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Positive affectivity predicts successful and unsuccessful adaptation to stress

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Abstract This study examined adaptation to work stress among public school teachers ($n = 267$). Regression analyses tested whether positive affect predicted successful and unsuccessful adaptation to stress (viz., resilience and burnout, respectively) after controlling for demographic characteristics and work stress. Positive affect was largely correlated with resilience ($r = .65$, $p < .001$) and burnout ($r = -.57$, $p < .001$). The regression of resilience showed that positive affect had a direct effect ($\beta = .66$, $p < .001$) and the total model explained 44 % of the variance (R^2 *Change* = 37 %). In the regression of burnout, positive affect also had a direct effect ($\beta = -.41$, $p < .001$) and the total model explained 52 % of the variance (R^2 *Change* = 14 %). Further analyses found no significant interaction between work stress and positive affect, but revealed that positive affect completely mediated the effect of work stress on resilience. Results provide support for the broaden-and-build theory of positive emotions, particularly the theory's building and undoing effects.

Keywords Teachers · Work stress · Positive affect · Resilience · Burnout

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Introduction

Studies have found that teachers are seriously affected by the stressfulness of their work environment (e.g., Dunham and Varma 1998; Travers and Cooper 1996; Zhang and Sapp 2008). Teaching is among the most stressful professions with 42 % of teachers reporting high work stress and 36 % feeling stressed all or most of the time (Smith et al. 2000). Longitudinal evidence indicates that approximately 95 % of teachers experience increasing levels of perceived work stress over time (Chan et al. 2010). Teachers face a variety of stressors in the workplace, such as excessive workload, changes in curriculum, disruptive students, lack of support from parents and the administration, conflicts with colleagues, increasingly strict standards of accountability, and performance evaluations (Kyriacou 2001; Manthei et al. 1996; Montgomery and Rupp 2005).

Constant exposure to high levels of work stress can disrupt teachers' homeostasis, inhibiting their ability to cope effectively and maintain healthy functioning, and result in either diminished (i.e., establishing a lower level of homeostasis) or dysfunctional recovery (i.e., succumbing to the stressful situation and feeling defeated; Carver 1998; Connor and Davidson 2003; O'Leary and Ickovics 1995). Persistent unsuccessful adaptation to stress contributes to the development of health problems such as the burnout syndrome (Bakker et al. 2000; Bellingrath et al. 2009; Melchior et al. 2007; Wang 2005). Work stress and burnout among teachers have reached alarming levels, threatening the quality of the educational system and subsequent student achievement (e.g., Kyriacou 2001; Travers and Cooper 1996; Zhang and Sapp 2008). Difficult working conditions and low teacher salaries (Macdonald 1999; Skaalvik and Skaalvik 2011) fuel psychosomatic symptoms and disorders related to burnout, all of which contribute to

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teachers prematurely leaving the profession (Bauer et al. 2006). It is estimated that 40–50 % of new teachers leave the profession after only 3 years (Ingersoll and Smith 2003), and over 90 % of new teachers are replacements for those who resigned for reasons other than retirement (Ingersoll 2002).

Teacher burnout is characterized by three interrelated components: emotional exhaustion, depersonalization, and reduced personal accomplishment (Maslach et al. 1996, 2001). Emotional exhaustion is the stress component and central quality of burnout, occurring when a teacher is extremely fatigued and feels overextended by work and drained of emotional and physical resources (Schwarzer and Hallum 2008). Depersonalization represents the interpersonal component and is described as feeling cynical, irritable, and negative towards others. Teachers are more likely to develop an indifferent or cynical attitude and detached response on the job when feeling emotionally exhausted and discouraged (Maslach et al. 2001). Finally, reduced personal accomplishment—the self-evaluation component—includes feelings of ineffectiveness and a lack of productivity and achievement at work; it is difficult to feel a sense of accomplishment at work when feeling emotionally exhausted and indifferent or cynical toward others (Maslach and Leiter 2008). Burned-out teachers typically report concurrent feelings of extreme fatigue (Schwarzer and Hallum 2008), cynicism and negativity toward others (Maslach et al. 2001), and a sense of despair and diminished achievement at work (Maslach and Leiter 2008).

