and .94 for BM, .90 and .92 for SE, and .85 and .86 for ES, respectively.

PROCEDURE

Data were collected from teachers in two waves (January-March and May-July) with a three-month time interval. During each wave, teachers completed a two-part survey on demographic background factors, the quality of the student–teacher relationship, and their sense of student-specific self-efficacy for the eight selected students from their classroom. Teachers were asked to fill out the first, written part of the survey during two planned school visits. This part contained items regarding teachers’ perceived quality of their relationships with the eight selected students and students’ and teachers’ background characteristics, which served as covariates in this study. Directly after the school visits, teachers received an e-mail invitation with a personal link to the second part of the survey that contained, among others, items regarding disruptive student behavior and the student-specific self-efficacy questionnaire about the eight selected students. Teachers were requested to return this digital survey within two weeks after the invitation was sent. To improve the participation rate, regular reminders were sent to non-responding teachers.

Once all surveys were collated, the cover sheet of the written part of the survey (containing the name of the participants) was discarded and all completed surveys were assigned a unique identification number that could be used to identify responses for matching T1 and T2 data in longitudinal analyses. This unique identifier was also used to assure anonymity and confidentiality for all participants.

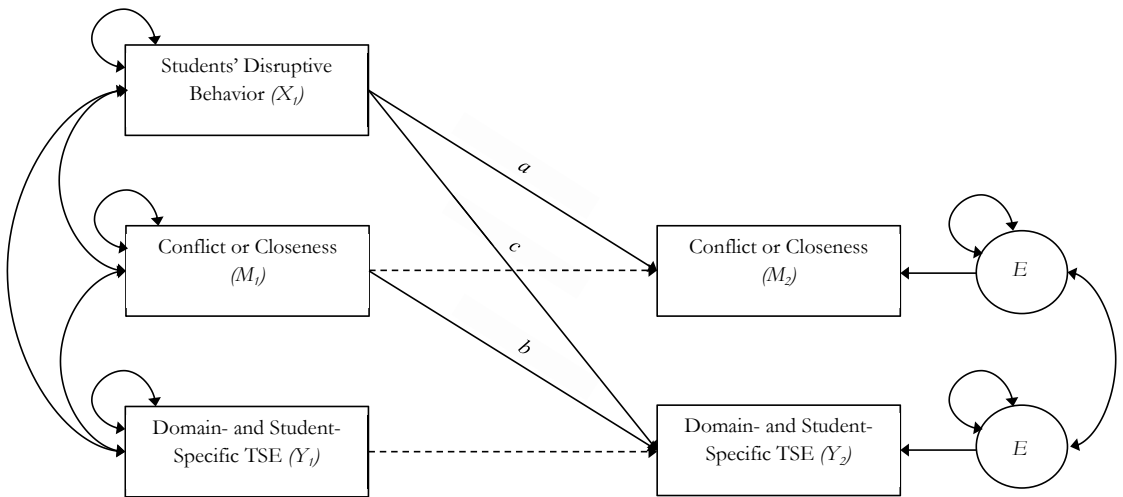
DATA ANALYSIS

Given that mediation, by its very definition, infers change over time, we specified a series of two-wave longitudinal mediation models (see Figure 2) in *Mplus* 7.11, adjusting for the nested nature of the data (Muthén & Muthén, 1998-2012). Although models with at least three time-points would essentially be required to establish a true indirect pathway across time, two-wave models have previously been recognized as a relatively valid method to test for mediation (Cole

& Maxwell, 2003; Little, 2013). Specifically, similar to full-longitudinal models with three waves, two-wave mediation models rely on the assumptions that the causal parameters are constant over time (i.e., *stationarity*), and that the relationships among the predictors (X), mediators (M), and outcome variables (Y) are unchanging in terms of their variances and covariances (i.e., *equilibrium*; Cole & Maxwell, 2003; Little, 2013). Under these two assumptions, the hypothesized associations between the mediators at Wave 1 and outcome variables at Wave 2 (mediation parameters a and b , and the direct effect c in Figure 2) can be expected to be equal to the same associations measured at later time-points, and estimates of the effects of X on Y through M in the two-wave model can be expected to be the same as in the three-wave model. Additionally, two-wave models allow the modeling of prior levels of M and Y to isolate the amount of change variance in these variables (Little, 2013). As such, these models can generally be considered as superior to cross-sectional research on mediation, in which this change information is not an explicit part of the design (ibid.).

