Teachers emotionally profit from positive school leadership: Applying the PERMA-Lead model to the control-value theory of emotions

Abstract

Based on Pekrun's (2006) control-value theory (CVT) of achievement emotions, we investigated the antecedents of school teachers' emotions. We hypothesized that teachers' perception of positive leadership at school as assessed via PERMA-Lead, a leading style grounded in positive psychology, would lead to teachers' experiences of high positive and low negative teaching emotions. According to CVT, those relations should be mediated by teachers' perceptions of control and value of their work at school. We could confirm this mediation hypothesis based on a sample of n = 446 teachers. Implications for research and practice are outlined.

Keywords: Positive leadership, PERMA-Lead, control-value theory, emotions, teachers

Highlights:

- Control-value theory was adopted to investigate relations between positive leadership at school and teachers' emotions.
- Positive leadership enhanced positive emotions and reduced negative emotions in teachers.
- Those effects were mediated by teachers' appraisals of control and value related to their work.
- Implementing positive leadership at school could be a highly effective investment in teachers' emotions.
- This could help to address current issues like teacher burnout and teacher shortages effectively.

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Introduction

In schools worldwide, there are numerous indicators that suggest teachers' emotional experiences at school are far from optimal. For instance, teachers often exhibit very high burnout rates (García-Carmona et al., 2019), report excessive job demands (Granziera et al., 2022), report poor general well-being (Skaalvik & Skaalvik, 2017), and feel undervalued in society (Akiba et al., 2023). Moreover, negative emotional experiences among teachers (Frenzel et al., 2021) and the expectation of similar emotions in students who aspire to become teachers may contribute to teacher shortages in numerous countries, causing serious societal problems (Organization for Economic Cooperation and Development [OECD], 2021). However, despite the presumed negative effects of suboptimal emotional experiences of teachers, research on teachers' emotions has been largely neglected (Frenzel et al., 2021). Consequently, we still lack knowledge about the antecedents of teachers' emotions in the school context, first of all on the distal antecedents of teachers' emotions (e.g., the social environment at school; Pekrun, 2023).

To bridge this research gap, we aim to draw on Pekrun's control-value theory of achievement emotions (Pekrun, 2006, 2018, 2023). According to this theory, teachers' perceived control and value related to their teaching (i.e., proximal antecedents of emotions) should mediate the effects of the social environment (i.e., a distal antecedent) on their emotions. In this study, we particularly focus on the school leadership as a potentially highly important distal antecedent of teachers' emotions that has been significantly overlooked in previous research. We refer to positive leadership at school as a leadership style grounded in the PERMA model, as

founded within positive psychology (Seligman, 2011). Specifically, we focus on PERMA-Lead, a more behaviourally defined positive leadership style that evolved from the original, rather generally formulated positive leadership approach (Ebner, 2019, 2020).

Theoretical Background

Antecedents of Teachers' Emotions: The Control-Value Theory of Achievement Emotions

A core theory concerning the antecedents of emotions in the context of learning and achievement is Pekrun's (2006, 2018, 2023) control-value theory of achievement emotions (CVT). CVT is based on appraisal theory but also incorporates propositions from transactional theories of stress-related emotions (Lazarus and Folkman, 1984), attribution theory (Graham and Taylor, 2014; Weiner, 2007), and is conceptually related to expectancy-value theories of achievement motivation (Eccles & Wigfield, 2002; Pekrun, 1993; Wigfield & Cambria, 2010).

According to the CVT, two appraisals are particularly significant in eliciting achievement emotions: individuals' subjective control over learning- and performance-related activities and outcomes, and their subjective value of these activities and outcomes (Pekrun et al., 2023). Subjective control refers to the perception that one is able (or unable) to influence performance activities and their outcomes (Skinner, 1996), while value appraisals refer to how important or personally significant the activities or achievement results are (Gaspard et al., 2015). High levels of control should foster positive emotions (e.g., enjoyment, pride) and reduce negative emotions (e.g., anxiety, anger). High levels of value are assumed to enhance both positive and negative emotions. However, one exception with regard to the latter contingency is boredom, in that boredom should be less pronounced when a learning task or a situation is considered important or personally relevant (Goetz et al., 2019).

The social-cognitive basis of CVT suggests that the social environment, as perceived by individuals, plays a crucial role in shaping their control and value appraisals in a particular situation (Pekrun, 2023). For example, if tasks are assigned to individuals that match their strengths, the situation is likely to be perceived as highly controllable. Similarly, if the meaning of a specific task is implicitly or explicitly outlined by others, it is expected to enhance perceptions of value. Thus, CVT highlights that appraisals of control and value (i.e., proximal antecedents of emotions) mediate the effects of the social environment (i.e., distal antecedents) on emotions. Importantly, although CVT is rooted in appraisal theory, which primarily proposes that environmental factors predict cognitive appraisals, leading to emotional experiences, it also acknowledges that emotions are reciprocally linked to their cognitive antecedents and the social environment (Goetz et al., 2021).

