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Teacher performance goal practices and elementary students' behavioral engagement: A developmental perspective

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Abstract

We investigated growth trajectories for classroom performance goal practices and for student behavioral engagement across grades 2 to 5 for 497 academically at-risk elementary students. This study is the first longitudinal investigation of performance goal practices in the early elementary years. On average, teacher use of performance goal practices increased and students' behavioral engagement declined across the four years. Using autoregressive latent trajectory (ALT) models, we examined the synchronous relations between teacher-reported performance goal practices and teacher-reported student behavioral engagement. As expected, as students move into classrooms with a new teacher with less emphasis on performance goal practices, they become more behaviorally engaged in school. Gender did not moderate these results. Implications for teacher professional development are discussed.

Keywords

Goal structures; teacher practices; classroom context; elementary students; engagement

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Children who enter school with low academic readiness skills are at greatly increased risk for future low academic performance and failure (Alexander, Entwisle, & Horsey, 1997; Campbell, Helms, Sparling, & Ramey, 1998). Furthermore, children with lower academic readiness skills at the transition to formal schooling tend to exhibit poorer learning behaviors such as on-task and cooperative engagement behaviors in the classroom (Bodovski & Farkas, 2007). Poor learning behaviors are largely responsible for their lower growth in achievement over the elementary grades (Bodovski & Farkas, 2007; Bulotsky-Shearer, Fantuzzo, & McDermott, 2010). In an effort to prevent school failure among students with low academic readiness skills, researchers have investigated the role of aspects of the classroom context on learning behaviors and achievement in the elementary grades. This body of research has identified a number of dimensions of classroom context associated with the development of learning behaviors and academic competencies (for reviews see Brophy,

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2004; Urdan & Schoenfelder, 2006). For example, academically at-risk students in elementary classrooms characterized by affectively warm, sensitive, and responsive teacher–student interactions improve more in behavioral and academic competencies than do students in classrooms low on these dimensions (Hamre & Pianta, 2005).

The current study investigates a dimension of classroom context referred to as the classroom goal structure (see following section) and its relation to student engagement in learning. It considers how teacher use of practices associated with a performance classroom goal structure and student engagement change over the 4-year period of elementary school between grades 2 and 5. The study also considers the overall relation between the trajectories of teacher performance goal practices and student engagement as well as within-grade relations. Negative relations were expected between teachers' performance goal practices and teacher-rated student behavioral engagement in learning. Finally, the manuscript concludes with a consideration of the implications of our findings for teaching practice and professional development.

Goal Orientation Theory

One important approach to classroom goal structure (Ames, 1992; Maehr & Midgley, 1996; Meece, Anderman, & Anderman, 2006) is goal orientation theory. According to this theory, individual student achievement goal orientations are considered to be a result of an individual's learning history and other dispositions such as perceived competence, as well as aspects of the current learning context, notably classroom goal structures. That is, students adopt different learning goals in different learning contexts (Shim, Ryan, & Anderson, 2008; Urdan & Midgley, 2003).

Achievement goal orientations—Achievement goal orientations represent students' reasons or purposes for engaging in academic tasks (Lau & Nie, 2008). Researchers have identified two broad student achievement goal orientations, *mastery goal orientation* and *performance goal orientation*, with the second goal orientation being divided into two subcategories. Children with a mastery goal orientation are motivated to improve their skills, learn new things, and master new material (Wigfield, Eccles, Schiefele, Roeser, & Davis-Kean, 2006). In contrast, children with a *performance approach* goal orientation are motivated in learning situations to demonstrate high academic competence to others, to outperform others, and to receive positive recognition for their performance, and children with a *performance avoidance* goal orientation are motivated to avoid the demonstration of incompetence and negative evaluation from others.

An extensive body of literature documents consequences of different achievement goal orientations (for reviews see Meece, Anderman, & Anderman, 2006; Wigfield et al., 2006). To briefly summarize this literature, mastery goal orientations are associated with active engagement in learning, use of deeper cognitive strategies, intrinsic motivation, and high levels of achievement. Performance avoidance goal orientations are associated with low effort, low perceived academic competence, poor persistence, and low achievement. A performance approach orientation may have a positive impact on some outcomes, such as grades and perceived competence but a negative impact on other outcomes, such as intrinsic motivation to learn.

Classroom goal structures—Classroom goal structures refer to messages in the learning environment, particularly teacher practices that make certain achievement goals salient (Ames, 1992). As such, classroom goal structures are viewed as an important antecedent to students' achievement goal orientations. A *classroom performance goal structure* is characterized by the teacher emphasizing student performance relative to

normative standards rather than relative to the student's prior performance. Features of this structure are the teacher's provision of more public versus private performance feedback, and the valuation of correct answers over effort and learning. In contrast, a *classroom mastery goal structure*, also referred to as a task structure (Ames, 1992; Simpson & Rosenhotz, 1986), is characterized by instructional practices that emphasize effort and improvement over correct answers, the development of competencies, and the student's intrinsic motivation (Ames, 1992; Maehr & Midgley, 1996; Urdan & Midgley, 2003).

Consequences of classroom goal structures—Drawing from self-determination theory (Deci & Ryan, 1985) as well as achievement goal theory (Ames, 1992), researchers theorize that instructional practices that are performance goal-oriented, especially social comparison feedback and competition between students, make ability differences salient in the classroom and undermine intrinsic motivation, especially for low achieving students. These practices have the effect of “increasing the salience of extrinsic motivation and ego-focused learning goals” (Wigfield et al., 2006, p. 977). Consequently, achievement situations become a means of demonstrating one's ability and self-worth (Dweck, 1986). As a result, in classrooms with a performance goal structure, students adopt either a performance approach goal orientation (i.e., demonstrating high academic competence to others) or a performance avoidance goal orientation (i.e., avoiding the demonstration of incompetence and negative evaluation from others; Elliott & Harakiewicz, 1996; Skaalvik, 1997). Consistent with such reasoning, an extensive body of research documents an association between classroom goal or task structures and students' personal learning goal orientations, as well as emotional well-being, cognitive engagement, feeling of school belonging, persistence in the face of failure, and achievement (for reviews see Ames, 1992; Elliott & Dweck, 1988; Urdan, Midgley, & Anderman, 1998; Wigfield et al., 2006).

