



**University of
Zurich**^{UZH}

**Zurich Open Repository and
Archive**

University of Zurich
University Library
Strickhofstrasse 39
CH-8057 Zurich
www.zora.uzh.ch

Year: 2018

When teacher enthusiasm is authentic or inauthentic: Lesson profiles of teacher enthusiasm and relations to students' emotions

Keller, Melanie M ; Becker, Eva S ; Frenzel, Anne C ; Taxer, Jamie L

Abstract: It was recently proposed that teacher enthusiasm encompasses an experienced component as well as a behaviorally displayed component. Aiming to validate this proposition, the present study utilized lesson diaries to explore patterns of teacher-reported experienced enthusiasm and student-reported enthusiastic teaching behaviors and to investigate whether those patterns were related to students' enjoyment and boredom. Findings imply that the two enthusiasm components do not always co-occur. Four lesson profiles were identified: (1) experienced enthusiasm and enthusiastic teaching coinciding at a high level, (2) teachers reporting high levels of experienced enthusiasm but not being perceived as enthusiastic, (3) teachers being perceived as enthusiastic but not reporting high levels of experienced enthusiasm, and (4) low levels of experienced enthusiasm and enthusiastic teaching. The first pattern was superior to the other profiles regarding students' emotions. Study findings are discussed with respect to teachers' emotional well-being and teaching effectiveness.

DOI: <https://doi.org/10.1177/2332858418782967>

Posted at the Zurich Open Repository and Archive, University of Zurich

ZORA URL: <https://doi.org/10.5167/uzh-170996>

Journal Article

Published Version



The following work is licensed under a Creative Commons: Attribution-NonCommercial 4.0 International (CC BY-NC 4.0) License.

Originally published at:

Keller, Melanie M; Becker, Eva S; Frenzel, Anne C; Taxer, Jamie L (2018). When teacher enthusiasm is authentic or inauthentic: Lesson profiles of teacher enthusiasm and relations to students' emotions. *AERA Open*, 4(2):1-16.

DOI: <https://doi.org/10.1177/2332858418782967>

When Teacher Enthusiasm Is Authentic or Inauthentic: Lesson Profiles of Teacher Enthusiasm and Relations to Students' Emotions

Melanie M. Keller 

University of Kiel

Eva S. Becker

University of Zurich

Anne C. Frenzel

University of Munich

Jamie L. Taxer

Stanford University

It was recently proposed that teacher enthusiasm encompasses an experienced component as well as a behaviorally displayed component. Aiming to validate this proposition, the present study utilized lesson diaries to explore patterns of teacher-reported experienced enthusiasm and student-reported enthusiastic teaching behaviors and to investigate whether those patterns were related to students' enjoyment and boredom. Findings imply that the two enthusiasm components do not always co-occur. Four lesson profiles were identified: (1) experienced enthusiasm and enthusiastic teaching coinciding at a high level, (2) teachers reporting high levels of experienced enthusiasm but not being perceived as enthusiastic, (3) teachers being perceived as enthusiastic but not reporting high levels of experienced enthusiasm, and (4) low levels of experienced enthusiasm and enthusiastic teaching. The first pattern was superior to the other profiles regarding students' emotions. Study findings are discussed with respect to teachers' emotional well-being and teaching effectiveness.

Keywords: *teacher enthusiasm, teacher enjoyment, enthusiastic teaching, lesson diary, latent profile analysis*

SINCE the early days of empirical educational research, being enthusiastic has been considered a part of effective teachers. Not only is enthusiasm regarded as an element of teachers' effectiveness in higher education research (Feldman, 2007; Jackson et al., 1999; Marsh, 2007) and considered an aspect of secondary teachers' competence (Kunter et al., 2013) and motivation (Kunter & Holzberger, 2014), but teachers themselves consider enthusiasm as one of the most important and desirable characteristics of effective teachers (Minor, Onwuegbuzie, Witcher, & James, 2002). Teachers strive to be enthusiastic for the benefit of their students (Sutton, 2004). Over the years, evidence has accumulated showing that teacher enthusiasm has a substantial impact on students' learning experiences and outcomes (see Keller, Woolfolk Hoy, Goetz, & Frenzel, 2016). This impact is restricted not only to students' learning and achievement (Kunter et al., 2013) but—maybe even predominantly—to their motivation (interest: Keller, Goetz, Becker, Morger, & Hensley, 2014; self-concept: Keller, Neumann, & Fischer, 2014; intrinsic motivation: Patrick, Hisley, & Kempler, 2000) and their affect (enjoyment: Frenzel, Becker-Kurz, Pekrun, Goetz, &

Lüdtke, 2017; Frenzel, Goetz, Lüdtke, Pekrun, & Sutton, 2009; anxiety: Kunter et al., 2013).

The aim of the present study was to empirically explore an integrative definition of teacher enthusiasm recently put forward by Keller et al. (2016), which conceptualizes enthusiasm as including both an experienced component and a displayed component. To empirically examine this proposed definition, we sought to identify teachers' lesson profiles in the two distinct yet interrelated components of enthusiasm and determine whether the emerging profiles were related to students' emotions in the given lesson.