CVT has been predominantly used in research on high school and university students (Pekrun, 2023). The assumed links between students' control and value appraisals and a range of achievement emotions (e.g., enjoyment, pride, anxiety, anger, boredom) have been supported by extensive empirical evidence (e.g., Forsblom et al., 2022; Goetz et al., 2010; Pekrun and Perry, 2014; Loderer et al., 2020; Putwain, et al., 2018; Shao et al., 2020). The same applies to the mediating role of control and value appraisals (e.g., Flunger et al., 2019; Goetz et al., 2020; Lazarides & Buchholz, 2019).

CVT can clearly be adapted to study teachers' emotions, as their work reflects an achievement situation as outlined in the CVT (Frenzel, 2014; Frenzel et al., 2009). As such, core facets of CVT, namely perceived control and value, can be assumed to play a crucial role for teachers (e.g., control with respect to achieving classroom goals, value with respect to the importance of the class achieving good achievement outcomes). There are scattered findings

which indicate that facets of control and value, as well as facets of the social environment, are related to teachers' emotions. For example, Becker et al. (2015) found that goal conduciveness, which can be seen as a facet of control, is positively related to teachers' enjoyment and negatively to their anger, which is in line with assumptions of CVT. Additionally, class motivation (distal antecedent) was positively related to teachers' enjoyment, and class discipline was negatively related to teachers' anger, also aligning with CVT. In this study, goal conduciveness partly mediated the effects of class motivation and class discipline on teachers' emotions. However, aspects of perceived value were not investigated. Furthermore, scattered studies have found relations between teachers' emotions and their instructional strategies (Frenzel et al., 2021). For example, teachers' enjoyment was positively related to teaching strategies that support self-regulation in students (Chatzistamatiou et al., 2014).

To the best of our knowledge, no study to date has investigated the assumed mediation mechanisms as outlined in CVT for teachers by taking both perceived control and value into account. The present study aims to close this research gap.

Positive School Leadership and Teachers' Emotions

As outlined above, teachers' emotions can be assumed to be impacted by their social environment (distal antecedents) via perceptions of control and value (proximal antecedents). A core aspect of the social environment at school, which has previously been largely neglected with respect to its importance for teachers' emotions, is leadership at school (cf., Liebowitz & Porter, 2019). For school leadership, the school principal, deputy principals, and, at some schools, the school leadership team are responsible. Furthermore, subject leaders might also play a role in this respect, especially in the first phase of teaching.

Leadership at school is a very new topic in emotion research. In our study, we refer to a leadership style that might have a pivotal role in influencing teachers' emotions, namely positive leadership. Positive leadership represents a rather comprehensive concept, within which there are various more specific models. A very widely known model has been developed by Cameron and colleagues (Cameron, Dutton, & Quinn, 2003). In this model, also called Positive Organizational Scholarship, they describe four organizational factors (positive climate, positive sense, positive communication, positive relations) that lead to a "positive deviation", as they call it. This approach does not define leadership behavior or specific characteristics of a leader directly. Instead, it offers an organizational theory that can lead to indirect derivation of leadership behaviour. In line with other positive leadership approaches, the model by Cameron et al. (2003) reflects a strengths-based, resource-oriented approach (Ebner, 2019). Adopting the main ideas of this model to the school context implies that school leaders should become aware of the specific strengths of the teachers working there and foster those strengths. This implies that, above and beyond addressing problems, school leadership centers around nurturing the potentials of teachers at school.

Based on those general ideas on positive leadership as outlined by Cameron et al. (2003), Ebner (2019, 2020) developed a more behavioural oriented model of positive leadership, namely the PERMA-Lead model. In doing so, Ebner (2019, 2020) refers to the PERMA model, which clearly has a behavioural focus, and has adapted it to the general ideas on positive leadership (Cameron et al, 2003). PERMA is an acronym - each letter represents one element of the PERMA model, namely Positive emotions, Engagement, Relationships, Meaning, and Accomplishments (Seligman, 2011). The presence of all five elements of PERMA is theorized to result in flourishing, a state in which individuals find fulfilment and are living 'the good life'

(Seligman, 2011). Numerous studies show significant relations between the experience of PERMA (or individual elements from this model) and other relevant factors such as life satisfaction, school engagement, physical vitality (Kern, Waters, Adler, & White, 2014), positive work outcomes, such as organizational citizenship behavior and positive work role performance (Donaldson & Donaldson, 2020), and psychological safety (Lorenz, Ho, Beyer, & Hagitte, 2023) Thus, PERMA-Lead is a leadership behaviour that refers to a type of leadership that fosters all five PERMA elements among employees, which means enabling positive emotions, fostering engagement, creating sustainable relationships, conveying the meaning of work, and making accomplishments visible.

PERMA-Lead captures a behavioural oriented leadership style which can potentially be realized in rather different contexts and institutions. In the present study, we adopted PERMA-Lead in the school context and investigated whether positive leadership at school has an impact on teachers' emotions via their perceptions of control and value, as outlined above. It can be assumed that the PERMA elements make the school environment feel more controllable. For example, perceiving the aim to enable positive emotions and visible accomplishments might reflect a work environment that is perceived as controllable. Furthermore, engagement, sustainable relationships, and realizing the meaning of work might reflect a highly valuable work environment. In turn, perceived control and value are assumed to further impact teachers' positive and negative emotions as described in CVT. Thus, as outlined above, according to CVT, the elements of PERMA-Lead are assumed to foster both perceptions of control and value in teachers, which, in turn, should enhance their positive emotions and reduce their negative emotions.