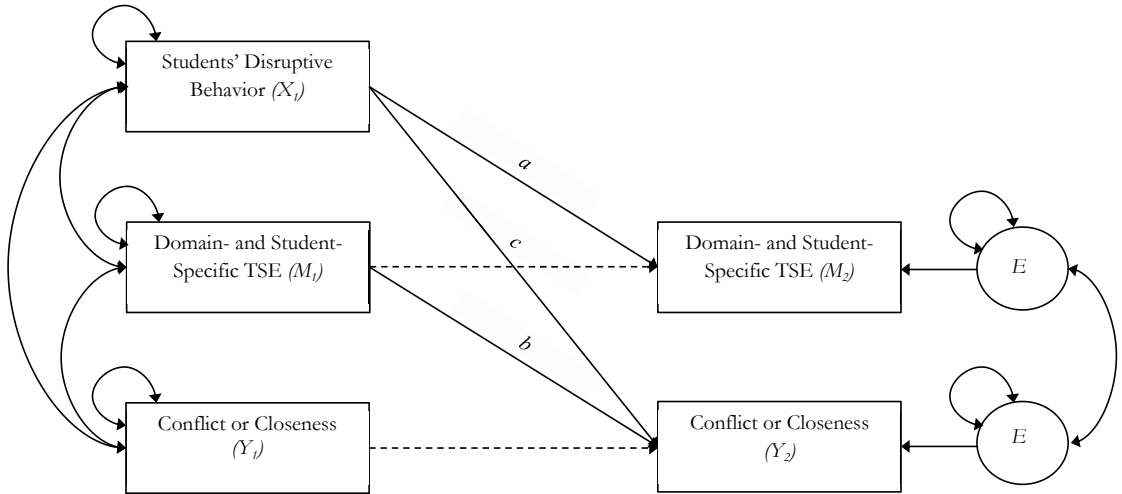
FIGURE 2A

The Hypothesized Longitudinal Mediation Model



Note. X_1 = Predictor at Wave 1; M_1, M_2 = Mediators at Waves 1 and 2; Y_1, Y_2 = Outcome variables at Wave 1 and 2. Coefficients a and b reflect associations between predictor and mediators, and mediators and outcome measures, respectively. The product ab reflects the indirect effect of individual students' disruptive behavior on domains of student-specific self-efficacy, through teachers' perceptions of conflict and closeness. Coefficient c reflects the direct association between predictor (students' disruptive behavior) and outcome variables (domains of student-specific self-efficacy). Dashed lines represent autoregressive paths.

FIGURE 2B

The Alternative Longitudinal Mediation Model

Note. X_1 = Predictor at Wave 1; M_1, M_2 = Mediators at Waves 1 and 2; Y_1, Y_2 = Outcome variables at Wave 1 and 2. Coefficients a and b reflect associations between predictor and mediators, and mediators and outcome measures, respectively. The product ab reflects the indirect effect of individual students' disruptive behavior on teachers' perceptions of conflict and closeness, through domains of student-specific self-efficacy. Coefficient c reflects the direct association between predictor (students' disruptive behavior) and outcome variables (teacher-perceived conflict and closeness). Dashed lines represent autoregressive paths.

MODELING PROCEDURE

To ensure adequate statistical power, separate two-wave longitudinal mediation models were fitted for each of the relationship dimensions (i.e., closeness and conflict) in relation to each of the domains of student-specific TSE (i.e., instructional strategies, behavior management, student engagement, and emotional support), resulting in eight different models. Based on Cole and Maxwell's (2003) recommendations, all eight models were specified in three steps (see Figure 2). First, we estimated path a in the regression of M_2 (student-teacher conflict or closeness at Wave 2) onto X_1 (individual students' disruptive behavior at Wave 1), controlling for the effects of M_1 and path b in the regression of Y_2 (student-specific TSE domain at Wave 2), after taking prior levels of Y_1 into account (Cole & Maxwell, 2003; Little, 2013). The product of paths a and b then offered an estimate of the mediation effect of X on Y via M . This first model pertained to the hypothesized full-mediation model depicted in Figure 1a.

Second, we performed follow-up tests to explore the possible existence of direct effects of individual students' disruptive behavior on domains of student-specific TSE over time. To this end, we estimated path ϵ in the regression of Y_2 onto X_i . The statistical significance of this direct path would indicate that teachers' perceptions of closeness and conflict in the student-teacher relationship only partially mediate the longitudinal association between disruptive student behavior and domains of student-specific TSE. Third, as an additional test of validity for the hypothesized model, we tested the alternative proposition that student-specific TSE has a mediational effect on the association between disruptive student behavior and teachers' student-teacher relationship perceptions (see Figure 1b).

After estimating all models, we employed the Monte Carlo simulation approach developed by MacKinnon, Lockwood, and Williams (2004; see also Preacher & Selig, 2012) to formally test the statistical significance of the mediation effects. This method involves directly spawning sample statistics based on the joint asymptotic distribution of the component statistics to obtain multiple estimates of the mediating pathway (Little, 2013). As such, the Monte Carlo method largely resembles other recommended approaches for testing the significance of the indirect effects, including bootstrap estimation (Preacher & Hayes, 2008). In line with our hypotheses, we reported 90% confidence intervals for all Conflict models, and 95% confidence intervals for the Closeness models, based on 5000 simulated draws for the indirect effects. If the confidence interval around the point estimate of the indirect effect covers zero, this effect is considered to be non-significant.

MODEL GOODNESS-OF-FIT

Overall fit of each of the specified models was gauged by using a number of absolute and relative fit indices. Absolute fit was evaluated with the (mean-adjusted) model χ^2 . Generally, non-significant χ^2 tests are considered indicative of good model fit, implying that the reproduced variance-covariance matrices are statistically equal to the observed matrices (Kline, 2011; Little, 2013). However, as even trivial discrepancies between the expected and the observed model may lead to the model's rejection (Chen, 2007), other fit indices were consulted as well. Among those were the root mean square error of approximation (RMSEA), the standardized root mean square residual (SRMR), and the comparative fit index (CFI). The RMSEA and SRMR are absolute fit indices of the degree of misfit in the model, with values $\leq .05$ reflecting a close fit, and $\leq .08$ a satisfactory fit (Browne & Cudeck, 1993; Hu & Bentler, 1999; Kline, 2011). The CFI essentially reflects the ratio of misfit of the specified model, with

values $\geq .95$ indicating close fit, and values $\geq .90$ indicating acceptable fit (Bentler, 1992; Little, 2013). Based on these model fit criteria, modification indices, and theoretical considerations, the most parsimonious and best fitting models were chosen as final models.

