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Zee, M.; Koomen, H.

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Engaging Children in the Upper Elementary Grades: Unique Contributions of Teacher Self-Efficacy, Autonomy Support, and Student-Teacher Relationships

Marjolein Zee and Helma Koomen
Research Institute of Child Development and Education, Netherlands

ABSTRACT
This short-term longitudinal study explored the unique role of proximal classroom factors (teachers’ student-specific self-efficacy, autonomy-supportive behaviors, and student-teacher relationships) in students’ emotional and behavioral engagement, and the moderating role of grade level. Participants were 472 students and 63 teachers (grades 4–6). Path models examined within-time and longitudinal associations between proximal classroom factors and engagement, and multigroup models explored the moderating role of grade level. Results indicated significant within-time associations among all proximal classroom factors and students’ engagement. When initial levels of engagement were controlled for, teachers’ student-specific self-efficacy predicted positive changes in emotional engagement, and closeness predicted positive changes in behavioral and emotional engagement. The association of closeness with the engagement measures was strongest for students in 6th grade.

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Autonomy support; emotional and behavioral engagement; student-specific teacher self-efficacy; student-teacher relationships

Classrooms have long been recognized as one of the central contexts for children’s academic and social-emotional development (Eccles & Roeser, 1999; Hamre et al., 2013). During the many hours students spend in their classrooms, they acquire new knowledge and skills, learn how to behave appropriately, and are likely to develop a sense of self. What comes to pass in classrooms during children’s school careers may also have a deep influence on their behavioral and emotional participation and interest in learning activities (Skinner, Kindermann, & Furrer, 2009; Skinner & Pitzer, 2012). Whereas children generally begin their school career highly engaged with learning opportunities, their engagement, effort, and interest in school have been demonstrated to gradually decline over the course of elementary school (Eccles, Wigfield, et al., 1993; Eccles & Midgley, 1990; Fredricks & Eccles, 2002; Wang & Eccles, 2013). Given that children’s engagement may play an important part in their development and learning outcomes (e.g., Dotterer & Lowe, 2011; Wang & Holcombe, 2010), these downturns have brought into question what proximal classroom factors may facilitate or impair students’ engagement at different grade levels.

In light of this question, the present study aimed to investigate unique associations between proximal classroom factors (teachers’ self-efficacy, their autonomy-supportive behaviors, and student-teacher relationship quality) and children’s engagement in upper elementary school, as well as potential moderating effects of students’ grade level on these associations. Empirical knowledge in this direction may advance understanding of the role classroom factors play in children’s school experiences at different grade levels and add to our ability to develop interventions to improve children’s engagement in class.

CONTACT Marjolein Zee m.zee@uva.nl Research Institute of Child Development and Education, University of Amsterdam, P.O. Box 15776, Amsterdam NL-1001 NG, the Netherlands
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The role of proximal classroom factors in children’s engagement

Drawing on bio-ecological and self-determination theories, Eccles and Roeser’s (1999) have previously formulated a conceptual framework to explain how factors and processes at various levels of the school environment may contribute to children’s development. At the center of these nested, coextensive levels is the classroom environment, which is generally perceived as the proximal ecological niche within which children develop and express their emotional, cognitive, and social needs (Bronfenbrenner & Morris, 1998). According to Eccles and colleagues (e.g., Eccles & Roeser, 2009), such needs are likely to gradually change as children move through the elementary and middle grades. Conceivably, children are more likely to display engaged behaviors, including attendance, effort exertion, and concentration, and engaged emotions, such as enthusiasm, interest, and enjoyment, when such needs are adequately met (see Skinner, Furrer, Marchand, & Kindermann, 2008; Skinner et al., 2009). Yet, to the extent that such needs are not appropriately supported by the classroom context, children may, as they mature, become behaviorally and emotionally disengaged from school, leading to passivity, lack of initiation, and, eventually, poor grades (e.g., Connell & Wellborn, 1991; Skinner et al., 2009).

To date, rigorous empirical studies among children in both early childhood (e.g., Hamre, Hatfield, Pianta, & Jamil, 2014; Hamre & Pianta, 2005; Rimm-Kaufman, Curby, Grimm, Nathanson, & Brock, 2009) and middle school settings (Wentzel, 1997) have provided evidence for the idea that social and cognitive supports in the proximal classroom context are pivotal to students’ engagement and learning. Yet with some exceptions (e.g., Furrer & Skinner, 2003), far less is known about the unique contributions of such supports in the upper grades of elementary school. This lack of knowledge is unfortunate, given that early adolescence, more than any other period, may bring various biological, physical, social, and educational changes that, in the absence of proper support, are likely to lead to a lack of engagement and adjustment problems in children (Eccles, Midgley, et al., 1993). Therefore, exploration of proximal classroom factors that facilitate or undermine children’s behavioral and emotional engagement in the final grades of elementary school seems timely. Based on Eccles and Roeser’s (1999) theoretical framing, we focus in this study on three types of proximal classroom factors that may be linked to students’ behavioral and emotional engagement: teachers’ self-efficacy, their autonomy-supportive behaviors, and the quality of student–teacher relationships.

Teachers’ self-efficacy

Teachers’ self-efficacy (TSE), or their self-referent judgments of capability, have been considered a key determinant of teachers’ effective functioning in the classroom (Zee & Koomen, 2016; Tschannen-Moran & Woolfolk Hoy, 2001). A sizable literature has suggested that teachers with a positive sense of self-efficacy toward their class are likely to perceive difficult or low-achieving children as less challenging, take more adequate approaches to increasing their students’ engagement and performance in class, and do anything to ensure they succeed at difficult tasks (e.g., Caprara, Barbaranelli, Steca, & Malone, 2006; Martin & Sass, 2010; Raudenbush, Rowan, & Cheong, 1992). Accordingly, teachers’ self-efficacy judgments are now commonly believed to be powerful predictors of their behaviors in class, and may thereby affect students’ engaged behaviors and emotions as well (Bandura, 1997).