Multicomponent Conceptualization of Teacher Enthusiasm

Locke and Woods (1982) were the first to clearly differentiate teacher enthusiasm in terms of “teacher experiences as a personal feeling,” the teaching behaviors that “display that inner state,” and the consequent effects that it has on students (p. 5). Yet, despite this early idea of teacher enthusiasm as an internal affective experience on one hand and its



behavioral expression on the other, most research to date has examined either internally experienced enthusiasm or behaviorally displayed enthusiasm (for a review, see Keller et al., 2016). The experiential component of enthusiasm is understood to encompass teachers' positive feelings and excitement toward teaching and interacting with students in the classroom, and it has been conceptualized in previous studies as teaching-related enjoyment or, more precisely, the experienced part of teaching-related enjoyment (Keller, Goetz, et al., 2014; Kunter et al., 2013; Kunter, Frenzel, Nagy, Baumert, & Pekrun, 2011). Displayed enthusiasm, however, includes behaviors that convey excitement in a visible and perceivable way to students (enthusiastic teaching behaviors; e.g., "[Our teacher] is full of dynamic energy when he or she teaches" in Patrick et al., 2000, p. 222) and is often restricted to behaviors of nonverbal expressiveness (e.g., "[Our teacher] gestures with hands and arms" [Murray, 2007, p. 150]; see also Bettencourt, Gillett, Gall, & Hull, 1983; Brigham, Scruggs, & Mastropieri, 1992).

These two distinct yet equally valid conceptualizations of teacher enthusiasm have led to ambiguity regarding what exactly teacher enthusiasm entails and how it affects students. To address this ambiguity, an integrative definition was recently proposed, which states that enthusiasm is the "conjoined occurrence of positive affective experiences, that is, teaching-related enjoyment, and the behavioral expression of these experiences, that is (mostly nonverbal) behaviors of expressiveness" (Keller et al., 2016, p. 751). This redefinition of enthusiasm, including an experienced component as well as an expressed component, offers the opportunity to integrate two previously diverging strands of research. However, this redefinition is currently lacking empirical support.

The two enthusiasm components have rarely been examined in conjunction. From the little research that has examined both components, we know that they are moderately related yet distinct. Experienced enthusiasm in the form of teachers' self-reported teaching-related enjoyment has been found to be moderately correlated to displayed enthusiasm in the form of students' reports of perceived enthusiastic teaching behaviors: $r = .36$ (Frenzel et al., 2009), $r = .34$ (Keller, Goetz, et al., 2014), and $r = .41$ (Kunter et al., 2008). Furthermore, the studies by Keller, Goetz, et al. (2014)¹ and Taxer and Frenzel (2018) revealed that teachers' self-reported enthusiastic teaching behaviors were moderately related to their self-reported positive affect ($r = .35/.43$).

Effects of the Co-occurrence of Experienced Enthusiasm and Enthusiastic Teaching Behaviors

The co-occurrence of experienced enthusiasm and enthusiastic teaching behaviors should have positive consequences—for teachers as well as students. In contrast, if there is a discrepancy between experienced enthusiasm and

enthusiastic teaching behaviors, this might be undesirable for teachers and perhaps also students.

Teachers' authenticity seems to matter to students (e.g., Johnson & LaBelle, 2017; Pogue & Ahyun, 2007; see also Kreber, Klampfleitner, McCune, Bayne, & Knottenbelt, 2016), including teachers' emotional authenticity (Zembylas, 2002). In teacher enthusiasm research, evidence for the benefit of balanced experienced and displayed enthusiasm for students is rare. However, Keller, Goetz, et al. (2014) could show that teachers' positive affect and self-reported behavioral display of positive affect conjointly explained a greater share of variance in students' perceptions of their teachers' enthusiasm than either component alone.

Expressing an inauthentic emotion—that is, expressing an emotion that does not correspond to one's affective experience—is referred to as *surface acting* (e.g., Grandey, 2003) in emotional labor literature. Emotional labor thereby captures the effort involved for individuals to present a desired emotional image to others irrespective of whether this image corresponds to their subjective emotional experience (e.g., Morris & Feldman, 1996). Emotional labor can deplete self-regulatory resources (Muraven, Tice, & Baumeister, 1998), which can have negative consequences for individuals' occupational well-being (see Hülshager & Schewe, 2011). The emotional labor of teachers has been well investigated, but this research has predominately focused on their negative emotions, especially the suppression of anger (e.g., Chang, 2013; Keller, Chang, Becker, Goetz, & Frenzel, 2014; Tsouloupas, Carson, Matthews, Grawitch, & Barber, 2010). However, emotional labor presumably occurs not only as a consequence of striving for low levels of expressed negative emotions but also as a consequence of striving for high levels of expressed positive emotions. In fact, teachers strive to present a positive emotional image to their students and behave enthusiastically to do so (Sutton, 2004). This idealized emotion image and the fact that teacher emotions are known to be highly dynamic phenomena (Frenzel, Becker-Kurz, Pekrun, & Goetz, 2015) implies that teachers may occasionally need to upregulate their expression of positive emotions (Taxer & Frenzel, 2015), which may result in an imbalance between experience and expression. In fact, a recent study (Taxer & Frenzel, 2018) separately assessed teachers' experienced enjoyment and their expressed enthusiasm and indicated that they do not co-occur for all individuals. Additionally, the authors of that study found that teachers who were characterized by an imbalance—that is, high levels of expressed enthusiasm without a corresponding level of experienced enjoyment—also evidenced lower levels in their occupational well-being.

