Social Psychology of Education (2019) 22:209–226
https://doi.org/10.1007/s11218-018-9468-4

Do quality teacher–student relationships protect teachers from emotional exhaustion? The mediating role of enjoyment and anger

Jamie L. Taxer[1] · Betty Becker-Kurz[2] · Anne C. Frenzel[2]

Received: 7 December 2017 / Accepted: 30 August 2018 / Published online: 13 November 2018

Abstract
Teaching can be an emotionally exhausting profession, thus mechanisms that protect teachers from feeling emotionally overextended need to be investigated. In two studies, we examined the indirect role teacher–student relationships have on teachers' level of emotional exhaustion through teachers' experiences of enjoyment and anger. In the first, we used a latent path analysis to examine the indirect effect of teacher-perceived ($N = 266$) teacher–student-relationships on teachers' emotional exhaustion in a cross-sectional design. In the second study, we extended these findings to a longitudinal design that utilized student perceptions and replicated the indirect effect of teacher–student relationships on teachers' ($N = 69$) emotional exhaustion using student ($N = 1643$) perceptions of teacher–student relationships. The results from both studies indicated that high quality teacher–student relationships help protect teachers from being emotionally exhausted through increasing the amount of enjoyment and decreasing the amount of anger they experienced in the classroom.

Keywords Teacher–student relationships · Teacher emotions · Anger · Enjoyment · Emotional exhaustion

1 Introduction

Teaching is widely recognized as a stressful profession (Johnson et al. 2005). One common result of work related stress is burnout, which results from prolonged emotional and interpersonal job stressors and consists of three components: emotional exhaustion, depersonalization and personal accomplishment (Maslach et al. 2001). Teachers experience more burnout symptoms than individuals in many other

✉ Jamie L. Taxer
jtaxer@stanford.edu

[1] Department of Psychology, Stanford University, 420 Serra Mall, Stanford, CA 94305, USA

[2] University of Munich, Munich, Germany

professions (de Heus and Diekstra 1999). The core element of burnout within teachers is emotional exhaustion (Chang 2009; Klusmann et al. 2008a), which is defined as feeling overextended and depleted of emotional and physical resources (Maslach et al. 2001). The main determinant of emotional exhaustion are the demands associated with the job (Maslach et al. 2001). For teachers these demands include students' misbehavior, work overload, and the physical work environment (Hakanen et al. 2006). Feeling emotionally exhausted has been linked to low teaching motivation and professional efficacy (Hakanen et al. 2006), low job satisfaction (Wolpin et al. 1991), intentions to quit (Leung and Lee 2006), and poor teaching quality (Klusmann et al. 2008b). However, not all teachers experience emotional exhaustion or leave the profession because of it. Equally as important as knowing the causes and negative effects of emotional exhaustion is knowing what protects teachers from becoming emotionally exhausted. One such protective factor could be having a good relationship with one's students (Klassen et al. 2012; Spilt et al. 2011).

The influence of positive teacher–student relationships for school aged children has been widely researched and recognized (see Roorda et al. 2011); however, the influence of teacher–student relationships on teachers has so far received little research attention. In their review Spilt et al. (2011) speculated that teachers' well-being is influenced by teacher–student relationships through enhancing teachers' emotional experiences. These relationships were, however, not empirically tested. This study attempted to address this research gap by investigating whether teachers' experiences of enjoyment and anger mediate the relationship between teacher–student relationships and teachers' emotional exhaustion.

1.1 The protective influence of teacher–student relationships

Having quality interpersonal–relationships is a basic need for all individuals, and having this need fulfilled improves our well-being (see Baumeister and Leary 1995; Deci and Ryan 2000). Conversely, feeling socially disconnected is linked to impaired psychological functioning (Cacioppo et al. 2006). Since teachers spend most of their working hours with students, it is assumed that they have the need to feel connected to their students and that their well-being increases from having this need met. Within the present research, we focused on one hallmark of teachers' well-being–emotional exhaustion (Klusmann et al. 2008b; van Horn e tal. 2004).

The opportunity to work closely with students is a primary reason many teachers enter the teaching field (Fokkens-Bruinsma and Canrinus 2014; Watt and Richardson 2007) and many teachers strive to build close and caring relationships with their students (Butler 2012). Thus, teachers have the desire to have quality relationships with their students. Furthermore, early career teachers benefit from experiencing positive teacher–student relationships (Le Cornu 2013). Feeling connected to students has been shown to be negatively linked to teachers' level of emotional exhaustion (Klassen et al. 2012); hence we predict that teachers who feel close to their students will exhibit lower levels of emotional exhaustion than teachers who do not feel close to their students.

1.2 The mediating role of enjoyment and anger

The finding that quality interpersonal–relationships produces good outcomes leads to the crucial question of what mechanisms contribute to this positive effect. We propose that positive relationships are linked to enhanced emotional experiences, which then positively influence well-being. In regards to the link between teacher–student relationships and teachers' emotions, based on the belongingness hypothesis (Baumeister and Leary 1995), experiencing belongingness should be associated with increased positive affect, whereas a lack of belongingness should be linked to increased negative affect. Within the present research, we focused on the two discrete emotions that teachers most frequently report experiencing while teaching and interacting with students, namely enjoyment and anger (see Frenzel 2014). There are isolated findings that how related teachers feel to their students is connected to teachers' experiences of enjoyment and anger in the classroom. For example feeling close to one's students has been found to be positively associated with teachers' experiences of enjoyment and negatively related to experiences of anger (Hagenauer et al. 2015; Klassen et al. 2012). Furthermore, in interviews with 60 teachers, Hargreaves (2000) found that most teachers named relationships with their students as a key source of their enjoyment. Accordingly, we posit that teachers who experience positive relationships with their students will experience more enjoyment and less anger in the classroom.

We propose that teachers' experiences of enjoyment and anger are linked to their well-being because psychological functioning is enhanced through positive emotions and diminished through negative emotions (cf. Bonanno and Keltner 1999; Folkman and Moskowitz 2000; Fredrickson 2001). According to Fredrickson's (2001) broaden-and-build theory, experiencing positive emotions broadens momentary thoughts and actions and builds personal resources. Accordingly, experiencing enjoyment should protect teachers from becoming emotionally exhausted, whereas experiencing anger should contribute towards teachers becoming emotionally exhausted. Several studies have established a link between teachers' emotions and experiences of emotional exhaustion (Carson 2006; Frenzel et al. 2016; Keller, Chang, et al. 2014; Taxer and Frenzel 2015). These studies have consistently found that enjoyment is negatively and anger is positively related to emotional exhaustion. Thus, we propose that enjoyment is negatively and anger is positively linked to teachers' level of emotional exhaustion. In sum, we propose that experiencing positive teacher–student relationships indirectly influences teachers' level of emotional exhaustion through increasing the amount of enjoyment and decreasing the amount of anger they experience.

