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Teacher- and school-level predictors of teacher efficacy and burnout: Identifying potential areas for support[☆]

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ABSTRACT

Although several studies relate low teacher efficacy and high burnout to the quality of instruction and students' academic achievement, there has been limited research examining factors that predict teacher efficacy and burnout. The current study employed a longitudinal, multilevel modeling approach to examine the influence of teacher- and school-level factors on the development of both teacher efficacy and burnout. Data were collected 3 times across 2 academic years from 600 teachers at 31 elementary schools. The results indicated that both teacher efficacy and burnout increased over time. Teacher preparedness and perceptions of teacher affiliation and leadership were significantly associated with both the intercept and growth of teacher efficacy and burnout; however, school-level factors were generally unrelated to both outcomes. Implications for screenings and teacher-targeted interventions are discussed.

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1. Introduction

With approximately half of all teachers leaving the field within their first five years, there is a great need for research on factors commonly associated with teachers' job satisfaction and retention, such as teacher efficacy and burnout. Legislative mandates, heightened accountability, and high rates of behavioral challenges among students have increased interest in the climate of schools and the role teachers play in student outcomes.

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These growing pressures likely impact teacher efficacy and burnout, which both contribute to teacher turnover (Glickman & Tamashiro, 1982; Marvel, Lyter, Peltola, Strizek, & Morton, 2006). Given that teacher efficacy and burnout are also linked with effective instruction and a number of student outcomes (Skaalvik & Skaalvik, 2007), identifying predictors of low teacher efficacy and high burnout, and changes in these key teacher factors over time, may result in both increased staff retention and enhanced student outcomes.

1.1. Definitions and effects of teacher efficacy and burnout

Research on *teacher efficacy* is rooted in the broader social cognitive literature on *self-efficacy* (Bandura, 1977), which is defined as a person's general belief of one's own ability to execute the tasks required by their job. Teacher efficacy relates both to the ability to create an adequate learning environment and to deliver academic instruction. An important aspect of teacher efficacy is the belief that one has the ability to successfully teach children who are at risk for school failure because of their behavior, family background, or other external factors (Gibson & Dembo, 1984); therefore, teachers with low teacher efficacy typically believe that their ability to impact student learning is hampered by external factors (Gibson & Dembo, 1984). A factor related to teacher efficacy is *locus of control* (Hoy & Woolfolk, 1993), the extent to which teachers believe that they can control the outcomes—specifically, learning or behavior—in their classroom (Brouwers, Tomic, & Boluijt, 2011; McCoach & Colbert, 2010; Rotter, 1954). An associated construct is *burnout*, the inability to effectively perform one's job as a result of job-related stress (Betoret, 2009; Skaalvik & Skaalvik, 2010). Burnout has been investigated in a variety of work settings, including schools (e.g., Betoret, 2009; Brouwers et al., 2011; Maslach & Jackson, 1981). An essential aspect of teacher burnout is emotional exhaustion (Tsouloupas, Carson, Matthews, Grawitch, & Barber, 2010), which occurs when a teacher is no longer able to provide students with support (Maslach, Jackson, & Leiter, 1996).

Not surprisingly, a number of studies have linked teacher efficacy and burnout with indicators and predictors of both teacher performance and student achievement (Tschannen-Moran, Woolfolk Hoy, & Hoy, 1998; Tsouloupas et al., 2010). Specifically, teacher efficacy has been shown to be positively correlated with effective instruction, proactive and positive classroom management (Woolfolk, 2007), and students' academic performance (Skaalvik & Skaalvik, 2007, 2010; Tschannen-Moran & Woolfolk Hoy, 2001; Wolters & Dougherty, 2007). On the other hand, teachers who experience high levels of burnout are at increased risk of experiencing both physical and mental health problems, which could result in diminished performance and increased irritability (Huberman, 1993). Teachers reporting high levels of burnout are often less tolerant of student conduct, which may contribute to problematic student behavior through teachers' inability to mediate and calmly pacify potentially volatile situations (Huberman, 1993; Lamude & Scudder, 1992). The physiological and emotional characteristics associated with burnout often can lead to increased absenteeism (Schonfeld, 2001), which results in a greater need for costly substitute teachers. Although several studies have documented the potentially negative effects of low teacher efficacy and high rates of burnout (Huberman, 1993; Hughes, 2001; Jenkins & Calhoun, 1991; Lamude & Scudder, 1992; McCoach & Colbert, 2010), comparatively few studies have examined the predictors of teacher efficacy and burnout (e.g., Brouwers et al., 2011) or changes in these factors over the course of multiple school years.

1.2. Potential predictors of teacher efficacy and burnout

Social cognitive theory (Bandura, 1977) suggests that prior experience (e.g., teacher preparation and training) and perceptions of the school context (e.g., organizational and leadership factors) would be associated with teacher efficacy and burnout. In the following sections, we consider the extant research linking each of these factors and potential individual characteristics of teachers possessing teacher efficacy and experiencing burnout.

1.2.1. Teacher demographic characteristics

There has been some research examining demographic factors, like gender, in relation to different aspects of burnout. Specifically, three aspects of burnout (i.e., depersonalization, emotional exhaustion, and personal accomplishment) have been studied, often individually. For example, research on gender shows that men are more likely to report elevated levels of depersonalization specifically (Schwab & Iwanicki, 1982; Schwab, Jackson, & Schuler, 1986), whereas women typically report higher levels of emotional exhaustion and reduced

personal accomplishment (Lau, Yuen, & Chan, 2005). There has been less research on the relation between teacher efficacy and gender, with relatively few studies demonstrating a link between the two variables. However, most of the studies exploring this association had relatively small sample sizes and typically included few male teachers, thus limiting their power (e.g., Maslach & Jackson, 1981; Ross, Cousins, & Gadalla, 1996). Nevertheless, based on prior research (e.g., Ross et al., 1996), we hypothesized that female teachers would report higher levels of emotional exhaustion, or burnout in the current study. We made no specific hypothesis regarding gender and efficacy, due to the lack of prior research on this issue. Although few studies have examined the relation between teacher efficacy or burnout and race/ethnicity, it was expected that teachers who are racial/ethnic minorities would report higher rates of burnout and lower teacher efficacy in comparison to their colleagues. This hypothesis was based, in part, on prior findings regarding the association between race/ethnicity and staff members' perceptions of the school environment (Bevans, Bradshaw, Miech, & Leaf, 2007) and the hypothesis that as minorities in the school environment, both men and racial/ethnic minorities (i.e., assuming racial/ethnic minorities are a minority in the school) may feel more isolated and therefore may encounter higher levels of burnout.