Potential effects of (in)authentic enthusiasm expression on students can be informed by drawing on the paradigm of emotions as social information (e.g., van Kleef, 2010). Emotional expressions send cues to interaction partners about an individual's current emotional state, beliefs, and intentions

(Keltner & Haidt, 1999). With expressed teacher enthusiasm, the cue to students is that the teacher is enjoying teaching or the subject currently being discussed. Recognizing the internal emotional state of an interaction partner aids in correctly responding to the social interaction. However, based on emotional labor theory, an expressed emotion does not actually have to be subjectively experienced, and a subjectively experienced emotion does not have to be expressed. That is, individuals can separately regulate their emotional experiences and expressions (Gross, 2015). Previous research revealed that individuals can differentiate between authentic and inauthentic emotions in the facial expressions of others (Johnston, Miles, & Macrae, 2010; Maringer, Krumhuber, Fischer, & Niedenthal, 2011; McLellan, Johnston, Dalrymple-Alford, & Porter, 2010). More important, individuals are also differentially affected by authentic versus inauthentic emotional expressions. For example, viewing authentic smiles, as opposed to fake smiles, leads to a higher increase in reported enjoyment (Surakka & Hietanen, 1998). So not only can interaction partners distinguish between authentic and inauthentic expressions, but inauthentic expressions are not beneficial for the interaction partner.

In summary, teacher enthusiasm comprises an experiential component and a behavioral component. These two components of enthusiasm are related yet decoupled: Teachers can—and do—regulate their emotional expressions independent of their emotional experiences. Yet, the consequence of imbalanced levels of experienced enthusiasm and enthusiastic teaching behaviors for students' affective learning experience remains largely unexplored.

Present Study

The present study aims to provide an empirical test for the redefinition of enthusiasm (provided by Keller et al., 2016) as the conjoined occurrence of teachers' experienced enthusiasm and enthusiastic teaching behaviors. Even though these components are related (Frenzel et al., 2009; Frenzel et al., 2017; Keller, Goetz, et al., 2014; Kunter et al., 2008), they represent distinct phenomena. That is, teachers may regulate their expressed behaviors independently from their experience, which should result in discernible profiles in these two variables (Taxer & Frenzel, 2018). However, true to the redefinition, only the two components coinciding at a high level would be considered authentic enthusiasm; consequently, an imbalance in the components would be considered inauthentic enthusiasm. Based on these considerations, the present study aimed to investigate the relationship between and the co-occurrence of the two enthusiasm components while, for the first time, combining the teacher perspective for the assessment of the experiential enthusiasm component with the student perspective for the assessment of teachers' enthusiastic behaviors.

Emotions are fluctuating and highly dynamic phenomena; thus, they are highly situation and context specific. This also applies to teachers' teaching-related emotions: When examining the amount of variance in teachers' emotions that is on the personal, class, or lesson level, Frenzel et al. (2015) found that the majority of variance (about two thirds) was on the lesson level. This widely understood and accepted fact about the nature of emotions contrasts with methodological practices in the current literature. Most often, emotions are assessed on a person level (i.e., trait level), as in the case of teachers' emotions (including teachers' experienced enthusiasm). In fact, Kunter et al. (2008) defined the experiential component of enthusiasm as a "trait-like, habitual, recurring emotion" (p. 470). The stability of teachers' enthusiastic teaching behavior, the other component of the integrative definition of teacher enthusiasm, is largely unknown. To date, no studies have examined whether and to what extent enthusiastic teaching behaviors vary from lesson to lesson or if they are rather stable for a given teacher. Thus, a third aim of the present study was to examine the stability of teacher enthusiasm and its two components. To do so, we utilized lesson diaries (Bolger, Davis, & Rafaeli, 2003) with multiple measurements within teachers so that we could investigate the extent of situational within-teacher variability of experienced enthusiasm and enthusiastic teaching.

Numerous studies found a positive effect of one teacher enthusiasm component on students' learning experiences and outcomes (some of those studies were longitudinal or experimental, so the causal link seems established; for a summary, see Keller et al., 2016), yet no studies have so far examined if coinciding experienced enthusiasm and enthusiastic teaching are more beneficial for students than the presence of only one enthusiasm component. Given previous findings (Collishaw, Dyer, & Boies, 2008; Surakka & Hietanen, 1998), we expect students' affective learning experiences to be more positive in lessons when teachers have high levels of experienced enthusiasm coinciding with high levels of enthusiastic teaching behaviors. Thereby, we targeted two academic achievement emotions that focus on the momentary (learning) activity: students' enjoyment and boredom (Pekrun, 2006). Previous studies showed that enjoyment or related constructs, such as interest, are influenced by teachers' enthusiasm (Frenzel et al., 2009; Frenzel et al., 2017; Frenzel, Goetz, Pekrun, & Watt, 2010; Keller, Goetz, et al., 2014; Kunter et al., 2013), whereas boredom serves as the reverse indicator that should be high when teacher enthusiasm is low (Cui, Yao, & Zhang, 2017; Daschmann, Goetz, & Stupnisky, 2011). Therefore, the study also aimed to investigate the relation of teacher enthusiasm profiles at the lesson level to students' experiences of enjoyment and boredom during the lesson.

In summary, we addressed the following four research questions:

Research Question 1: How closely are teachers' experienced enthusiasm (assessed via self-reported teaching-related enjoyment) and enthusiastic teaching behaviors as observed by their students related on a situational level (within teachers across lessons in a given class)?

Research Question 2: Are there lesson-level differences in the co-occurrence of teachers' experienced and displayed enthusiasm?

Research Question 3: To what extent are teachers' experienced and displayed enthusiasm as well as emerging lesson profiles in these two enthusiasm components stable within teachers?

Research Question 4: Do enthusiasm profiles differ with regard to students' enjoyment and boredom?