Interestingly, not all teachers experience symptoms of burnout. Some teachers adapt successfully to stressful situations and demonstrate resilience—they perceive change and stressful situations as a challenge, maintain their commitment to teaching despite challenging conditions and recurring setbacks (Brunetti 2006), and perceive a sense of personal control in handling day-to-day events (Kobasa 1979). Such adaptive outcomes from otherwise challenging conditions suggest that resilient teachers are able to cope with and persist in the face of adversity, balancing their internal needs and desires with those of their students and the context of the external environment. For example, Gu and Day (2007) explored the role of resilience in characterizing teacher effectiveness among 300 teachers throughout their careers, and found that resilient teachers sustain their motivation, commitment, and effectiveness despite the range of difficult experiences they encounter in their work environments. Similarly, a recent study of novice teachers working in stressful under-resourced public schools found that teacher effectiveness was predicted by individual traits such as perseverance, passion for long-term goals, and life satisfaction (Duckworth et al. 2009). These findings are consistent with a recent review on teacher resilience that identified having a positive attitude, self-efficacy, coping and teaching skills, professional reflection and growth, and self-care, as well as important contextual factors such as positive student–teacher relationships, administrative support, and support from peers, colleagues, family, and friends as enabling teachers to thrive rather than just survive (Beltman et al. 2011). Further, the role of resilience in teacher effectiveness is consistent with the wider research literature that describes resilient characteristics as including goal setting, patience, faith, tolerance of negative affect, having close and secure relationships, possessing the ability to focus and think clearly, humor, and having a positive outlook even under negative circumstances (Connor and Davidson 2003).

Research in positive psychology has demonstrated that positive affectivity plays a significant role in predicting whether an individual will successfully or unsuccessfully adapt to stressful situations (Danner et al. 2001; Duckworth et al. 2009; Lyubomirsky et al. 2005). A wide spectrum of empirical evidence documents the adaptive value of positive affect in promoting resilience and successful adaptation to stress (e.g., Danner et al. 2001; Davis et al. 1998; Folkman and Moskowitz 2000). From a theoretical perspective, Fredrickson's broaden-and-build theory of positive emotions posits that the experience of positive affect expands one's scope of attention and cognition, and thus enables more flexible and creative thinking (Fredrickson 2004; Fredrickson and Joiner 2002; Isen and Daubman 1984; Isen et al. 1987). The broadened cognition and engaged attitude, in turn, promotes successful adaptation to stress, and over time builds enduring psychosocial resources (e.g., adaptive coping strategies, positive personal traits, and enhanced social support). These resources promote resilience and prevent undesirable outcomes such as burnout (Fredrickson 2001, 2009; Fredrickson et al. 2003). In contrast, the theory also suggests that individuals who experience lower levels of positive affect tend to have narrowed mindsets during stressful situations; this response is due to the fight-or-flight reaction, which constricts one's cognitive capacity in order to expedite decision-making and immediately remove adversity. While this response may be critical in life-or-death situations, it is often maladaptive in situations that call for more time-consuming and thoughtful actions, especially against stressors that are constant and unrelenting such as those commonly reported by teachers. As a result, teachers who experience lower levels of positive affect are less likely to effectively cope with stress and more likely to express problems such as the burnout syndrome.

Previous studies have examined the influence of positive affect on a variety of stress-related outcomes (e.g., Fredrickson et al. 2000, 2003). For example, positive affect was found to have a direct effect on psychological functioning

(Nelson and Knight 2010), physiological health (Fredrickson and Levenson 1998), and effectiveness of novice teachers in disadvantaged schools (Duckworth et al. 2009). In addition, researchers have also demonstrated that positive affect interacts with stress and moderates its negative effect on health (Davis et al. 1998; Faulk et al. 2012; Ong et al. 2006) such that the impact of stress on health is reduced when one's positive affect is high. However, we have yet to find studies that have assessed the influence of positive affect on the relationships among work stress, burnout, and resilience with public school teachers. Therefore, the purpose of the present study was to examine whether positive affect predicted successful and unsuccessful adaptation in teaching (viz., resilience and burnout, respectively), while controlling for the effects of a variety of demographic characteristics and perceived work stress.