1.2.2. Teacher preparation and experience

A construct related to teacher efficacy is preparedness. Teachers who feel better prepared report feeling highly capable of educating current students. Furthermore, teachers who are more prepared to meet the demands of the job report higher teacher efficacy, less burnout (specifically, emotional exhaustion), and a closer connection to their students (Schonfeld, 2001; Tatar & Horenczyk, 2003). Additionally, first-year teachers who ended the year feeling efficacious reported having higher quality preparation than did those with lower efficacy, suggesting that effective teacher preparation and efficacy are positively associated (Tschannen-Moran et al., 1998). It is likely that teachers with more advanced training feel more prepared to handle different challenges, and thus, they are more likely report higher levels of teacher efficacy, which then renders them less vulnerable to burnout (Brissie, Hoover-Dempsey, & Bassler, 1988; Brouwers et al., 2011; Brouwers & Tomic, 2000). Although teacher preparation has been linked with burnout, the number of years of teaching experience has not. For example, a study by Anderson and Iwanicki (1984) found that new teachers and veteran teachers reported similar levels of burnout. As a result, we hypothesized that preparedness and having a graduate degree would be related to greater teacher efficacy and lower burnout whereas years of experience would be unrelated to burnout but would be associated with greater teacher efficacy.

1.2.3. Perceptions of the school environment

In addition to our overarching social cognitive theoretical framework, we also draw upon the job demands–resources theoretical model of burnout (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001), which suggests that when teachers work in an environment with a high level of demand, they are more likely to express burnout (Brouwers et al., 2011; Demerouti et al., 2001). Similarly, a lack of sufficient resources and administrative support has been linked with increased aspects of burnout, such as disengagement from work (Demerouti et al., 2001); however, jobs with better organizational capacity (e.g., participation in decision making and increased autonomy) and social and emotional support can protect employees against the harmful effects of high levels of demand (Demerouti et al., 2001; for a review of research on this model, see Bakker & Demerouti, 2007). The organizational health of the school environment may relate both directly and indirectly to staff perceptions, burnout, and teacher efficacy (Hoy & Woolfolk, 1993). For example, prior research indicates that staff who perceive their school to be organizationally healthy report higher levels of work commitment (Tarter, Bliss, & Hoy, 1989; Tarter, Hoy, & Kottkamp, 1990) and teacher efficacy (Hoy & Woolfolk, 1993), which, in turn, enhances the quality of educational services they provide to students (Tsui & Cheng, 1999).

Specific school-based organizational and social resources, such as principal leadership and collegial support, may also be associated with decreased levels of burnout and increased teacher efficacy. Research suggests that when principals address and support school-wide issues, such as the development of a consistent structure for management of student behavioral infractions, greater efficacy is reported among staff members (Hipp, 1997; McCoach & Colbert, 2010). Furthermore, teachers report greater teacher efficacy when they receive greater principal support (Tschannen-Moran & Woolfolk Hoy, 2001). Strained teacher–administration relationships have also been shown to predict teacher pessimism (Grayson & Alvarez, 2008), which likely translates into increased burnout (Hepburn & Brown, 2001). The more satisfied a teacher is with the decisions made and the support provided by the principal, the more positive this teacher's outlook toward

their job will be (Hepburn & Brown, 2001). Therefore, we hypothesized that better perceptions of principal leadership would be associated with higher teacher efficacy and lower burnout.

On the other hand, inconsistency in the school's leadership, as evidenced by principal turnover, may be associated with greater burnout. In fact, principal turnover is typically linked with poorer outcomes for both students and staff (for a review, see Norton, 2002). Although prior research has linked administrator turnover with poorer school climate, there has been less empirical research investigating its association with teacher reports of burnout or efficacy. One would expect that principal turnover would be associated with both, as inconsistent leadership may result in instability and unpredictability for teachers.

Teacher affiliation, the sense of friendliness between teachers and their strong connections to the school (Hoy & Hannum, 1997), also seems to be an important resource and has been linked with greater commitment to students and colleagues (Henderson et al., 2005) and teacher efficacy (Tschannen-Moran & Woolfolk Hoy, 2001, 2007). When provided with opportunities to collaborate with other staff, teachers also report a greater sense of efficacy (Tschannen-Moran & Woolfolk Hoy, 2007). Higher ratings of affiliation were expected to be related to increased teacher efficacy and decreased burnout.

Another potential contributor to teacher efficacy and burnout is teachers' assessment of student and parent involvement and the extent to which students prioritize academic achievement. For example, when teachers perceive that students and their parents are highly involved in their education, these teachers may feel a greater internal locus of control resulting in greater teacher efficacy and lower burnout (Gibson & Dembo, 1984). In addition, this perception may decrease the actual or perceived demands of a teacher's job to educate their students. Therefore, we expected that higher teacher ratings of parent and student involvement and academic emphasis would be associated with higher levels of teacher efficacy and lower burnout.

Finally, the job demands–resources model, together with social disorganization theories (Shaw & McKay, 1972), suggests that structural aspects of the school, such as high concentration of student poverty, large school size, high student mobility, and high rates of student behavior problems, likely challenge the school's functioning and stability (Birnbaum et al., 2003), and increase demands on teachers (Demerouti et al., 2001), which in turn likely affects teachers' efficacy and burnout (Hoy, Tarter, & Bliss, 1990). Therefore, we hypothesized that these school-level indicators of disorder would be associated with less efficacy and higher rates of burnout within the current study.

1.3. Overview of the current study

Despite the increased interest in teacher efficacy and burnout, there has been limited research focused on identifying a variety of teacher and school contextual factors that predict the changes in teacher efficacy and burnout over time. Although cross-sectional research can shed light on the factors associated with teacher efficacy and burnout, further research is needed to examine how teacher and contextual factors are associated with changes in these two constructs over time, as such work has important implications for interventions. We focused specifically on the efficacy to handle behavioral concerns because of their relevance to teacher performance in the classroom and retention, as well as to student outcomes, and the emotional exhaustion aspect of burnout. More specifically, the majority of studies reviewed explicitly examined emotional exhaustion (i.e., calling it burnout) as we do here. Teacher efficacy as it relates to student behavior is important in determining teachers' perceived ability to instruct and is largely absent in the research. To address gaps in the extant research, we examined how (a) teacher efficacy and burnout change over time, (b) teacher characteristics, attitudes, and perceptions relate to these changes (i.e., growth) over time; and (c) how school-level variables relate to teacher efficacy and burnout. To examine these aims, we considered the following four groups of factors that are hypothesized to be related to teacher efficacy and burnout and that could influence changes over time: (a) teacher demographic characteristics (i.e., gender and race/ethnicity), (b) teacher experience (i.e., education, preparedness, and years teaching), (c) teacher perceptions of the school environment (i.e., principal leadership, teacher affiliation, academic emphasis, and student and parent involvement), and (d) school-level contextual factors (e.g., organizational health, indicators of disorder, and principal turnover).