1.3 The present research

We aim to contribute to the existing literature in at least two ways. First, building on previous research (Spilt et al. 2011), we suggest that a better understanding of the protective influence of positive teacher–student relationships on teachers' well-being

can be achieved by exploring the mediating role of teachers' experiences of enjoyment and anger. Specifically, we hypothesized that teachers' positive relationships with their students are related to increased levels of enjoyment and decreased levels of anger, which in turn should be related to decreased levels of emotional exhaustion. Second, we argue that if high quality teacher–student relationships do serve as a protective factor against emotional exhaustion through their influence on teachers' enjoyment and anger, these findings should hold true if assessing teacher–student relationships from the perspective of the teacher or students. Thus, in Study 1 we examined the quality of teacher–student relationships through teachers' reports of how connected they felt to their students and in Study 2 we examined teacher–student relationships through students' reports of how much they felt connected to and accepted by their teacher. Furthermore, in Study 2 we examined our research questions in a longitudinal design.

2 Study 1

In Study 1, our aim was to investigate the links between teacher–student relationships and teachers' experiences of enjoyment, anger, and emotional exhaustion. In this study, we investigated the teacher–student relationships from the teacher perspective to capture how teachers' subjective beliefs about their relationships with their students are related to their emotional experiences and well-being.

2.1 Method

2.1.1 Participants and procedure

Participants were 266 secondary school teachers (65.9% female) from both rural and urban Oklahoma, USA, with a mean age of 43.43 years ($SD = 11.65$; range 21–68 years). Teachers taught a variety of subjects and had on average 14.86 years of teaching experience ($SD = 10.43$). The questionnaires were placed in teachers' school mailboxes. Participation was voluntary and teachers were requested to return the completed questionnaire to the school secretary. Teachers were informed that by returning the survey they were consenting to have their data included in our study. The return rate (32.8%) was comparable to the return rates of other studies with teachers (e.g., Hogarty et al. 2003, 35%; Metler 2003, 21%). Teachers were requested to refer to their current class while answering all the measures. If they taught more than one class, they were instructed to refer to their first class on Tuesday mornings. This ensured that teachers consistently thought of one group of students while answering all questions, which is particularly important for enjoyment and anger since these emotions show considerable variation based on subject and students being taught (Frenzel e tal. 2015). This study was conducted in compliance with the ethical standards of the University of Munich.

2.1.2 Measures

All items were measured on scale ranging from 0 (*strongly disagree*) to 4 (*strongly agree*).

2.1.2.1 Teacher–student relationships The extent teachers felt related to their students was measured with four items from Klassen et al. (2012). A sample item is "I feel connected to the students in this class." The scale was internally consistent (Cronbach's $\alpha = .79$).

2.1.2.2 Experienced enjoyment and anger Teachers' experiences of enjoyment and anger while in the classroom were measured with the enjoyment and anger scales from the group-specific variant of the Teacher Emotion Scales (Frenzel et al. 2016). A sample enjoyment item is "I enjoy teaching these students" and a sample anger item is "I often have reasons to be angry while I teach these students." Both scales yielded an acceptable internal consistency (Cronbach's $\alpha = .84$ and .87 for enjoyment and anger, respectively).

2.1.2.3 Emotional exhaustion Teachers' level of emotional exhaustion was measured with the 9-item emotional exhaustion subscale of the Maslach Burnout Inventory (Maslach et al. 1996) for educators. A sample item is "I feel burned out from my work". The scale was highly internally consistent (Cronbach's $\alpha = .89$).

2.1.3 Statistical analyses

We conducted two separate latent path analyses in M*plus* 7.11 (Muthén and Muthén 1998–2013) using the full information maximum likelihood estimator to examine if teachers' experiences of enjoyment and anger separately mediate the effect between teacher–student relationships and emotional exhaustion (i.e., is there an indirect effect). We analyzed our proposed mediators in separate models because we were interested in how each mediator (i.e., enjoyment and anger) was separately related to our proposed independent (i.e., teacher–student relationships) and dependent (i.e., emotional exhaustion) variables rather than their relationship with the other variables while controlling for one another. That is, including them in the same model would indicate the indirect relationship between teacher–student relationships and emotional exhaustion through enjoyment while controlling for anger and through anger while controlling for enjoyment, which was not the focus of the present research. Bias-corrected bootstrapping with 10,000 bootstrap samples was utilized to estimate the confidence intervals of the mediated effects (Preacher and Hayes 2008). The indirect effects were considered significant if the 95% confidence intervals (CI) did not include zero. According to standard recommendations, a comparative fit index (CFI) and the Tucker Lewis index (TLI) of .95 or greater, and root mean square error of approximation (RMSEA) of .05 or lower were assumed to indicate an excellent model fit, whereas a CFI or TLI of .90 or higher and an RMSEA

between .05 and .08 were assumed to indicate an adequate model fit (cf. Bentler 2007; Browne et al. 1993; Hu and Bentler 1999; McDonald and Marsh 1990). As recommended by Hayes (2013, p. 200), we reported unstandardized coefficients.

2.2 Results

2.2.1 Descriptive results

Descriptive statistics and correlations between the latent variables are presented in Table 1. Teachers reported having high quality relationship with their students, being mildly emotionally exhausted, and experiencing high levels of enjoyment and mild levels of anger while teaching their students. All study variables were significantly correlated to one another in the expected directions.

2.2.2 Mediation

We examined two mediation models in which emotional exhaustion was regressed on teacher–student relatedness mediated by either enjoyment or anger. The model with enjoyment as the mediator yielded an adequate fit to the data ($\chi^2 = 248.85$, $df = 116$, $p < .001$, CFI = .94, TLI = .92, RMSEA = .066). As can be seen in Fig. 1a, teacher–student relationships were significantly positively related to teacher enjoyment ($B = 1.89$, $SE = 0.48$, $p < .001$) and teacher enjoyment in turn was significantly negatively related to emotional exhaustion ($B = -.40$, $SE = 0.14$, $p = .004$). The direct effect of teacher–student relationships ($B_{\text{direct}} = .36$, $SE = 0.37$, $p = .33$; 95% bootstrap CI = − 0.18, 1.14) on emotional exhaustion with enjoyment in the model was not significant. The total indirect effect of teacher–student relationships on emotional exhaustion was significant and the bootstrap confidence intervals did not include zero ($B_{\text{indirect}} = -.75$, $SE = 0.37$, $p = .04$; 95% bootstrap CI = − .66, − 0.12). Thus, teacher–student relationships did have an indirect effect on teachers' emotional exhaustion through teachers' experiences of enjoyment.