It was hypothesized that positive affect would have a significant independent direct positive effect on resilience and a negative effect on burnout, above and beyond that of perceived work stress and demographic covariates. We also tested whether there was a significant interaction, or moderating effect, between perceived work stress and positive affect in predicting resilience and burnout; we hypothesized that positive affect would significantly interact with stress and moderate the influence of stress on resilience and burnout (i.e., as levels of stress increase, individuals with higher levels of positive affect will report lower levels of burnout and higher levels of resilience, in contrast to those with lower levels of positive affect). Results of this study could provide support for the broaden-and-build theory of positive emotions as an effective theoretical framework for developing programs designed to help teachers maintain resilience and prevent burnout.

Methods

Participants and procedures

Participants were obtained with assistance from a convenience sample of public school teachers in Texas identified as recipients of a prestigious Teaching Excellence Award granted by the alumni association of a large public university. Each teacher was sent a package via the United States Postal Service that contained a letter explaining the purpose of the study as well as six packets with copies of a self-report survey and stamped addressed envelopes for the convenient return of the completed surveys. A snowball sampling technique was used in which the award-winning teachers ($n = 170$) were instructed to complete one of the six surveys, and distribute the remaining five survey packets to fellow teachers who they believed represented a variety of teaching skills and years of experience. A deck of inspirational quote cards ($5 value) was included in each packet as a small incentive for participation. To further encourage participation, a stamped addressed postcard was also included to allow participants to be entered into a raffle drawing for a number of prizes, such as an autographed university football ($100 value), a university t-shirt ($19 value), or a gift card ($15 value). One incentive prize was given for every 10 surveys that were received. To maintain participant anonymity, the survey instruments were anonymous and completed at participants' discretion; the identifiable raffle postcards were mailed separately from the surveys.

The final sample consisted of $n = 267$ public school teachers from 94 different zip codes across Texas, representing a moderate response rate of 26 % (Alreck and Settle 2004). Approximately 75 % were female with a mean age of 45 years (ranging from 23 to 68 years); 86 % were White, 8 % Hispanic or Latino, 3 % African-American, and less than 1 % each was Native-American or Asian-American. The majority were high school teachers (75 %), while others taught in middle (13 %) or elementary (12 %) school. Overall, the sample was highly experienced, with an average of 18 years of teaching experience. Most earned a bachelor's degree (55 %), although 43 % held a master's degree, and 2 % had attained a doctorate degree. Approximately 22 % of these teachers ($n = 58$) were recipients of a prestigious Teaching Excellence Award from the university conducting the study.

Measures

The survey instrument assessed participant demographic characteristics, work stress, positive affect, resilience, and teacher burnout. A copy of the survey may be requested from the corresponding author.

Demographics

Participants were asked to report personal characteristics including age, gender, ethnicity, education level, grade level taught, years of teaching experience, and whether they had received a Teaching Excellence Award from the university's alumni association.

Work stress

Perceived work stress was conceptualized as taxing work conditions that undermine adaptation, and was assessed using a modified version of the Teacher Stress Inventory (Fimian 1984). The original instrument was updated to include a broad range of potential stressors as well as an assessment of each stressor's exposure and appraisal. The instrument assessed if participants had experienced 41

commonly occurring stressful situations within the past year (0 = *not experienced*, 1 = *experienced*). Sample stressor items included "not enough time to get things done," "administration not supportive enough," "class size or caseload is too big," "tension with another teacher or administrator," and "pressure to adhere to instructional planning guides." If the stressor had been experienced, the participant appraised "how negative, undesirable, or upsetting" the stressful situation was on a five-point scale ranging from 0 to 4 (*not at all* to *extremely*). To score each of the 41 items, the responses to the exposure and appraisal questions were multiplied. A final perceived work stress score was then calculated as the sum of the 41 (exposure × appraisal) items, with higher scores indicating greater levels of work stress. The instrument obtained a strong internal consistency ($\alpha = .92$), and concurrent validity was confirmed by a significant correlation ($r = .59$, $p < .001$) with the 4-item Perceived Stress Scale (PSS; Cohen et al. 1983).