We employed a longitudinal, multilevel modeling approach to examine the main effects of these four sets of predictors, measured in the fall of one school year, in relation to teacher efficacy and burnout across two years. Specifically, we were interested in the association between these variables and both the intercept and growth of teacher efficacy and burnout over the course of two school years. A multilevel

modeling approach was necessary, due to the nested nature of the data and our hypotheses, as highlighted throughout the introduction. These analyses allowed us to simultaneously examine the relation between teacher and school contextual factors and the intercept and growth of teacher efficacy and burnout. The study was intended to enhance the understanding of the association between teacher- and school-level characteristics with teacher efficacy and burnout. These findings may inform the development of screening and intervention procedures to prevent negative outcomes for both teachers and students.

2. Method

2.1. Participants

Data for the current study were collected from 600 teachers in 31 Maryland public elementary schools during the fall of 2007 and the spring of 2008 and 2009. See Table 1 for demographic information on the participating schools and teachers.

2.2. Measures

2.2.1. Teacher-level outcomes

Teachers completed a five-item measure of Teacher Efficacy (Hoy & Woolfolk, 1993) that specifically related to handling students with behavior problems (e.g., “I can effectively work with deviant or disruptive students” and “I can manage almost any student behavior problem;” $\alpha = .84$). This particular facet of teacher efficacy was selected due to our broader interest in targeting teacher factors in order to optimize teacher performance and retention, as well as to reduce children’s behavior problems. Considerable research has examined the reliability and validity (e.g., concurrent and predictive validity) of this widely-used measure (see Hoy & Woolfolk, 1993). Teachers also completed a self-report measure of the Emotional Exhaustion component of Burnout (Maslach & Jackson, 1986), which included four items (e.g., “I feel emotionally drained

Table 1
Teacher and school demographic characteristics.

Teacher characteristics ($N = 600$ teachers)	N (%)
Gender – female	564 (94.0)
Race/ethnicity – White	511 (85.2)
Highest education level – graduate degree	261 (43.5)
Number of years experience (mean [SD])	8.27 (8.41)
Teacher ratings	Mean (SD)
Baseline efficacy	3.03 (0.57)
Baseline burnout	2.17 (0.84)
Spring year 1 efficacy	3.01 (0.61)
Spring year 1 burnout	2.61 (0.86)
Spring year 2 efficacy	3.05 (0.56)
Spring year 2 burnout	2.82 (0.85)
Parent and student involvement	2.37 (0.64)
Teacher preparedness	3.28 (0.59)
Collegial leadership	3.17 (0.70)
Teacher affiliation	3.19 (0.53)
Academic emphasis	2.56 (0.49)
School characteristics ($N = 31$ schools)	Mean (SD)
Student mobility	33.83 (25.62)
School enrollment	461.74 (141.53)
Student suspension rate	9.79 (7.26)
Free and reduced meals (FARMs) rate	45.20 (18.28)
Number of schools with principal turnover (%)	8 (25.8%)

Note. All teacher ratings are on a scale of 1 to 4.

from my work” and “I feel like I am at the end of my rope;” $\alpha = .90$) from the Maslach Burnout Inventory (Maslach et al., 1996), which is a widely used measure of teacher-reported burnout that is supported by considerable reliability and validity evidence (see Maslach & Jackson, 1981). Our decision to focus on this particular aspect of burnout was informed by prior psychometric research on this measure that highlighted the significance of items tapping emotional exhaustion (e.g., “I feel burned out by my work;” Maslach & Jackson, 1981). Teachers completed both measures by responding on a four-point Likert-type scale, which was scored such that higher scores indicated higher ratings of teacher efficacy and burnout. Item responses were averaged to create a scale score, ranging from 1 to 4. Therefore, a desirable score for teacher efficacy was high and for burnout was low.

2.2.2. Teacher demographics

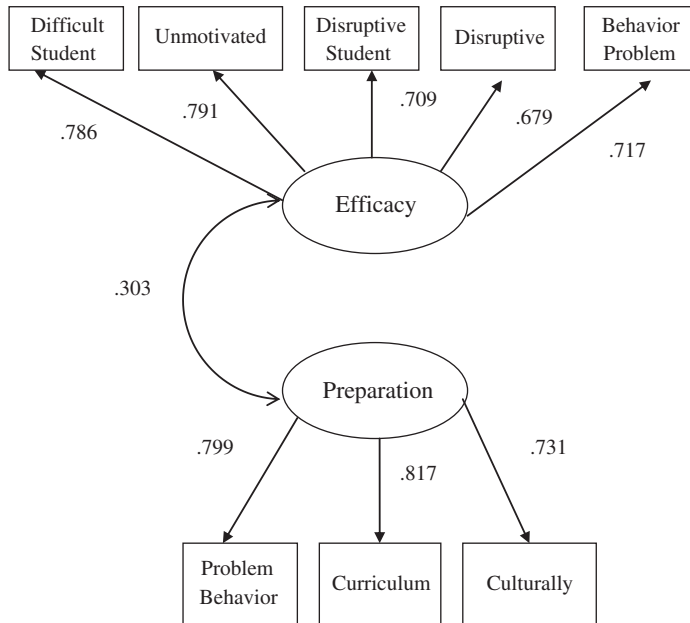
Data regarding the individual teachers' demographic information were assessed through a brief self-report measure. The demographic measure included their gender (coded 1 = men, 0 = women) and their race/ethnicity. Given the relatively small sample of non-White staff (see Table 1), we coded the race/ethnicity as White = 0 and non-White = 1.

2.2.3. Teacher preparation and experience

Teachers responded to a series of questions regarding different aspects of their preparation and experience. These variables included teachers' number of years of teaching experience and education level (coded 1 = received a graduate degree and 0 = no graduate degree). Teachers also completed a brief measure of Teacher Preparedness, which comprised three items indicating teachers' preparation in handling a range of classroom management and disruptive behavior concerns, selecting and adapting curriculum and instructional materials, and providing culturally responsive instruction ($\alpha = .82$). The responses to these items were averaged to create a scale score for each teacher. The Teacher Preparedness items were taken from the teacher-report version of the Schools and Staffing Survey (SASS; National Center for Education Statistics (NCES), 2007). Similar measures of preparedness have been examined and found to be significantly related to efficacy and emotional exhaustion (Schonfeld, 2001; Tatar & Horenczyk, 2003). Teachers responded to a four-point Likert-type scale, which was scored such that higher scores indicated higher levels of preparation. Although there may seem to be overlap in the constructs of efficacy and preparedness, both exploratory factor analyses and confirmatory factor analyses confirmed that these measures reflect distinct constructs and are not redundant. The results of the two-factor model (including Efficacy and Preparation) from a confirmatory factor analysis (CFA) are depicted in Fig. 1; the two-factor model was significantly better fitting than a single-factor model wherein the two factors were combined into a single factor, χ^2 diff = 516.091, df diff = 1, $p < .001$.