Table 1 Latent correlations and descriptive statistics of Study 1 variables

Variable	1	2	3	4
1. Teacher–student relationships	–	− .34***	− .88***	− .34***
2. Emotional exhaustion		–	− .46***	− .45***
3. Enjoyment			–	− .58***
4. Anger				–
Observed range	1.00–4.00	0–3.67	0.75–4.00	0–4.00
M	3.46	1.32	3.29	1.05
SD	0.56	0.80	0.62	0.93

All variables were measured on a 0–4 scale

**$p < 0.01$

***$p < 0.001$

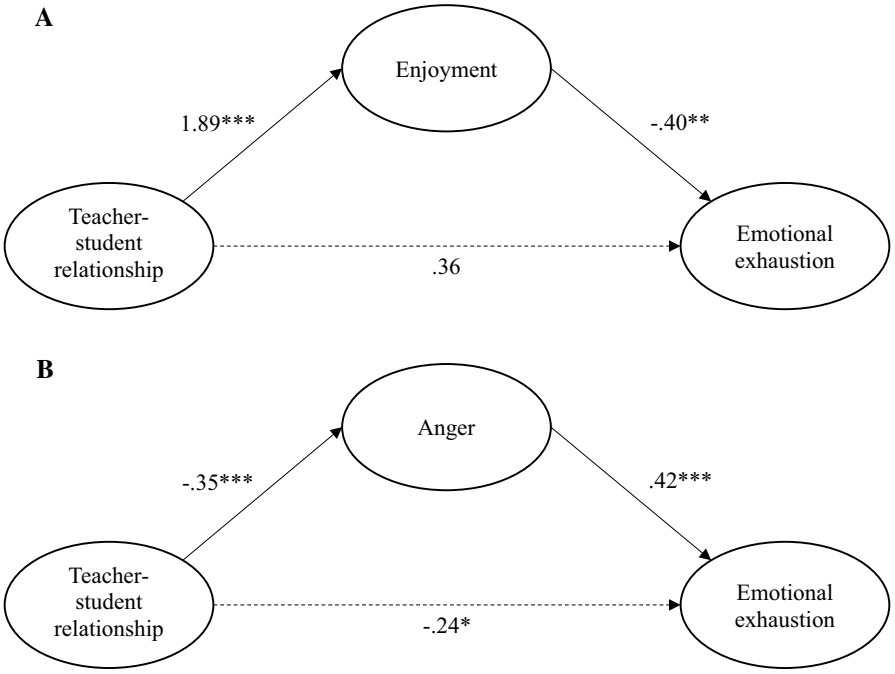

Fig. 1 The indirect effect of teacher–student relationship from the teachers' perspective on teachers' emotional exhaustion through their enjoyment (**a**) and anger (**b**). Values are unstandardized coefficients. $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

The model with anger as the mediator yielded an adequate fit to the data ($\chi^2 = 238.82$, $df = 116$, $p < .001$, CFI = .94, TLI = .92, RMSEA = .063). As is shown in Fig. 1b, teacher–student relationships were significantly negatively related to teacher anger ($B = -.35$, $SE = 0.09$, $p < .001$) and teacher anger was significantly positively related to emotional exhaustion ($B = .42$, $SE = 0.10$, $p < .001$). The direct effect of teacher–student relationships ($B_{\text{direct}} = -.24$, $SE = 0.10$, $p = .02$; 95% bootstrap CI = −0.45, −0.06) on emotional exhaustion with anger in the model was significant. The total indirect effect of teacher–student relationships on emotional exhaustion was significant and the bootstrap confidence intervals did not include zero ($B_{\text{indirect}} = -.15$, $SE = 0.05$, $p = .007$; 95% bootstrap CI = 0.23, 0.61). Teacher–student relationships also indirectly affected teachers' level of emotional exhaustion through teachers' experiences of anger.

2.3 Discussion

The results of Study 1 support our prediction that teacher–student relationships serve a protective function for teachers. We found that teachers' perceptions of their relationships with a group of students were related to their experiences of enjoyment and anger while teaching those students. These increased experiences of enjoyment

and decreased experiences of anger were then related to lower levels of emotional exhaustion. Thus, teacher–student relationships indirectly influence teachers' emotional exhaustion through their experiences of enjoyment and anger.

This study provided compelling evidence for our proposed hypotheses using a large sample size; however, it suffered from two "typical" deficiencies: All data were obtained from one single source and obtained at one single point in time. Thus, despite a clear theoretical rationale for the proposed mediated effects, the empirical evidence for them was relatively weak. Thus, we sought to replicate our findings on the protective nature of positive teacher–student relationships in a longitudinal study design that involved an additional source of measurement—the students.

3 Study 2

Study 2 had two key goals. The first goal was to conceptually replicate our findings on the protective benefits of high quality teacher–student relationships on teachers' experiences of enjoyment and anger as well as emotional exhaustion by using students' instead of teachers' perceptions of the teacher–student relationships. The second goal was to more rigorously test the mediating effects of teacher enjoyment and anger through a longitudinal design.

First, relationships are not one-sided; they involve mutual exchanges and social perceptions between two interaction partners. In the case of teacher–student relationships, they are between one teacher and multiple students in a classroom. Thus, the quality of teacher–student relationships can be captured by the teacher's subjective beliefs regarding their relationships with their students (as in Study 1), but it is also conceivable to operationalize the quality of teacher–student relationships through aggregating across the perceptions of students in one class. We proposed that incorporating student instead of teacher perceptions of teacher–student relationships would result in a conceptual replication of the results of Study 1.

Second, Study 2 had a longitudinal rather than a cross-sectional design, which established a clear temporal order between the hypothesized cause (teacher–student-relationships), mediators (enjoyment and anger), and outcome (emotional exhaustion). Furthermore, we measured our hypothesized outcome, teacher emotional exhaustion, at the beginning of the schoolyear as well as half a year later. This enabled us to examine the indirect effect of teacher–student relationships on teachers' experiences of emotional exhaustion through teachers' experiences of enjoyment and anger while controlling for teachers' initial levels of emotional exhaustion.