Most empirical studies on the effect of classroom goal structures on student adjustment have been cross-sectional (e.g., Ames & Archer, 1988; Roeser, Midgley, & Urdan, 1996; Urdan et al., 1998; Wolters, 2004). A richer perspective on the processes relating classroom goal structures and student performance can potentially be provided by longitudinal studies. The study of developmental processes requires that researchers study change within individuals across time (Hartmann & George, 1999). Relatively few longitudinal studies have been conducted; these studies have considered students in grades 5 and higher. These studies have found that students' perceptions of performance goal structures predict greater use of academic avoidance behaviors (Urdan, 2004), increased negative affect (Anderman, 1999), and lower levels of academic values, self-efficacy, and academic achievement, after controlling for relevant baseline measures (Roeser & Eccles, 1998).

In a quasi-experimental study conducted with 5th and 6th graders, Linnenbrink (2005) assigned five teachers to one of three classroom goal conditions for a 5-week math class. Prior to the start of the study, the school district had assigned students to 1 of 10 classrooms taught by the five participating teachers. Classes were heterogeneous with regard to ability. Classes were initially assigned to one of three goal conditions based on a teacher-report measure of mastery and performance goal-oriented instructional practices (i.e., mastery, performance-approach, and combined mastery/performance approach). Two teachers taught multiple classes and were therefore assigned to the two classroom goal conditions most closely aligned with their self-reported instructional approach. The experimenter then discussed with teachers ways to enhance specific instructional practices to create the assigned goal condition. The combined mastery/performance approach condition was associated with the most positive student outcomes. Students assigned to the condition emphasizing only the performance approach showed an increase in a maladaptive form of help seeking (i.e., asking for the answer versus trying to solve the problem) over the 5-week period.

Classroom goal structures in the elementary grades—Published studies of the effect of classroom goal structures on student learning behaviors or achievement in grades below 5th grade are sparse to nonexistent. The fact that student reports are the most common method of assessing goal structures may serve as one obstacle to research with younger students who may have limited ability to report on goal structures. Additionally, important concerns over the observed normative decline in academic motivation occurring at the transition from elementary to middle school, a transition marked by an increase in practices that make relative ability more salient (Maehr & Anderman, 1993; Maehr & Midgley, 1991; Roeser & Eccles, 1998), may account for the emphasis on this later developmental period.

Teacher performance-oriented instructional practices (e.g., ability grouping, public performance feedback, frequent classroom reminders of the importance of not making mistakes and of earning good grades, and grading in reference to comparisons with others rather than in relation to personal improvement) may affect younger students' academic motivation via their social interactions in the classroom and their self-perceived academic competence. In classrooms with a greater emphasis on performance-oriented instructional practices, students are more aware of classmates' abilities (Filby & Barnett, 1982; MacIver, 1988; Rosenholtz & Simpson, 1984). Because peers' perceptions of classmates' ability are associated with their liking for classmates (Ladd, Birch, & Buhs, 1999), lower ability students may experience lower levels of peer acceptance in classrooms where social comparison cues are more prevalent. In turn, low peer acceptance predicts reduced engagement and achievement (Buhs, 2005; Buhs, Ladd, & Herald, 2006; Ladd et al., 1999). Consistent with this reasoning, Hughes and Zhang (2007) found that in 1st-grade classrooms in which students were more aware of differences in the relative ability of classmates, lower achieving students were less well accepted, less engaged, and less confident of their ability, relative to similarly lower achieving students in classrooms in which students were less aware of differences in relative ability.

Student Engagement in Learning

Engagement in learning is a multi-dimensional construct encompassing behavioral and psychological dimensions (Appleton, Christenson, Kim, & Reschly, 2006; Fredericks, Blumenfield, & Paris, 2004). Motivational theorists view psychological engagement variables such as achievement goals and self-efficacy as indirectly affecting academic achievement via their influence on students' behavioral engagement (Appleton et al., 2006; Perry & Weinsstein, 1998). Behavioral engagement, defined in terms of time on task, persistence or effort on learning tasks, or cooperative engagement, is associated concurrently and prospectively with higher academic achievement, over and above measures of general cognitive ability (Alexander et al., 1993; Greenwood, 1991; Hughes & Kwok, 2007; Ladd et al., 1999; McWayne, Fantuzzo, & McDermott, 2004; Miles & Stupek, 2006). Engagement has been found to mediate the effect of a number of classroom contextual variables on achievement, including teacher–student relationship quality (Hughes, Luo, Kwok, & Loyd, 2008), peer acceptance (Ladd et al., 1999), and classroom instructional practices (Greenwood, 1996; Taylor, Pearson, Peterson, & Rodriguez, 2003; Zimmer-Gembeck, Chipeur, Hanisch, Creed, & McGregor, 2006). Of particular relevance to the current study, performance goal structures are associated with low levels of psychological and behavioral engagement among secondary students (Lau & Nie, 2008; Linnenbrink, 2005; Urdan, Midgley, & Anderman, 1998).