Empirical research has indicated that students with generally self-efficacious teachers are likely to display higher levels of engagement in the classroom (e.g., Reyes, Brackett, Rivers, White, & Salovey, 2012; Van Uden, Ritzen, & Pieters, 2013). Yet, the bulk of this research seems to focus on aspects of either behavioral or emotional engagement. With regard to behavioral engagement, Robertson and Dunsmuir (2013) have demonstrated that teachers’ self-efficacy beliefs toward their class serve as a positive predictor of middle schoolers’ on-task behavior in the classroom. In other studies (e.g., Hardré et al., 2006; Van Uden et al., 2013), students with highly self-efficacious teachers have also been found to be more likely to put forth the effort and persistence needed to complete their learning activities. Turning to engaged emotions, Jimmieson, Hannam, and Yeo (2010) have demonstrated that students in middle school may
benefit from self-efficacious teachers in terms of higher levels of school satisfaction and confidence in their achievement at school, and lower levels of psychological distress. Additionally, cross-sectional results from Van Uden et al. (2013) indicated that teachers’ self-efficacy beliefs may positively contribute to students’ overall level of emotional engagement in secondary school. Based on these findings, it can be assumed that teachers’ general self-efficacy toward the class as a whole is likely to facilitate children’s behavioral and emotional engagement in class.

Yet, it should be noted that classroom-level self-efficacy beliefs do not necessarily hold for individual students as well (cf. Zee, Koomen, Jellesma, Geerlings, & de Jong, 2016). Prior studies have indicated that between 13% and 44% of the variance in TSE can be explained by within-class variables, including students’ academic level and interest in their schoolwork (Raudenbush et al., 1992; Ross, Cousins, & Gadalla, 1996). Moreover, recent empirical research has suggested that teachers are likely to develop differentiated sets of self-beliefs about their ability to deal with individual children, depending on these students’ behaviors in class (e.g., Zee, Koomen, et al., 2016; Zee, de Jong, & Koomen, 2016). Conceivably, the differential capability beliefs teachers may hold for individual students within the same classroom are more likely to reflect true proximal classroom factors and may afford better explanation of teachers’ differential treatment of and day-to-day interactions with particular students than general TSE (Zee, Koomen, et al., 2016). To our knowledge, such self-efficacy beliefs in relation to individual students have not yet been considered in prior empirical research on the link between TSE and students’ engagement. Therefore, this study focuses on the contribution of teachers’ student-specific self-efficacy beliefs for student engagement to students’ emotional and behavioral engagement, rather than teachers’ classroom-level TSE.

**Teachers’ autonomy-supportive behaviors**

Next to teachers’ self-efficacy toward individual children, teachers’ instructional behaviors and styles may serve as key engagement-fostering processes in the classroom (Eccles & Roeser, 2009). Teachers’ instructional styles may comprise various aspects, including their provision of informational feedback, structure and clarity, choice, and use of instructional discussion (Pianta, La Paro, & Hamre, 2008; Ryan & Deci, 2002). Of these engagement-promoting aspects, (student perceptions of) teachers’ autonomy-supportive behavior is probably the most extensively investigated. Following the basic tenets of Ryan and Deci’s (2002) self-determination theory, teachers’ autonomy-supportive behaviors have typically been considered to reside along a continuum from highly controlling to highly autonomy supportive (e.g., Reeve, Bolt, & Cai, 1999). Whereas the former refer to instructional behaviors and interpersonal sentiments that force children to think, feel, or behave in a specific way, the latter behaviors are generally believed to emphasize students’ academic needs, preferences, and viewpoints, and encourage their autonomy in class (Reeve, Deci, & Ryan, 2004). As such, teachers with instructional behaviors at the autonomy-supportive side of the continuum have been theorized to be more likely to develop students’ inner motivation and foster their engagement than controlling teachers (e.g., Ryan & Deci, 2002; Stroet, Opdenakker, & Minnaert, 2013).

There is ample empirical evidence to support the supposition that autonomy-supportive teacher behaviors may be relevant to students’ engagement in the classroom. Using a variety of approaches to measurement (e.g., teacher observations, student self-reports), several studies among early adolescents have indicated that teachers’ overall level of autonomy support in class may lead students to be more fully engaged, both behaviorally and emotionally (e.g., Assor, Kaplan, & Roth, 2002; Jang, Reeve, & Deci, 2010; Tucker et al., 2002). Moreover, specific aspects of students’ behavioral and emotional engagement have been linked to teachers’ autonomy-supportive instructional style (e.g., Buff, Reusser, Rakoczy, & Pauli, 2011; Roeser, Eccles, & Sameroff, 1998). Cluster-analytic results from Vansteenkiste et al. (2012) have pointed out, for instance, that secondary school students who perceived their teachers as autonomy-supportive are likely to score relatively high on such engaged behaviors as concentration, persistence, and time management, and lower on test anxiety, which can be considered an aspect of emotional disengagement. Other studies, conducted in both the
elementary and secondary grades, have also underscored the benefits of teachers’ autonomy-supportive behaviors for students’ positive affect, behavioral persistence, expectancies, and values (Buff et al., 2011; Roeser et al., 1998). Together, these studies provide fairly robust evidence for the idea that students’ behavioral and emotional engagement are higher when they feel their teachers provide high levels of autonomy support.

**Student-teacher relationship quality**

Notwithstanding the relevance of teachers’ beliefs and instructional practices, the quality of relationships between teachers and individual children may be paramount to students’ engagement. Guided by attachment and developmental systems frameworks (e.g., Pianta, Hamre, & Stuhlman, 2003), student-teacher relationships are commonly conceptualized as key proximal factors involving the unique dimensions of emotional closeness and conflict (e.g., Verschueren & Koomen, 2012). Generally, closeness has been considered a positive dimension of the student-teacher relationship, reflecting the degree of warmth, affection, and emotional security between the teacher and the child. Conflict, in contrast, has commonly been described as a negative relationship factor, reflecting the degree of discordance, negativity, and unpredictability in the student-teacher relationship (Pianta, 1999).

Researchers following the basic tenets of attachment theory have generally presumed that emotionally close and conflict-free relationships between students and teachers may help children explore the classroom environment and diminish feelings of stress associated with increasing school complexity and changes in learning goals (Verschueren & Koomen, 2012; Wang & Holcombe, 2010). Meta-analytical results from Roorda, Koomen, Spilt, and Oort (2011) seem to support this assumption. Based on 99 empirical studies, these authors concluded that students, on average, experience higher levels of overall school engagement when their relationships with teachers are marked by positive quality, including closeness, and a general lack of negative quality, such as conflict. Additionally, students who feel that their efforts and skills are recognized by the teacher have been found to be more eager to explore and learn, and to have higher self-esteem and confidence in their ability to learn (Murray, Murray, & Waas, 2008; Murray & Zvoch, 2011; Wang & Holcombe, 2010). When students believe that their teachers care for them, they are also more likely to respond with greater effort, to set numerous goals for themselves, and to exhibit greater compliance with teachers’ behavioral and academic expectations (e.g., Furrer & Skinner, 2003; Hamre & Pianta, 2001; Reddy, Rhodes, & Mulhall, 2003; Wu, Hughes, & Kwok, 2010). From this line of evidence, it can be hypothesized that closeness between teachers and individual students may positively contribute to students’ behavioral and emotional engagement. In contrast, conflict may hamper students’ emotional and behavioral engagement in class.