Positive affect

Positive affect was operationalized as the individual's experience of general positive feelings that enhance adaptation. This global measure of positive affect is reflective of one's general feelings and emotions, in contrast to emotional reactions in response to specific stimuli (Rottenberg 2005). This conceptualization is in alignment with the research base that most often focuses on global positive affect without distinguishing between moods and emotions (Lyubomirsky et al. 2005). Positive affect was measured using a 19-item modified version of the Positive Activation subscale of the Positive and Negative Affect Schedule (PANAS; Watson et al. 1988). This modified measure consists of the original 10 items included in the PANAS plus 9 additional positive emotions (viz., amused, calm, content, curious, happy, relaxed, relieved, satisfied, surprised) added by Tugade and Fredrickson (2004). On a five-point scale ranging from 1 to 5 (*not at all* to *very much so*), participants were asked to respond to the following instructions: "This scale consists of a number of words that describe different feelings and emotions. Read each item and then indicate how you generally feel." The positive affect score was then calculated as the sum of the 19 items, with higher scores indicating greater positive affect. The internal consistency of the modified instrument was strong ($\alpha = .92$).

Resilience

Participant resilience (i.e., successful adaptation to stress) was assessed using the 25-item Connor–Davidson Resilience Scale (CD-RISC; Connor and Davidson 2003). This instrument measured a variety of resilient characteristics that enable individuals to thrive in the face of adversity, such as goal setting, patience, faith, humor, and tolerance of negative affect, as well as the ability to perceive a challenge, make a commitment, and take control. On a five-point scale ranging from 0 to 4 (*not true at all* to *true nearly all the time*), participants responded to items including "I believed I could achieve my goals, even if there were obstacles" and "under pressure, I stay focused and think clearly." The resilience score was calculated as the sum of the items, with higher scores indicating greater resilience. The CD-RISC instrument reported a strong ($\alpha = .89$) internal consistency.

Teacher burnout

The Maslach Burnout Inventory-Educators Survey (MBI-ES) was used to assess teacher burnout (i.e., unsuccessful adaptation to stress; Maslach et al. 1996). The MBI-ES measures all three components of the burnout syndrome: emotional exhaustion (9 items), depersonalization (5 items), and reduced personal accomplishment (8 items), on a seven-point scale ranging from 0 to 6 (*never* to *every day*). A sample emotional exhaustion item includes "I feel emotionally drained from my work;" a sample depersonalization item includes "I don't really care what happens to some students;" and a sample reduced personal accomplishment item (reverse-scored) includes "I feel I'm positively influencing other people's lives through my work." Total burnout was calculated as the sum of all three components, with higher scores indicating greater teacher burnout. The internal consistency of the MBI-ES instrument was strong ($\alpha = .93$).

Statistical analyses

All analyses were conducted using the Statistical Package for the Social Sciences (SPSS) version 16. Years of teaching experience was retained as a continuous control variable; multiple-category demographic control variables were collapsed into binary values in order to construct appropriately-sized groups for analysis: award recipient (0 = *did not receive a Teaching Excellence Award*, 1 = *received an award*), secondary school (0 = *taught elementary school*, 1 = *taught middle/high school*), female (0 = *male*, 1 = *female*), minority (0 = *nonminority*, 1 = *minority*), and advanced degree (0 = *bachelor's degree*, 1 = *master's or doctorate*).

Hierarchical multiple regression analyses were used to examine the ability of positive affect to predict levels of resilience and teacher burnout, after controlling for the variance associated with the demographic variables and work stress. The interactive effects of work stress and positive affect on resilience and burnout were also

Table 1 Correlations, means, standard deviations, and range values for all variables

	1	2	3	4	5	6	7	8	9
1. Work stress	–								
2. Positive affect	−.30***	–							
3. Resilience	−.16**	.65***	–						
4. Burnout	.57***	−.57***	−.47***	–					
5. Years taught	−.05	.22***	.11	−.18**	–				
6. Award recipient	−.12	.20**	.19**	−.24***	.44***	–			
7. Secondary school	.04	.02	−.01	.08	.02	−.01	–		
8. Female	.18**	−.07	.07	.07	−.04	.06	−.13*	–	
9. Minority	.04	.03	.03	−.05	−.10	−.08	−.14*	−.20**	–
10. Advanced degree	−.06	.09	.02	−.05	.29***	.22***	.10	−.11	.01
Mean	65.68	69.49	78.99	38.55	17.52	–	–	–	–
Standard deviation	34.93	10.84	10.69	19.29	10.86	–	–	–	–
Minimum	.00	37.00	47.00	1.00	1.00	–	–	–	–
Maximum	161.00	95.00	100.00	89.00	44.00	–	–	–	–

* $p < .05$, ** $p < .01$, *** $p < .001$ (two-tailed)

examined. Due to the high correlation ($r = .81$) between age and years of teaching experience, age was excluded from the analyses. Preliminary analyses were conducted to ensure that statistical assumptions of power, normality, linearity, multicollinearity, independence, and homoscedasticity were satisfied. Values of all continuous predictors were centered to prevent potential multicollinearity problems (Aiken and West 1991).