To our knowledge, no single study is available that has analysed the effects of PERMA-Lead on teachers' emotions via their cognitive appraisals. However, there are a few studies that have examined the PERMA elements with respect to constructs related to emotions. For example, teacher well-being, as captured through the PERMA model, has been linked to greater life satisfaction and job satisfaction (Kern et al., 2014). Furthermore, and also related to our research, previous studies found that the perception of administration at a school significantly affected general life satisfaction and well-being of teachers (Censkseven-Onder & Sari, 2009). In addition, social support and leadership support have both been linked to job satisfaction in general (Kuoppala et al., 2008; Viswesvaran et al., 1999) and in teaching specifically (Cansoy, 2019; Kinman et al., 2011). Work-specific context factors in teaching, such as job demands and available resources (Yin et al., 2018), feedback and variety in tasks (Bermejo-Toro et al., 2016), and autonomy (Ebersold et al., 2019) have been associated with teacher well-being.

In sum, while this is the first study to investigate the effects of PERMA-Lead at school on teachers' emotions based on CVT, previous studies on affective variables (e.g., well-being) indicate that PERMA factors might be related to emotions. However, whether the assumed mediation mechanisms as proposed in CVT work in the context of school leadership is still an open question.

The Present Study

Based on the theoretical propositions of CVT (Pekrun, 2006, 2018, 2023), we aimed to test the following hypothesis: Teachers profit emotionally from positive leadership at school, as operationalized via PERMA-Lead (Ebner, 2019, 2020). That is, high levels of the PERMA-Lead factors should go in line with higher levels of teachers' positively valenced emotions. According

to CVT, this effect should be mediated by teachers' perceptions of control and value related to their work at school.

Method

Study Design

APA ethical standards were followed in the conduct of the study. In 2022, teachers and school principals in public schools in Austria, Germany, and the German speaking parts of Switzerland, were recruited through various methods. One of the primary recruitment strategies involved leveraging existing contacts with partner schools of the University of Vienna and ministries of education in the participating countries. Additionally, social networks such as WhatsApp, LinkedIn, Facebook, and lehrerforen.de were utilized to reach potential participants. Users within these networks were asked to share information about the study, employing a snowball sampling approach (Parker et al., 2019).

To school principals who agreed to participate, a link to an online questionnaire was sent. The school principals then forwarded this link to all teachers at their respective schools or shared it with the teachers via social media. In cases where recruitment occurred through social media, the link to the online questionnaire was already included in the information about the study.

The online questionnaire was created using the SoSci Survey platform (Leiner, 2019). Upon activating the link, participants received detailed information about the study, data handling procedures, guarantees of full anonymity, and responsible study leaders. Providing their consent was mandatory for participants before proceeding with the questionnaire.

The questionnaire began with gathering information about demographics, followed by the assessment of all further variables. Participants had the option to stop the assessment at any time without needing to provide a reason.

Participants

A total of *n* = 446 teachers participated in the study, with the majority of teachers teaching in vocational schools (*n* = 161), followed by secondary schools (*Gymnasium/AHS[Allgemeinbildende höhere Schule], n* = 84; *Mittel-, Haupt-, Real-, Gesamtschule, n* = 59), elementary schools (*n* = 96), schools for special needs (*n* = 38), one special school (*Montessori School*) and further schools (*n* = 7). The sample consisted of *n* = 349 female teachers and *n* = 84 male teachers (*n* = 3 teachers indicated non-binary gender and *n* = 10 did not indicate gender). The average age of teachers was 44.68 years (*SD* = 10.47) with 15.49 years (*SD* = 10.14) working experience as a teacher. The majority of teachers were employed in Germany (*n* = 251), followed by Austria (*n* = 190), and Switzerland (*n* = 5).

Instruments

Positive Leadership – PERMA-Lead

The teacher's perceptions of positive leadership in schools were examined via the 15-item PERMA-Lead-Profiler (Ebner et al., 2019), which examines leadership perceptions through the lens of the five factors of the PERMA model (Seligman, 2018). As such, participants were asked to reflect on their direct supervisor's behaviour during the past 12 months in the following five PERMA factors: 1. enabling *Positive Emotions* (3 items, e.g. 'My supervisor makes me feel comfortable at work'; McDonald's [1999] omega was ω = .947), 2. *fostering Engagement* (3 items, e.g. 'My supervisor gives me tasks that match my strengths'; ω = .937), 3. creating sustainable *Relationships* (3 items, e.g. 'My supervisor makes sure we support each other in our team'; ω = .929), 4. conveying the *Meaning* of work (3 items, e.g. 'My supervisor ensures that I experience meaning in my work'; ω = .939), and 5. making *Accomplishments* visible (3 items, e.g. 'My supervisor is happy with me when I achieve a goal and tells me so'; ω = .974). The reliability of the full scale was ω = .982. All items were measured on an 11-point

scale, ranging from 0% to 100% with 10% intervals, where 0% indicates minimal agreement and 100% indicates maximal agreement.