RESULTS

DATA SCREENING AND DESCRIPTIVE STATISTICS

Prior to main analysis, all variables used in this study were examined for conformity to multivariate regression assumptions. Means, standard deviations, and bivariate correlations (see Table 1) were inspected to determine whether the main constructs correlated in the expected directions. The correlation coefficients supported a priori expectations. Specifically, both teachers' Student-Specific Self-Efficacy percepts and Student-Teacher Relationship judgments appeared to be relatively stable over time, with correlations between time-adjacent variables ranging from .65 (Student-Specific TSE for IS) to .81 (Conflict). Individual students' Disruptive Behavior was negatively associated with Closeness, and positively associated with Conflict, both concurrently and predictively. Moreover, statistically significant negative correlations were documented between students' Disruptive Behavior and all domains of Student-Specific TSE, and the domain of BM in particular.

Associations among Closeness and Conflict and Student-Specific TSE were also in the expected direction. Whereas Closeness was associated with stronger Self-Efficacy toward individual students in all teaching domains, Conflict was found to be negatively correlated with these capability beliefs. Notably, the highest correlations were noted between Student-Specific TSE for Behavior Management and Conflict. Lastly, the correlations among domains of Student-Specific TSE were all moderate to high, suggesting potential multicollinearity among dimensions of teachers' Student-Specific Self-Efficacy. To circumvent issues related to multicollinearity, we estimated separate models for each of the Student-Specific TSE domains.

Students' Age and Gender, and teachers' years of Teaching Experience and Gender served as the study's covariates. Correlations showed that teachers were likely to report higher levels of Closeness and Student-Specific TSE domains in relation to girls and younger students, and higher levels of Conflict and Disruptive Behavior in relation to boys. Teaching Experience, lastly, was positively associated both with teacher-perceived Closeness, and teachers' sense of Student-Specific TSE, irrespective of teaching domain.

TABLE 1

Descriptive Statistics and Correlations

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.
<i>Student Behavior</i>																	
1. Disruptive Behavior	1.00																
<i>Student-Teacher Relationship</i>																	
2. Closeness T1	-.25**	1.00															
3. Conflict T1	.69**	-.38**	1.00														
4. Closeness T2	-.23**	.70**	-.35**	1.00													
5. Conflict T2	.64**	-.25**	.81**	-.36**	1.00												
<i>Student-Specific TSE</i>																	
6. TSE for IS T1	-.46**	.31**	-.41**	.34**	-.35**	1.00											
7. TSE for BM T1	-.74**	.32**	-.73**	.33**	-.66**	.50**	1.00										
8. TSE for SE T1	-.57**	.34**	-.48**	.36**	-.42**	.87**	.56**	1.00									
9. TSE for ES T1	-.55**	.46**	-.51**	.48**	-.47**	.80**	.66**	.81**	1.00								
10. TSE for IS T2	-.39**	.27**	-.33**	.38**	-.32**	.65**	.34**	.65**	.57**	1.00							
11. TSE for BM T2	-.60**	.22**	-.58**	.28**	-.59**	.37**	.66**	.42**	.50**	.52**	1.00						
12. TSE for SE T2	-.49**	.27**	-.39**	.35**	-.39**	.62**	.40**	.70**	.59**	.90**	.60**	1.00					
13. TSE for ES T2	-.46**	.38**	-.39**	.48**	-.40**	.56**	.47**	.59**	.66**	.82**	.69**	.83**	1.00				
<i>Covariates</i>																	
14. Teacher Gender	-.08	.08	-.04	.13**	-.09*	-.04	.00	-.04	.01	.02	.06	-.00	.042	1.00			
15. Teaching Experience	-.04	.09*	-.05	.13**	-.02	.15**	.11*	.18**	.17**	.10	.14**	.13**	.13**	-.28**	1.00		
16. Student Gender	-.26**	.30**	-.17**	.30**	-.19**	.15**	.27**	.16**	.26**	.11*	.22**	.13**	.20**	.03	-.02	1.00	
17. Student Age	-.03	-.15**	.02	-.14**	.05	-.18**	-.05	-.15**	-.17**	-.13**	-.02	-.13**	-.11*	-.28**	.05	-.07	1.00
<i>Descriptive Statistics</i>																	
Mean	1.96	3.91	1.55	4.00	1.58	5.53	6.14	5.57	5.81	5.56	6.16	5.56	5.85	-	16.67	-	10.57
Standard Deviation	0.82	0.81	0.88	0.78	0.87	0.91	0.99	1.00	0.78	0.94	0.95	1.00	0.79	-	11.87	-	1.11

Note. * $p < .05$; ** $p < .01$. Gender: 0 = boys/male teachers, 1 = girls/female teachers. TSE = Teachers' student-specific self-efficacy; IS = Instructional strategies; BM = Behavior management; SE = Student engagement; ES = Emotional support.

LONGITUDINAL MEDIATION MODELS

Model fit indices and parameter estimates of the Hypothesized and/or Alternative Mediation Models per domain of Student-Specific TSE and dimension of the Student–Teacher Relationship are provided in the following sections. In all models, teachers’ Gender and Teaching Experience, and students’ Gender and Age were entered first into the regression equation to accurately gauge the unique effect of the model’s predictors and mediators on the outcome variables. Notably, though, none of these covariates appeared to be statistically significant, nor did these variables alter the direction and magnitude of the coefficients in our models. For reasons of parsimony, all models were therefore reported without covariates.