Results

Table 1 displays the correlations, means, standard deviations, and range values for all study variables. Positive affect had a large positive correlation with resilience and a large negative correlation with teacher burnout, according to Cohen's criteria (1988). The strongest association among the control variables was a moderate correlation between winning an award and years of teaching experience. Additionally, teachers with an advanced degree had more years of teaching experience and were more likely to have won an award. Control variables were not strongly related to work stress, positive affect, resilience, or teacher burnout; although there were some significant correlations, they were small in size. More experienced and award winning teachers reported greater positive affect and less burnout. Award winning teachers also reported greater resilience and females reported greater work stress.

Positive affect predicts successful adaptation to stress

The six demographic variables (viz., years taught, award recipient, secondary school, female, minority, and advanced degree) were entered in Step 1, but did not significantly contribute to the variance in resilience (see Table 2). After entry of work stress in Step 2, the total variance explained by the model as a whole was 7 %, F (7, 256) = 2.76, $p < .01$. Work stress demonstrated a significant direct negative effect on resilience ($\beta = -.17$, $p < .01$), explaining an additional 3 % of the variance in resilience, after controlling for the demographic variables, R^2 *Change* = .03, *F Change* (1, 256) = 7.21, $p < .01$. Upon entering positive affect in Step 3, the total variance explained by the model as a whole was 44 %, F (8, 255) = 25.22, $p < .001$. Positive affect explained an additional 37 % of the variance in resilience, after controlling for the effects of the demographic variables and work stress, R^2 *Change* = .37, *F Change* (1, 255) = 169.73, $p < .001$. In this equation, positive affect recorded a significant direct positive effect ($\beta = .66$, $p < .001$), but work stress became non-significant ($\beta = .02$, $p > .05$).[1]

[1] Interestingly, the unexpected drop in the significance of work stress suggested that positive affect could be mediating the link between work stress and resilience. To analyze this model, we used Preacher and Hayes' (2008) INDIRECT macro with the bootstrapping method to determine if positive affect actually mediated the relationship between work stress and resilience, while controlling for demographic covariates (viz., years taught, award recipient, secondary school, female, minority, and advanced degre). Results revealed significant direct paths between work stress and positive affect ($b = -.09$, $p < .001$), and between positive affect and resilience ($b = .66$, $p < .001$). After controlling for the effects of positive affect and the set of demographic controls, the direct relationship between work stress and resilience was nonsignificant ($b = .01$, $p > .05$), indicating that positive affect fully mediated the link between work stress and resilience. The control variables had nonsignificant relationships with resilience, except for female ($b = 2.50$, $p < .05$) which indicated that female teachers reported greater resilience than males. The indirect

Table 2 Summary of hierarchical regression analysis for variables predicting resilience

Variable	Step 1			Step 2			Step 3			Step 4		
	B	SE *B*	*β*	*B*	SE *B*	*β*	*B*	SE *B*	*β*	*B*	SE *B*	*β*
Years taught	.05	.07	.05	.05	.07	.05	−.06	.05	−.06	−.06	.05	−.06
Award recipient	4.53	1.77	.18*	3.95	1.77	.15*	2.34	1.38	.09	2.29	1.38	.09
Secondary school	.57	2.11	.02	1.01	2.09	.03	.21	1.63	.01	.22	1.63	.01
Female	1.71	1.56	.07	2.59	1.57	.11	2.59	1.22	.11*	2.60	1.22	.11*
Minority	2.04	1.98	.07	2.51	1.97	.08	1.07	1.53	.03	1.11	1.53	.04
Advanced degree	−.63	1.38	−.03	−.71	1.37	−.03	−.75	1.06	−.04	−.80	1.06	−.04
Work stress				−.05	.02	−.17**	.01	.02	.02	.01	.02	.02
Positive affect							.65	.05	.66***	.66	.05	.67***
Work stress × positive affect										−.00	.00	−.04
R^2	.04			.07			.44			.44		
F for R^2 *Change*	1.97			7.21**			169.73***			.69		

* $p < .05$, ** $p < .01$, *** $p < .001$

Holding all else constant, as positive affect increased by one standard deviation, resilience was estimated to increase by .66 standard deviation. To examine if positive affect had a moderating effect on the relationship between work stress and resilience, the interaction term work stress x positive affect was tested in Step 4 but was non-significant.