2.2.4. Perceptions of the school environment

Teachers completed the 31-item Organizational Health Inventory (OHI; Hoy & Feldman, 1987) as an indicator of school context. The following three subscales of the OHI were modeled as teacher-level report measures: the Collegial Leadership scale comprised 10 items (e.g., “The principal conducts meaningful evaluations” and “The principal treats all faculty as his or her equal,” $\alpha = .94$), the Teacher Affiliation scale comprised nine items (e.g., “There is a feeling of trust and confidence among the staff” and “Teachers identify with the school;” $\alpha = .88$), and the Academic Emphasis scale comprised five items (e.g., “Students respect others who get good grades” and “Students neglect to do homework;” $\alpha = .68$). Teachers responded to these scales on a four-point Likert-type scale, which ranged from *rarely occurs* to *very frequently occurs*. These scales were scored such that higher scores indicated higher levels of leadership, affiliation, and academic emphasis. Teachers also completed a brief measure of teachers' perceptions of Parent and Student Involvement, which comprised seven items in which teachers rated indicators of involvement and readiness of parents and students (e.g., parent involvement, student tardiness, and poor student health; $\alpha = .87$). These items were also adapted from the SASS (NCES, 2007). Teachers responded to a four-point Likert-type scale, which ranged from *serious concern* to *not a concern*, and was scored such that higher scores indicated fewer concerns or higher levels of involvement. Each predictor was a mean score of the items on the scale.



Note. All factor loadings are significant at $p < .001$. The two-factor model resulted in a significant improvement in model fit over a single-factor model, χ^2 diff = 516.091, $df = 1$, $p < .001$. Fit indices for this model are CFI = .92, TLI = .88, SRMR = .05, and RMSEA = .10.

Fig. 1. Confirmatory factor analysis results for two-factor model of efficacy and preparation.

2.2.5. School-level contextual factors

School-level indicators of disorder (i.e., mobility, enrollment, and percentage of students suspended in the school) were obtained from the Maryland State Department of Education. Principal turnover between the first and second years were reported to project staff annually on a school profile form, and data were confirmed through review of the staff rosters obtained annually. We also included an overall Organizational Health score representing an average across all OHI items for each staff member ($\alpha = .94$) and aggregated to the school-level by averaging all teachers' overall OHI scores within a building (Hoy & Feldman, 1987). Consistent with prior research, this score was used as a school-level indicator of the overall school environment and organizational health; the OHI scale scores were used as individual teachers' perceptions of the school, as these can vary within schools (Bevans et al., 2007; Hoy & Feldman, 1987).

2.3. Procedure

Staff reports of teacher efficacy, burnout, demographics, and school organizational health were collected in the fall of 2007 via an individually-addressed survey packet. Ratings of efficacy and burnout were also collected in the springs of 2008 and 2009 in the same manner. The survey packets were mailed in bulk to the school; distributed to school mailboxes by the principal, school psychologist, or administrative assistant; and returned to the researchers via a self-addressed, stamped envelope. Staff participation was voluntary, written consent was provided, and confidentiality was ensured. Each staff questionnaire packet included a small incentive (e.g., a disposable ballpoint pen). The staff response rate was 76% in the fall of 2007, 75% in the spring of 2008, and 85% in the spring of 2009. Across the two years, 75% of the total number of teachers employed across both school years had data for both years. Analyses were conducted using data from these 600 teachers.

2.4. Analyses

2.4.1. Missing data

As noted above, the analyses for this study were conducted on 600 teachers in 31 schools. The targeted sample included 849 teachers who identified as general educators, of which 724 were present for the first school year. Those teachers who were not present in the first year did not have baseline predictor variables, and thus, they were omitted from the analyses due to missingness on the predictors (Raudenbush, Bryk, Cheong, Congdon, & du Toit, 2004). The remaining teachers were missing either partial data (49 teachers) or all baseline data (75 teachers), and they were therefore also omitted. The final sample size in this study included 600 teachers. Exploration of factors predicting missingness generally suggested that a few demographic covariates (e.g., male gender and attainment of a graduate degree) were associated with being missing on the outcome variables. Therefore, these covariate variables were included in the analyses.

2.4.2. Multilevel analyses

A series of correlational analyses and factor analyses was completed to ensure that the items on the Preparedness and Efficacy scales assessed distinct constructs and to determine that teacher- and school-level variables were not too highly correlated and would result in collinearity in the multilevel models. The correlations between all teacher variables and schools variables appear in Tables 2 and 3. Three-level growth models were conducted in HLM 6.01 (Raudenbush et al., 2004) to examine the influence of individual teacher variables and school-level variables on teachers' reports of efficacy and burnout across two school years. As noted above, a desirable score on the Efficacy scale was high (or positive coefficient for the intercept), whereas a desirable score on the Burnout scale was low (or negative coefficient for the intercept). The equations used for these two models were as follows:

Level One (Growth)

$$\text{Efficacy/Burnout}_{ij} = \pi_0 + \pi_1(\text{Time}) + e \quad (1)$$

Level Two (Teacher)

$$\pi_0 = \beta_{00} + \beta_{01}(\text{Preparation}) + \beta_{02}(\text{Parent/Student Involvement}) + \beta_{03}(\text{Years Experience}) \quad (2)$$

$$+ \beta_{04}(\text{Graduate Degree}) + \beta_{05}(\text{Gender}) + \beta_{06}(\text{Race}) + \beta_{07}(\text{Principal Leadership})$$

$$+ \beta_{08}(\text{Academic Emphasis}) + \beta_{09}(\text{Teacher Affiliation}) + r_0$$

$$\pi_{1j} = \beta_{10} + \beta_{11}(\text{Preparation}) + \beta_{12}(\text{Parent/Student Involvement}) + \beta_{13}(\text{Years Experience}) \quad (3)$$

$$+ \beta_{14}(\text{Graduate Degree}) + \beta_{15}(\text{Gender}) + \beta_{16}(\text{Race}) + \beta_{17}(\text{Principal Leadership})$$

$$+ \beta_{18}(\text{Academic Emphasis}) + \beta_{19}(\text{Teacher Affiliation}) + r_1$$