Perceived Control

Within research on CVT (Pekrun, 2006, 2018, 2023) perceived control has often been assessed via self-efficacy (Goetz, Bieleke et al., 2023; Graf et al., in press). In our study, teachers' perception of the control they have over their teaching environment was examined via the Teacher Self-Efficacy scale (Pfitzner-Eden, 2016). This scale is aligned with Bandura's original definition of task-related self-efficacy (Marsh et al., 2019). The scale models self-efficacy as a multidimensional construct with the following three subscales: 1. Instructional Strategies (4 items, e.g. 'How convinced are you that you would be able to find an alternative explanations or example when students do not understand something?'; ω = .681), 2. Classroom Management (4 items, e.g. 'How convinced are you that you would be able to control a disruptive class?'; ω = .883), and 3. Student Engagement (4 items, e.g. 'How convinced are you that you can foster critical thinking in students?'; ω = .690). The reliability of the full scale was ω = .829. All items were measured on a 5-point Likert scale from '*strongly disagree*' to '*strongly agree*'.

Perceived Value

Meaning has been found to be a core facet of value (Gaspard et al., 2015) and as such was used as a measure to capture value within the context of CVT. The ME-Work scale (Schnell & Hoffmann, 2020) was utilised to measure teacher's perceptions of meaning in their work. The multidimensional ME-Work scale contains four subscales, namely: 1. Coherence (3 items, e.g. 'My work reflects my interest'; ω = .855), 2. Significance (3 items, e.g. 'My work makes the world a bit better'; ω = .862), 3. Purpose (4 items, e.g. 'My employer cares about the welfare of

society'; ω = .866), and 4. Belonging (3 items, e.g. 'We are a great team at work'; ω = .851). The reliability of the full scale was ω = .936. All items were measured on a 5-point Likert scale from '*strongly disagree*' to '*strongly agree*'.

Teacher Emotions (positively valenced)

We assessed two discrete positive emotions (i.e., enjoyment, pride) and three negative emotions (i.e., anger, anxiety, boredom) which we combined to one overall teacher emotion scale, inverting the negative emotions so that higher values on this scale would indicate more positive emotional experiences. For the assessment of teacher enjoyment, anger, and anxiety we used the general Teacher Emotions Scale (TES; Frenzel et al., 2016). Enjoyment was measured through 4 items (e.g. 'I generally enjoy teaching'; ω = .869), anger was captured through five[1] items (e.g. 'I often have reasons to be angry while I teach'; ω = .837), and anxiety was measured through four items (e.g. 'I generally feel tense and nervous while teaching'; ω = .802). As we aimed to expand the number of emotions assessed, we developed new scales on teachers' experiences of pride and boredom. Seven items each were used to assess boredom (Teacher Boredom Scale, TBoS; e.g., 'During teaching I often have reason to be bored; ω = .878) and pride (Teacher Pride Scale, TPrS; e.g., 'While teaching, I feel pride'; ω = .901). The development of those two scales was inspired by the corresponding scales of the Achievement Emotions Questionnaire (AEQ, Pekrun et al., 2011), the Dutch Boredom Scale (DUBS; Reijseger et al., 2013), as well as the Boredom Proneness Scale-Short Form (PBS-SR; Struk et al., 2017). All items of the newly developed two scales (TBoS, TPrS) are presented in Appendices A and B (in German and English language). All emotion items were measured using a 5-point Likert scale, ranging from '*strongly disagree' to* '*strongly agree*'. The reliability of the

overall “Teacher Emotion” scale containing all 27 items from the five discrete teacher emotions subscales was ω = .903.

Data Analysis

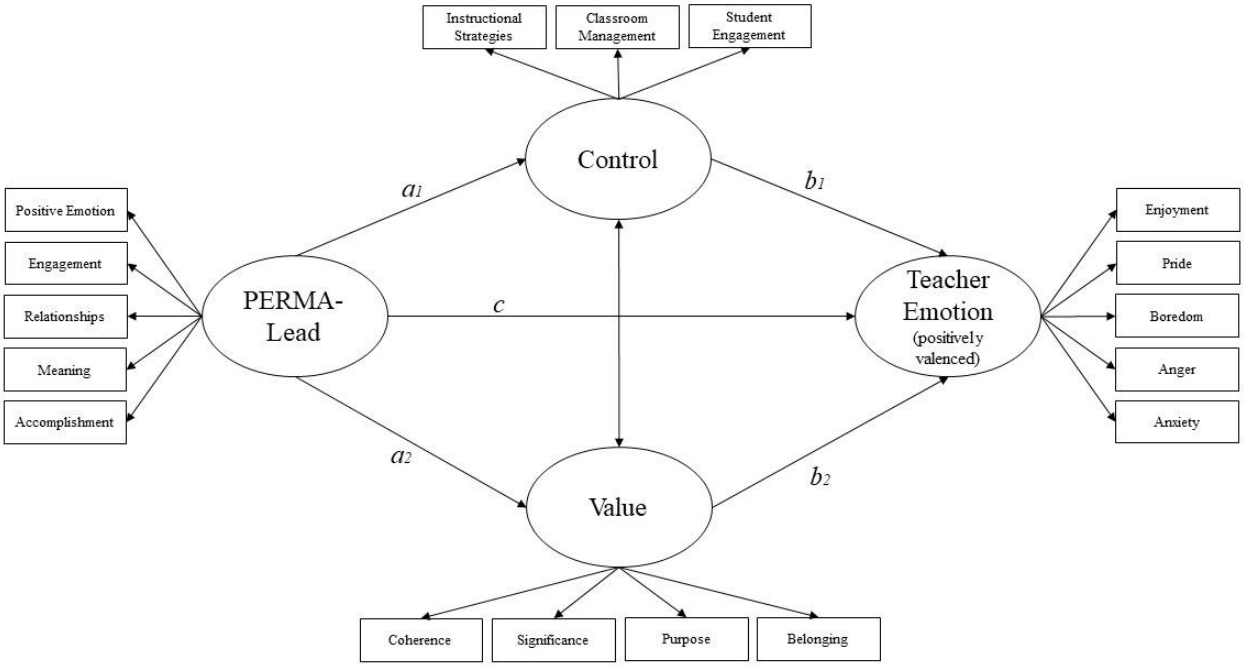
Descriptive analysis, scale reliabilities, and Pearson’s correlation coefficients were calculated in JASP version 0.17.1 (JASP Team, 2023). The mediation model (see Figure 1) was examined via latent mediation in RStudio via the lavaan package (Rosseel, 2012), with maximum likelihood estimation and a bias-corrected bootstrap (500 bootstrap samples; Biesanz et al., 2010). Model fit was analysed through the following fit indices: Root Mean Square Error of Approximation (RMSEA), the Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), and the Standardised Root Mean Square Residual (SRMR). Fit index cut-off recommendations proposed by Kenny (2020) were used to evaluate the model with an RMSEA and SRMR below .08, and in turn, a CFI and TLI of larger than .90 as indications of reasonable fit.