**The moderating role of grade level**

Based on their idea of person-environment fit, Eccles and Roeser’s (1999) have postulated that different types of classroom supports may be needed for students in different grades to maintain and foster children’s engagement. Presumably, children who are exposed to developmentally appropriate classroom supports experience a good person-environment fit, resulting in higher levels of engagement in class (Eccles & Roeser, 2009). Yet in contrast, developmentally hampering supports have commonly been suggested to decrease students’ engagement, effort, and interest in school.

Although empirical research supporting this line of reasoning is scarce and relatively outdated, there are some indications that developmental mismatches in the classroom may be particularly true for students in higher grades (e.g., Eccles, Midgley, et al., 1993). For instance, studies have generally indicated that students in higher grades are more likely to come across teachers with low self-efficacy toward the class as a whole than students in lower grades (Midgley, Feldlaufer, & Eccles, 1989; Wolters & Daugherty, 2007). In addition, in a recent study on student-specific TSE in upper elementary school, Zee, Koomen, et al. (2016) found that teachers, when dealing with older children, tend to report less confidence in their ability to keep individual students engaged at school. Yet, at a time that older students need additional
social and instructional support to maintain their engagement at school (cf. Murray, 2009), teachers’ self-efficacy may play a particularly important role. As such, it seems reasonable to assume that the positive association between teachers’ self-efficacy and students’ behavioral and emotional engagement may be stronger for older students than for younger ones.

Similarly, teachers’ autonomy-supportive behaviors and provision of choice are likely to decrease as a function of age (Eccles, Midgley, & Feldlaufer, 1993). Research dating back to the 1980s suggests that students in junior high school are provided with fewer opportunities to be autonomous and to participate in classroom decision making than younger students in elementary school (e.g., Feldlaufer, Midgley, & Eccles, 1988; Midgley & Feldlaufer, 1987). Such a lack of autonomy support is in sharp contrast with early adolescents’ need for more, rather than less, say in their schooling (Gillet, Vallerand, & Lafrenière, 2012; Ryan & Deci, 2002) and may therefore lead to a developmental mismatch. Accordingly, the link between teachers’ autonomy-supportive behaviors and students’ engagement can be assumed to be stronger for older students than for younger ones.

Last, mean levels of student-teacher relationship quality have been found to decline across the elementary school years, probably due to students’ increasing independence from their teachers (e.g., Hargreaves, 2000). Typically, gradual increases in conflict and decreases in closeness have been noted by the time students reach the upper elementary grades (Jerome, Hamre, & Pianta, 2009; Spilt, Koomen, & Jak, 2012). Yet despite these declines, there is empirical evidence suggesting that student-teacher relationships continue to play an important part in older students’ engagement (Furrer & Skinner, 2003; Roorda et al., 2011; Wang & Holcombe, 2010). Specifically, meta-analytical results from Roorda et al. (2011) have convincingly shown that the quality of student-teacher relationships has a stronger effect on the engagement of older children than on younger ones. Of note, closeness has been found to be the most important for older students’ engagement. Probably, such warm and close student-teacher relationships may provide students with the emotional support needed to deal with increasingly demanding academic tasks (Eccles, Midgley, et al., 1993; Hamre & Pianta, 2001). Conflict between students and teachers, however, appears to have a stronger impact on younger children (Roorda et al., 2011), which seems to align with the idea that different age groups may have different developmental needs (Eccles & Roeser, 2009).

**Present study**

The purpose of the present study was twofold. Using a short-term longitudinal design, we first aimed to explore unique within- and across-time associations between proximal classroom factors and children’s engagement in upper elementary school. Based on Eccles and Roeser’s (1999, 2009) ecological model of schools and development, we paid specific attention to the role of teachers’ student-specific self-efficacy, their autonomy-supportive behaviors, and relationships with individual students in the upper elementary grades. Although each of these factors have previously been studied in relation to children’s engagement, this is, to our knowledge, one of the few investigations in which the unique contributions of those factors are investigated among a sample of early adolescents and in one model. Moreover, rather than investigating indiscriminate aspects of engagement, we aim to explore how various proximal classroom factors are associated with two key forms of engagement (i.e., behavioral and emotional engagement). Thereby, we not only account for the interrelatedness between these forms of engagement, but may also advance insight into potential differences among them (e.g., Wang & Holcombe, 2010).

A second aim of this study was to explore the potential moderating role of grade level (i.e., Grade, 4, 5, and 6) in the associations of proximal classroom factors and students’ emotional and behavioral engagement. Knowledge about the relevance of proximal factors for students’ engagement across the upper elementary grades seems important, as empirical research in this area is scarce and relatively outdated. Drawing on stage-environment theory (Eccles & Midgley, 1990), the associations of teachers’ self-efficacy and autonomy-supportive behavior with students’ engagement were expected to be stronger for students in higher than in lower grades. With
respect to student-teacher relationship quality, the association between closeness and engagement was hypothesized to be stronger for students in higher grades than for those lower grades. Last, the associations between conflict and engagement were assumed to be stronger for students in higher grades than for those in lower grades.

**Method**

**Participants**

This investigation included short-term longitudinal data from 472 children in 63 fourth- to sixth-grade classrooms from 23 regular elementary schools located in both urban and rural areas across the Netherlands. This study was approved by the institutional Ethics Review Board (project no. 2013-CDE-3188) and consent from teachers and students’ parents was obtained prior to participation. On average, parental consent rates per classroom ranged between 46% and 100%. From the total pool of parental consents, we randomly selected four boys and four girls from each teacher’s classroom about whom teachers completed questionnaires. Due to illness or time constraints, eight of 63 teachers completed questionnaires about fewer children (range = 2 to 7 students). Thereby, we avoided making the data collection too burdensome for participating teachers.