Method

Sample

Overall, 758 students (55% female) from 9th- and 10th-grade classes and their 39 mathematics teachers (49% female) at Gymnasium (the highest-achieving track of the three-tiered German school system, which approximately 40% of the total student cohort attends) in the southern state of Baden-Württemberg in Germany participated in the study. Participation in the study was voluntary. In a first round, 45 schools were contacted, 15 of which participated with at least one mathematics teacher and her or his classes; in a second round, another 77 schools were contacted, 6 of which participated with at least one teacher and his or her classes. After data collection was completed, the teachers were given a small compensation in the form of a bookstore voucher, and the class received 50 euros to be used for class-related expenses.

Teachers and students provided diary entries for a total of 316 lessons (on average, 8.10 lessons per teacher and class; range, 3–14 lessons); lessons were rated by an average of 16.4 students (range, 1–27), yielding 5,328 ratings. Teachers were on average 39.53 years old ($SD = 11.40$ years) and had 10.79 years of teaching experience ($SD = 10.86$ years). Students' average age was 15.60 years ($SD = 0.72$ years).

Study Design

The present study employed a diary design (Bolger et al., 2003) that allowed including multiple assessments per person and combining situational assessments of teachers' emotional experience with students' perceptions of teachers' behavior. Trained research personnel gave the teachers and each student in the participating class a diary (a booklet containing short questionnaires) and briefly explained how to fill it in. The diary phase lasted between 2 and 3 weeks with the aim of obtaining 5 to 10 mathematics lessons per teacher. At the end of each mathematics lesson, teachers and

students simultaneously filled in the diary questionnaires, which took about 3 to 5 minutes to complete. Teachers reported having no problems in implementing this procedure. The diary phase was framed with pre- and postassessment during which various trait measures and demographics were assessed.

Anonymity of data was ensured by not collecting participants' names and by deleting all personal identifiers from the data set after data collection. Confidentiality of students' diaries from their teachers was ensured by having research personnel hand out the diaries during the pretest and collect them during the posttest; thus, teachers never had access to the students' diaries.

Instruments

The two enthusiasm components as well as students' emotional experiences (enjoyment, boredom) were assessed with two and one items, respectively. This allowed for minimally disturbing the situational assessments and is common in diary or experience sampling studies in academic contexts (e.g., Ahmed, van der Werf, Minnaert, & Kuyper, 2010; Goetz, Lüdtke, Nett, Keller, & Lipnevich, 2013). Previous research indicated that single items are adequately reliable for our intended purposes (Gogol et al., 2014; Wanous, Reichers, & Hudy, 1997).

Teacher enthusiasm. In line with previous research on teacher enthusiasm (see Keller et al., 2016), the experienced enthusiasm component was assessed via teachers' self-report, and the behavioral enthusiasm component was assessed via students' perceptions. All items were rated on a 5-point scale (1 = *strongly disagree*, 5 = *strongly agree*).

Experienced enthusiasm (teacher reported). The experienced enthusiasm component was conceptualized and operationalized as teachers' self-reported teaching-related enjoyment (Keller, Goetz, et al., 2014; Kunter et al., 2008). Items for its assessment were modified from two established measures: the Teacher Emotion Scales (TES; Frenzel et al., 2016) and the Achievement Emotions Questionnaire–Mathematics (AEQ-M; Pekrun, Goetz, & Frenzel, 2005), which is a domain-specific variant of the Achievement Emotions Questionnaire (Pekrun, Goetz, Frenzel, Barchfeld, & Perry, 2011). We selected the following two items for our diary study: "I enjoyed teaching this lesson" (as taken from the TES) and "In this lesson, I often thought that things were going great" (as taken from the AEQ-M; see Table A1 for the German version of the items). The two items were correlated at $r = .54$ (within teachers and at the lesson level) and averaged per person and lesson for further analyses.

Enthusiastic teaching behavior (student reported). The displayed enthusiasm component was conceptualized as

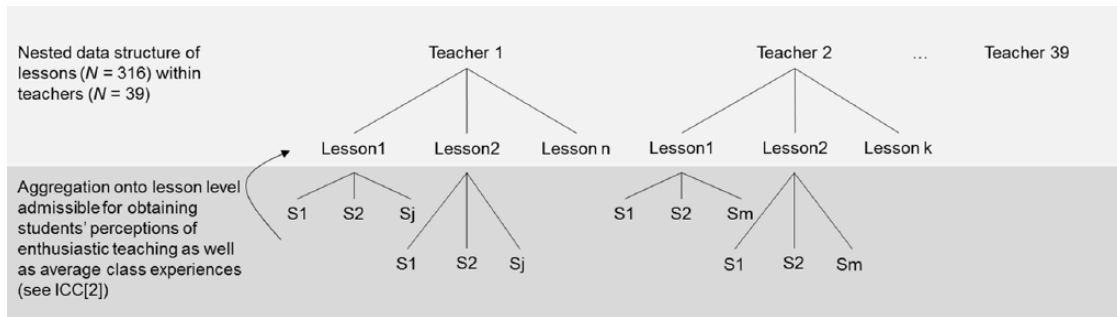


FIGURE 1. Data structure of students belonging to one class (S) nested within lessons nested within teachers. ICC = intraclass correlation.

enthusiastic teaching behaviors (Keller, Goetz, et al., 2014; Kunter et al., 2008) and assessed via students' perceptions. It was assessed with the item "In this lesson, our teacher was teaching with enthusiasm" (see Table A1 for the German version of the item). For each lesson, all students within each class rated the teachers' enthusiastic teaching behavior. This resulted in a nested data structure, with student ratings nested in classes for each lesson and with lessons nested in teachers (see Figure 1 and the section Data Analysis). Class-average ratings were found to be an appropriate source for assessing teachers' behavior (Lüdtke, Trautwein, Kunter, & Baumert, 2006), with their reliability represented by the intraclass correlation (ICC), which takes into account the consistency of students' ratings within each class relative to the total variance across all students in the sample (ICC[1]). If one additionally accounts for the average number of student ratings per class (cluster size), the ICC(2) can be calculated, which can be interpreted like a reliability coefficient (Lüdtke et al., 2006; Lüdtke, Robitzsch, Trautwein, & Kunter, 2009). In the present study, the ICC(1) was .24, and the ICC(2) was .84 (the variance components were derived from 5,328 student ratings nested within 316 lessons), which according to Lüdtke et al. (2006) indicates sufficient reliability. Therefore, for each lesson, the student ratings were aggregated onto the lesson level and thus utilized for further analyses.