3.1 Method

3.1.1 Participants and procedure

The data reported here were part of a larger, longitudinal study on teachers' and students' emotions (see Frenzel et al. 2016). A total of 69 teachers (76.8% female, mean age = 40 years, $SD = 12$) from ten Bavarian upper (52.5%) and middle (42.8%) track

secondary schools voluntarily participated along with one of their classes (average class size 23.81 students). Most teachers had been teaching for 5–10 years and taught a variety of subjects. The student sample consisted of 1643 students (53.5% female, mean age = 14.37 years, *SD* = 1.58) from grades 5 through 10.

Teachers meeting the following inclusion criteria were invited to participate in the study: (1) they had not taught the same group of students in previous years, (2) the students were not participating in the study with another teacher, and (3) the teacher taught the students for at least 3 h per week in a core subject area (i.e., German, foreign language, mathematics/natural sciences, or social sciences). All teachers that were invited to participate in the study chose to do so and provided informed consent. Teachers filled out the questionnaire either at school or home. Students of participating teachers were invited to voluntarily participate and written parental consent was obtained. The student participation rate was high (90.1% across classes). Students filled out the questionnaires in their classrooms in the presence of trained research assistants. Teachers as well their participating class filled out questionnaires at three time points during the schoolyear. The first measurement point was in September at the beginning of the schoolyear, the second measurement point was in October, and the final measurement point was in February. At the end of the study, teachers received a debriefing letter and a small thank you gift. This study was conducted in compliance with the ethical standards of the University of Munich.

3.1.2 Measures

3.1.2.1 Student reported teacher–student relationship Teacher–student relationships were assessed with eight items measuring the extent students trusted, liked and felt accepted by their teacher. We used items similar to those used in previous research to assess teacher–student relationships from the student perspective and included both positive and negative aspects of relationship quality (cf. Gehlbach et al. 2012; Murray and Zvoch 2010). Items were "I like our teacher," "I trust my teacher," "I wish I had a different teacher for this subject," "I am satisfied with our teacher for this subject," "Our teacher takes time for me when I want to talk to her or him about something," "Our teacher takes care of me when I have problems," "Our teacher takes me seriously," and "Our teacher understands me." Items were measured on a scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The scale was internally consistent (Cronbach's $\alpha = .89$). We used the intraclass correlations (ICC) Type 1 and 2 to determine if aggregated individual-level ratings of student perceptions of teacher–student relationships were a reliable indicator of the class-level construct (Bliese 2000; Snijders and Bosker 1999). An ICC(1) of .28 and ICC(2) of .90 indicated that there was within-class homogeneity in teacher–student relationships and student ratings aggregated at the class level were highly reliable (Lüdtke et al. 2009).

3.1.2.2 Teacher enjoyment and anger Teachers' emotional experiences were again measured with the enjoyment and anger subscales from the group-specific variant of the Teacher Emotion Scales (Frenzel et al. 2016). All items were answered on a

scale ranging from 1 (*strongly disagree*) to 4 (*strongly agree*). Both scales were again highly internally consistent (Cronbach's α = .81/.84 for enjoyment/anger).

3.1.2.3 Emotional exhaustion Teachers' level of emotional exhaustion was measured with the 5-item German adaptation of Maslach et al.'s (1996) emotional exhaustion scale for teachers (Böhm-Kasper et al. 2000). A sample item is "Sometimes I am really depressed at the end of the school day". Items were measured on scale ranging from 1 (*strongly disagree*) to 4 (*strongly agree*). The scale exhibited a low internal consistency at the first measurement point (Cronbach's α = .60) but was internally consistent at the second measurement point (Cronbach's α = .78).

3.1.3 Statistical analyses

We used the PROCESS macro for SPSS (Model 4; Hayes 2013) to analyze our two proposed mediation models. PROCESS calculates bias-corrected bootstrap confidence intervals for the indirect effects (10,000 bootstrap samples), with significant mediation indicated by a confidence interval that does not include zero. Since our key focus was on level 2 variables, namely class-aggregated ratings of students' perceptions of teacher–student relationships and teachers' experiences of enjoyment, anger and emotional exhaustion, given our sample size at this level we chose to analyze our data on a manifest level.

We again ran two separate mediation models, exploring the indirect effects of teacher–student-relationships on teacher emotional exhaustion via enjoyment, on the one hand, and anger, on the other. In those models, we used the students' perceptions of their relationship with their teacher from the first measurement point as the independent variable, teachers' enjoyment or anger from the second measurement point as the mediator, and teachers' emotional exhaustion from the third measurement point as the dependent variable, while controlling for teachers' emotional exhaustion at time one. Thus, we established temporal order between our hypothesized cause, mediator, and outcome, while controlling for initial levels of the hypothesized outcome. Due to our interest in how students' perceptions of their relationship with their teacher influenced the teacher's emotions and level of emotional exhaustion, we aggregated students' responses at the class level to represent the overall quality of each teacher's relationship with the students from the participating class. In accordance with Hayes' (2013, p. 200) recommendation we reported unstandardized coefficients.

3.2 Results

3.2.1 Descriptive results

The descriptive statistics and intercorrelations of the study variables are shown in Table 2. With respect to the mean levels of the assessed variables, students reported having high quality relationships with their teachers at the beginning of the school

Table 2 Correlations and descriptive statistics of Study 2 variables

Variable	1	2	3	4	5
1. Teacher–student relationships (T1)	–	− .22	− .27*	.37**	− .30*
2. Emotional exhaustion (T1)		–	.54***	− .21	.20
3. Emotional exhaustion (T3)			–	− .39***	.46***
4. Enjoyment (T2)				–	− .73***
5. Anger (T2)					–
Observed range	2.56–4.57	1.00–3.00	1.00–4.00	1.75–4.00	1.00–3.50
M	3.69	1.92	1.98	3.25	1.69
SD	0.45	0.46	0.62	0.58	0.63

Teacher–student relationships were measured from the students' perspective on a 1–5 scale. All other variables were measured on a 1–4 scale. T1 = first measurement time point (beginning of schoolyear); T2 = second measurement time point (1 month into the schoolyear); T3 = third measurement time point (midterm)

*$p < 0.05$

**$p < 0.01$

***$p < 0.001$

year. Teachers reported being mildly emotionally exhausted at the first and third measurement point. At the second measurement point, teachers reported high levels of enjoyment and mild levels of anger while teaching their class. With respect to covariations among our study variables, students' class-level perceptions of their relationship with their teacher at the beginning of the schoolyear were negatively but not significantly correlated to teachers' emotional exhaustion at the beginning of the schoolyear and were significantly negatively correlated to teachers' emotional exhaustion at the final measurement point. Teachers' emotional exhaustion at the beginning of the schoolyear was not significantly correlated to their experiences of enjoyment or anger at the second measurement point. Teachers' experiences of enjoyment and anger were both significantly correlated to their level of emotional exhaustion at the third measurement point. Thus, we could conceptually replicate our Study 1 findings that positive teacher–student relationships are negatively correlated with teachers' emotional exhaustion and anger and positively correlated with teachers' enjoyment.