Among the total student sample were 157 students (33.3%) from Grade 4, 165 (35.0%) from Grade 5, and 150 (32.8%) from Grade 6, respectively. Students’ mean age was 10.77 years at the start of this study ($SD = 0.97$, range = 8 to 13 years), and the gender composition was evenly distributed, with 236 girls (50.0%). Based on their parents’ country of birth, 86% of the students could be considered Dutch. This is comparable to demographic information reported in nationally representative studies (Zee, Koomen, & van der Veen, 2013). Furthermore, teacher-reported employment statistics and parents’ education levels indicated that most students had an average to high socioeconomic status. Specifically, in 76.7% of the families, both parents of participating students were employed; in 20.3% of the cases, at least one parent was employed; and in only 2.5% of the families, two parents were unemployed. Additionally, the majority of the parents had finished senior vocational education (46.6%) or higher education (49.4%), leaving less than 5% of the parents to have only finished primary education. The mean class size in this study was 24.54 ($SD = 4.85$, range = 10 to 34). Participating teachers ($N = 63$) were predominantly female (69.5%), relatively experienced in teaching ($M = 16.83$ years, $SD = 12.04$, range = 1.5 to 44.0 years), and had a mean age of 41.47 ($SD = 12.43$, range = 23 to 63 years).

**Procedure**

Two planned school visits were held in the winter (wave 1) and in the spring (wave 2), roughly three months later. During the first wave, students were asked to complete a survey on their teachers’ autonomy-supportive behaviors and self-reports of their engagement in class, and filled out some demographic questions (e.g., age, gender, grade level, ethnicity) and a sociometric questionnaire on their classmates’ relationships with the teacher. Directly after this school visit, an e-mail invitation containing an anonymous survey link was sent to participating teachers. This digital survey, which was, on average, completed for eight randomly selected students from teachers’ classrooms, had a forced response format and involved questions on student-specific TSE and general background questions. Teachers were asked to return the digital survey within two weeks after the invitation was sent.

During a second, planned school visit in the spring of the same school year, students completed self-report questions regarding their behavioral and emotional engagement for a second time. Both at wave 1 and wave 2, a test assistant was present in the classroom to answer students’ questions and to ensure that students answered all items in a serious way. Teachers were not present in class during the data collection. All participating teachers completed and returned their questionnaires at wave 1. Students’ response rate was 98% at wave 1 and 96% at wave 2. Nonparticipation of students and teachers was mainly due to absence or sickness at the time of data collection.
Instruments

Teachers’ student-specific self-efficacy
Teachers rated their self-efficacy in relation to individual students using the Student-Specific Teacher Self-Efficacy Scale (Student-Specific TSES; Zee, de Jong, et al., 2016), which is based on Tschannen-Moran and Woolfolk Hoy’s (2001) TSES. Yet unlike the original TSES, the student-specific version reflects teachers’ self-referent beliefs about their ability to deal with a specific child, rather than the classroom as a whole. Moderate levels of correspondence between classroom-level and student-specific TSE suggest that both instruments tap into different aspects of the self-efficacy belief system (Zee, de Jong, et al., 2016; Zee, Koomen, & de Jong, 2018).

Generally, the Student-Specific TSES comprises four teaching domains: Instructional Strategies (IS; 6 items), Student Engagement (SE; 6 items), Behavior Management (BM; 5 items), and Emotional Support (ES; 7 items). Yet, for purposes of the present study, we only used the Student Engagement domain, as tasks related to teachers’ ability to activate students’ interest in their schoolwork can be assumed to be best tailored to students’ engagement and thus have the most predictive power (cf. Bandura, 2006). An example item for this domain is “To what extent can you motivate this student for his/her schoolwork?” The six items were rated by teachers on a seven-point Likert-type scale, ranging from 1 (nothing) to 7 (a great deal). Support for the reliability and construct validity of the Student-Specific TSES has been provided by (Zee, de Jong, et al., 2016; Zee et al., 2018). The internal consistency of the SE-Scale was excellent, \( \alpha = .96 \). Scale scores, represented by teachers’ mean response to the six items, were used to reflect their student-specific TSE for SE.

Teachers’ autonomy-supportive behaviors
Students’ perceptions of their teachers’ autonomy-supportive behavior in the classroom were evaluated using eight items from the Teacher As Social Context Questionnaire (TASCQ; Belmont, Skinner, Wellborn, & Connell, 1988, 1992). An example item of this scale is “My teacher gives me a lot of choice about how I do my schoolwork.” All items were responded to on a 5-point Likert scale, ranging from 1 (not at all true) to 5 (very true). Consistent with Cronbach’s alpha coefficients in prior research (Belmont et al., 1992), the internal consistency of this scale in the present study was .71. Scale scores were used to represent students’ perceptions of their teachers’ autonomy-supportive behaviors.

Quality of the student-teacher relationship
To gain insight into the degree of closeness and conflict in relationships between teachers and individual children, we asked all students (\( N = 1507 \)) from participating classrooms to complete a four-item sociometric questionnaire on their classmates’ relationships with the teacher. An unlimited nomination procedure was used, in which students could name as many peers in their classroom as they wanted for each question (Terry, 2000). The dimension of Closeness was evaluated using two items, including “I think these children have a good relationship with the teacher” and “These children really trust the teacher and tell the teacher things that are important to them.” Another two items focused on student-teacher Conflict, including “These children easily have quarrels with the teacher” and “The teacher gets angry at these children very often.” Sociometric scores were computed for each individual student, by counting the number of nominations of all classmates per question and standardizing them within classrooms. Subsequently, the sociometric scores for the respective Conflict and Closeness items were summed to represent one score for each relationship dimension. In the present study, Cronbach’s alphas were .83 for Closeness and .96 for Conflict.

Students’ behavioral and emotional engagement
Students’ perceptions of their behavioral and emotional engagement were evaluated using a short, 12-item version of the Engagement Versus Disaffection With Learning Scale (EvDS; Skinner et al., 2008). The Behavioral Engagement subscale consists of six items that tap into students’ effort,
attention, and persistence while initiating and participating in learning activities, with example items such as “I try hard to do well in school” and “When I’m in class, I just act like I’m working” (reverse coded). The Emotional Engagement subscale (6 items) generally reflects students’ motivated participation during learning activities. Example items are “I enjoy learning new things in class” and “Class is not all that fun for me” (reverse coded). All items were rated on a 5-point Likert scale, ranging from 1 (no, that is not true) to 5 (yes, that is true).