Level Three (School)

$$\beta_{00} = \gamma_{000} + \gamma_{001}(\text{OHI}) + \gamma_{002}(\text{Mobility}) + \gamma_{003}(\text{Suspensions}) + \gamma_{004}(\text{Enrollment}) \quad (4)$$

$$+ \gamma_{005}(\text{Principal Turnover}) + u_{00}$$

$$\beta_{01} = \gamma_{010} \quad (5)$$

$$\beta_{02} = \gamma_{020} \quad (6)$$

$$\beta_{03} = \gamma_{030} \quad (7)$$

$$\beta_{04} = \gamma_{040} \quad (8)$$

$$\beta_{05} = \gamma_{050} \quad (9)$$

$$\beta_{06} = \gamma_{060} + u_{06} \quad (10)$$

$$\beta_{07} = \gamma_{070} \quad (11)$$

$$\beta_{08} = \gamma_{080} + u_{08} \quad (12)$$

$$\beta_{09} = \gamma_{090} \quad (13)$$

$$\begin{aligned} \beta_{10} = & \gamma_{100} + \gamma_{101}(\underline{OHI}) + \gamma_{102}(\text{Mobility}) + \gamma_{103}(\text{Suspensions}) + \gamma_{104}(\underline{Enrollment}) \\ & + \gamma_{105}(\text{Principal Turnover}) + u_{10} \end{aligned} \quad (14)$$

$$\beta_{11} = \gamma_{110} \quad (15)$$

$$\beta_{12} = \gamma_{120} \quad (16)$$

$$\beta_{13} = \gamma_{130} \quad (17)$$

$$\beta_{14} = \gamma_{140} \quad (18)$$

$$\beta_{15} = \gamma_{150} \quad (19)$$

$$\beta_{16} = \gamma_{160} \quad (20)$$

$$\beta_{17} = \gamma_{170} \quad (21)$$

$$\beta_{18} = \gamma_{180} \quad (22)$$

$$\beta_{19} = \gamma_{190} \quad (23)$$

Table 2

Correlations among teacher-level factors.

Classroom/ teacher-level factors	Involvement	Preparedness	Leadership	Affiliation	Academic emphasis	Years	Graduate degree	Ethnicity	Gender
Parent and student involvement	1								
Teacher preparedness	.08	1							
Collegial leadership	.07	.10	1						
Teacher affiliation	.25*	.17*	.58*	1					
Academic emphasis	.47*	.16*	.26*	.45*	1				
Years of experience	-.04	.24*	-.07	.01	.00	1			
Teacher has a graduate degree	.02	-.14*	.07	.01	.01	-.38*	1		
Teacher race/ethnicity	.01	.09*	.05	-.08	.05	.10*	-.06	1	
Teacher gender	.10*	.03	-.01	-.03	-.01	-.04	.04	.04	1

Note. Teacher race/ethnicity is coded 1 for not White and gender is coded 1 for male.

* $p < .05$.

Table 3
Correlations among school-level factors.

School-level factors	OHI	Mobility rate	Suspension rate	Student enrollment	Turnover
Organizational Health Inventory (OHI) overall score	1	.19	–.41*	–.30	.08
Student mobility rate (%)		1	.33	–.27	.04
Out-of-school suspension rate			1	–.11	–.19
Student enrollment				1	–.12
Principal turnover					1

Note. Principal turnover was collected at a different time (i.e., between the first and second years) than the other covariates, which were collected in the fall of the first year. Mobility indicates the total percentage of entrants and withdrawals in the previous school year. Data regarding out-of-school suspensions came from the state department and reflect school-level duplicated count of students receiving an out-of-school suspension divided by student enrollment. Student enrollment is the number of students in the school.

* $p < .05$.

In these equations, variables not underlined were uncentered and those that were underlined were grand-mean centered. Grand-mean centering was employed for all variables in which zero was not a possible value to provide a feasible interpretation of the intercept coefficient. When a variable was dichotomous or had 0 as a possible value (i.e., gender, race/ethnicity, years of teaching, and graduate degree), the variable was uncentered (Luke, 2004). As indicated in the equations, the level-1 model measured teachers' growth in efficacy or burnout over time, treating repeated measures of the outcome variable as nested within each teacher. The only variable modeled at this level was the uncentered time covariate. Time was weighted to correct for the unevenly spaced intervals between data collections (i.e., the fall to spring interval was less than one year whereas the spring to spring interval was a full year) and coded 0 for fall, .75 for spring, and 1.75 for the following spring.

The level-2 model consisted of teacher-level covariates, including teacher demographics (i.e., gender and race/ethnicity), teacher experience (i.e., years of teaching experience, graduate degree, teacher-rated Preparedness), and teacher perceptions of the school (i.e., ratings of Parent and Student Involvement, Collegial Leadership, Teacher Affiliation, and Academic Emphasis). In the analyses, these variables were modeled as predictors of both the intercept (i.e., average Efficacy and Burnout at the first data collection) and the slope (i.e., linear growth) terms. All level-2 predictor variables were tested for randomly varying slopes (i.e., at level-3); however, only two randomly varying slopes emerged. In predicting the intercept of teacher efficacy, teacher race/ethnicity had a randomly varying slope (u_{06} in Eq. (10)) and in predicting the intercept of burnout, academic emphasis had a randomly varying slope (u_{08} in Eq. (12)). Both of these slopes were freed (Raudenbush & Bryk, 2002).

School-level Organizational Health, principal turnover, and the indicators of school disorder (i.e., mobility, enrollment, and suspension rates) were modeled as predictors of the intercept and growth parameters of teacher efficacy and burnout at level-3. Due to collinearity concerns among indicators of school disorder, and the limited number of school-level covariates that could be included, additional covariates (e.g., school-level percent of minority students and percent of students receiving free and reduced meals; FARMs) were not included in these analyses.¹ Effect size estimates (i.e., Cohen's d) were calculated for all significant findings (Cohen, 1992) to provide the reader with a standardized coefficient and to ease interpretation.

3. Results

3.1. Changes in teacher efficacy and burnout over time

The growth parameters for both efficacy, $\gamma_{100} = 0.07$, $d = 0.12$, $p = .024$, and burnout, $\gamma_{100} = 0.25$, $d = 0.29$, $p = .030$, were statistically significant, indicating that both teacher efficacy and burnout significantly increased over time. These results are depicted in the first row of Tables 4 and 5.