Measurement of Performance Goal Structures

Aggregating individual student perceptions of the classroom goal structure is the most common approach to assessing classroom goal structures in the upper elementary and middle school grades. This practice has recently come under scrutiny based on the common

finding that much of the variance in student reports of the classroom goal structure is due to variability at the individual student-report level (i.e., variance associated with individual differences in student perceptions within each classroom and measurement error) rather than systematic variation at the classroom level, which is of primary interest (Lau & Nie, 2008; Wolters, 2004). In addition, scores on measures of student perceived goal structures have not demonstrated their reliability or validity with primary grade children. A second approach to assessing the classroom performance goal structure is to obtain teachers' reports of their own goal practices. The Approaches to Instruction Scale of the Pattern for Adaptive Learning Scales (Midgley et al., 2000) is a teacher-report measure of performance and mastery goal strategies that has exhibited good evidence of internal consistency and construct validity. Example mastery goal practices items include "During class I often provide several different activities so that students can choose among them" and "I consider how much students have improved when I give them report card grades." Example performance goal practices include "I give special privileges to students who do the best work" and "I encourage students to compete with each other." In 9th-grade classrooms, teacher reports of the performance goal structure were significantly and positively correlated with students' perceptions of performance goal structure and with students' disruptive behaviors, even when students' individual performance orientations were held constant (Kaplan, Ghenn, & Midgley, 2002). In a sample of 5th graders, higher teacher reported performance goal practices on this measure were associated with higher levels of student self-handicapping and other avoidant behaviors (Urdu et al., 1998).

Study Purpose

The primary aim of the current study was to investigate the effect of teacher-reported performance goal practices on growth trajectories for teacher-reported behavioral engagement of students in grades 2–5. The primary aim involved four objectives.

First, the study assesses the pattern of change in teacher performance goal structure across grades 2–5. Previous research on developmental changes in goal structures has focused on students' perceptions of goal structures during the transition from elementary school to middle school (Anderman, 1999; Midgley, 2002). Virtually nothing is known about changes in teacher practices during the elementary years. With the advent of standards-based assessment in elementary schools, schools and teachers are increasingly focused on students' performance on grade-level accountability tests, which begin in grade 3 in some states (e.g., Florida Department of Education, 2005; Heubert & Hauser, 1999), including Texas, the location of the current study (Texas Education Agency, 2008). We expected that this increased focus on test scores may be associated with an increase in teachers' utilization of performance goal structures. Thus, we analyzed growth trajectories for performance goal structures across grades 2–5. We investigated both linear and nonlinear (quadratic) forms of the trajectory for performance goal structures in this study.

Second, the study examines potential associations between the two series, teacher reported performance goal structures and teacher reported student behavioral engagement in learning. Based on prior cross-sectional research (Urdu et al., 1998; Wolters, 2004), we expected to find associations between performance goal structures and engagement in learning. We tested two related hypotheses that are consistent with our theoretical conceptualization: (a) The trajectory of the performance goal structure experienced by each student over grades 2–5 is negatively related to the trajectory of each student's engagement in learning and (b) Deviations from a student's trajectory in one process (teacher performance goal structure) are associated with deviations from the student's trajectory in a second process (student engagement) each year. By determining if deviations from the trajectory on one process (goal practices) are associated with deviation from the trajectory in a second process (behavioral engagement) over four years, we addressed the question, "What are the

implications of changes from year to year in the goal performance practices of different teachers for changes in each student's behavioral engagement?"

Third, the study assesses the pattern of change in teacher-rated behavioral engagement. If the expected negative relations between performance goal structure and engagement in learning exist, we would expect a declining trajectory of school engagement such that on average students' engagement would decline each year.

Finally, the study examines the effect of child gender on engagement trajectories and the effect of gender on the synchronous relation between the two trajectories. Previous research has found that girls in elementary school exhibit higher levels of behavioral engagement than boys (Finn, Pannozzo, & Voelkl, 1995; Luo, Hughes, Kwok, & Liew, 2009). Little is known, however, about gender differences in patterns of change in engagement or in the association between classroom context and engagement.

These objectives were pursued with a sample of students who entered first grade with low literacy skills. Most studies on achievement goal structures do not describe the ability level of participants or describe participants as heterogeneous for ability (Linnenbrink, 2005; Wolters, 2004). Researchers who have examined possible interactive effects of student ability and goal structures on student outcomes have found that lower achieving students and students who lack confidence in their abilities are especially likely to fare poorly under performance goal structures (Dweck & Leggett, 1988; Elliott & Dweck, 1988; Mac Iver, 1988; Urdan & Midgley, 2003). A finding that performance goal practices diminishes academically at-risk students' engagement during the early grade years, when patterns of engagement and achievement become solidified, would have implications for efforts to enhance the chances of academic success for students with low academic readiness skills.

Method

Participants

Participants were low-achieving students who were drawn from a larger sample of children participating in a longitudinal study of children's achievement in elementary school (Hughes & Kwok, 2007). Participants were recruited from three school districts in Texas (1 urban and 2 small city) across two sequential cohorts in first-grade during the fall of 2001 and 2002. Children were eligible to participate in the longitudinal study if they scored *below the median score* on a state-approved, district-administered measure of literacy given in first grade, spoke either English or Spanish, were not receiving special education services, and had not previously been retained in first grade. Teachers distributed consent forms to parents of all eligible children via children's weekly folders so that the exact number of parents who actually received the consent forms cannot be determined. Incentives in the form of small gifts to children and the opportunity to win a larger prize in a random drawing were instrumental in obtaining return of 1,200 of 1,374 consent forms placed in children's folders. A total of 784 parents (65%) provided consent and 416 declined. Children with and without consent did not differ on age, gender, ethnicity, economic disadvantage status, bilingual class placement, scores on the district literacy test, cohort, or school context variables (i.e., the percentage of ethnic/racial minority and economically disadvantaged students).

From the larger sample, a subsample of 497 children (49% boys) was selected for inclusion in the present study. Children who did not have at least one observation on both school engagement and teaching practice over grades 2 to 5 ($n = 50$) and children who were retained during the four years ($n = 256$) were excluded from the subsample. (A total of 19 of these children met both exclusion criteria.) The second criterion permitted us to focus on children making normal progress in school who did not experience the disruption of grade

retention, possibly changing their school engagement, the relation between teaching practice and school engagement, or both (Wu, West, & Hughes, 2010). Given the selection criteria which led to the exclusion of retained students, it is not surprising that the 497 selected students differed from the remaining 287 students on age, sex, ethnicity, economic disadvantage status, bilingual class placement, scores on the district literacy test, cohort, and the school percentage of economically disadvantaged students.