Students' emotions. Student enjoyment and boredom served as our learning-related outcomes for teacher enthusiasm profiles. To assess students' experiences of enjoyment and boredom during the lesson, we adapted items from the AEQ-M (Pekrun et al., 2005; Pekrun et al., 2011). Item formulations for students' emotions and their original German wording are given in the appendix (Table A2). All items were rated on a 5-point scale (1 = *strongly disagree*, 5 = *strongly agree*). Students' ratings with respect to one lesson were aggregated onto the lesson level.

Enjoyment. The items for enjoyment were "I had fun during this mathematics lesson" and "In this lesson, I enjoyed myself." The two items were highly correlated within lessons ($r = .62$) and subsequently averaged within each student

and for every lesson. The average across the two enjoyment items yielded an ICC(1) of .13 (based on 5,328 student ratings nested within 316 lesson) and revealed a sizable amount of variance between lessons; an ICC(2) of .71 indicated good reliability of the lesson-aggregated measure.

Boredom. Boredom was assessed with the items "I found this mathematics lesson boring" and "During this lesson, I was bored." Both items were highly correlated within lessons ($r = .76$) and averaged within each student and for every lesson. This average lesson-aggregated value showed an acceptable reliability: ICC(2) = .69 (ICC[1] = .12; based on 5,328 student ratings nested within 316 lesson).

Data Analysis

Due to the diary design, data obtained in the present study were nested: The lowest level—that is, student ratings ($N = 5,328$)—was nested within lessons ($N = 316$), and lessons were nested within teachers ($N = 39$); this uppermost teacher level also represents the class level because every teacher participated with only one class (see Figure 1). For analysis purposes, students' individual ratings were aggregated at the lesson level. All further analyses were conducted only with the two-level data of lessons nested within teachers (upper panel in Figure 1).

To examine the co-occurrence of teachers' experienced enthusiasm and enthusiastic teaching behavior as the two components of an integrative enthusiasm concept, latent profile analyses (LPAs) were conducted. LPA is a data analysis technique that aims to identify clusters that are similar on a number of indicators (e.g., Magdison & Vermunt, 2004; Muthén, 2009; Pastor, Barron, Miller, & Davis, 2007). Typically, the clusters are individuals, yet in the present study we aimed to identify lesson profiles. Thereby, we investigated whether lessons can be characterized according to teachers' self-reported experienced enthusiasm and student-perceived enthusiastic teaching behaviors or, in other words, whether lesson profiles (i.e., clusters) in these two variables can be identified. Therefore, latent profiles based on teachers' experienced enthusiasm and enthusiastic teaching behaviors

were derived on the lesson level (i.e., within teachers) utilizing the analysis *Type Is Twolevel Mixture* in *Mplus* 7.1 (Asparouhov & Muthén, 2008). As recommended by Nylund, Asparouhov, and Muthén (2007), we chose the best solution by interpreting multiple statistical fit indices; that is, no solution was discounted or approved per a single index. Specifically, Nylund et al. (2007) recommended utilizing the Bayesian information criterion (BIC) and the bootstrap likelihood ratio test (BLRT). The BLRT compares the k class solution with the $k - 1$ class solution, allowing for interpreting whether the former provides a superior fit as compared with the latter. Additionally, we consulted the average latent class probabilities for the most likely class memberships, which should be around $\geq .80$, as well as the interpretability and parsimony of the solution.

For analyzing differences in lesson profiles with regard to students' enjoyment and boredom, we utilized the auxiliary variable option in *Mplus*. Enjoyment and boredom were thereby defined as distal continuous outcomes (utilizing the auxiliary variable function [e]; Asparouhov & Muthén, 2013); which ensured that the proposed distal outcomes did not influence the estimation of the latent profiles; that is, in a first step, the profiles were estimated, and then in a second step, the levels of students' enjoyment and boredom were explored for each obtained profile. This analysis computes overall as well as pairwise χ^2 -difference tests for each distal outcome.

Results

Interrelation of Teacher Experienced Enthusiasm and Enthusiastic Teaching Behaviors

The two enthusiasm components were moderately correlated on the lesson level and within teachers ($r = .29, p < .001$; see Table 1). This means that, irrespective of the individual differences in experienced and displayed enthusiasm—which were previously shown to be related on an individual level (Keller, Goetz, et al., 2014; Kunter et al., 2008; Taxer & Frenzel, 2018)—in a situation when one teacher reports a higher level of experienced enthusiasm, she or he is also perceived by the class as being more enthusiastic, as opposed to a situation in which the same teacher reports a lower level of experienced enthusiasm.