PERMA-Lead was modelled as a higher-order factor indicated by the manifest variables of subscale average scores (see Figure 1), following an existing precedent in the literature to examine PERMA as a higher-order factor (Coffey et al., 2016; Tansey et al., 2017; Umucu, 2021). Both control and value variables were also modelled as latent factors indicated by manifest subscale average scores. Lastly, Teacher Emotion (positively valenced) was modelled as a higher-order factor of enjoyment, pride, boredom, anxiety and anger. The three negative emotions (boredom, anger, and anxiety) were included as reverse-scored items in the correlation coefficients and descriptive statistics of Teacher Emotion and thus indicated a lack of negative emotion. In the latent model, the negative emotion variables were included as negative indicators of latent Teacher Emotion. In so doing, we captured emotion as a broad positive construct not indicative of a single emotion but rather a general positive feeling towards teaching.[2]

Figure 1. Theoretical mediation model

Finally, mediation was considered on the basis of the following requirements outlined by Kline (2015):

1. The predictor (PERMA-Lead) had a statistically significant effect on the outcome variable of Teacher Emotion (positively valenced).
2. The predictor (PERMA-Lead) had a statistically significant effect on the mediator variables (control and value) - and as such paths a_1 and a_2 are significant.
3. The mediators (control and value) have statistically significant effects on the outcome variable (Teacher Emotion – positively valenced) – thus paths b_1 and b_2 are



significant.

4. Full mediation only occurs if the mediators (control and value) are fully responsible for the effect found between the predictor (PERMA-Lead) and the outcome variable

(Teacher Emotion – positively valenced) – thus path *c* is not significant. Should path c be statistically significant, a partial mediation would be declared.

In addition, the total effects, direct effect (*c*), and indirect effects ($a_1 + b_1$; $a_2 + b_2$) of the mediation model were examined. Effect estimates with a 95% confidence interval containing zero were disregarded as insignificant, regardless of the *p*-value found (Baron & Kenny, 1986; Kline, 2015).

Results

Descriptive Statistics and Correlation Coefficients

The descriptive statistics of the variables assessed are shown in Table 1, with the correlation matrix in Table 2. No multicollinearity or skewness concerns were observed, however, Teacher Emotion (positively valenced) can be considered to have a somewhat leptokurtic distribution (> 2.00; Field, 2013). The descriptive statistics and correlation matrix of the subscales used in the mediation model can be found in the Supplementary Materials.

Table 1. *Descriptive statistics and normality distribution*

Variable	Mean	*SD*	Min	Max	Skewness	Kurtosis
PERMA-Lead	7.32	2.88	1	11	-.66	-.71
Control	3.88	.49	1.5	5	-.77	1.95
Value	4.12	.69	1.08	5	-1.07	1.44
Teacher Emotion (positively valenced)	4.30	.47	2.07	5	-1.27	2.16

Note. PERMA-Lead: items were measured on an 11-point scale, ranging from 0% to 100% with 10% intervals, where 0% indicates minimal agreement and 100% indicates maximal agreement.

Control/Value: items were measured on a 5-point Likert scale from '*strongly disagree*' to '*strongly agree*'. Teacher Emotion (positively valenced): this overall scale includes all items related to enjoyment and pride, as well as all inverted items related to boredom, anger, and anxiety; all emotion items were measured using a 5-point Likert scale, ranging from '*strongly disagree' to* '*strongly agree*'. $N = 446$.

Table 2. *Correlation Matrix*

Variable	1	2	3	4
1. PERMA-Lead	-			
2. Control	.15*	-		
3. Value	.37**	.38**	-	
4. Teacher Emotion (positively valenced)	.24**	.49**	.67**	-

Note. $^{**}p < .001$ $^{*}p < .01$. $N = 446$.