The racial/ethnic composition of the final subsample employed in the study was 37% White, 41% Hispanic (33% Limited English Proficient), 18% African American, and 4% other races/ethnicities. Not all students had complete data at each time period. Of these 497 children, 86% had behavioral engagement scores at grade 2, and this total decreased to 73% at grade 5. A total of 82% had teacher-reported performance goal practice scores at grade 2, and this total decreased to between 68% and 72% at grades 3–5. A total of 181 (36%) children had complete behavioral engagement scores, and 157 (32%) children had complete teacher performance goal scores across the four grades. The number of observations and descriptive statistics for the two outcomes at each time point during grades 2 to 5 are shown in Table 1. Although the central analyses in the current study utilize only teacher report data, secondary analyses of attrition and missing data utilized child performance data (i.e., cognitive ability and reading and math achievement). Given the significant number of Limited English Proficient Hispanic children, it is important to note that Hispanic children who spoke any Spanish were tested each year by Spanish–English bilingual examiners to determine whether they were more proficient in English or Spanish, and all tests were administered in the language in which the student was more proficient (for details see Hughes & Kwok, 2007). Children more proficient in Spanish were administered the *Batería Woodcock–Muñoz: Pruebas de aprovechamiento—Revisada* (Woodcock & Muñoz-Sandoval, 1996), the comparable Spanish version of the Woodcock–Johnson Tests of Achievement — Revised (WJ-R; Woodcock & Johnson, 1989).

No differences between those with and without complete data were found on a range of demographic variables (i.e., gender, age, parent educational and occupational level) or on child characteristics that have been found in previous research to be associated with behavioral engagement (i.e., IQ, reading and math achievement, teacher-rated behavioral adjustment, and teacher–student relationship quality). We also added these variables as auxiliary variables in the data analysis model to adjust for possible effects of missing data (Enders, 2008; Graham, 2003). If the missingness were related to any of the auxiliary variables, then adding those variables would result in different parameter estimates. We found that including and excluding those auxiliary variables resulted in very similar parameter estimates (only different at the third or fourth decimal place). All statistical inferences remained the same. We report in the text the parameter estimates from the model without the auxiliary variables.

The teachers of these 497 students in grades 2–5 were predominantly women (86% to 96% across grades) and White (73% to 84%) or Hispanic (14% to 17%). Teachers reported on their number of years experience in terms of several categories: less than 1 (2.0–7.7%), 1–3 years (17.4–21.5%), 4–6 years (12.4–27.4%), 7–9 years (10.2–13.3%), 10–12 years (4.9–14.3%), and more than 12 (31.8–35.7%), with the range of percentages reflecting the different grade levels. The median number of years of teacher experience fell in the 7–9 years category across all grade levels.

Overview of Design and Measures

Teachers completed measures of behavioral engagement and instructional practices annually beginning when all participants were in 2nd grade. These measures were included in a

questionnaire mailed to teachers in the spring of each year. Teachers received \$25.00 for completing and returning each student questionnaire.

Teacher-rated behavioral engagement—As is often the case in longitudinal research, no single measure of teacher-rated behavioral engagement appropriate for the ages spanned in the study was available. Thus two measures were employed across the 4-year study and then equated for purposes of modeling growth in behavioral engagement. In grade 2, behavioral engagement was assessed with a teacher-report, 10-item scale comprised of 8 items from the Conscientious scale of the Big Five Inventory (BFI; John & Srivastava, 1999) and 2 items from the Social Competence Scale (Conduct Problems Prevention Research Group, 2004) that assess effort, attention, persistence, and cooperative participation in learning. These 10 items will be referred to as the Conscientious and Social Competence (CSC) scale below; these items are similar to items used by other researchers to assess behavioral engagement (Ladd et al., 1999; Ridley, McWilliam, & Oates, 2000). Example items are “Is a reliable worker,” “Perseveres until the task is finished,” “Tends to be lazy (reverse scored), and” “Is easily distracted” (reverse scored). The two items from the Social Competence Scale were “Sets and works toward goals” and “Turns in homework.” Items were rated on a 1–5 Likert-type scale. Coefficient alpha for this scale for our sample was .95 in grade 2. The CSC measure has shown good criterion-related and construct validity. For example, in a series of studies (Hughes & Kwok, 2007; Hughes et al., 2008; Luo et al., 2009), CSC scores were negatively associated with peer and teacher ratings of student aggression and positively associated with peer and teacher ratings of prosocial behaviors. Furthermore, in a three-year longitudinal study, teacher rated behavioral engagement on the CSC mediated the effect of teacher–student relationship quality on students’ achievement (Hughes et al., 2008).

At grades 3, 4 and 5, teachers rated students’ behavior engagement with an 18-item questionnaire. Items were adapted from both the teacher and the student ratings of students’ engagement (Skinner, Zimmer-Gembeck, & Connell, 1998). Teachers were asked to indicate the extent to which each statement was true of their student on a 1 (*Not true at all*) to 4 (*Very true*) scale. Based on exploratory factor analysis with the larger longitudinal sample in Year 3, only one factor met the dual criteria of interpretability and a minimum of three items loading on the factor (Kline, 1998). Based on these results, a behavioral engagement score was calculated, referred to as BE below, as the mean of the 11 items that loaded on the behavioral engagement factor ($\alpha = .92$ to $.93$ for grades 3–5 in the current sample). The items assess effort, persistence, concentration, and interest. Example items include “Tries hard to do well in school,” “Concentrates on doing work,” and “Participates in class discussion.” Scores on the behavioral engagement scale are significantly positively correlated with students’ reading and math achievement, student liking for school, and peer-rated academic competence (Chen, Hughes, Liew, & Kwok, 2009).