*INDIRECT EFFECTS OF DISRUPTIVE BEHAVIOR ON STUDENT-SPECIFIC TSE THROUGH CONFLICT**Student-specific TSE for instructional strategies*

The Hypothesized Mediation Model showed quite sound goodness of fit, $\chi^2(2) = 3.34, p = .19$, RMSEA = .036 (90% CI [.000–.101]), CFI = .996, SRMR = .014. Freely estimating the direct path from Disruptive Student Behavior to Student-Specific TSE for IS in the second step could not further improve this already well-fitting model. Moreover, the Alternative Model, placing Student-Specific TSE for IS in a mediational role between Disruptive Student Behavior and teachers’ perceptions of Conflict, appeared to reflect a poorer fit of the data than the Hypothesized Mediation Model, $\chi^2(2) = 20.62, p < .001$, RMSEA = .133 (90% CI [.085–.188]), CFI = .941, SRMR = .021. Accordingly, we retained the Hypothesized Full-Mediation Model.

Table 2 presents the standardized path estimates for the final model. After accounting for prior levels of teacher-perceived Conflict, individual students’ Disruptive Behavior predicted more subsequent Conflict ($\beta = .18, p < .001$). Perceptions of Conflict, in turn, predicted lower levels of Student-Specific TSE for IS over time ($\beta = -.11, p < .05$). The estimate of the indirect effect of individual students’ Disruptive Behavior on their teachers’ Student-Specific TSE in the domain of IS was $-.025$ (Monte Carlo 90% CI [–.045 –.004]), suggesting a statistically significant mediation effect.

TABLE 2

Final Longitudinal Models with Mediating Effects Among Disruptive Student Behavior, Conflict, and Student-Specific Self-Efficacy

	Model 1		Model 2		Model 3		Model 4	
	Student-Specific TSE for IS		Student-Specific TSE for BM		Student-Specific TSE for SE		Student-Specific TSE for ES	
	Conflict	T2	Conflict	T2	Conflict	T2	Conflict	T2
<i>Direct Effects</i>								
Disruptive Student Behavior T1	.18*	—	.12*	-.25*	.18**	—	.18**	—
Conflict T1	.69**	-.11*	.61**	—	.70**	-.10*	.70**	-.11*
Student-Specific TSE for IS T1	—	.61**	—	—	—	—	—	—
Student-Specific TSE for BM T1	—	—	-.16**	.49**	—	—	—	—
Student-Specific TSE for SE T1	—	—	—	—	—	.67**	—	—
Student-Specific TSE for ES T1	—	—	—	—	—	—	—	.61**
<i>Indirect Effects</i>								
Through Conflict	—	-.03*	—	—	—	-.02*	—	.02*
Through TSE for BM	—	—	.04*	—	—	—	—	—
<i>R-statistics</i>	.68**	.44**	.69**	.48**	.68**	.52**	.69**	.47**

Note. * $p < .05$, ** $p < .01$. Standardized regression coefficients (β) are reported. Point estimates of the indirect effects are unstandardized.

Student-specific TSE for behavior management

The Hypothesized Mediation Model for Conflict did not reach a satisfactory fit to the data, $\chi^2(2) = 11.50, p < .01, RMSEA = .095$ (90% CI [.047–.152]), CFI = .959, SRMR = .026. Although slight improvement in model fit was achieved by adding a direct path from students' Disruptive Behavior to Student-Specific TSE for BM, follow-up analyses indicated that the Alternative Model with Student-Specific TSE for BM as the mediator produced better parameter estimates and yielded a slightly better fit than the Hypothesized Model, $\chi^2(2) = 8.70, p < .01, RMSEA = .080$ (90% CI [.031–.138]), CFI = .971, SRMR = .024. Modification indices suggested some further improvement by adding the direct path from Disruptive Student Behavior to Conflict. This resulted in a well-fitting final model, $\chi^2(1) = 3.05, p = .08, RMSEA = .063$ (90% CI [.000–.148]), CFI = .991, SRMR = .019.

Table 2 displays the standardized coefficients for the final Alternative Partial-Mediation Model. Teachers were found to experience lower TSE for BM ($\beta = -.25, p < .01$) and more Conflict ($\beta = .12, p < .05$) in relation to individual students with Disruptive Behavior, when controlling for initial levels of Student-Specific TSE. In addition, teachers' Student-Specific capability beliefs for BM predicted less subsequent Conflict in the student–teacher relationship ($\beta = -.16, p < .01$). The Monte Carlo confidence limits suggested that the indirect effect of Disruptive Student Behavior on Conflict through Student-Specific TSE for BM is statistically significant, (point estimate = .044, Monte Carlo 90% CI [.012–.076]). Hence, contrary to expectations, Student-Specific TSE for BM partially mediated the association between Disruptive Student Behavior and teachers' perceptions of Conflict in the relationship.

Student-specific TSE for student engagement

The model fit of the Hypothesized Mediation Model was satisfactory, $\chi^2(2) = 4.14, p = .13, RMSEA = .045$ (90% CI [.000–.108]), CFI = .994, SRMR = .014. In the second step, we added the direct path between individual students' Disruptive Behavior and Student-Specific TSE for SE. This path did not reach the significance threshold and could not further improve the fit of this model. Moreover, the Alternative Model clearly reflected an inferior summary of the data, $\chi^2(2) = 16.89, p < .001, RMSEA = .119$ (90% CI [.071–.175]), CFI = .955, SRMR = .019. For this reason, the Hypothesized Full-Mediation Model was chosen as the most parsimonious and best fitting model.