¹ Post-hoc analyses were conducted to determine whether the substitution of school-level covariates with alternative school-level indicators of disorder (e.g., FARMs rate or percent of minority students) resulted in a superior model. In addition, cross-level interactions were explored. These results were not statistically significant.

Table 4

Teacher- and school-level factors influencing teacher perceptions of teacher efficacy.

Predictor variables	Variable description	Intercept	Linear growth
Time	Reflects linear growth across the three data points	–	0.07*
Teacher-level factors			
Teacher demographic factors			
Ethnicity	Dichotomous (non-White = 1)	0.01	0.01
Gender	Dichotomous (male = 1)	0.02	–0.03
Teacher experience			
Teacher preparedness	Continuous variable (1–4)	0.43**	–0.13**
Years of experience	Number or years	0.00	0.00
Graduate degree	Dichotomous (yes = 1)	–0.01	–0.03
Perceptions of the school			
Collegial leadership	Continuous variable (1–4)	0.09*	–0.03
Teacher affiliation	Continuous variable (1–4)	0.06	–0.02
Academic emphasis	Continuous variable (1–4)	0.21**	–0.02
Parent and student involvement	Continuous variable (1–4)	0.00	0.00
School-level factors			
Average overall Organizational Health	Continuous variable (1–4)	0.16	–0.21
Inventory rating			
Student mobility rate	Percent mobility	0.002**	–0.001*
Student suspension rate	Percent suspensions	0.00	0.00
Student enrollment	Number of students	0.02	–0.01
Principal turnover	Dichotomous (yes = 1)	0.03	0.00
Proportion variance explained			
Pseudo R^2		23.0%**	
Within-school variance (sigma-squared)		4.9%	
Between-school variance (tau)		39.5%	

Note. The Pseudo R^2 reflects the percentage reduction in ICC (i.e., $\tau/[\sigma^2 + \tau]$) comparing the fully unconditional and final model ICC calculations. The reduction in sigma-squared and tau reflects the percentage reduction in each, comparing the fully unconditional and final model values.

* $p < .05$.

** $p < .01$.

3.2. Influence of teacher-level factors on teacher efficacy and burnout

3.2.1. Teacher demographic characteristics

As can be seen in the teacher demographics section of Tables 4 and 5, neither teacher gender nor race/ethnicity was significantly related to the intercept or growth of teacher efficacy or burnout.

3.2.2. Teacher preparation and experience

As hypothesized, teachers' ratings of their preparedness at the first data collection were significantly associated with initial teacher efficacy and burnout, as evidenced by the significant effect on the intercept, such that better preparation was associated with higher efficacy, $\gamma_{010} = 0.43$, $d = 0.74$, $p < .001$, and lower burnout, $\gamma_{010} = -0.27$, $d = 0.31$, $p < .001$. Preparedness was also significantly associated with the growth of both teacher efficacy and burnout across two years. In predicting the growth of teacher efficacy, $\gamma_{110} = -0.13$, $d = 0.22$, $p = .001$, and burnout, $\gamma_{110} = 0.17$, $d = 0.20$, $p = .016$, those who initially had reported higher preparedness had less growth in teacher efficacy and more growth in burnout as compared to those with lower initial ratings of preparedness. Neither years of experience nor having a graduate degree was a significant predictor of the intercept and slope for the outcomes.

3.2.3. Teacher perceptions of the school environment

In contrast to our hypothesis, teachers' ratings on the Parent and Student Involvement scale was not significantly related to the intercept or growth of teacher efficacy. As expected, higher ratings of parent and student involvement were related to lower levels of initial burnout, $\gamma_{020} = -0.37$, $d = 0.43$, $p < .001$, as evidenced by the significant effect on the intercept. Parent and student involvement was also significantly related to growth in burnout, $\gamma_{120} = 0.30$, $d = 0.34$, $p < .001$, such that over time, the differences between

Table 5
Teacher- and school-level factors influencing teacher perceptions of burnout.

Predictor variables	Variable description	Intercept	Linear growth
Time	Reflects linear growth across the three data points	–	0.25*
Teacher-level factors			
Teacher demographic factors			
Ethnicity	Dichotomous (non-White = 1)	– 0.04	0.08
Gender	Dichotomous (male = 1)	0.02	– 0.09
Teacher experience			
Teacher preparedness	Continuous variable (1–4)	– 0.27**	0.17*
Years of experience	Number or years	0.00	0.00
Graduate degree	Dichotomous (yes = 1)	0.08	– 0.08
Perceptions of the school			
Collegial leadership	Continuous variable (1–4)	– 0.30**	0.19**
Teacher affiliation	Continuous variable (1–4)	– 0.22**	0.16*
Academic emphasis	Continuous variable (1–4)	– 0.11	0.10
Parent and student involvement	Continuous variable (1–4)	– 0.37**	0.30**
School-level factors			
Average overall Organizational Health Inventory rating	Continuous variable (1–4)	0.15	0.01
Student mobility rate	Percent mobility	0.00	0.00
Student suspension rate	Percent suspensions	0.01	0.00
Student enrollment	Number of students	0.05	– 0.02
Principal turnover	Dichotomous (yes = 1)	– 0.07	0.12
Proportion variance explained			
Pseudo R ²		10.6%**	
Within-school variance (sigma-squared)		19.4%	
Between-school variance (tau)		27.9%	

Note. The Pseudo R² reflects the percentage reduction in ICC (i.e., tau/[sigma-squared + tau]) comparing the fully unconditional and final model ICC calculations. The reduction in sigma-squared and tau reflects the percentage reduction in each, comparing the fully unconditional and final model values.

* $p < .05$.
** $p < .01$.

teachers with high and low initial ratings of involvement appeared to diminish. See Fig. 2 for an illustration of this effect.

The three measures of teacher-reported perceptions of the school reported on the OHI (i.e., Collegial Leadership, Teacher Affiliation, and Academic Emphasis) were significantly related to both teacher efficacy and burnout, as hypothesized. Higher ratings of Collegial Leadership at the first time point were

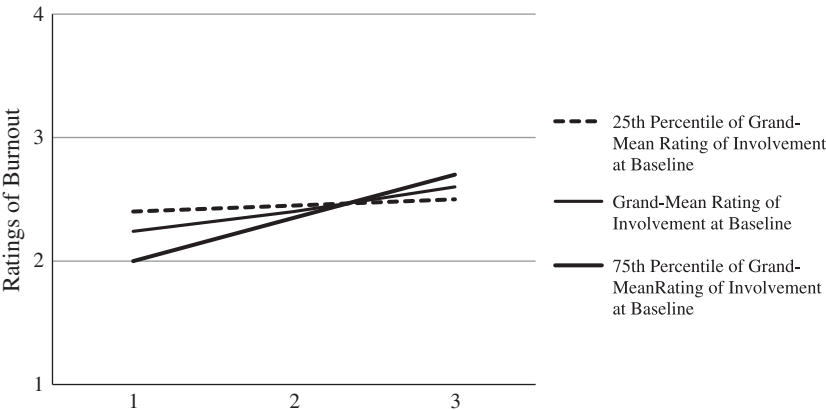


Fig. 2. Association between teacher's perception of parent and student involvement and burnout.