Because the teacher-rated behavioral engagement scores from the CSC and BE scales were in different metrics, one can not directly use those scores in one longitudinal model (Khoo, West, Wu, & Kwok, 2005), a problem commonly encountered when different measures of the same construct are used for different age groups. We overlapped the assessment of behavioral engagement in grade 3 with teachers reporting on both scales, permitting us to link the two scales. The equating procedure is described briefly below. To facilitate the illustration, the engagement measures at grade 1 to grade 3 using the first test are named EngCSC1, EngCSC2 and EngCSC3, respectively. The engagement measures using the second test from grade 3 to grade 5 are named EngBE3, EngBE4 and EngBE5, respectively. First, we calculated transformation constants A and B as shown in Equation 1. Then we used A and B as weights to transform EngBE3, EngBE4 and EngBE5, as shown in Equations 2 to 4

$$A = \frac{SD_{ENG_{CSD3}}}{SD_{ENG_{BE3}}}, \quad B = M_{ENG_{CSC3}} - \frac{SD_{ENG_{CSC3}}}{SD_{ENG_{BE3}}} M_{ENG_{BE3}} \quad (1)$$

$$ENG_{BE3-equated} = A \times ENG_{BE3} + B \quad (2)$$

$$ENG_{BE4-equated} = A \times ENG_{BE4} + B \quad (3)$$

$$ENG_{BE5-equated} = A \times ENG_{BE5} + B \quad (4)$$

where *SD* is the standard deviation and *M* is the mean of the subscripted measure. This transformation is appropriate when two assumptions are met. First, the trajectory of the common construct measured by *Eng_{CSC}* and *Eng_{BE}* is assumed to be linear over the grade 2 to grade 5 period. Second, because the grade 3 measures were used to link the scales, the distribution of the two measures at grade 3 should not differ. Checks showed that both assumptions were satisfied in our case. Following transformation, the distributions of the two scales were very similar and did not differ at grade 3 in terms of mean, variance, skewness, or kurtosis. In addition, at grade 3 the level and slope of the growth trajectories for the two measures did not differ (Willson, Kwok, & Liew, 2008). The equated scores for school engagement were then used in the growth curve modeling.

Teacher-reported performance goal practices—The 5-item performance goal-oriented practice scale from the Approaches to Instruction Scale (Midgley et al., 2000) asks teachers to indicate on a 5-point scale, with anchors 1 (*Not at all true of my classroom*) to 5 (*Very true of my classroom*), the degree to which they engage in performance goal practices (i.e., give special privileges to students who do the best work, display the work of the highest achieving students as an example; help students understand how their performance compares to others; encourage students to compete with each other; and point out those students who do well as a model for the other students). Scores on the scale have been found to predict students' engagement in self-handicapping strategies in achievement situations (Urdan et al., 1998), students' disruptive behaviors (Kaplan et al., 2002), and students' reports of performance goal structures (Kaplan et al., 2002). In the current study coefficient alpha ranged from .70 to .78 across grades 2–5.

Data Analysis

Latent growth curve models were used to study the growth trajectory in both teacher-reported behavioral engagement and teacher-reported performance goal practices over grades 2 to 5 (Bollen & Curran, 2006; Singer & Willett, 2003). Growth curve models (GCMs) permit estimation of individual differences in the children's growth trajectories. In searching for the GCM that best captures the trajectory and the individual variability in the trajectory for each of the outcome variables, we investigated models with different functional forms (i.e., linear and quadratic) and different error structures, using likelihood-ratio tests to select the optimal GCM. Then we combined the optimal GCMs for the two outcomes into one autoregressive latent trajectory (ALT) model to investigate the relation between the two outcomes within each school year over grades 2–5 (Bollen & Curran, 2006; MacCallum, Kim, Malarkey & Kiecolt-Glaser, 1997; Meredith & Tisak, 1990). Finally, we

used multiple group analysis to examine whether there were any gender differences in either the GCMs for each of the outcomes or longitudinal relation between the two variables.

We estimated all growth models using Mplus 5 (Muthén & Muthén, 1998–2007). Given the presence of missing data, full information maximum likelihood (FIML) was used to estimate the model. FIML utilizes all of the observations available for each case to compute the likelihood function (Enders & Bandalos, 2001). FIML provides unbiased estimates with minimal standard errors when data are missing at random (Schafer & Graham, 2002). FIML adjusts for the effects of missing data for all variables included in the analysis. In the growth models considered in this study, we centered time at grade 2 (the first measurement of teacher practice, the first time when both variables were measured in the same time period), so that the intercepts in the growth curve models represented the status of school engagement or teaching practice at grade 2.

Results

Separate Growth Curve Models for Engagement and Performance Goal Practices

To identify the appropriate GCM for teacher-rated behavioral engagement and teacher-rated performance goal practice, we tested a set of models with different functional forms of growth and error structures. Given that we have a maximum of four yearly assessments corresponding to grades 2–5, we considered two types of functional form: linear and quadratic. We also considered two types of error structures: a structure with constant residual variance over time and a structure with residual variances varying across time. These considerations led to four sets of models that were estimated: a quadratic GCM with non-constant residual variances over time (model 1), a quadratic GCM with constant residual variances over time (model 2), a linear GCM with non-constant residual variances over time (model 3), and a linear GCM with constant residual variances over time (model 4). Comparison of the four models using likelihood-ratio tests (Table 2) suggested that the optimal model for both school engagement and goal structure is a linear GCM with non-constant error variances. For both variables, the linear GCM with non-constant error variances fit better than the linear GCM with constant error variance but did not differ in fit from the quadratic growth model with nonconstant error variance. Table 3 summarizes the parameter estimates for the optimal models.

As shown in Table 3, on average, teacher ratings of students' behavioral engagement decreased over the four grades (slope = $-.036$ with $SE = .016$, $p = .024$). However, there was no significant variability in the slope across the students (slope variance = $.019$, $SE = .012$, ns). There was a negative correlation between the estimated level of school engagement at grade 2 (intercept) and the slope (covariance between intercept and slope = $-.081$ with $SE = .025$, $p = .001$, correlation = $-.742$). This finding suggests that higher teacher reported behavioral engagement at grade 2 was associated with relatively faster rates of decline (more negative slopes) over the four grades.