3.2.2 Longitudinal mediation

Figure 2 depicts results from our mediational model with teacher enjoyment as the mediator. The model supported our assumptions in that teacher–student relationships from the students' perspective at time one were significantly positively related to teachers' enjoyment at time two (B = 0.44, *SE* = 0.15, $p = .006$), while controlling for the influence of teachers' initial levels of emotional exhaustion (B = − 0.18, *SE* = 0.15, $p = .23$). Teachers' enjoyment at time two was in turn significantly negatively related to their emotional exhaustion at time three (B = − 0.29, *SE* = 0.12, $p = .02$), while controlling for the influence of teachers' initial levels of emotional

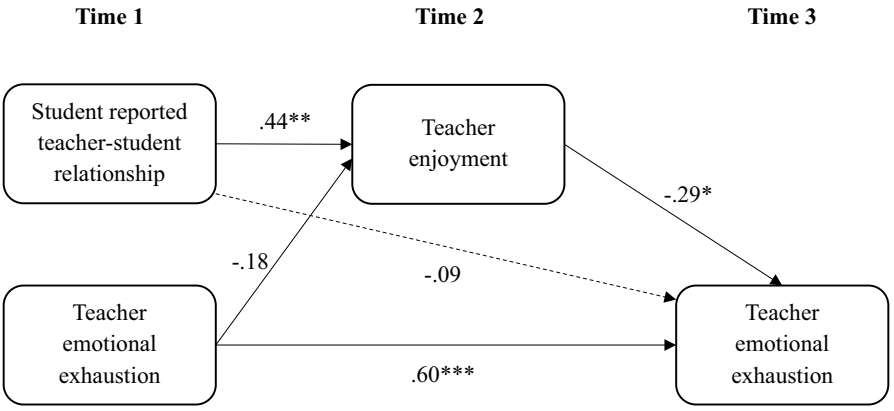

Fig. 2 The indirect effect of teacher–student relationships from the students' perspective on teachers' emotional exhaustion through their enjoyment while controlling for teachers' initial level of emotional exhaustion. Values are unstandardized coefficients

exhaustion (B = 0.60, $SE = 0.14$, $p < .001$). The direct effect of teacher–student relationships at time one ($B_{direct} = -0.09$, $SE = 0.15$, $p = .55$; 95% bootstrap CI = −0.39, 0.21) on emotional exhaustion with enjoyment in the model was not significant. There was an indirect effect of teacher–student relationships at time one on emotional exhaustion at time three ($B_{indirect} = -0.13$, $SE = 0.09$; 95% bootstrap CI = −0.39, −0.01). Thus, teacher–student relationships did have a negative indirect effect on teachers' emotional exhaustion through teachers' experiences of enjoyment.

Figure 3 depicts the results of our mediational model with anger as the mediator. Again, this model fully supported our assumptions: Teacher–student relationships from the students' perspective at time one were significantly negatively related

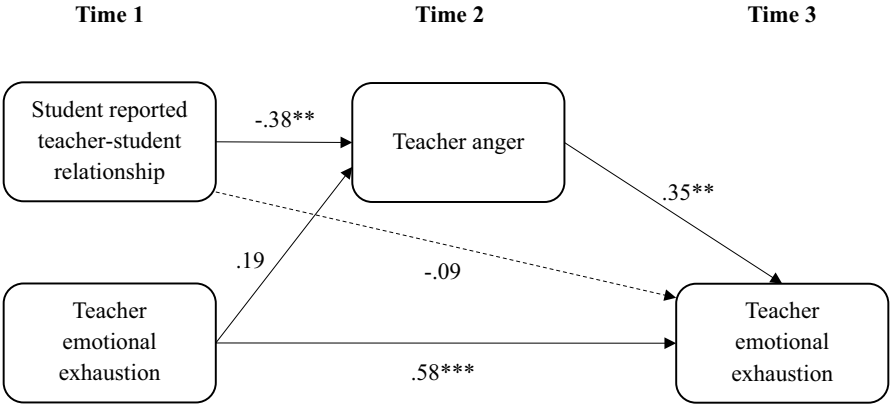

Fig. 3 The indirect effect of teacher–student relationships from the students' perspective on teachers' emotional exhaustion through their anger while controlling for teachers' initial level of emotional exhaustion. Values are unstandardized coefficients

to teachers' anger at time two (B = − 0.38, *SE* = 0.17, *p* = .03), while controlling for the influence of teachers' initial levels of emotional exhaustion (B = − 0.19, *SE* = 0.17, *p* = .26). Teachers' anger at time two was in turn significantly positively related to their emotional exhaustion at time three (B = 0.35, *SE* = 0.10, *p* = .001), while controlling for the influence of teachers' initial levels of emotional exhaustion (B = 0.58, *SE* = 0.14, *p* < .001). The direct effect of teacher–student relationships at time one (B_{direct} = − 0.09, *SE* = 0.14, *p* = .54; 95% bootstrap CI = − 0.37, 0.20) on emotional exhaustion with anger in the model was not significant. There was an indirect effect of teacher–student relationships at time one on emotional exhaustion at time three ($B_{indirect}$ = −0.13, *SE* = 0.09; 95% bootstrap CI = − 0.39, − 0.02). Thus, teacher–student relationships did have an indirect effect on teachers' emotional exhaustion through teachers' experiences of anger.

3.3 Discussion

In Study 2 we found further support for our hypothesis that high quality teacher–student relationships help protect teachers from emotional exhaustion through increasing their enjoyment and decreasing their anger. These results complemented the findings of Study 1 in two ways. First, we could conceptually replicate the direct effect of teacher–student relationships on teachers' experiences of enjoyment and anger, and its indirect effect on teachers' level of emotional exhaustion, using students rather than teachers as the source of information for teacher–student-relationships. Second, we found our proposed effects in a longitudinal design. While controlling for the effect of teachers' initial level of emotional exhaustion, we found that teachers' enjoyment and anger several months into the schoolyear while teaching one group of students mediated the effect of these students' perceptions of their relationship with their teacher at the beginning of the schoolyear on their teachers' level of emotional exhaustion at mid-term.