A comparative analysis from Fredricks and McColskey (2012) has shown that the (test-retest) reliability and construct validity of the EvDS are sufficient. To evaluate the factor structure of the two subscales in the present study, we performed a confirmatory factor analysis, using maximum likelihood estimation with robust standard errors and a mean-adjusted chi-square test statistic (MLR; Muthén & Muthén, 1998–2012). Compared to a one-factor solution, the model specifying both Behavioral and Emotional Engagement factors yielded a significantly better fit to the data, Trd (1) = 49.94, p < .001, ΔCFI = .062. Yet one Emotional Engagement item (“When we start something new in class, I feel nervous”) appeared to load extremely poorly on its corresponding factor (λ = –.02, p = .827). A statistic item was probably too complex for students to answer reliably, we decided to remove this item from the model. Removal of this item resulted in a well-fitting model, χ²(43) = 81.27, p < .001, RMSEA = .044 (90% CI [.029–.058]), CFI = .964, SRMR = .034. The factor loadings of the subscales in the present study were also adequate, ranging from .56 to .74 for Behavior Engagement and from .50 to .74 for Emotional Engagement. Cronbach’s alphas were .80 (wave 1) and .76 (wave 2) for Behavior Engagement, and .75 (wave 1) and .79 (wave 2) for Emotional Engagement.

**Data analysis**

We conducted multilevel path modeling and multiple group modeling in Mplus 7.1 (Muthén & Muthén, 1998–2012). Unlike regression analysis, this technique enabled us to specify covariances among the predictors in our models and to include multiple outcome variables (Kline, 2011). As such, we could estimate within-time and across-time associations between the proximal classroom factors and both students’ behavioral and emotional engagement in one model. The dependency among the sampled observations (students) within clusters (classrooms) was taken into account by employing the complex analysis option in Mplus.

**Modeling procedure**

To evaluate within- and across-time associations between the proximal classroom factors and students’ engagement, we first fitted a multilevel path model to the data. Within-time associations were evaluated by freely estimating the covariances among the predictors at wave 1. Additionally, we accounted for prior levels of behavioral and emotional engagement to estimate associations across time (Little, 2013). After establishing the path model, we conducted multiple group analysis to explore whether the associations among the study’s main constructs differed across grade level (i.e., Grade 4, 5, and 6). In the first step, we tested a fully unconstrained model, in which all within- and across-time associations were freely estimated across grade levels. In the second step, we successively fixed the model’s parameters across grade levels to determine potential moderation effects. The Wald chi-square test for parameter constraints was used to test specific contrasts. Technically, moderation exists when the difference in chi-square between the constrained and unconstrained models is statistically significant. In all models, missing data (< 4%) were treated using full information maximum likelihood estimation.

**Model goodness-of-fit**

Robust maximum likelihood estimation (MLR; Muthén & Muthén, 1998–2012) was used in all analyses. This estimation method offers a mean-adjusted model χ², which is asymptotically equivalent to the T² test-statistic Yuan and Bentler (2000), and adjusted standard errors that are robust for non-normality (Muthén & Muthén, 1998–2012). Generally, non-significant χ² tests are indicative of good model fit (Kline, 2011; Little, 2013). Yet, given that trivial discrepancies between the expected
and the observed model may already lead to the model’s rejection (Chen, 2007), other fit indices were consulted as well. These included the root mean square of approximation (RMSEA), with values ≤ .05 reflecting close fit and values ≤ .08 signifying reasonable fit (Browne & Cudeck, 1993); and the Comparative Fit Index (CFI), with values ≥ .90 indicating satisfactory fit and values ≥ .95 indicating close fit (Bentler, 1992). Modification indices, residual correlations, and their associated summary statistic SRMR (standardized root mean square residual) were used to evaluate component fit. Values ≤ .08 indicate good fit of the model to the data (Kline, 2011). To compare alternative models, we employed the Satorra-Bentler scaled chi-square difference test (TRd; Satorra & Bentler, 2010) and the CFI-difference, with CFI changes ≥ .02 being indicative of model nonequivalence (Cheung & Rensvold, 2002). To test for specific contrasts in the multiple group analyses, we used the Wald test for parameter constraints.

Results
Descriptive statistics

Means, standard deviations, and zero-order correlations (see Table 1) were inspected to determine whether the main constructs correlated in the expected direction. The correlation coefficients supported a priori expectations. Specifically, teachers’ Autonomy Support, their student-specific Self-Efficacy, and peer-nominated Closeness were all positively associated with students’ Behavioral and Emotional Engagement, both within and across time. Conflict, in contrast, appeared to be negatively associated with both measures of engagement. Additionally, moderate positive associations were noted between students’ Behavioral and Emotional Engagement, suggesting that Behavioral and Emotional Engagement, though related, tap into unique aspects of students’ involvement with learning tasks. None of the covariates (students’ gender and age) were related to any of the study’s outcome measures.

Ecological model of students’ behavioral and emotional engagement

The overall model1 testing the relationship between proximal classroom factors and students’ engagement showed a reasonable goodness of fit, $\chi^2(2) = 8.02, p = .018, \text{RMSEA} = .080 (90\% \text{ CI } [.028–.141]), \text{CFI} = .985, \text{SRMR} = .033$. As suggested by the modification indices, the model’s fit to the data could not be further improved. Figure 1 displays the standardized parameter estimates of this model. With respect to the within-time associations, we found small to moderate correlations of all proximal classroom factors and students’

<table>
<thead>
<tr>
<th>Proximal Classroom Factors</th>
<th>1</th>
<th>2</th>
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<td>.12**</td>
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<td>.15**</td>
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<td>.01</td>
<td>-.14**</td>
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Descriptive Statistics

| Mean       | 3.58 | 5.59 | 0.25 | 0.08 | 4.11 | 3.77 | 4.05 | 3.68 | - | 10.77   |
| Standard Deviation | 0.67 | 1.01 | 0.15 | 0.15 | 0.58 | 0.77 | 0.58 | 0.82 | - | 0.97    |

Note. Gender: 0 = boys, 1 = girls. TSE = Teacher self-efficacy; SE = Student engagement; T1 = Wave 1; T2 = Wave 2.