Lesson Profiles of Teacher Enthusiasm

We conducted LPA to derive lesson profiles of the two teacher enthusiasm components. The fit indices for the one- to five-class solutions are presented in Table 2. The adjusted BIC and BLRT both pointed toward the four-class solution. Specifically, the sample-adjusted BIC was lowest for the four-class solution, whereas the BLRT indicated that the five-class solution was not significantly better than the four-class solution. When considering the interpretability of the

four-class solution, especially when compared with the profiles in the three-class solution, we opted for the four-class solution.

The four profiles based on the z -standardized variables of experienced enthusiasm and enthusiastic teaching are depicted in Figure 2. The most frequently occurring profile ($n = 203$) was characterized by above-average (i.e., positive) values in experienced enthusiasm and enthusiastic teaching and was, congruent with the proposed two-fold definition of enthusiasm, labeled “high enthusiasm.” As compared with this profile, the second-most frequent profile ($n = 70$) had below-average levels of experienced enthusiasm but average levels of enthusiastic teaching: It was thus labeled “externalized enthusiasm.” The third profile ($n = 31$) was characterized by above-average experienced enthusiasm but below-average values in enthusiastic teaching and was therefore labeled “internalized enthusiasm.” Finally, occurring in only 12 of the total 316 observed lessons, the fourth profile showed below-average values in both components and was therefore labeled “low enthusiasm.” According to the definition of enthusiasm as the conjoint occurrence of the two components, the high and low enthusiasm profiles with balanced levels in both components would be considered authentic, whereas the profiles of externalized and internalized enthusiasm where the two components are imbalanced would be considered inauthentic.

Stability of Lesson Profiles Within Teachers

As a preliminary step before exploring the stability of the lesson profiles within teachers, we explored the variability of each enthusiasm component across lessons. Variance decomposition showed that for teachers' self-reported experienced enthusiasm, the majority (84%) of variance was within teachers (see Table 1), whereas only 28% of the total variance for student-perceived enthusiastic teaching occurred within teachers. In other words, teachers' experience of enthusiasm highly fluctuated from lesson to lesson, whereas enthusiastic teaching behavior as perceived by students was rather stable.

Due to the nominal nature of the enthusiasm profiles, we calculated a measure of dispersion, H (Eid, Gollwitzer, & Schmitt, 2010).³ Dispersion is minimal and H is zero when observations cluster only in one category, and dispersion is maximal and H equals 1 when observations are evenly distributed across categories. The overall dispersion of enthusiasm profiles in our sample yielded an H value of .70, which indicated an uneven distribution but a substantive amount of dispersion across categories. We also calculated the average dispersion within teachers by calculating H for every teacher and then averaging across teachers, which resulted in an H value of .26 (range, 0–.52). This within-teacher dispersion is substantially smaller than the total dispersion, indicating that dispersion of enthusiasm profiles within teachers was more

TABLE 1
Descriptive Statistics of Study Variables

	<i>M</i>	ICC(1)	Correlations			
			1	2	3	4
1. Experienced enthusiasm	3.75	.16	0.59/0.11	.09	.00	-.25
2. Enthusiastic teaching	3.51	.72	.29	0.11/0.28	.58	-.46
3. Student enjoyment	2.85	.40	.34	.45	0.13/0.09	-.64
4. Student boredom	2.35	.45	-.16	-.04	-.47	0.12/0.10

Note. Experienced enthusiasm was assessed via teacher self-report; enthusiastic teaching and students' emotions were assessed via student self-report. The sample size was 316 lessons nested within 39 teachers; the average cluster size was 8.10. ICC(1) gives the percentage of variance that lies on the between level ($\tau^2 / [\tau^2 + \sigma^2]$). The diagonal shows the within-teacher variance (σ^2) and the between-teacher variance (τ^2) of the unstandardized variables, respectively (the sum of the two gives the total variance). The within-teacher correlations are shown below the diagonal; the between-teacher correlations are shown above the diagonal. ICC = intraclass correlation.

TABLE 2
Fit Statistics for Latent Profile Analysis on the Lesson Level

	Number of extracted profiles				
	1	2	3	4	5
Log likelihood	-684.349	-666.358	-653.55	-645.169	-644.163
AIC	1,376.698	1,346.716	1,327.1	1,316.337	1,320.326
BIC	1,391.721	1,373.006	1,364.657	1,365.162	1,380.418
Adjusted BIC	1,379.034	1,350.804	1,332.94	1,323.929	1,329.67
Entropy	—	0.71	0.754	0.766	0.67
BLRT					
-2*LogLIDiff	—	35.982	25.617	16.764	2.011
<i>p</i>	—	<.001	<.001	<.001	.6667
Classification probabilities for most likely class membership	—	.83-.95	.70-.95	.72-.95	.70-.86
<i>n</i> (%) for each class ^a	316	236 (75) 80 (25)	215 (68) 77 (24) 24 (08)	203 (64) 70 (22) 31 (10) 12 (4)	117 (37) 90 (28) 67 (21) 30 (10) 12 (4)

Note. Profiles were extracted on the lesson level, which is based on 316 lessons. Latent profile analyses were conducted by taking the nested data structure (lessons nested within classes/teachers) into account by utilizing the Type Is Twolevel Mixture option in *Mplus*. The decision on number of classes was based on statistical fit indices (Nylund, Asparouhov, & Muthén, 2007) as well as interpretability of the extracted profiles. AIC = Akaike information criterion; BIC = Bayesian information criterion; BLRT = bootstrap likelihood ratio test.