The standardized coefficients for the final model for Student-Specific TSE for SE are depicted in Table 2. Assessment of path coefficients pointed to a small, though statistically significant association between individual students' Disruptive Behavior and teachers' succeeding perceptions of Conflict in the relationship ($\beta = .18, p < .001$), after initial levels of Conflict were taken into account. In turn, teachers who perceived the relationship with the child to be marked by Conflict were likely to feel less efficacious in relation to the child in the domain of SE ($\beta = -.10, p < .05$). Using the Monte Carlo simulation approach, the estimate of the indirect effect was $-.023$ (Monte Carlo 90% CI $[-.044 - -.003]$). As the confidence interval did not cover zero, the indirect effect of Disruptive Student Behavior on Student-Specific TSE for SE through Conflict can be assumed to be statistically significant.

Student-specific TSE for emotional support

Fit indices suggested that the Hypothesized Mediation Model fitted the sample reasonably well, $\chi^2(2) = 8.27, p < .05$, RMSEA = .077 (90% CI $[.028-.135]$), CFI = .980, SRMR = .023. Examination of the modification indices, as well as the parameters estimates and their standard errors, indicated that no further estimates would improve the model's fit. Hence, the Hypothesized Full-Mediation Model appeared to be a reasonable approximation of the data, and fitted slightly better than the Alternative Model, $\chi^2(2) = 12.43, p < .01$, RMSEA = .100 (90% CI $[.052-.156]$), CFI = .967, SRMR = .018.

The final model (see Table 2) generally reflected the hypothesized indirect effects of students' Disruptive Behavior on the Student-Specific TSE for ES, through Conflict. Specifically, Disruptive Student Behavior led to significant changes in teachers-perceived Conflict ($\beta = .18, p < .001$), after controlling for preceding levels of Conflict. Additionally, teachers' perceptions of Conflict resulted in lower levels of Student-Specific TSE for ES ($\beta = -.11, p < .05$). The point estimate of the indirect effect (.021, Monte Carlo 90% CI $[.002-.041]$) deviated significantly from zero, suggesting that Conflict mediates the association between Disruptive Student Behavior and Student-Specific TSE for ES.

INDIRECT EFFECTS OF DISRUPTIVE BEHAVIOR ON STUDENT-SPECIFIC TSE THROUGH CLOSENESS

Student-specific TSE for instructional strategies

Contrary to the Conflict Model, the Hypothesized Model that placed Closeness in a mediating role between Disruptive Student Behavior and Student-Specific TSE for IS had a poor fit to

the data, $\chi^2(2) = 19.80, p < .001$, RMSEA = .130 (90% CI [.082–.185]), CFI = .942, SRMR = .052. To identify possible sources of misfit, we examined the model's modification indices, parameter estimates, and standard errors. These provided clear evidence in favor of the Alternative Model, specifying an indirect effect of Disruptive Student Behavior on Closeness through Student-Specific TSE for IS. This Alternative Model indeed approximated the data well, $\chi^2(2) = 3.91, p < .001$, RMSEA = .043 (90% CI [.000–.106]), CFI = .994, SRMR = .021, and could not be further improved by adding a direct path between Disruptive Student Behavior and Closeness.

As displayed in Table 3, students' Disruptive Behavior, while controlling for initial levels of Student-Specific TSE for IS, was significantly related to subsequently lower levels of these capability beliefs ($\beta = -.13, p < .05$). In turn, teachers' Student-Specific Self-Efficacy beliefs for IS predicted higher levels of Closeness ($\beta = .19, p < .001$), after accounting for the stability in these positive relationship perceptions. Using the Monte Carlo simulation approach, the estimate of the mediating pathway proved to be statistically significant, $-.024$ (Monte Carlo 95% CI $[-.047 - -.000]$).

Student-specific TSE for behavior management

The Hypothesized Mediation Model reflected a far poorer fit to the data ($\chi^2(2) = 19.04, p < .001$, RMSEA = .127 (90% CI [.079–.183]), CFI = .931, SRMR = .037) than the Alternative Mediation Model ($\chi^2(2) = 0.64, p = .72$, RMSEA = .000 (90% CI [.000–.062]), CFI = 1.00, SRMR = .010). Moreover, follow-up tests provided no evidence for the existence of direct effects of students' Disruptive Behavior on teachers' perceptions of Closeness in the Student–Teacher Relationship. Therefore, the Alternative Model was chosen as the final model.

The standardized path estimates for this model are presented in Table 3. Even after controlling for cross-wave stability, the negative association between Disruptive Student Behavior and teachers' subsequent levels of Student-Specific Self-Efficacy for BM was statistically significant ($\beta = -.25, p < .001$). In turn, Student-Specific TSE for BM predicted higher levels of teacher-perceived Closeness in the relationship ($\beta = .16, p < .001$). The indirect effect of Disruptive Student Behavior on Closeness via Student-Specific TSE was also statistically significant, point estimate = $-.040$, Monte Carlo 95% CI $[-.067 - -.013]$.