4 General discussion

Being a teacher can be stressful, thus it is important to understand what mechanisms help teachers to not succumb to the emotional stress of the job. Spilt et al. (2011) proposed that one such mechanism is positive teacher–student relationships. They proposed that teacher well-being is influenced by positive relationships with their students, through positive relationships optimizing teachers' emotional experiences. We examined this proposition by investigating the indirect effect teacher–student relationships have on teachers' level of emotional exhaustion through their experiences of enjoyment and anger. In Study 1, we found that feeling connected to one's students was related to teachers experiencing more enjoyment and less anger and these emotions were in turn related to reduced levels of emotional exhaustion. In Study 2, we found that students' reports of their relationship with their teacher at the beginning of the schoolyear predicted teachers' experiences of enjoyment and anger weeks later and these emotions were predictive of teachers' mid-schoolyear

emotional exhaustion. Thus, teacher–student relationships do seem to serve as a protective factor against emotional exhaustion.

Everyone has the need to belong and having this need met positively influences well-being (see Baumeister and Leary 1995; Deci and Ryan 2000). Teachers spend a large portion of their day with students, and thus, naturally have the desire to feel connected to them. So far, researchers have concentrated on the positive influence teacher–student relationships have on students and have largely neglected the potential effects positive teacher–student relationships have on teachers (see Roorda et al. 2011). In the present studies, we found that teacher–student relationships are a positive source for teachers in that they indirectly decrease teachers' level of emotional exhaustion. In support of past research, we found that feeling related to one's students is linked to experiencing more enjoyment and less anger (Hagenauer et al. 2015; Hargreaves 2000; Klassen et al. 2012). We extended these previous findings by establishing a link between teacher–student relationships and teachers' enjoyment and anger using students as the source of relationship quality. In further support of past research, we found that teachers' enjoyment and anger contribute to protecting them from becoming emotionally exhausted (Carson 2006; Keller, Chang, et al. 2014; Taxer and Frenzel 2015). We extended previous research by establishing that teacher–student relationships indirectly influence emotional exhaustion, through increasing the experience of enjoyment and decreasing the experience of anger.

4.1 Limitations and future directions

In the present research, we focused solely on enjoyment and anger because they are the most commonly reported positive and negative emotions of teachers (see Frenzel 2014). However, teachers experience a variety of emotions while in the classroom (see Keller, Frenzel, et al. 2014). Some of these emotions probably also stem from their relationships with their students and influence their emotional exhaustion. Future research could investigate the extent other emotions such as pride, anxiety, and boredom are related to teacher–student relationships and emotional exhaustion. Furthermore, we took a discrete approach to emotions in the present research, but it could be that teachers overall experiences of positive and negative emotions are more informative for their level of emotional exhaustion. Taking a positive versus negative affect approach would allow researchers to examine whether emotional exhaustion stems from a lack of positive emotions, an influx of negative emotions, or a combination of the two.

Within the present research we have focused on positive relationships leading to experiencing more enjoyment and less anger and these emotional experiences leading to decreased emotional exhaustion, as was suggested but not empirically examined by Spilt et al. (2011). However, it is likely that these relationships are bidirectional. For example, relationship quality is probably influenced by an individual's experiences of positive and negative emotions when interacting with the relationship partner. Emotions communicate information to both the self and others about internal feelings, relational orientation, and behavior intentions, and are thus influential in maintaining and developing relationships (e.g., Keltner and

Haidt 1999; van Kleef 2009). Hence, it could be that experienced emotions and relationship quality mutually influence one another. A longitudinal study with a much larger sample size would be necessary to examine these bidirectional effects.

Overall, our results support Spilt et al.'s (2011) assumptions that teachers benefit from experiencing positive relationships with their students because of enhanced emotional experiences. However, Spilt et al. claim that both positive and negative aspects of teachers' well-being should be indirectly influenced by teacher–student relationships. In the present research, we only concentrated on one indicator of poor well-being, emotional exhaustion. It will be important for future research to examine how teacher–student relationships indirectly enhance positive aspects of teacher well-being, such as job satisfaction.

4.2 Implications and conclusion

Despite the limitations, our findings make an important contribution toward understanding what protects teachers from falling prey to emotional exhaustion. We see two implications of our findings. First, our results suggest that teacher–student relationships should be fostered. One way for teachers to do so is through sharing personal information about themselves and allowing the students to do the same (Cole and Goettsch 1981; Collins and Miller 1994). Positive teacher–student relationships not only benefit students, as has been shown by previous research (see Roorda et al. 2011), but, as our research shows, are also linked to teachers experiencing more enjoyment and less anger, which is related to teachers' experiencing lower levels of emotional exhaustion. Second, it seems that targeting teachers' emotional experiences while in the classroom would be a promising method to reduce teachers' emotional exhaustion. One way to target teachers' emotional experiences is through emotion regulation or mindfulness interventions (Cameron and Jago 2008; Hülsheger et al. 2013). Providing teachers with the tools needed to regulate their emotions in a healthy manner could enable them to reduce their experiences of negative emotions. Emotion regulation and mindfulness strategies could already be introduced in teacher education programs so that teachers are better prepared for the battlefield.

This investigation highlights the potential benefits that teachers gain from establishing good relationships with their students. We examined mechanisms which help protect teachers from experiencing emotional exhaustion. Teachers experience emotional exhaustion at an alarming rate and many beginning teachers leave the profession within the first 5 years (cf. Ingersoll and Strong 2011). Understanding the factors that protect teachers from experiencing emotional exhaustion could potentially aid in reducing the number of teachers who leave the profession due to feeling emotionally over extended. Within the present research, we demonstrated the important role teacher–student relationships play in indirectly decreasing teachers' level of emotional exhaustion through increasing their enjoyment and decreasing their anger.

Acknowledgements Preparation of this article was supported by a grant from the German Research Foundation (TA 1184/1) to Jamie Taxer.

Compliance with ethical standards

Ethical standards All procedures performed in studies involving human participants were in accordance with the ethical standards of the University of Munich and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Conflict of interest Jamie L. Taxer declares that she has no conflict of interest. Anne C. Frenzel declares that she has no conflict of interest. Betty Becker-Kurz declares that she has no conflict of interest.

References

Baumeister, R. F., & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin, 117*(3), 497.