^aBased on the most likely class membership.

uneven than across teachers (36% of total dispersion was within teachers, meaning that the majority of dispersion was between teachers). To illustrate this finding, we plotted the distribution of profiles within each teacher (see Figure 3) and explored patterns of lesson profiles within teachers. While there were some teachers who exhibited only one profile in all their assessed mathematics lessons (e.g., Teachers 2901 and 3002, for whom *H* was zero), the majority of teachers exhibited two (*n* = 24 teachers) or three (*n* = 9 teachers) profiles across their reported lessons. None of the teachers in our sample exhibited all four profiles. For some teachers, profiles were more clustered within consecutive

lessons, and for some a change in profile occurred for every lesson. It was especially striking that one profile—internalized enthusiasm—appeared to be more teacher specific than the other profiles (see Figure 3): This profile was not dispersed evenly across all teachers, instead it was rather concentrated within some teachers (mainly Teachers 0302, 3001, and 3002).

Relation of Lesson Profiles With Students' Emotions

Chi-square difference tests with the *Mplus* option of auxiliary variables for distal outcomes (see Asparouhov &

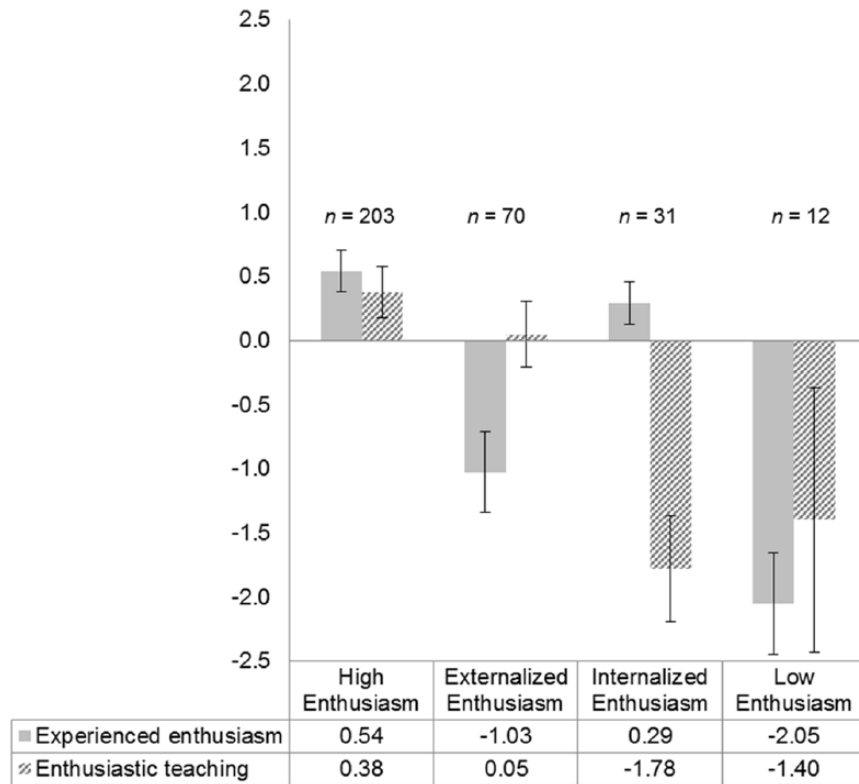


FIGURE 2. Lesson profiles in teachers' self-reported experienced enthusiasm and student-perceived enthusiastic teaching. The two variables were z standardized prior to latent profile analysis, meaning that zero is the sample mean and positive/negative values denote above/below-average values. Means for the two variables in each profile are displayed at the bottom; the numbers at the top denote the respective frequencies of the profiles (based on most likely class membership). The whiskers indicate 95% CIs.

Muthén, 2014) yielded overall significant differences in students' enjoyment ($\chi^2 = 27.25, p < .001$); the overall test with regard to students' boredom was not significant ($\chi^2 = 7.13, p = .07$).

Beyond overall differences, we also looked at pairwise comparisons (see Table 3 and Figure 4). Students' emotions were the most positive for the high enthusiasm profile, with enjoyment being highest and boredom being lowest. Specifically, in lessons characterized by high versus externalized enthusiasm, students reported higher enjoyment and lower boredom in the high enthusiasm lessons. The same result was found when high versus internalized enthusiasm was compared, as well as when high versus low enthusiasm was compared. Difference tests further revealed that students' enjoyment, but not their boredom, in the externalized enthusiasm lessons significantly differed as compared with internalized enthusiasm and low enthusiasm lessons. Students' enjoyment was higher in lessons characterized by externalized enthusiasm versus lessons characterized by internalized enthusiasm or low enthusiasm. Finally, students' affective learning experiences in the internalized enthusiasm lessons did not significantly differ from their affective experiences in low enthusiasm lessons.

Discussion

The purpose of the present study was to investigate the interrelation of two teacher enthusiasm components—experienced enthusiasm and enthusiastic teaching behaviors. Using a diary approach with multiple assessment points (i.e., lessons), we aimed to investigate the relationship between the two enthusiasm components on the lesson level and to explore if differing constellations (i.e., profiles) in lessons could be found. We further investigated how these enthusiasm profiles were distributed within teachers and how they related to students' experiences of enjoyment and boredom. The present study adds to extant teacher enthusiasm research by simultaneously considering the two components of enthusiasm and, in doing so, integrating teachers' self-reported experienced enthusiasm and students' perceptions of teachers' enthusiastic teaching behaviors.