TABLE 3

Final Longitudinal Models with Mediating Effects Among Disruptive Student Behavior, Closeness, and Student-Specific Self-Efficacy

	Model 1		Model 2		Model 3		Model 4	
	Student-Specific T2	TSE for IS T2	Closeness T2	Student-Specific TSE for BM T2	Closeness T2	Student-Specific TSE for SE T2	Closeness T2	Student-Specific TSE for ES T2
<i>Direct Effects</i>								
Disruptive Student Behavior T1	-	-.13*	-	-.25**	-	-.14*	-	-.15**
Closeness T1	.65**	-	.65**	-	.64**	-	.58**	-
Student-Specific TSE for IS T1	.19**	.60**	-	-	-	-	-	-
Student-Specific TSE for BM T1	-	-	.16**	.49**	-	-	-	-
Student-Specific TSE for SE T1	-	-	-	-	.18**	.64**	-	-
Student-Specific TSE for ES T1	-	-	-	-	-	-	.26**	.59**
<i>Indirect Effects</i>								
Through TSE for IS	-.02*	-	-	-	-	-	-	-
Through TSE for BM	-	-	-.04*	-	-	-	-	-
Through TSE for SE	-	-	-	-	-.03*	-	-	-
Through TSE for ES	-	-	-	-	-	-	-.04*	-
<i>R² statistics</i>	.52**	.45**	.52**	.48**	.52**	.53**	.54**	.47**

Note. * $p < .05$; ** $p < .01$. Standardized regression coefficients (β) are reported. Point estimates of the indirect effects are unstandardized.

Student-specific TSE for student engagement

The fit of the Hypothesized Mediation Model for Student-Specific TSE for ES was poor, $\chi^2(2) = 18.44, p < .05$, RMSEA = .125 (90% CI [.077–.180]), CFI = .950, SRMR = .043. Inspection of parameter estimates and modification indices suggested that Student-Specific TSE for SE, rather than teachers' perceptions of Closeness, is more likely to serve as a mediator. This assumption was indeed substantiated by the Alternative Model's fit criteria, $\chi^2(2) = 0.66, p = .72$, RMSEA = .000 (90% CI [.000–.062]), CFI = 1.00, SRMR = .009. Because the direct path in the regression of teacher-perceived Closeness at Wave 2 onto Disruptive Student Behavior at Wave 1 was not statistically significant, we retained the Alternative Full-Mediation Model as the final model.

Table 3 presents the standardized path estimates for the Alternative Model testing the indirect effect of Disruptive Student Behavior on teacher-perceived Closeness via Student-Specific TSE for SE. Inspection of these estimates suggest that, after accounting for the stability in Student-Specific TSE for SE, teachers are likely to experience lower subsequent levels of self-efficacy for SE in relation to individual students who display Disruptive Behavior ($\beta = -.14, p < .05$). In turn, Student-Specific TSE for SE appeared to be a statistically significant positive predictor of teachers' perceived levels of Closeness over time ($\beta = .18, p < .001$). The product of these two pathways was also significant, $-.026$ (Monte Carlo 95% CI $[-.050 - -.001]$), thereby providing support for the indirect effect of Disruptive Student Behavior on Closeness through Student-Specific TSE for SE.

Student-specific TSE for emotional support

The Hypothesized Mediation Model appeared to be a far worse representation of the data ($\chi^2(2) = 35.89, p < .001$, RMSEA = .180 (90% CI [.131–.234]), CFI = .901, SRMR = .070) than the Alternative Mediation Model ($\chi^2(2) = 4.33, p = .11$, RMSEA = .047 (90% CI [.000 –.109]), CFI = .993, SRMR = .024). Moreover, the direct path from Disruptive Student behavior to teachers' perceptions of Closeness in the relationship did not significantly add to prediction and consequently deteriorated the model's initial fit. Therefore, the Alternative Full-Mediation Model was chosen as the final model (see Table 3).

After accounting for initial levels of Student-Specific TSE for ES, teachers' reported lower subsequent levels of self-efficacy for Emotional Support in relation to children with Disruptive Behavior ($\beta = -.15, p < .01$). Also, teachers' sense of Student-Specific Self-Efficacy for ES,

when controlling for initial levels of Closeness, was significantly and positively associated with their subsequent experiences of relational Closeness ($\beta = .26, p < .001$). Using the Monte Carlo simulation approach, the coefficient of the indirect effect is estimated as $-.039$ (Monte Carlo 95% CI $[-.073 - -.006]$). Hence, these results suggest that Student-Specific TSE for ES significantly mediates the association between Disruptive Student Behavior and teachers' perceptions of Closeness in the student–teacher relationship.

DISCUSSION

Following Bandura's (1986, 1997) social-cognitive principles, we aimed to explore a model within which teachers' perceptions of closeness and conflict in the student–teacher relationship acted as the intermediary mechanisms by which individual students' disruptive behavior may affect teachers' student-specific self-efficacy over time. Our approach departed from previous work on the sources of TSE in three essential ways. First, we adhered to and extended Bandura's original conceptualization of self-efficacy by embedding TSE in an interpersonal social-cognitive framework and measuring this complex construct both at the student- and domain-specific level. Second, rather than focusing on *direct* sources of TSE, we were explicitly interested in specifying mediating processes through which disruptive student behavior, as a source of self-efficacy information, may become instructive to teachers' student-specific capability beliefs. Lastly, given that mediation essentially is a statement of change (Little, 2013), we used a longitudinal design to evaluate hypothesized and alternative models, controlling for prior levels of teachers' perceptions of student–teacher closeness and conflict, and judgments of student-specific TSE.