Positive affect predicts unsuccessful adaptation to stress

Initially, the effects of the demographics, work stress, and positive affect were calculated on each component of teacher burnout (viz., emotional exhaustion, depersonalization, and reduced personal accomplishment) as well as on total burnout (i.e., the sum of the three components). Given that the regression results for each component of the burnout syndrome were similar to those using a total score, only the results using the total burnout score are presented.

The six demographic covariates were entered in Step 1, and significantly explained 8 % of the variance in burnout (see Table 3). After entry of perceived work stress in Step 2, the total variance explained by the model as a whole was 38 %, F (7, 255) = 22.35, $p < .001$. Work stress demonstrated a significant direct positive effect on burnout ($\beta = .57$, $p < .001$), explaining an additional 30 % of the variance in burnout, after controlling for the demographic variables, R^2 *Change* = .30, *F Change* (1, 255) = 123.10, $p < .001$. Upon entering positive affect in Step 3, the total variance explained by the model as a whole was 52 %, F (8, 254) = 34.73, $p < .001$. Positive affect explained an additional 14 % of the variance in burnout, after controlling for the effects of work stress and the demographic variables, R^2 *Change* = .14, *F Change* (1, 254) = 75.62, $p < .001$. In this equation, work stress and positive affect both recorded significant direct effects; work stress had a positive effect ($\beta = .45$, $p < .001$) while positive affect had a negative effect ($\beta = -.41$, $p < .001$). Holding all else constant, as work stress increased by one standard deviation, burnout was estimated to increase by .45 standard deviation. In contrast, as positive affect increased by one standard deviation, burnout was estimated to decrease by .41 standard deviation. To examine if positive affect had a moderating effect on the relationship between work stress and burnout, the interaction term work stress x positive affect was examined in Step 4 but was non-significant.

Discussion

Using survey data from a cross-sectional study design, we examined the influence of positive affect on successful and unsuccessful adaptation to perceived work stress (viz., resilience and burnout, respectively) in a convenience sample of public school teachers in Texas. After controlling for the effects of demographic characteristics and work stress, positive affect had a direct positive effect on resilience and a direct negative effect on burnout; further analysis indicated that positive affect completely mediated the relationship between work stress and resilience.

The direct effect of positive affect on resilience supported the value of positive affect in predicting successful adaptation to stress (Fredrickson and Losada 2005; Keyes 2002). Specifically, our results indicated that higher scores

Footnote 1 continued
effect of work stress on resilience via positive affect was significant ($b = -.06$) at 99 % confidence interval across three types of point estimates (viz., percentile, bias corrected, and bias corrected and accelerated). Taking together the direct and indirect effects, the total effect of work stress on resilience was significant ($b = -.05$, $p < .05$). The overall model accounted for 45 % of the total variance in resilience.

Table 3 Summary of hierarchical regression analysis for variables predicting burnout

Variable	Step 1			Step 2			Step 3			Step 4		
	B	SE *B*	*β*	*B*	SE *B*	*β*	*B*	SE *B*	*β*	*B*	SE *B*	*β*
Years taught	−.18	.12	−.10	−.22	.10	−.12*	−.09	.09	−.05	−.09	.09	−.05
Award recipient	−9.67	3.15	−.21**	−6.14	2.61	−.13*	−4.34	2.30	−.09	−4.22	2.30	−.09
Secondary school	4.75	3.75	.08	2.07	3.09	.03	2.97	2.72	.05	2.96	2.72	.05
Female	3.63	2.76	.08	−1.77	2.32	−.04	−1.77	2.04	−.04	−1.81	2.04	−.04
Minority	−2.81	3.52	−.05	−5.66	2.91	−.10	−4.06	2.56	−.07	−4.14	2.56	−.07
Advanced degree	1.15	2.46	.03	1.64	2.02	.04	1.68	1.78	.04	1.80	1.78	.05
Work stress				.31	.03	.57***	.25	.03	.45***	.25	.03	.45***
Positive affect							−.73	.08	−.41***	−.76	.09	−.42***
Work stress × positive affect										.00	.00	.05
R^2	.08			.38			.52			.53		
F for R^2 *Change*	3.76**			123.10***			75.62***			1.43		