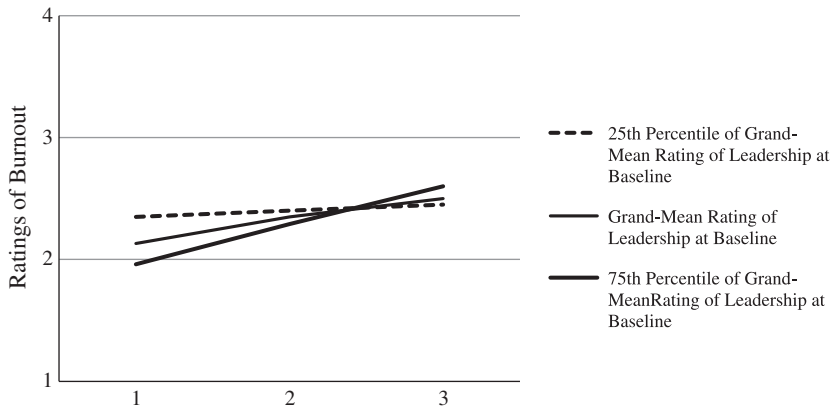


Fig. 3. Association between teacher's perception of school leadership and burnout.

significantly associated with the intercept of teacher efficacy and burnout. Ratings that reflected better leadership were associated with higher ratings of initial teacher efficacy, $\gamma_{070} = 0.09$, $d = 0.16$, $p = .019$, and lower ratings of initial burnout, $\gamma_{070} = -0.30$, $d = 0.35$, $p < .001$. Collegial Leadership was not significantly associated with growth in teacher efficacy. However, it was significantly related to the growth in burnout, $\gamma_{170} = 0.19$, $d = 0.22$, $p = .007$, such that the differences in burnout appeared to diminish over time. See Fig. 3 for an illustration of this effect.

Teacher Affiliation was not significantly related to either the intercept or growth of teacher efficacy. Higher ratings of affiliation on the OHI were associated with lower levels of burnout at the intercept, $\gamma_{090} = -0.22$, $d = 0.25$, $p = .006$. As with the other organizational ratings, there was a significant relation between teacher affiliation and the growth in burnout, $\gamma_{190} = 0.16$, $d = 0.18$, $p = .014$. Those teachers who initially reported higher levels of affiliation had greater growth in their burnout than those who initially reported lower affiliation. Finally, higher ratings on the Academic Emphasis scale were related to the intercept of teacher efficacy, $\gamma_{080} = 0.21$, $d = 0.36$, $p < .001$. Teachers who reported that students emphasized academic achievement also reported higher teacher efficacy. Academic emphasis was not, however, significantly related to the growth of teacher efficacy or to the intercept or growth of burnout.

3.3. Effects of school-level predictors on teacher efficacy and burnout

School-level indicators of disorder (i.e., school enrollment, mobility, and suspension rate) were not consistently significantly associated with teacher burnout or efficacy when controlling for the teacher-level covariates. School-level mobility was the only variable significantly associated with the intercept of teacher efficacy, $\gamma_{002} = 0.002$, $d = 0.001$, $p = .008$, and growth, $\gamma_{002} = -0.001$, $d = 0.002$, $p = .025$. All other relations were not statistically significant. See Tables 4 and 5 for a full listing of the HLM results.

4. Discussion

The current study aimed to examine the changes in teacher efficacy and burnout over a period of two years, and the extent to which these changes varied as a function of individual- and school-level contextual factors. We employed a multilevel modeling approach to examine how teacher demographics, teacher preparation and experience, teachers' perception of the school environment, and school-level contextual factors related to both the intercept and the growth of teacher efficacy and burnout.

In general, there was growth in both teacher efficacy and burnout, indicating slightly higher efficacy and increased burnout over time. It appears that burnout increased more rapidly (effect size = 0.29) than did teacher efficacy (effect size = 0.12). Some of the variables tested were not significantly related to either the intercept or slope of efficacy or burnout, such as the demographic characteristics (i.e., gender and race/ethnicity) and experience (i.e., years of experience and whether a teacher had a graduate degree).

Perhaps, like previous studies, we had too small a sample of male (6%) and non-White (15%) teachers to demonstrate or detect effects. Our findings regarding teaching experience and graduate degree were consistent with previous research (e.g., [Anderson & Iwanicki, 1984](#)).

We explored a self-reported measure of Preparedness, which we found to be associated with both the intercept and growth of teacher efficacy and burnout. Consistent with prior research on the importance of mastery ([Bandura, 1977](#); [Schonfeld, 2001](#); [Tatar & Horenczyk, 2003](#)), teachers who reported feeling more prepared to handle a range of classroom management and instructional challenges—regardless of their level of experience or formal training—also reported higher teacher efficacy and lower burnout at the first data collection. This finding suggests that preparation could be one aspect to address during pre- and in-service training, as it may help teachers feel more efficacious and experience lower levels of burnout. Unfortunately, the results from this study suggested that ratings of preparedness do not appear to be a protective factor across time. These findings should be interpreted with caution, as this measure has not been widely researched. Additional research is needed to explore this measure specifically, and the construct of preparedness more generally, to determine whether these effects vary as a function of the type of preparation teachers experience, such as pre-service training as compared to in-service training, or the focus of those trainings (e.g., their being academically versus behaviorally focused).

We also examined a set of variables related to teachers' perceptions of the school environment with regard to parent and student involvement, administrative leadership, teacher affiliation, and academic emphasis. Similar trends emerged for these variables as for the Preparedness scale discussed above, such that teachers with initially higher ratings on the Collegial Leadership and Teacher Affiliation scales showed greater growth in their burnout than teachers who reported lower ratings of these areas at the first data point. It is likely that when teachers work in a positive environment with good relations between staff, they feel more supported and therefore report less work-related burnout ([Hoy & Woolfolk, 1993](#)); however, perceptions of the environment were not associated with suppressed burnout over time. Although Collegial Leadership had a significant relation with the intercept of the teacher efficacy measure, it was unrelated to growth. Teacher Affiliation was not significantly related to teacher efficacy and Academic Emphasis was only associated with the intercept of teacher efficacy. Parent and Student Involvement was significantly related with both the intercept and slope of burnout but not with efficacy. Initially, those teachers who reported higher levels of involvement also reported lower levels of burnout. However, the growth of their burnout was greater than the growth of burnout for other teachers.