Mediation Model

The latent mediation model displayed reasonable to close fit (χ^2 (113) = 292.392; $p <$ .001), with RMSEA = .060 indicating a reasonable fit and SRMR = .044 a close-fitting model (Kenny, 2020). In addition, the CFI (.964) and TLI (.957) both indicated close fit. Both indirect effects were statistically significant (see Table 3), with the indirect effect of value having a considerably larger effect size ($\beta = .295$; $p < .001$) than control ($\beta = .060$; $p < .05$). Indeed, the indirect effect of control had a poorer significance level and although the 95% confidence interval of the effect size did not contain zero, the lower bound of the interval was very close (.001). In addition, the direct effect between PERMA-Lead and Teacher Emotion (positively

valenced) was significant in terms of the *p*-value ($p = .040$), however due to the 95% confidence interval containing zero, the effect is disregarded as insignificant (Kline, 2015). As such, due to the insignificance of path *c* in the mediation model, we concluded that control and value fully mediated the relationship between PERMA-Lead and Teacher Emotion (positively valenced).

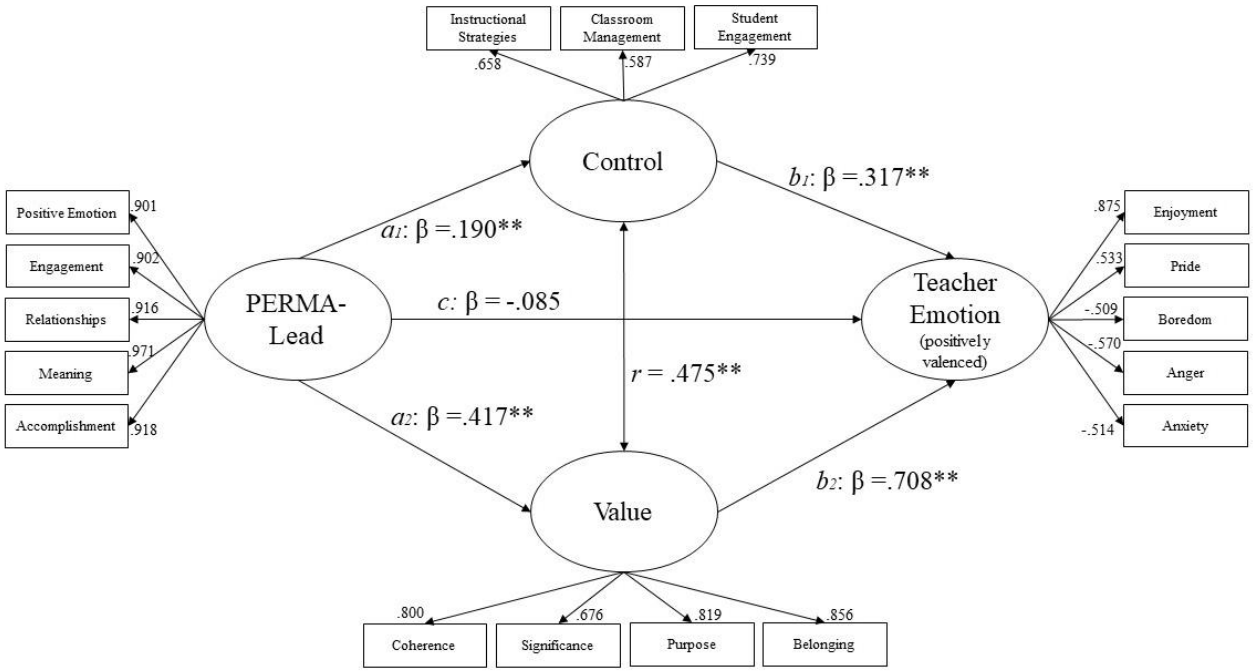


Figure 2. Mediation Model

Note. All factor loadings are significant at $p < .001$. $^{**}p < .001$.

Table 3. *Mediation Model Results*

					95% Confidence Interval		
	B	SE	z-value	p-value	Lower	Higher	β
Direct Effect							
PERMA-Lead → Teacher Emotion (pv)	-.006	.003	-2.052	.040	-.012	.000	-.085

Indirect Effects							
PERMA-Lead → Control → Teacher Emotion (pv)	.004	.002	2.333	.020	.001	.009	.060
PERMA-Lead → Value → Teacher Emotion (pv)	.022	.004	5.379	<.001	.014	.030	.295
Total Effect							
PERMA-Lead → Teacher Emotion (pv)	.020	.005	4.273	<.001	.011	.028	.271

Note. SE = Standard Error; B = Unstandardised estimate; β = Standardised estimate; pv = positively valenced. $N = 446$

Discussion

Based on assumptions as outlined in Pekrun's control-value theory (2006, 2018, 2023) we investigated the effects of positive leadership using the PERMA-Lead model (Ebner, 2020) on teachers' positively valenced emotions (i.e., discrete positive emotions and inverted discrete negative emotions). We hypothesized that those relations would be mediated by teachers' perceptions of control and value related to their work. Based on a sample of $N = 446$ teachers our hypothesis could fully be confirmed. To our knowledge, this is the first study bringing together research on CVT and positive leadership.