* $p < .05$, ** $p < .01$, *** $p < .001$

on positive affect were associated with higher scores on resilience. This finding supported the "building effect" of Fredrickson's (2001) broaden-and-build theory of positive emotions, which suggests that experiences of positive affect build one's cognitive and behavioral resilience resources, and thereby help individuals more effectively manage stress and adaptively cope with adversity. Further, the non-significant interaction between work stress and positive affect indicated that the effect of stress on resilience did not depend on the teachers' levels of positive affect. Our data instead revealed that the impact of work stress on resilience was fully mediated by positive affect, suggesting that teachers' resilience was not directly determined by work stress but rather indirectly via their positive affectivity (see Footnote 1); this supports previous work, as positive affect has been found to restore psychological resources and enhance well-being in the face of stress (Folkman 1997, 2008; Fredrickson et al. 2003). Thus, from a practical standpoint, we recommend that in addition to creating positive workplace conditions, interventions should also focus on individual stress management programs that increase experiences of positive affect even amidst stressful working conditions (e.g., adoption and practice of adaptive coping strategies; mindfulness strategies) as a method to promote successful adaptation to adversity and enhance teacher resilience. Although hardships are inevitable, this strategy may be more effective than attempting to change environmental workplace stressors, considering that individual positive affect is more malleable and within one's locus of control, as opposed to stressful work conditions, which often are unavoidable and uncontrollable.

With regard to teacher burnout and unsuccessful adaptation to stress, the direct positive effect of stress on burnout suggested that teachers with higher levels of perceived work stress were more burned out, while the direct negative effect of positive affect on burnout suggested that teachers with higher levels of positive affect were less likely to experience burnout. The non-significant interaction, or moderation effect, between work stress and positive affect indicated that the impact of work stress on teacher burnout was not dependent upon one's level of positive affect; this was an unexpected finding considering previous evidence behind the moderating influence of positive affect on stress (Davis et al. 1998; Faulk et al. 2012; Ong et al. 2006). Overall, the direct effects of work stress and positive affect on burnout revealed a summative relationship between the two predictors, meaning that while high stress levels led to teacher burnout, positive affect had a restorative effect which reduced the accumulation of stress and prevented the precipitation of teacher burnout (Fredrickson 2000; Seery et al. 2010). From a theoretical standpoint, Fredrickson and colleagues refer to this process as the "undoing effect" of positive affect on the harmful consequences of stress (Fredrickson et al. 2000; Fredrickson and Levenson 1998; Tugade and Fredrickson 2004).

Implications from the present study should be viewed in light of several limitations. First, the cross-sectional survey design of the study cannot determine directionality or temporality of associations between variables; as such, the resulting associations between variables may be true in reverse direction (e.g., perceived work stress predicts adaptation and/or adaptation predicts perceived work stress; positive affect predicts adaptation and/or adaptation predicts positive affect). It may also be possible that other confounding factors accounted for some of the observed relationships. Likewise, a prospective design would allow

for assessment of the stress levels teachers experience over the course of the academic year, as evidence suggests that it may vary (Travers and Cooper 1996). Second, the self-report nature of the survey instrument and voluntary participation may have influenced the results with inherent errors and biases, such as the potential for untruthful or inaccurate responses due to lack of self-awareness. Although the use of anonymous surveys enhanced the strength of the study, the response rate of 26 % was only moderate (Alreck and Settle 2004), and information was not available about non-respondents. Additionally, the snowball sampling procedure of asking initial participants to recruit five other teachers to complete the surveys may have resulted in a biased sample that may not be well-representative of the true teacher population. Our sample was comprised of experienced individuals with an average of 18 years of teaching, and 22 % were recipients of a prestigious Teaching Excellence Award. However, Duckworth et al. (2009) found that positive traits predicted effectiveness in a sample of novice teachers; this previous work, coupled with the present study, suggests that positive affect may be beneficial to teachers across all levels of experience. Despite these limitations, the findings of this study offer important implications and provide support for the broaden-and-build theory of positive emotions as an effective theoretical framework for developing stress management programs, enhancing positive affect, and promoting resilience among public school teachers.

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