LINKAGES BETWEEN DISRUPTIVE BEHAVIOR, CONFLICT, AND STUDENT-SPECIFIC TSE

Generally, the results of our study provide a first indication that teachers' perceptions of relational conflict may function as the mediating or explaining mechanism whereby individual students' disruptive behavior leads to changes in student- and domain-specific TSE. To be specific, teachers seemed to experience slightly higher subsequent levels of conflict in relationships with individual students who initially displayed disruptive behavior in class which, in turn, translated into lower levels of self-efficacy toward these students in various teaching domains. These associations held even after taking relatively stable prior levels of student–teacher conflict and student-specific teacher self-efficacy into account. Previous longitudinal studies with younger elementary school children (e.g., Mejía & Hoglund, 2016; Roorda et al.,

2014; Zhang & Sun, 2011) are largely in line with our findings, reporting cross-lagged paths between externalizing student behavior and teachers' perceptions of conflict that were similar in magnitude to the coefficients reported in the present study. However, no empirical studies have yet uncovered that deleterious judgments of the student–teacher relationship quality may also serve as a *go-between*, passing on efficacy-relevant sources of information from individual students to the teacher. By unveiling these complex processes, our study gently corroborates and extends Bandura's (1997) longstanding belief that teachers not only have to manage various sources of self-efficacy during their interactions with students, but also weigh and integrate this information via such common judgmental processes as their representations of relational conflict.

Interestingly, what our models seem to emphasize is that the role of teachers' percepts of conflict may vary across different domains of teaching and learning. More precisely, it appears that the associations between individual students' behavior and the more instructional and affective domains of TSE are primarily mediated by teacher-perceived conflict. Through their perceptions of conflict, teachers may thus come to see the task of teaching, engaging, and emotionally supporting disruptive students as more problematic and may subsequently adjust their self-efficacy toward these students downward. This finding accords well with prior notions that, for most teachers, it is probably a major and time-consuming challenge simply to get disruptive students with whom they entertain conflictuous relationships to learn and pay attention in class (e.g., Arbeau & Coplan, 2007; Sutherland & Oswald, 2005; Yeo et al., 2008). The sequels of such challenges evidently are that teachers, despite their sustained efforts, feel less effective in teaching and motivating disruptive students, thereby stimulating student–teacher interactions marked by even more anger, conflict, and disruptive student behavior over time (e.g., Emmer & Stough, 2001; Pianta, 2001; Spilt et al., 2011; Yeo et al., 2008). This is alarming, given that challenging students, and especially those with conflictuous student–teacher relationships, have repeatedly been shown to be at risk for social and academic adjustment problems (e.g., Hamre & Pianta, 2001; Roorda, Koomen, Spilt, & Oort, 2011).

Markedly, relational conflict did not appear to act as a mediator in the association between disruptive student behavior and student-specific TSE for behavior management. Rather, individual students who displayed disruptive behavior first seemed to hamper teachers' efforts to adequately manage these students' behavior in class which, in turn, resulted in higher levels of conflict in the student–teacher relationship. This relatively unexpected finding corroborates

the idea that teaching tasks related to behavior management may be relatively distinct from other core responsibilities, such as providing the instructional, motivational, and emotional supports that generate gains in learning (cf. Tschannen-Moran & Woolfolk Hoy, 2001). An explanation for this contrasting result that aligns with prior empirical work (e.g., Tsouloupas et al., 2010; Zee et al., 2016) is that student-specific TSE for behavior management may serve as a strong and direct proxy for teachers' inability to deal with disruptive students' behavior. Thereby, these student-specific capability beliefs for behavior management may, more than any other domain of TSE, be more contiguous with students' disruptive behavior than perceptions of conflict. This is a notable outcome, given that students' disruptive behavior, among other child-level correlates, have previously been found to be most predictive of teachers' experiences of relational conflict, and may even promote vicious cycles of disharmonious relationships and escalating problem behaviors (e.g., Doumen et al., 2008; Hamre et al., 2008; Murray & Murray, 2004; Roorda et al., 2014).

Although the sequence of linkages described in the present study are only preliminary in nature and not fully consistent, they generally seem to suggest that teachers' student-specific capability beliefs are inextricably intertwined with their experiences of conflict in relationships with disruptive students. Helping teachers to reflect on their actions and behaviors toward disruptive students, and associated emotions and cognitions during daily interactions with these children, may be a step forward to break negative relationship patterns between teachers and behaviorally at-risk elementary students (e.g., Spilt et al., 2012).

LINKAGES BETWEEN DISRUPTIVE BEHAVIOR, CLOSENESS, AND STUDENT-SPECIFIC TSE

Initial evidence from this study corroborates the alternative premise that the association between individual students' disruptive behavior and teachers' perceptions of closeness in the relationship is mediated, or explained, by student-specific TSE. Counter to the mixed findings in prior cross-sectional and longitudinal work (e.g., Roorda et al., 2014; Thijs et al., 2012), teachers were consistently found to develop less healthy self-efficacy beliefs toward disruptive students in *all* teaching domains, and consequently, to experience less closeness in the dyadic relationship with these students. The theoretical significance of these findings is substantial, given that there is a general shortage of evidence on how features of teachers may impact on the formation of their relationships with individual students (Pianta et al., 2003). Moreover, the observed differences between closeness and conflict in the sequence of associations appear to

underscore that these constructs reflect two distinct qualities of the relationship, as opposed to falling along an underlying continuum.

We can only make a well-educated guess about why closeness and conflict play different roles in the development of teachers' sense of efficacy toward individual disruptive students. For instance, sources of self-efficacy, including students' behaviors and characteristics, can be suggested to significantly vary in the degree of information they provide to teachers (cf. Bandura, 1997). Probably, disruptive student behaviors are stronger and more reliable indicators of student–teacher conflict than closeness, and may thereby contribute less information to teachers' representations of relational closeness and subsequent self-efficacy beliefs. Indeed, prior research (Hamre et al., 2008; Jerome et al., 2009) has indicated that conflict may depend more on stable student attributes (e.g., disruptive behavior), whereas closeness seems to be more proximal to dynamic teacher characteristics (e.g., student-specific TSE). This may explain why teachers' sense of student-specific self-efficacy may better account for the association between disruptive student behavior and closeness in the student–teacher relationship than closeness for the association between those challenging behaviors and student-specific TSE.