*p < .05. **p < .01. ***p < .001.
engagement. Specifically, both students’ Behavioral and Emotional Engagement showed positive correlations with student-specific TSE for SE \((r = .30; r = .17, p < .001)\). These two dimensions were also positively associated with teachers’ autonomy-supportive behaviors \((r = .30; r = .42, p < .001)\), and peer-nominated Closeness \((r = .12, p < .05; r = .16, p < .01)\). In contrast, peer-nominated Conflict was negatively correlated with both Behavioral Engagement \((r = -.23, p < .001)\) and Emotional Engagement \((r = -.15, p < .001)\).

Regarding change in children’s engagement, we found that their perceptions of both their Behavioral Engagement \(\beta = .57, p < .001\) and Emotional Engagement \(\beta = .56, p < .001\) were moderately stable over time. After accounting for the stability in both constructs, only a modest, but statistically significant positive association between peer-nominated Closeness and students’ Behavioral Engagement was found \((\beta = .07, p < .05)\). Across time, Emotional Engagement appeared to be positively predicted by teachers’ student-specific TSE for SE \(\beta = .12, p < .01\), and peer-nominated Closeness \(\beta = .09, p < .01\). None of the other proximal classroom factors reached the significance threshold.

The moderating effect of grade level

To explore whether the covariates, stability coefficients, and paths between the main constructs varied across grade level, we first fitted a fully unconstrained multiple group model to the data. In this model, all parameters were allowed to vary across grade levels (Grade 4, \(n = 157\); Grade 5, \(n = 165\); and Grade 6, \(n = 150\)). Despite a relatively high RMSEA, the unconstrained model yielded a reasonable fit according to established cutoff values of .08 for the SRMR (Kline, 2011) and .90 for the CFI (Bentler, 1992), \(\chi^2(6) = 14.99, p = .020, \text{RMSEA} = .098 (90\% \text{CI } [.036 -.161]), \text{CFI} = .980, \text{SRMR} = .038\).

To evaluate the potential moderating role of grade level, we successively constrained the within- and across-time associations across the three grade levels. Using the Wald chi-square test of parameter constraints, we found that the stability coefficient for students’ Behavior Engagement was significantly larger for students in Grade 4 \(\beta = .69, p < .001\) than students in Grade 5 \(\beta = .40, p < .001\), \(\chi^2(1) = 5.33, p < .05\).
Additionally, the stability coefficient for students’ Emotional Engagement was significantly larger for students in Grade 4 (β = .62, p < .001) than students in Grade 6 (β = .45, p < .001), \( \chi^2(1) = 7.89, p < .05 \).

Regarding the model’s across-time associations, we noted that the relationship between peer-nominated Closeness and students’ Behavioral Engagement was statistically significant, but also stronger for students in Grade 6 (β = .16, p < .05) than for students in Grade 5 (β = -.06, ns), \( \chi^2(1) = 5.33, p < .05 \). The across-time association between Closeness and Behavioral Engagement in Grade 4, however, did not differ significantly from the associations in Grades 5 and 6. Notably, Closeness was also more relevant for students’ Emotional Engagement in Grade 6 (β = .21, p < .01) than for students in Grade 5 (β = -.02, ns), \( \chi^2(1) = 8.54, p < .01 \), but not Grade 4. Constraining the remaining across- and within-time coefficients to be equal did not deteriorate the overall model’s fit, \( \chi^2(42) = 49.03, p = .212 \). These results suggest that of all proximal classroom factors, only student–teacher Closeness may be more relevant for older students’ Behavioral and Emotional Engagement. The fit of the final, partially constrained model was reasonable, \( \chi^2(48) = 65.18, p = .049 \), RMSEA = .048 (90% CI [.001 – .075]), CFI = .961, SRMR = .098.

**Discussion**

Empirical research on children’s engagement has been steadily growing in the last couple of decades (Eccles & Roeser, 2009). Yet, relatively little attention has been paid to the unique contributions of various proximal classroom factors that facilitate or undermine children’s engagement in the final grades of elementary school. Using Eccles and Roeser’s (1999) ecological framework, this study aimed to address this gap in the literature by exploring the unique associations of teachers’ student-specific self-efficacy, their autonomy-supportive behaviors, and aspects of the student–teacher relationship quality with early adolescents’ emotional and behavioral engagement, as well as the potential moderating role of grade level. The across-time associations in the present study were small. Yet, it should be noted that we controlled for within-time associations and stability in students’ emotional and behavioral engagement. Furthermore, we investigated the predictive role of three types of social and cognitive classroom factors in one model, instead of evaluating such factors in isolation from one another. Thereby, our models provided a relatively strict and conservative test of unique associations.

**Within-time associations between proximal classroom factors and engagement**

Within time, students were found to express higher levels of behavioral and emotional engagement when their teachers had high self-efficacy toward them, displayed autonomy-supportive behaviors, and maintained relatively close and conflict-free relationships with them. These findings are largely in accordance with cross-sectional and meta-analytic studies (e.g., Jang et al., 2010; Roorda et al., 2011; Shih, 2008; Stroet et al., 2013; Van Uden et al., 2013), suggesting that each of these particular classroom factors may lead students to feel more fully engaged with school. Yet, whereas prior studies have typically focused on either overall levels or only one specific component of engagement (e.g., Marks, 2000), our results additionally suggest that these proximal classroom factors may play a differential role in students’ engaged behaviors and emotions in class. Despite the relatively high consistency between students’ engaged behaviors and emotions, teachers’ autonomy-supportive behaviors seemed to have the strongest associations with students’ emotional engagement. These findings mirror those of Shih (2008), who also found slightly more robust associations of autonomy support with various aspects of emotional engagement, including curiosity, enjoyment, and anxiety, than with aspects of behavioral engagement, including participation and persistence. Additionally, our results suggested that teachers’ student-specific self-efficacy for student engagement was slightly more important for students’ emotional engagement than for their behavioral engagement. Previous theory and research has suggested that teachers who believe they can do whatever it takes to teach a particular student are more likely to get themselves to put in the effort and persistence to fulfill their tasks (Bandura, 1997; Tschannen-Moran & Woolfolk Hoy, 2001). It is likely that individual students reciprocated such positive teacher behaviors and actions by displaying higher levels of
enthusiasm, enjoyment, and interest during school tasks. At least from a cross-sectional perspective, then, positive teacher behaviors, cognitions, and interactions may help students to engage in school activities out of personal interest and enjoyment, and to persist in difficult situations (cf. Connell & Wellborn, 1991).