Taken together, these effects generally suggested a strong association between the predictors and the intercept rather than the growth parameters. This pattern of findings may be influenced by the time of year when the data were collected and seasonal variation in teachers' perceptions of efficacy and burnout. Specifically, the first data point was collected in the fall of the first school year, whereas the two subsequent data points were obtained in the spring. It is possible that the staff- and school-level contextual factors were more positively related to ratings in the fall of a school year, when teachers are beginning a new school year, rather than the spring, when they generally may be more burned out and feeling less efficacious. The lack of a fall data point for both school years limits us from examining potential seasonal trends in teacher efficacy and burnout.

Finally, only one of the school-level indicators of disorder (i.e., mobility) was significantly associated with both the intercept and the slope of efficacy. It does not appear that we lacked sufficient power to detect such effects, as there was enough power to detect the very small effect of mobility (effect size = .002, $p = .01$). It appears that the school-level contextual factors may not have as great of an influence on teacher efficacy and burnout as do the more proximal individual-level factors. It is also possible that shared method variance could contribute to the higher associations between the individual-level factors and the self-reported outcomes. Additional research is needed to better understand the relative influence of contextual-level versus individual-level factors as well as potential direct and indirect influences of contextual factors on changes in teachers' efficacy and burnout over time.

4.1. Limitations and future research

It is important to consider some limitations of the current study when reviewing these findings. Although the overall participation rate was relatively high for a longitudinal study of this scale, teacher participation was voluntary. As noted above, missing data points were associated with select teacher demographic variables,

which were included as covariates in the models. Of concern is that some teachers—perhaps those who felt the least efficacious or were the most burned out—may have chosen not to participate, but we do not have a way to assess this information from teachers. Despite this fact, the majority of teachers excluded from the analyses were those who were present in the second year, but not the first, and who were missing on the baseline covariates. However, those teachers with first-year data who subsequently left the schools were included in the analyses. Although the design was longitudinal, we only had data from the fall of the first year and from the spring of the subsequent two years. Additional data points across a single school year may better clarify whether there are seasonal changes in teacher efficacy and burnout. Nevertheless, we are unable to draw causal conclusions about the observed associations.

The 31 schools participating in the study were from a single state and were not a random sampling of elementary schools. The number of schools was relatively small, given the number of school-level factors examined and the complexity of the modeling. This limited sampling, in turn, limited the number of school-level variables that could be examined. As noted above, additional research is needed with a larger and perhaps more diverse set of schools, in order to further explore potential contextual influences on teacher efficacy and burnout. Furthermore, all schools were implementing the school-wide Positive Behavioral Interventions and Supports model (PBIS; Sugai & Horner, 2006), which provides a system of school-wide behavior management. As a result, the sample of schools may have been more homogenous, or more similar to each other, than a sample of non-PBIS schools. Although the schools were relatively diverse with regard to student demographics (e.g., race/ethnicity and FARMs rate), these findings may not generalize to teachers in schools of varying grade levels (e.g., secondary schools) or student composition. Additional research is needed with more diverse teachers, to enable a richer evaluation of gender and racial relationships.

Finally, future studies should include a broader set of teacher constructs and should examine why the positive relations between these constructs and the intercept diminish over time. For example, the measurement of burnout in this study focused on emotional exhaustion and not the other two components of burnout. General efficacy, rather than efficacy in relation to behavioral concerns, could also be examined. Despite the potentially limited measurement of outcomes, these factors are particularly relevant to teacher practice. Further research is needed to explore why factors such as leadership and involvement are associated with higher efficacy and lower burnout at the intercept (i.e., first data collection) but higher rates of growth on burnout and lower rates of growth in efficacy over time. Studies with multiple data points over a single school year could reveal whether this trajectory continues over a longer period.

4.2. Conclusions and implications for school psychologists

Prior research has shown that low teacher efficacy and high teacher burnout have costly implications for school systems, which include both financial ramifications as well as negative effects on staff morale and student outcomes (Leithwood, Menzies, Jantzi, & Leithwood, 1999; Schonfeld, 2001). Consequently, it is important to understand what contributes to lower teacher efficacy and higher burnout in teachers. By examining the predictors and designing program changes that impact alterable predictors (i.e., training as opposed to demographics), school systems can better support teachers, enhance teacher efficacy, and prevent burnout. As mental health providers, school psychologists understand the importance of preventing the emotional exhaustion associated with burnout and can assist school administrators in preventing the negative consequences of poor teacher efficacy and burnout (e.g., turnover and poor student achievement).

The current findings indicated that both teacher efficacy and burnout increase over time, with some evidence suggesting that burnout increases at a faster rate. This highlights the need for interventions that increase the rate of growth in teacher efficacy and decrease the rate of growth of burnout. The significance of preparedness and perceptions of teacher affiliation in predicting efficacy and burnout illustrates the importance of these factors and perhaps a need for screening and intervening on these malleable factors (Bradshaw, Koth, Thornton, & Leaf, 2009). However, additional research is needed on the timing of training to promote preparedness in relation to teacher efficacy and burnout, and how these effects may vary over a longer period of time. For example, there may be a difference between preparation that results from pre-service training years as compared to in-service training (Tschannen-Moran et al., 1998). Furthermore, some types of preparedness may be easier to foster during the pre-service time (e.g., content) than during in-service events (e.g., classroom management) when teachers have more applied experience.

Similarly, teacher affiliation appears to be an important potential target, thereby suggesting that activities that promote the formation of strong staff relationships and collegial support may have a positive impact on teacher efficacy and burnout. Interventions that explicitly target these teacher factors should be developed and tested to determine whether they impact these important teacher outcomes. Finally, there is some intervention literature that suggests that teacher efficacy can be improved through consultation services. A recent randomized trial of the Instructional Consultation Teams model (Rosenfield & Gravois, 1996), which uses consultation services as a vehicle for providing teachers with enhanced skills in the assessment and use of evidence-based practices to positively impact student achievement, evinced significant improvements in teachers' reports of efficacy (Vu et al., 2011). Additional research is needed on the impact of professional development and pre-service training programs that directly target preparedness and related teacher factors in order to determine their long-term effects on teacher efficacy, burnout, and, ultimately, student outcomes.

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