Bentler, P. M. (2007). On tests and indices for evaluating structural models. *Personality and Individual Differences, 42,* 825–829. https://doi.org/10.1016/j.paid.2006.09.024.

Bliese, P. D. (2000). Within-group agreement, non-independence, and reliability: Implications for data aggregation and analysis. In K. J. Klein & S. W. Kozlowski (Eds.), *Multilevel theory, research, and methods in organizations* (pp. 349–381). San Francisco, CA: Jossey-Bass.

Böhm-Kasper, O., Bos, W., Jaeckel, S., & Weishaupt, H. (2000). Skalenhandbuch zur Belastung von Schülern und Lehrern. Das Erfurter Belastungs-Inventar *Erfurter Materialien und Berichte zur Entwicklung des Bildungswesens (Bd. 2)*. Erfurt: Universität Erfurt.

Bonanno, G. A., & Keltner, D. (1999). Facial expressions of emotion and the course of conjugal bereavement. *Psychological Bulletin, 125*(6), 760–776. https://doi.org/10.1037/0033-2909.125.6.760.

Browne, M. W., Cudeck, R., Bollen, K. A., & Long, J. S. (1993). Alternative ways of assessing model fit. *Sage Focus Editions, 154,* 136–162.

Butler, R. (2012). Striving to connect: Extending an achievement goal approach to teacher motivation to include relational goals for teaching. *Journal of Educational Psychology, 104*(3), 726–742. https://doi.org/10.1037/a0028613.

Cacioppo, J. T., Hughes, M. E., Waite, L. J., Hawkley, L. C., & Thisted, R. A. (2006). Loneliness as a specific risk factor for depressive symptoms: Cross-sectional and longitudinal analyses. *Psychology and Aging, 21*(1), 140.

Cameron, L. D., & Jago, L. (2008). Emotion regulation interventions: A common-sense model approach. *British Journal of Health Psychology, 13*(2), 215–221. https://doi.org/10.1348/135910708X288800.

Carson, R. L. (2006). *Exploring the episodic nature of teachers' emotions as it relates to teacher burnout.* (67), ProQuest Information & Learning, US. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=psyh&AN=2007-99005-023&site=ehost-live. Available from EBSCOhost psyh database.

Chang, M. L. (2009). An appraisal perspective of teacher burnout: Examining the emotional work of teachers. *Educational Psychology Review, 21,* 191–218. https://doi.org/10.1007/s10648-009-9106-y.

Cole, C. L., & Goettsch, S. L. (1981). Self-disclosure and relationship quality. *Alternative Lifestyles, 4*(4), 428–466. https://doi.org/10.1007/bf01094176.

Collins, N. L., & Miller, L. C. (1994). Self-disclosure and liking: A meta-analytic review. *Psychological Bulletin, 116*(3), 457–475. https://doi.org/10.1037/0033-2909.116.3.457.

de Heus, P., & Diekstra, R. F. W. (1999). Do teachers burn out more easily? A comparison of teachers with other social professions on work stress and burnout symptoms. In R. V. A. M. Huberman (Ed.), *Understanding and preventing teacher burnout: A sourcebook of international research and practice* (pp. 269–284). New York, NY: Cambridge University Press.

Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry, 11*(4), 227–268. https://doi.org/10.1207/S15327965PLI1104_01.

Fokkens-Bruinsma, M., & Canrinus, E. T. (2014). Motivation for becoming a teacher and engagement with the profession: Evidence from different contexts. *International Journal of Educational Research, 65,* 65–74. https://doi.org/10.1016/j.ijer.2013.09.012.

Folkman, S., & Moskowitz, J. T. (2000). Positive affect and the other side of coping. *American Psychologist, 55*(6), 647–654. https://doi.org/10.1037/0003-066X.55.6.647.

Fredrickson, B. L. (2001). The role of positive emotions in positive psychology: The braoden-and-build theory of positive emotions. *American Psychologist, 56*(3), 218–226.

Frenzel, A. C. (2014). Teacher emotions. In R. Pekrun & L. Linnenbrink-Garcia (Eds.), *International handbook of emotions in education*. New York, NY: Routledge.

Frenzel, A. C., Becker-Kurz, B., Pekrun, R., & Goetz, T. (2015). Teaching this class drives me nuts!–Examining the person and context specificity of teacher emotions. *PLoS ONE, 10*(6), e0129630. https://doi.org/10.1371/journal.pone.0129630.

Frenzel, A. C., Pekrun, R., Goetz, T., Daniels, L. M., Durksen, T. L., Becker-Kurz, B., et al. (2016). Measuring teachers' enjoyment, anger, and anxiety: The Teacher Emotions Scales (TES). *Contemporary Educational Psychology, 46,* 148–163. https://doi.org/10.1016/j.cedpsych.2016.05.003.

Gehlbach, H., Brinkworth, M. E., & Harris, A. D. (2012). Changes in teacher–student relationships. *British Journal of Educational Psychology, 82*(4), 690–704. https://doi.org/10.1111/j.2044-8279.2011.02058.x.

Hagenauer, G., Hascher, T., & Volet, S. E. (2015). Teacher emotions in the classroom: Associations with students' engagement, classroom discipline and the interpersonal teacher–student relationship. *European Journal of Psychology of Education, 30*(4), 385–403.

Hakanen, J. J., Bakker, A. B., & Schaufeli, W. B. (2006). Burnout and work engagement among teachers. *Journal of School Psychology, 43*(6), 495–513.

Hargreaves, A. (2000). Mixed emotions: Teachers' perceptions of their interactions with students. *Teaching and Teacher Education, 16,* 811–826. https://doi.org/10.1016/S0742-051X(00)00028-7.

Hayes, A. F. (2013). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. New York, NY: Guilford Press.

Hogarty, K. Y., Lang, T. R., & Kromrey, J. D. (2003). Another look at technology use in classrooms: The development and validation of an instrument to measure teachers' perceptions. *Educational and Psychological Measurement, 63,* 138–161.

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal, 6*(1), 1–55. https://doi.org/10.1080/10705519909540118.

Hülsheger, U. R., Alberts, H. J., Feinholdt, A., & Lang, J. W. (2013). Benefits of mindfulness at work: The role of mindfulness in emotion regulation, emotional exhaustion, and job satisfaction. *Journal of Applied Psychology, 98*(2), 310.

Ingersoll, R. M., & Strong, M. (2011). The impact of induction and mentoring programs for beginning teachers: A critical review of the research. *Review of Educational Research, 81*(2), 201–233. https://doi.org/10.3102/0034654311403323.