**Across-time associations between proximal classroom factors and engagement**

Only two of the proximal classroom factors predicted a positive change in students’ motivational states across time. As expected, high levels of closeness between students and teachers seemed to transform students’ classroom experiences, such that they were more likely to exert effort and persistence in class (behavioral engagement) and feel satisfied with and committed to school (emotional engagement). This finding fits reasonably well with attachment theory, assuming that a high degree of teacher-child closeness may provide children with the emotional security needed to effectively explore the classroom environment and become engaged in their school work (e.g., Koomen, van Leeuwen, & van der Leij, 2004; Verschueren & Koomen, 2012). Such engaged behaviors and emotions, in turn, have previously been evidenced to serve as a mechanism explaining why emotionally close relationships between teachers and individual students usually help these students to achieve at higher levels (e.g., Woolley, Kol, & Bowen, 2009; Zimmer-Gembeck, Chipuer, Hanisch, Creed, & McGregor, 2006).

After accounting for the relatively strong stability in students’ behavioral and emotional engagement, conflict in the student-teacher relationship did not result in decreases in the two components of engagement across time. This finding is somewhat in contrast with results from prior empirical studies conducted among samples of elementary school children (e.g., DiLalla, Marcus, & Wright-Phillips, 2004; Hamre & Pianta, 2001). These studies have demonstrated that links between conflict and student engagement usually tend to be somewhat stronger than associations between closeness and engagement. There are several explanations for this unexpected result. First, there is empirical evidence to suggest that positive relationship quality, but not negative relationship quality, may become more important for students’ engagement as they move through the elementary grades (e.g., Roorda et al., 2011). It is possible that close student-teacher relationship may be particularly important for upper elementary students, as these relationships may help students deal with the various biological, social, and educational changes they face during this period.

Another explanation for this finding is the substantial overlap among the proximal classroom factors in our model, and between conflict and student-specific TSE for student engagement in particular. Due to this overlap, the unique contribution of conflict to students’ emotional and behavioral engagement might have been suppressed by other classroom factors, including student-specific TSE (see Maassen & Bakker, 2001). This suggests that the combination of positive factors, such as teacher-student closeness, may be more important for students’ engagement than negative factors, including conflict.

Last, these discrepant findings might have arisen out of differences in measurement approaches. Whereas previous investigators have typically derived the quality of student-teacher relationships from teachers’ reports of closeness and conflict, we made use of less well-known peer-nomination procedures to gain insight into these relationships. Although these peer-nominations are usually moderately associated with teacher reports of the student-teacher relationship, it seems likely that they also provided a unique view on the relationship quality. In support of this suggestion, prior studies (e.g., Hughes, Luo, Kwok, & Loyd, 2008; Silver, Measelle, Armstrong, & Essex, 2005) have indicated that teachers’ reports of conflict may, in large part, be a reaction to students’ behavioral challenges. Yet, in contrast, classmates’ perspectives of the relationship seem to be largely based on teachers’ (often unconscious) preference for certain students in class (e.g., Birch & Ladd, 1998; Hughes, Cavell, & Willson, 2001). Accordingly, these different, albeit overlapping, relationship views may each contribute differently to students’ sense of engagement in class. For this reason, it seems important to further investigate the associations of closeness and conflict with students’ engagement over time, using multiple informants of the relationship quality.
Next to the quality of the student-teacher relationship, teachers’ sense of self-efficacy for student engagement toward individual children appeared to positively change these children’s levels of engagement. Interestingly, though, only children’s engaged emotions, and not their engaged behaviors, seemed to be uniquely reactive to their teachers’ student-specific self-efficacy. To some extent, this is unlike previous empirical research on general TSE, in which associations between TSE and aspects of both students’ emotional and behavioral engagement have been established (e.g., Hardré et al., 2006; Robertson & Dunsmuir, 2013). There may be two explanations that account for these findings. First, it should be noted that the majority of research on general TSE has been cross-sectional in nature and tended to focus solely on aspects of either behavioral or emotional engagement. As such, it is difficult to compare the unique relevance of TSE for each particular component of students’ engagement. Second, it can be suggested that general TSE is mainly concerned with teachers’ ability to motivate the classroom as a whole. Probably, these more general capability judgments are likely to affect various teaching practices and classroom-level strategies which, in turn, mainly promote students’ willingness to exert effort and persistence in school. In contrast, student-specific TSE is more interpersonal in nature and focuses on teachers’ ability to invent and apply teaching strategies to promote learning and engagement in a particular child. As such, teachers with a positive sense of self-efficacy toward an individual child may be more likely to evoke positive feelings and reactions from the child to the teacher and school work than engaged behavior, such as attendance and effort (cf. Skinner et al., 2009).

Lastly, teachers’ autonomy support did not seem to be associated with students’ behavioral and emotional engagement in class, after initial levels of engagement were controlled for. This is a remarkable finding, given that autonomy support, of all proximal classroom factors in our study, appeared to be most strongly correlated with students’ emotional and behavioral engagement, both within and across time. One possible explanation is that the association among teachers’ autonomy-supportive behaviors and students’ behavioral and emotional engagement is reciprocal, rather than unidirectional. Indeed, when students are intrinsically motivated for their schoolwork, show interest and enjoyment, and stay concentrated in class, teachers may be more inclined to go along with students’ ideas, incorporate their interests, and provide opportunities for them to have choices (cf. Pianta et al., 2008). These autonomy-supportive teacher behaviors, in turn, may lead students to display even higher levels of emotional and behavioral engagement over time.

Although the lack of association between autonomy support and student engagement was inconsistent with our hypothesis, there is evidence to suggest that instructional practices, including autonomy support and structure, may be less relevant for students’ engagement than affective factors, such as student-teacher relationship quality and teachers’ (affective) involvement (e.g., Skinner & Belmont, 1993; Tucker et al., 2002). According to Skinner and Belmont (1993), for instance, teachers’ involvement with students, more so than other supportive teacher behaviors, may shape the quality of their daily classroom interactions. The affective tone, intent, and content of these interactions may, in turn, influence the extent to which students feel their basic needs are met and become engaged in their school activities.