One other compelling proposition of Bandura (1997) is that the route to low-quality student–teacher relationships may go through teachers' perceived (social) *inefficacy* to develop affective relationships with students who bring stress to teachers' job. Presumably, when teachers believe they cannot muster whatever it takes to support and deal with a disruptive child, they are apt to slacken their teaching efforts, avoid warm and open communications with the child, and settle for mediocre results or controlling actions (ibid.). This presumption fits reasonably well with our findings that individual disruptive students may particularly hamper teachers' perceptions of relational closeness through their student-specific self-efficacy for emotional support and behavior management. Thus, teachers' lack of self-efficacy may ultimately come at the expense of trust, warmth and affect between teachers and disruptive children.

Overall, the model evaluations in the current study seem to be in line with the social-cognitive and dynamic systems models advanced by Bandura (1997) and Pianta et al. (2003), suggesting that teachers' and students' personal characteristics and behaviors, as well as their daily interactions, may influence one another in a complex, reciprocal way. Future, longitudinal research in which multiple methods and data sources are integrated is needed to spur further

understanding of the complex relationships between disruptive student behavior, student–teacher conflict and closeness, and student- and domain-specific TSE.

LIMITATIONS AND FUTURE DIRECTIONS

The methodology and design of the present investigation brought several limitations that require further attention in future studies. First, analytic techniques such as longitudinal (multilevel) structural equation modeling are also bound by several specific assumptions, including multicollinearity, stationarity, and equilibrium (Cole & Maxwell, 2003; Sobel, 1990). Although we circumvented the issue of multicollinearity by evaluating separate models for the two student–teacher relationship qualities and the four domains of student-specific TSE, we cannot be sure whether the stationarity and equilibrium assumptions held. To be specific, with only two waves of data, it was virtually impossible to test whether the measured variables are invariant over time (i.e., *stationarity*), and whether the relationships among those variables are unchanging in terms of their variances and covariances (i.e., *equilibrium*; Cole & Maxwell, 2003; Little, 2013). Fortunately, however, several authors have argued that violating those two assumptions of mediation testing does not necessarily invalidate evidence of statistically significant mediation effects (ibid.). Nevertheless, future studies that incorporate analyses of stationarity and equilibrium over at least three time intervals could provide a stronger basis from which to discuss the complex, mediating processes proposed in the present study.

Related to this, the lags for the measurement occasions might not have been optimal for detecting changes in teachers' judgments of student-specific self-efficacy and experiences of closeness and conflict. Empirical research from Roorda and colleagues (2014) has indicated, for instance, that students' disruptive behavior and teachers' relationship perceptions mainly affect one another during the first couple of months of the school year, when relationships between teachers and students have yet to be crystalized. Possibly, teachers' relationships with individual students and their student-specific self-efficacy beliefs in the present study were already stabilized at the time of data collection (middle and end of the school year), making it more difficult to detect changes in teacher-perceived closeness and conflict, and student-specific TSE. Therefore, longitudinal data on changes in teachers' perceptions of the student–teacher relationships and student-specific self-efficacy beliefs from the beginning to the end of the school year would probably provide a more fine-grained picture of the processes by which individual students' disruptive behavior may exert pressure to change teachers' self-efficacy beliefs toward these children in different domains of teaching and learning.

Last, this study concentrated only on teachers' perceptions of relational closeness and conflict as mediators of the association between disruptive student behavior and student-specific TSE. It is likely, however, that the mediation processes presented in the current study may be far more complex, and that other cognitive or motivational factors or processes are responsible for changes in teachers' sense of self-efficacy in relation to particular students with disruptive behavior. Examples of such factors may be teachers' beliefs about student control, their motivation to engage in high-quality interactions with the child, their (perceived) skill level, and their classroom goal orientations (cf. Bandura, 1997; Cho & Shim, 2013; Deemer, 2004; Pianta et al., 2003; Tschannen-Moran et al., 1998; Woolfolk & Hoy, 1990). These and other potentially relevant factors and processes, measured either at a more general level or the dyadic level, may warrant consideration in future longitudinal studies.

CONCLUSION

In summary, we sought to expand the available evidence on the sources of student-specific TSE by evaluating an interpersonal social-cognitive model in which teachers' perceptions of the student–teacher relationship quality were assumed to account for the association between disruptive student behavior and student-specific TSE. Generally, data from this investigation provided initial support for the idea that teacher-perceived conflict may function as one explaining mechanism through which individual students' disruptive behavior results in changes in student-specific TSE across domains. Interestingly, though, teachers' experiences of closeness in their relationship with individual students did not mediate the association between students' disruptive behavior and student-specific TSE. Instead, convincing evidence was found for the alternative premise that teachers, through their poorer self-percepts of domain- and student-specific efficacy, are less capable of teaching and helping behaviorally disruptive students in ways that lead to closeness in the student–teacher relationship. These findings clearly suggest that student–teacher conflict and closeness each may play a different role in the development of teachers' sense of self-efficacy toward disruptive students in various teaching domains. For the development of empirically-based intervention programs for teachers, it is therefore essential to spur further understanding of the complex interrelationships among individual students' disruptive behavior, the student–teacher relationship quality, and teachers' student-specific self-efficacy across domains of teaching and learning.