On average, there was an increase in teacher reported performance goal practices over the four grades (average slope = $.108$ with $SE = .019$, $p < .001$), suggesting that teachers were systematically becoming more ability-goal oriented with increasing grade level. Each student had a different set of teachers across the four years, so these results provide a summary of each student's unique experience. Given that the very small variance in the slope of teacher reported performance goal practices led to problems in estimation, the slope variance and the covariance between the intercept and slope for goal practices were fixed at 0.

Longitudinal Relation between Engagement and Performance Goal Practices

We combined the separate GCMs for the two outcomes to examine the longitudinal relations between the two outcomes. In planning the study, we noted that the longitudinal relation between two outcome variables over grades 2–5 might be reflected one or both of the following ways. First, the growth parameters for the two outcomes might be related. Of most importance for a linear model, the correlation between the slopes for the two outcomes captures the relations between the predicted growth trajectories for the two outcomes (Curran, Stice, & Chassin, 1997). Second, the predicted synchronous relation between the two outcomes at each measurement wave (i.e., grade level) might exist. This relation is indicated by the covariance between the deviations of individual observations from the predicted individual trajectories for teacher-reported performance goal practice and the deviations of the individual observations from the predicted individual trajectories for teacher-reported behavioral engagement at each measurement wave (see Bollen & Curran, 2004). These relations are depicted in Figure 1 by curved double headed arrows between the residuals of the two series (e.g., Ee2 and Pe2) shown with values in a box in the middle of the Figure. The synchronous relation captures the association between the two outcomes within each measurement wave that cannot be explained by the predicted growth trajectories. For ease of interpretation, one would ideally wish to see a constant synchronous relation over time reflecting similar relations within each grade level.

Given that we fixed the variance of the slope for teaching practice at 0, we cannot examine the relation between this slope and any other growth parameter. We could examine only the association between the intercepts for teacher-reported performance goal practice and teacher-reported behavioral engagement and between the intercept for teacher reported performance goal practice and the slope for teacher reported behavioral engagement. The results indicated that neither of these associations was significant. Consequently, we focused on the predicted negative synchronous relation between the two outcome variables of teacher-reported performance-oriented instructional practices and teacher-reported behavioral engagement. The data for teacher-reported performance goal practice are clustered. Because there was one performance goal practice score for each teacher, students sharing the same teacher at each grade would have the same teaching performance practice score. There were 497 students in the sample. There were 199, 198, 265, and 255 clusters (i.e., teachers) at grades 2 to 5, respectively. In the majority of the cases, 3 or fewer students shared the same teacher. Although each student had different teachers across grades, the clustering within each grade might conceivably affect the analysis. Given the very small cluster sizes (many of size 1) in the present analyses, the expected effect of clustering would theoretically be expected to be minimal; problems in proper estimation of the cross-classified random effects model would also be likely. Thus we did not attempt to adjust for the effect of time-varying clustering in our analyses.

In the ALT model depicted in Figure 1, we first allowed the synchronous covariances to vary across grades. Then we used likelihood-ratio test to examine whether those covariances are equal across grades. The results showed that the synchronous covariances were constant across grades (covariance = $-.025$ with $SE = .015$, $p = .044$, one tailed). The correlations between the deviation scores of the two outcome variables ranged from $-.049$ to $-.065$. The correlations vary across grades because we allowed the residual variances to differ across grades. Correlations between residuals are expected to be small and likely underestimate the true magnitude of relation. The negative constant synchronous relation implies that across all four grades, when a student experienced teaching practice that was a positive deviation (e.g., more performance-oriented practices) from the predicted trajectory for that student, that student's level of teacher-reported behavioral engagement tended to be lower.

Gender Differences in Teacher-Reported Behavioral Engagement

Multiple group analyses were conducted to test whether boys and girls differ in their change trajectories for teacher-reported behavioral engagement. We started with the optimal model identified in the previous analysis of behavioral engagement (i.e., a linear trajectory with residual variances varying across time). We then added equality constraints on variance components and mean components across gender groups sequentially (see Table 4). Likelihood-ratio tests suggested that the girls and boys did not differ in any of the variance components (intercept and slope variances, covariance between intercept and slope, and residual variances) and mean slope. However, the mean intercepts did differ across the two groups, $\chi^2(1) = 23.60, n = 497, p < .001$; girls: mean intercept = 3.629, boys: mean intercept = 3.289). These results suggested that, although girls started with a higher level of behavioral engagement at grade 2 than boys, girls and boys did not differ in either their average rate of change for behavioral engagement nor in the variability of the growth trajectories. Otherwise stated, girls were more engaged in school than boys by .34 points in grade 2 on a scale that ranged from 1 to 5, and this difference was constant over the duration of the study.

Gender Differences in Synchronous Correlation

Multiple group analysis was also used to examine possible gender differences in synchronous covariances between the residuals from the individual trajectories for teacher-reported performance practice and teacher-reported behavioral engagement. Previous analysis showed that the synchronous relation is constant across grades for the whole sample. However, these relations could not be assumed to be constant across grades 2–5 within each of the gender groups. Thus, we first allowed the synchronous relation to vary across grades for boys and girls and then imposed equality constraints on the covariances across grades, across gender, and across both grade and gender sequentially. Four models were examined (see Table 5): a model without equality constraints on the synchronous covariances across either gender or grades (model 10), a model with synchronous covariances equated across gender but freely estimated across grades (model 11), a model with synchronous covariances equated across grades but freely estimated across gender (model 12), and a model with synchronous covariances equated across both gender and grades (model 13). Likelihood-ratio tests suggested not only that the synchronous covariances were constant across grades for both girls and boys but also that girls and boys did not differ in the constant synchronous covariances. These results indicate that the same negative relation exists between teacher-reported performance goal practice and teacher-reported behavioral engagement in school across gender and the four school grades (2–5) examined in this study.