Johnson, S., Cooper, C., Cartwright, S., Donald, I., Taylor, P., & Millet, C. (2005). The experience of work-related stress across occupations. *Journal of managerial psychology, 20*(2), 178–187.

Keller, M. M., Chang, M.-L., Becker, E. S., Goetz, T., & Frenzel, A. C. (2014a). Teachers' emotional experiences and exhaustion as predictors of emotional labor in the classroom: An Experience Sampling study. *Frontiers in Psychology*. https://doi.org/10.3389/fpsyg.2014.01442.

Keller, M. M., Frenzel, A. C., Goetz, T., Pekrun, R., & Hensley, L. (2014b). Exploring teacher emotions: A literature review and an experience sampling study. In P. W. Richardson, S. Karabenick, & H. M. G. Watt (Eds.), *Teacher motivation: Theory and practice* (pp. 69–82). New York: Routledge.

Keltner, D., & Haidt, J. (1999). Social functions of emotions at four levels of analysis. *Cognition and Emotion, 13*(5), 505–521.

Klassen, R. M., Perry, N. E., & Frenzel, A. C. (2012). Teachers' relatedness with students: An underemphasized component of teachers' basic psychological needs. *Journal of Educational Psychology, 104*(1), 150–165. https://doi.org/10.1037/a0026253.

Klusmann, U., Kunter, M., Trautwein, U., Lüdtke, O., & Baumert, J. (2008a). Engagement and emotional exhaustion in teachers: Does the school context make a difference? *Applied Psychology, 57,* 127–151. https://doi.org/10.1111/j.1464-0597.2008.00358.x.

Klusmann, U., Kunter, M., Trautwein, U., Lüdtke, O., & Baumert, J. (2008b). Teachers' occupational well-being and quality of instruction: The important role of self-regulatory patterns. *Journal of Educational Psychology, 100*(3), 702–715. https://doi.org/10.1037/0022-0663.100.3.702.

Le Cornu, R. (2013). Building early career teacher resilience: The role of relationships. *Australian Journal of Teacher Education, 38*(4), n4.

Leung, D. Y. P., & Lee, W. W. S. (2006). Predicting intention to quit among Chinese teachers: Differential predictability of the components of burnout. *Anxiety Stress and Coping, 19*(2), 129–141. https://doi.org/10.1080/10615800600565476.

Lüdtke, O., Robitzsch, A., Trautwein, U., & Kunter, M. (2009). Assessing the impact of learning environments: How to use student ratings of classroom or school characteristics in multilevel modeling. *Contemporary Educational Psychology, 34*(2), 120–131. https://doi.org/10.1016/j.cedpsych.2008.12.001.

Maslach, C., Jackson, S. E., & Leiter, M. P. (1996). *Maslach burnout inventory* (3rd ed.). Palo Alto, CA: Consulting Psychologists Press.

Maslach, C., Schaufeli, W. B., & Leiter, M. P. (2001). Job burnout. *Annual Review of Psychology, 52,* 397–422.

McDonald, R. P., & Marsh, H. W. (1990). Choosing a multivariate model: Noncentrality and goodness of fit. *Psychological Bulletin, 107*(2), 247–255. https://doi.org/10.1037/0033-2909.107.2.247.

Metler, C. A. (2003). Patterns of response and nonresponse from teachers to traditional and web surveys. *Practical Assessement, Research & Evaluation, 8*(22). Retrieved from http://pareonline.net/getvn.asp?v=8&n=22.

Murray, C., & Zvoch, K. (2010). The inventory of teacher–student relationships: Factor structure, reliability, and validity among African American youth in low-income urban schools. *The Journal of Early Adolescence, 31*(4), 493–525. https://doi.org/10.1177/0272431610366250.

Muthén, L. K., & Muthén, B. O. (1998–2013). *Mplus user's guide* (7th ed.). Los Angeles, CA: Muthén & Muthén.

Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods, 40*(3), 879–891. https://doi.org/10.3758/brm.40.3.879.

Roorda, D. L., Koomen, H. M. Y., Spilt, J. L., & Oort, F. J. (2011). The influence of affective teacher–student relationships on students' school engagement and achievement: a meta-analytic approach. *Review of Educational Research*. https://doi.org/10.3102/0034654311421793.

Snijders, T. A. B., & Bosker, R. J. (1999). *Multilevel analysis: An introduction to basic and advanced multilevel modeling*. London: Sage.

Spilt, J. L., Koomen, H. M. Y., & Thijs, J. (2011). Teacher wellbing: The importance of teacher–student relationships. *Educational Psychology Review, 23,* 457–477. https://doi.org/10.1007/s10648-011-9170-y.

Taxer, J. L., & Frenzel, A. C. (2015). Facets of teachers' emotional lives: A quantitative investigation of teachers' genuine, faked, and hidden emotions. *Teaching and Teacher Education, 49,* 78–88. https://doi.org/10.1016/j.tate.2015.03.003.

van Horn, J. E., Taris, T. W., Schaufeli, W. B., & Schreurs, P. J. G. (2004). The structure of occupational well-being: A study among Dutch teachers. *Journal of Occupational and Organizational Psychology, 77*(3), 365–375. https://doi.org/10.1348/0963179041752718.

van Kleef, G. A. (2009). How emotions regulate social life: The emotions as social information (EASI) model. *Current Directions in Psychological Science, 18*(3), 184–188. https://doi.org/10.1111/j.1467-8721.2009.01633.x.

Watt, H. M. G., & Richardson, P. W. (2007). Motivational factors influencing teaching as a career choice: Development and validation of the FIT-choice scale. *The Journal of Experimental Education, 75*(3), 167–202. https://doi.org/10.3200/JEXE.75.3.167-202.

Wolpin, J., Burke, R. J., & Greenglass, E. R. (1991). Is job satisfaction an antecedent or a consequence of psychological burnout? *Human Relations, 44*(2), 193–209. https://doi.org/10.1177/001872679104400205.

Jamie L. Taxer is a postdoctoral fellow at Stanford university, USA. In her research, she investigates teachers' emotions, emotion regulation, and consequences of emotional labor.

Betty Becker-Kurz received her doctorate from the University of Munich. Her research focused on emotional processes in the classroom.

Anne C. Frenzel is a professor for education psychology at the Department of Psychology at the university of Munich, Germany. Her research focuses on antecedents and effects of teachers' and students' emotional experiences as well as emotional transmission in the classroom.