Our study follows the tradition of a field of research and practice termed 'positive education' (Seligman et al., 2009; White, 2014), a concept that stresses that education should not only centre academic achievement as outcome, but also the well-being of learners and educators (O'Shaughnessy & Larson, 2014). Since the popularisation of 'positive education', the concept has been widely researched and practically implemented in school programmes (for overview, see White & Murray, 2015; White, 2016). However, on the whole, the application of positive psychology in education and the 'positive education' movement, have largely favoured learners

as the subject of research studies and interventions, with teacher-focused positive psychology a largely neglected field of research (Mercer et al., 2016).

Our results show that positive leadership is clearly related to teachers' emotions via shaping their cognitions, namely perceptions of control and value related to their work at school. Thus, in the sense of positive psychology, positive leadership can be assumed to contribute indeed to flourishing, happiness, and life satisfaction of teachers. In a broader framework, it can contribute to 'the good life' (Seligman, 2011) of teachers.

Fostering teachers' positive emotions via positive leadership likely has an undoing effect (Fredrickson et al., 2000) on the negative outcomes associated with teaching, with positive emotions being linked to lower levels of stress (von der Embse & Mankin, 2021) and burnout (Bermejo-Toro et al., 2016). Further, positive emotions are theorised to broaden the ability of individuals to cognitively engage with challenging experiences and build future capacity and resilience (Fredrickson, 2001, 2004)). Specifically, regarding teachers, this broadening-and-building capacity has been observed in the study of Williams et al. (2015), where more hopeful and positive teachers displayed greater resilience and confidence in dealing with environmental challenges. Thus, based on our study it can strongly be assumed that positive leadership contributes to teachers' positive emotions which in turn can be assumed to broaden teachers' mind and actions in a fruitful way.

Our finding is in line with studies on teacher's well-being, which can also be seen as an affective variable. However, research on teacher well-being has been criticised in that by focusing on individual elements of well-being and individual outcomes, context-specific and systemic elements are ignored (Cabanas, 2018; Ciarrochi et al., 2016; McNulty & Fincham, 2012). For example, the finding that greater teacher well-being may result in lower stress,

anxiety, and burnout (Puertas Molero et al., 2019), may lead to a simplistic conclusion being drawn that teachers need to improve their general well-being in order to relieve their job-specific stress. Thus, the responsibility for improving teachers' well-being is often shifted to the individual, ignoring contextual and environmental factors that may contribute to their negative affective experience. Positive psychology cannot be seen as a 'magic pill' used to fix systemic wrongs (Ciarrochi et al., 2016). Therefore, context-specific factors should be considered when examining teacher well-being. Our study specifically addressed an important contextual factor for teachers, namely the leadership climate they experience from their principals. Our findings underscore the critical role of this factor in the emotions teachers experience specifically in relation to their teaching.

As such, our study findings are also in line with previous research showing that the perception of administration at a school was linked with general life satisfaction and well-being of teachers (Censkseven-Onder & Sari, 2009). Our study has broadened this scope by focusing on teachers' emotions and by analysing the mechanisms leading to teachers' emotions, namely cognitive appraisals which are initiated by the social environment.

An important finding of our study was that perceived value might play a more important role than perceived control when moderating the effects of positive leadership on teachers' emotions. Thus, when the goal is to foster teachers' positive emotions, the value-inducing facets of PERMA-Lead (i.e., meaning, accomplishment) should be the main focus for school principals and intervention programs.

The findings of our study are also highly relevant for students' emotions, as previous research has shown that emotions of teachers and students are linked through reciprocal causation (Frenzel et al., 2009, 2018, 2021). Thus, fostering positive teacher emotions via

PERMA-Lead can be assumed to enhance positive feelings in students, which, in turn, further contributes to positive emotions in teachers. Similar reciprocal causations might also be assumed in the relationship between teachers and school leaders.

Fostering teachers' positive emotions via positive leadership might contribute to reducing serious ongoing problems at schools, as outlined above, namely very high burnout rates, reports of excessive job demands, poor well-being, and teacher shortages in numerous countries. An important aspect in this regard is that optimizing leadership at schools by implementing a positive leadership style does not require a significant investment of resources. Optimizing the leadership style of school principals is a relatively low-cost investment that can impact sometimes more than 100 teachers working at schools. Considering the potential effects on students and society, this could be a highly effective investment.

Limitations

Some limitations of the present study should be noted and can be used to derive directions for future research. First, concerning the assessment of the constructs of this study, we relied on self-report data, which may have resulted in common method bias (Podsakoff et al., 2003). To control for possible biases, future studies may add more objective assessments of positive leadership and teachers' emotions (e.g., observations of leadership practices at school; with respect to emotions physiological assessments of arousal in teachers; see Pekrun, 2023; Roos et al., 2021).

Second, our approach does not allow for conclusions on the causal ordering of variables. Future studies in this field may investigate the assumed relations over a longer time periods by adopting longitudinal designs. Including experience sampling assessments in longitudinal designs (Goetz, Steiner et al., 2023) could be highly insightful in understanding how causal

relationships unfold over time (e.g., measurement burst designs; e.g., Sliwinski, 2008).