Discussion

This is the first longitudinal study to investigate the effect of teacher-reported performance-oriented goal practices on elementary students' teacher-rated behavioral engagement. Growth curve models were used to estimate optimal growth models for the two outcomes, performance-oriented goal practices and student behavioral engagement. An ALT model (Bollen & Curran, 2004) was then used to investigate whether deviations from teachers' performance-oriented goal practices were negatively related with deviations from the students' expected level of behavioral engagement. The finding of a significant negative covariance between deviations in the two outcomes indicates that, as expected, increases in the performance orientation of students' classrooms is associated with decreased engagement of students. As students move into classrooms with a new teacher with less emphasis on a performance-oriented goal structure, they become more behaviorally engaged in school. By analyzing trajectories in both processes over four years, the current study

provides some of the strongest long-term evidence to date that teacher instructional goal practices may have implications for elementary students' engagement in learning. Although our design does not permit strong causal inferences, it is important to note that prior experimental and quasi-experimental studies that manipulated teacher instructional practices found parallel short-term effects on variables that are precursors to behavioral engagement (Ames, 1984; Elliot & Dweck, 1988; Linnebrink, 2005).

The present study is also the first to describe trajectories of teacher-reported performance-oriented instructional practices. As grade level increases in elementary school, teachers increase their use of strategies that make relative ability more salient and that emphasize grades and competition. However, one cannot conclude that this trajectory is a result of the increased emphasis in recent years on standards-based assessment and "high stakes" testing because the historical data necessary for the comparison is not available. One can conclude, however, that a trajectory of increasingly performance-oriented instructional practices begins well prior to the transition from elementary school to middle school. On average, there was also a decrease in students' teacher-rated behavioral engagement from grade 2 to grade 5. Although boys and girls consistently differ in their level of engagement, their growth patterns are similar, and the synchronous covariance between the deviations from the instructional practices and engagement trajectories does not differ across grades 2–5.

Limitations and Future Research Directions

Because the data are correlational, one cannot reach definitive causal inferences regarding the effect of teacher-reported performance-oriented instructional practices on teacher-reported behavioral engagement. However, the consistency of the relation between grades 2–5 and across gender is notable. Teachers reported on their instructional practices at the classroom level and not in relation to a particular student. The mean number of study students enrolled in a given classroom was 2.45 ($SD = 1.96$). The authors do not believe it is plausible that an individual student's behavioral engagement would affect the teachers' classroom-wide instructional practices. However, third variables not included in the study, such as the classroom ability composition or teacher variables such as years of experience, could possibly account for the association between instructional practices and engagement. Perhaps the biggest potential limitation is our reliance on the teacher to report both on instructional practices and on student behavioral engagement. Whereas teachers' reports of students' classroom behaviors have been found to be valid (Achenbach, 1991; Hill & Hughes, 2007), little is known about the validity of teachers' reports of their instructional goal practices. Also, we cannot rule out the possibility that teachers who report using performance oriented practices might be biased in their perceptions of students' engagement.¹ Observational studies would permit a clearer test of an effect of the classroom goal structure on student engagement in learning, although likely at a cost of permitting less examination of the longer term effects. Finally, the sample was comprised of academically at-risk, continuously promoted students who may be at greater risk of being undermined by performance-oriented instructional practices than students who enter elementary school with above average literacy skills. The present findings might not generalize to students with above average literacy skills or to lower achieving students who are retained in grade.

¹Both the intraclass correlations (ICCs, ratio of between group variance to total variance) and average cluster size (n , number of students sharing the same teacher) were small in the study. The ICCs were .07, .08, .10 and 0 for grades 2–5, respectively. The average cluster sizes were 2.84, 2.63, 2.05 and 2.09 across the four grades. We also calculated the design effect (deff) which is a function of the ICC and average cluster size ($deff = 1 + ICC*(n - 1)$) for each of the years. The design effects were 1.120, 1.136, 1.104 and 1, suggesting that the clustering of students within teacher did not inflate sampling variability substantially. Consequently, clustering would not substantially affect the standard error estimates in our study. Consequently, we ignored the clustering in the data analysis.

Future research employing multiple measures of classroom goal structures and samples of students who are representative of the full spectrum of academic ability is necessary to test the robustness of these findings. Experimental studies that manipulate classroom goal structures across shorter periods of time, such as six weeks, while observing students' behavioral engagement, would provide a stronger test of the causal effect of classroom goal structures on students' engagement. Future research is also needed to determine teacher and school-level factors that are associated with performance goal practices or that may moderate the associations between performance goal practices and student behavioral engagement.

Implications

Results show that elementary school teachers differ in their reported use of performance-oriented practices, and these differences matter for low-achieving students. These findings have implications for the practice of school psychology. First, the findings underscore the importance of developing and evaluating teacher professional development interventions that support teachers' reduced reliance on performance-oriented instructional practices and increased use of mastery-oriented practices such as rewarding effort and improvement, providing private performance feedback, and utilizing cooperative learning tasks. A new generation of teacher professional development programs shows promise in changing teachers' classroom instructional behaviors and student outcomes (e.g., Freiberg, Huzinec, & Templeton, 2009; Gallimore, Ermeling, Saunders, & Goldenberg, 2009; Landry, Swank, & Monseque-Bailey, 2009; Pianta, Mashburn, Downer, Hamre, & Justice, 2008). Although these programs differ in their specific foci and methods, they all are *intensive* programs, lasting months instead of days, providing clear exemplars of specific skills in classroom settings, and providing classroom-based feedback and individual consultation as teachers practice specific skills. These programs are successful in increasing teacher instructional practices that are consistent with a mastery goal structure.

Second, as members of a profession committed to increasing equity in educational opportunities, school psychologists should work to ensure that high quality teacher professional development efforts that incorporate the above principles become more widely available to schools. Elementary classrooms across the United States vary tremendously on indicators of effective instructional practices (Pianta, Belsky, Houts, Morrison, & National Institute of Child Health and Human Development, 2007; Rimm-Kaufman, La Paro, Downer, & Pianta, 2005). Furthermore, poor and minority students are more likely to be in classrooms with the lowest level of instructional quality (Pianta et al., 2007). Increasing access of teachers in schools serving poor and minority students to high-quality professional development programs that address classroom goal structures and other dimensions of instructional quality is critical to efforts to reduce disparities in educational achievement.