### The moderating role of grade level

In seeking to determine whether the patterns of association found for the total sample differed across Grades 4, 5, and 6, we generally noted that students’ grade level did not affect the associations of teachers’ autonomy support, their self-efficacy, and student-teacher conflict with students’ emotional and behavioral engagement. These findings suggest that for older students, these particular classroom factors are no more important for their engaged behaviors and emotions than for younger children. It might be that the differences among the various grade levels included in this study were too small. Indeed, in the Dutch education system, children of different ability levels follow the same educational program in upper elementary classrooms and share the same teacher throughout the school year. Yet in secondary education, students interact with various teachers throughout the day, follow different...
subjects, and are separated into different tracks, according to their ability level. As such, it may be that upper elementary students are less likely than secondary school students to need different types of classroom supports to foster their engagement. To some extent, this suggestion seems to be in line with Eccles and Roeser’s (1999) idea of person-environment fit, postulating that developmental mismatches may particularly occur during the transition from elementary to secondary school.

Interestingly, though, grade level did seem to moderate the association between peer-nominated closeness and students’ engagement. Largely consistent with our hypotheses, close and emotionally secure relationships between teachers and students seemed to be more important for students’ behavioral and emotional engagement in Grade 6 than in Grade 5, but not Grade 4. In the Netherlands, Grade 6 in particular marks the beginning of a challenging and important transition period for elementary students. Not only are they undergoing profound changes in their sense of self, but they are also likely to struggle with heavy curricular demands (Lynch & Cicchetti, 1997). Moreover, in the Netherlands, Grade 6 is the last year before students move to secondary school. During this year, important decisions about the type and level of secondary education most suited to students are made. This may be very stressful and challenging for students. Emotionally close relationships may therefore be particularly beneficial for students’ engagement in Grade 6, as teachers may serve as a safe haven and help them deal with the stresses of middle childhood (Zee, Koomen, & van der Veen, 2013). Meta-analytic results from Roorda et al. (2011) support this claim, indicating that the quality of student-teacher relationships may have a stronger effect on older students’ engagement than that of younger children.

Limitations

Although the current study contains several strengths, including the use of multiple informants, two time points, and a relatively large sample size, some limitations have to be noted. First, although this study employed a short-term longitudinal design and controlled for initial levels of behavioral and emotional engagement, it precludes any speculation about the direction of effects. Results from Skinner and Belmont (1993), for instance, suggest that links between various need-supportive teacher behaviors, such as autonomy, structure, and involvement, and aspects of students’ engagement are likely to be reciprocal across time. Longitudinal designs with more than two measurement occasions might deepen our understanding of potential transactional linkages among proximal classroom factors and students’ engaged behaviors and emotions.

Second, this study included 4th- to 6th-graders from Dutch elementary school settings. Although it can be assumed that the basic needs and levels of student engagement may differ substantially across these grades, it is possible that the relatively homogeneous nature of the Dutch elementary school system might have prevented us from finding evidence for the potential moderating role of grade level. Indeed, Eccles and Roeser’s (1999) person-environment fit theory suggests that changes in students’ motivation and engagement may typically arise during the transition from elementary to junior high school. Given the idea that the social environments of junior high school may be less well tailored to students’ basic needs than social supports in elementary classrooms, it may be both relevant and important to longitudinally investigate the role of proximal classroom factors in the engagement of students who make the transition from elementary to secondary school.

Third, we made use of a sample of primarily experienced female teachers who generally taught students from mid- to high-socioeconomic backgrounds. Although none of these background characteristics seemed to affect the results of this study, some caution is warranted when generalizing the results of this study to other populations or settings. Future investigators may provide a more detailed account of the proximal classroom factors that may contribute to students’ emotional and behavioral engagements by relying on more heterogeneous samples.

Last, we investigated three specific proximal classroom factors in relation to students’ emotional and behavioral engagement in class. Based on Eccles and Roeser’s (1999, 2009) ecological model of the school environment, however, it may well be possible that other factors in the proximal school environment...
might have explained such engaged behaviors and emotions. Examples of such factors are classroom and motivational climate, teachers’ provision of structure, their expectations of students, and their ability to effectively manage the classroom (Eccles & Roeser, 2009). Hence, to replicate these results, future researchers are advised to take account of such factors to better explain differences in students’ emotional and behavioral engagement.

Conclusion and future directions

Despite these limitations, this study may present some important implications for research and practice. First, the present study provides evidence that close relationships between teachers and individual students are among the most essential factors in the proximal classroom context that help students stay engaged over time. This seems to be particularly true for students who are about to make the transition to secondary school. During this time, emotionally close relationships with the teacher may help them deal with changes in peer relationships and increased cognitive and emotional demands, which, in turn, may result in higher levels of engagement and achievement at school (Eccles & Roeser, 2011; Goldstein, Boxer, & Rudolph, 2015; Roorda et al., 2011). Teachers may support students’ need for emotional involvement and foster their engagement by actively seeking opportunities to interact with individual students, showing personal interest, and providing appropriate comfort, reassurance, and assistance to them in a timely manner (Pianta et al., 2008). Importantly, such positive interpersonal behaviors and actions may also help teachers gain more pleasant emotional experiences with their students, resulting in a more positive classroom climate as well.

Second, the results of this study seem to stress the importance of teachers’ sense of self-efficacy toward individual students for these students’ engaged emotions. When teachers feel certain about their capability to teach and support a particular student, they are more likely to exert effort and persistence in helping this student. Thereby, they may evoke positive feelings from the child, such as interest, enjoyment, and satisfaction with school (cf. Zee & Koomen, 2016). Unfortunately, however, empirical research has indicated that teachers tend to feel less self-efficacious in relation to students who may be at increased risk of adjustment problems, including children with externalizing or internalizing behavior, and motivational problems (Zee, Koomen, et al., 2016; Raudenbush et al., 1992). To help teachers become more self-efficacious in relation to at-risk students, intervention programs should focus on providing teachers with the skills necessary to deal with them. Examples of such tools are goal-setting strategies, pedagogical strategies, behavior management approaches, and emotional support provision. Given the highly contextualized nature of teachers’ self-efficacy, it seems important that teachers can practice such skills and strategies in the context of their own classrooms. Possibly, by focusing on teachers’ skills and cognitions, rather than students’ behaviors and characteristics, further steps can be made in improving the emotional and behavioral engagement of early adolescents in class.

Note

1. To ensure that students’ gender and age did not confound the findings in our study, we also tested a model in which these covariates were included. Compared to the model without covariates, the strength and direction of the coefficients in this model were quite similar, but the fit was significantly worse. Moreover, none of the covariates appeared to be significantly related to students’ Emotional and Behavioral Engagement. Therefore, models without covariates are reported.

Disclosure statement

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**References**