Finally, our sample was not representative in nature. In order to validate our findings with respect to different school types, future studies might focus on one specific school type by using representative samples.

Conclusion

Our study shows that positive leadership in schools may play a critical role in promoting teachers' positive emotions at work. Specifically, we found that increasing teacher value of their work could be a key way to improve their positive emotions through positive leadership (i.e., via the PERMA components of meaning and accomplishment). These findings could help address some of the highly problematic situations at schools that may be caused in part by teachers' negative emotional experiences, such as high rates of burnout, reports of excessive work demands, and feelings of being undervalued.

Positive leadership might contribute via fostering teachers' emotions to reduce the teacher shortages, which is currently a serious problem in numerous countries. However, independently from the effects of positive teacher emotions, experiencing positive emotions can be regarded as a desired outcome in and of itself – for teachers and students alike.

Appendix

A Items of the Teacher Boredom Scale (TBoS)

Item-Number	Item (German/*English*)	*M* (*SD*)	Item-total correlation
TBoS-1	Während des Unterrichtens habe ich oft Grund mich zu langweilen. *During teaching, I often have reasons to be bored.*	1.44 (0.78)	.72
TBoS-2	Während des Unterrichtens schweifen meine Gedanken ab, weil ich mich langweile. *During teaching, my thoughts wander because I am bored.*	1.33 (0.68)	.71
TBoS-3	Immer wieder das Gleiche zu unterrichten langweilt mich. *Teaching the same things over and over again bores me.*	1.79 (1.09)	.53
TBoS-4	Manche Unterrichtsphasen ziehen sich wie Kaugummi. *Some teaching phases drag on like chewing gum.*	1.72 (0.95)	.61
TBoS-5	Zu unterrichten ist manchmal öde und monoton. *Teaching can be dull and monotonous at times.*	1.50 (0.85)	.78
TBoS-6	In Stilllernphasen/ Selbstlernphasen wird mir gelegentlich langweilig. *During quiet learning phases/self-learning phases, I occasionally get bored.*	1.62 (1.00)	.63
TBoS-7	In Phasen zäher Interaktion mit der Klasse langweile ich mich. *During phases of slow interaction with the class, I feel bored.*	1.54 (0.88)	.65

Note. Values are based on a sample of n = 446 teachers. All items were measured using a 5-point Likert scale ranging from '*strongly disagree' to* '*strongly agree*'.

B Items of the Teacher Pride Scale (TPrS)

Item-Number	Item (German/*English*)	*M* (*SD*)	Item-total correlation
TPrS-1	Während des Unterrichtens empfinde ich Stolz. *During teaching, I feel pride.*	3.37 (0.97)	.59
TPrS-2	Ich bin stolz, wenn meine Schüler:innnen den Stoff verstehen und anwenden können. *I am proud when my students can understand and apply the material.*	4.43 (0.82)	.71
TPrS-3	Wenn ich eine neue/außergewöhnliche Unterrichtseinheit geplant habe und diese funktioniert bin ich stolz. *When I have planned a new/extraordinary teaching unit and it works, I feel proud.*	4.54 (0.72)	.77
TPrS-4	Wenn ich merke, dass meine Aufgabenstellung die Schüler:innen motiviert, macht mich das stolz. *When I notice that my tasks motivate the students, it makes me proud.*	4.49 (0.77)	.76
TPrS-5	Ich bin manchmal stolz auf die Art und Weise, wie ich unterrichte. *Sometimes, I am proud of the way I teach.*	3.93 (0.95)	.64
TPrS-6	Ich bin stolz, wenn ich eine herausfordernde Unterrichtssituation meistere. *I am proud when I successfully handle a challenging teaching situation.*	4.33 (0.86)	.74
TPrS-7	Ich bin stolz, wenn auch leistungsschwächere Schüler:innen meinem Unterricht folgen können. *I am proud when even academically weaker students can follow my teaching.*	4.39 (0.82)	.73

Note. Values are based on a sample of n = 446 teachers. All items were measured using a 5-point Likert scale ranging from '*strongly disagree' to* '*strongly agree*'.

Footnotes

[1] It should be noted that the original TES contains 4 items within the anger subscale. However, one item of the scale (*"Teaching generally frustrates me"*) has shown relatively low item-total correlations in previous studies, especially when used in languages beyond German (see Frenzel et al., 2016; Musliu & Frenzel, 2023). Therefore, to ensure a high reliability of this scale, we decided to add a further item. The newly formulated item is as follows: *"While teaching, I occasionally get so angry that I notice my heart rate rising"* (German: *"Beim Unterrichten ärgere ich mich gelegentlich so sehr, dass ich merke, wie mein Puls hoch geht"*). For more information on the construct of teachers' anger and frustration, see also Sutton (2007).

[2] It should be noted that the use of manifest subscales to indicate latent variables can be considered a form of parcelling, which has been criticised for increasing the likelihood of Type II errors (Bandalos & Finney, 2001). However, the complexity of the model, number of items in each measure and the limited statistical power provided by the moderate sample size led to the decision to utilise subscales as indicator variables. It is likely that this decision led to the creation of more parsimonious data with less sampling error (MacCallum et al., 1999) and a lower likelihood of distributional violations (Little et al., 2002).

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