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Figure 1.

Synchronous relation between teacher-reported behavioral engagement and teacher-reported performance goal practice.

* $p < .05$. Tests of key directional hypotheses are one-tailed as noted in text.

Table 1

Descriptive Statistics for Behavioral engagement and Teaching Practice at Grades 2 to 5

Time	Behavioral Engagement			Performance Practice		
	Mean	SD	N ^a	Mean	SD	N ^a
Grade 2	3.51	1.05	428	2.36	0.78	410
Grade 3	3.37	1.00	364	2.59	0.77	339
Grade 4	3.39	0.78	364	2.59	0.76	337
Grade 5	3.39	0.80	362	2.70	0.88	356

Note.

^aThe number of observations at each grade level.

Chi-square Difference Tests for Locating the Optimal Growth Curve Model for Behavioral Engagement and Teaching Practice Separately

Table 2

Model	Behavioral Engagement		Performance Practice	
	Chi-square	Chi-square difference test	Chi-square	Chi-square difference test
Model 1	χ^2 (df = 4) = 12.89		χ^2 (df = 6) = 10.03	
Model 2	χ^2 (df = 7) = 27.33	χ^2 (Model 2 – Model 1) = 14.44, df = 3, $p < .01$	χ^2 (df = 7) = 13.28	χ^2 (Model 2 – Model 1) = 3.25, df = 1, $p = .07$
Model 3	χ^2 (df = 5) = 16.14	χ^2 (Model 3 – Model 1) = 3.25, df = 1, $p = .07$	χ^2 (df = 7) = 12.34	χ^2 (Model 3 – Model 1) = 2.31, df = 1, $p = .13$
Model 4	χ^2 (df = 8) = 31.20	χ^2 (Model 4 – Model 3) = 15.05, df = 3, $p < .01$	χ^2 (df = 10) = 22.68	χ^2 (Model 4 – Model 3) = 10.34, df = 3, $p = .02$

Note. The likelihood-ratio (chi-square difference) tests for behavioral engagement are presented in column 3, and the likelihood-ratio tests for goal structure are presented in column 5. Model 1 = Quadratic growth model with nonconstant residual variance; Model 2 = Quadratic growth model with constant residual variance; Model 3 = Linear growth model with nonconstant residual variance; Model 4 = Linear growth model with constant residual variance. For behavioral engagement, we fixed the variance of the quadratic term and correlations related to the quadratic term to be 0. For performance practice, we fixed the variance of both the linear and quadratic term and any correlations related to them to be 0.

Table 3
Parameter Estimates in the Optimal GCMs For Behavioral Engagement and Teaching Practice

Parameter	Behavioral Engagement		Performance Practice	
	Estimate	SE	Estimate	SE
Mean Intercept	3.460**	0.046	2.399**	0.034
Mean Slope	-0.036*	0.025	0.108**	0.019
Variance in intercept	0.631**	0.076	0.023	0.017
Variance in slope	0.019	0.012	0.000 ^a	0.000
Covariance between intercept and slope	-0.081**	0.025	0.000 ^a	0.000
Residual variance at grade 2	0.487**	0.076	0.583**	0.046
Residual variance at grade 3	0.438**	0.044	0.576**	0.048
Residual variance at grade 4	0.293**	0.031	0.555**	0.047
Residual variance at grade 5	0.295**	0.044	0.756**	0.059

Note.
* $p < .05$;
** $p < .01$.
^aFixed at 0.

Table 4
Likelihood-Ratio Tests for Gender Difference in GCM for Behavioral Engagement

Model	Behavioral engagement	
	Chi-Square	Likelihood-Ratio Test
Model 5	χ^2 (df = 10) = 19.05	
Model 6	χ^2 (df = 13) = 22.90	χ^2 (Model 6 – Model 5) = 3.85, df = 3, p = .56
Model 7	χ^2 (df = 17) = 23.49	χ^2 (Model 7 – Model 6) = 0.59, df = 4, p = .98
Model 8	χ^2 (df = 18) = 47.09	χ^2 (Model 8 – Model 7) = 23.60, df = 1, p < .001
Model 9	χ^2 (df = 18) = 26.04	χ^2 (Model 9 – Model 7) = 2.55, df = 1, p = .20

Note. The likelihood-ratio tests are reported in the third column. Model 5 = No Equality constraint; Model 6 = Variances of intercept and slope, covariance between intercept and slope were constrained to be equal across gender; Model 7 = Residual variances equated across gender+ constraints in model 6. Note that the residual variances varied across time; Model 8 = Mean intercept equated across gender + constraints in model 7; Model 9 = Mean slope equated across gender+ constraints in model 6.

Likelihood-Ratio Test for Gender Difference in Synchronous Relation between Behavioral Engagement and Performance Practice

Table 5

Model	Chi-Square	Likelihood-Ratio Test
Model 10	χ^2 (df = 62) = 74.88	
Model 11	χ^2 (df = 68) = 82.43	χ^2 (Model 11 – Model 10) = 7.55, df = 6, p = .27
Model 12	χ^2 (df = 66) = 81.48	χ^2 (Model 12 – Model 10) = 6.6, df = 4, p = .16
Model 13	χ^2 (df = 69) = 82.50	χ^2 (Model 13 – Model 10) = 7.62, df = 7, p = .37

Note. The likelihood-ratio (chi-square difference) tests are reported in the third column. Model 10 = no equality constraints on the synchronous correlations across either gender or grades; Model 11 = Synchronous covariances are freely estimated within each gender but equated across gender; Model 12 = Synchronous covariances are equated across grades but freely estimated across gender; Model 13 = Synchronous covariances are equated across gender and grades.