We found a moderate relationship between the two enthusiasm components on the lesson level. These findings are in line with previous findings showing a positive correlation between the affective and behavioral components (Frenzel et al., 2009; Keller, Goetz, et al., 2014; Kunter et al., 2008; Taxer & Frenzel, 2018) despite the fact that all of these previous investigations assessed enthusiasm on a trait level

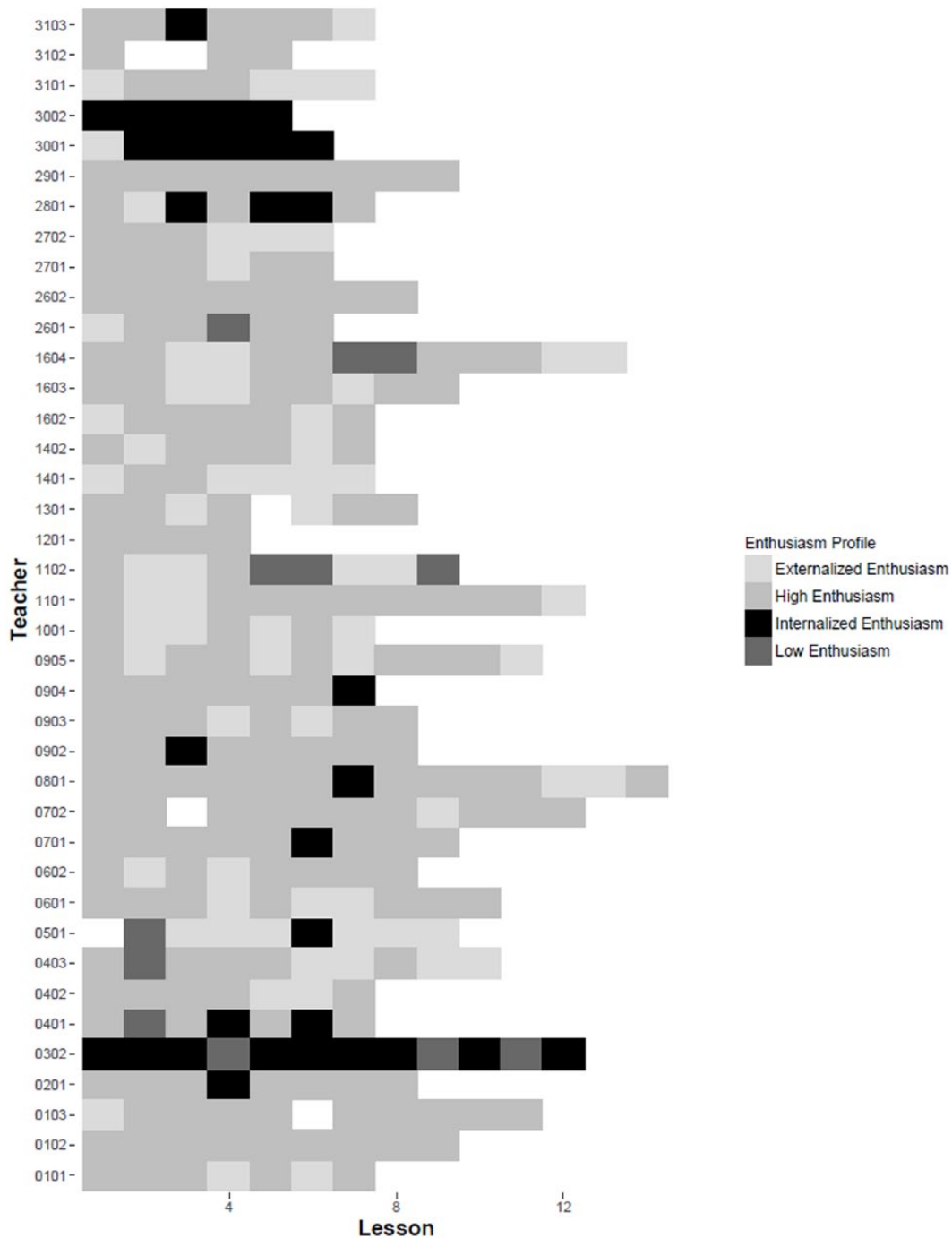


FIGURE 3. *Distribution of profiles within teachers. White denotes missing lessons.*

(i.e., generalized level), whereas the present study employed a situational approach to study teacher enthusiasm.

Importantly, although the two components are related, they need not always co-occur. Previous findings and theoretical considerations suggest that teachers may regulate one enthusiasm component independent from the other. For example, they may independently compensate in instances where they experience diminished levels of enjoyment by exaggerating

their enthusiasm to their students (Taxer & Frenzel, 2018). As a consequence, we expected different constellations in the two enthusiasm components to emerge on the lesson level. Indeed, the LPA yielded four distinct lesson profiles:

High enthusiasm—a profile in which teachers reported high levels of experienced enthusiasm and students perceived them as highly enthusiastic

TABLE 3

Overall and Pairwise Differences Across Lesson Profiles With Regard to Students' Emotions

	Pairwise differences													
	Overall		High vs. externalized		High vs. internalized		High vs. low		Externalized vs. internalized		Externalized vs. low		Internalized vs. low	
	χ^2	<i>p</i>	χ^2	<i>p</i>	χ^2	<i>p</i>	χ^2	<i>p</i>	χ^2	<i>p</i>	χ^2	<i>p</i>	χ^2	<i>p</i>
Enjoyment	27.25	<.001	12.49	<.001	32.30	<.001	19.69	<.001	8.44	<.001	4.42	.04	0.12	.73
Boredom	7.13	.07	8.91	<.001	8.15	<.001	4.98	.03	0.71	.40	0.25	.62	0.05	.83

Note. The χ^2 -difference tests were calculated with the *Mplus* option of auxiliary variables as distal outcomes (see Asparouhov & Muthén, 2014). For the overall test, *df* = 3; for the pairwise test, *df* = 1.

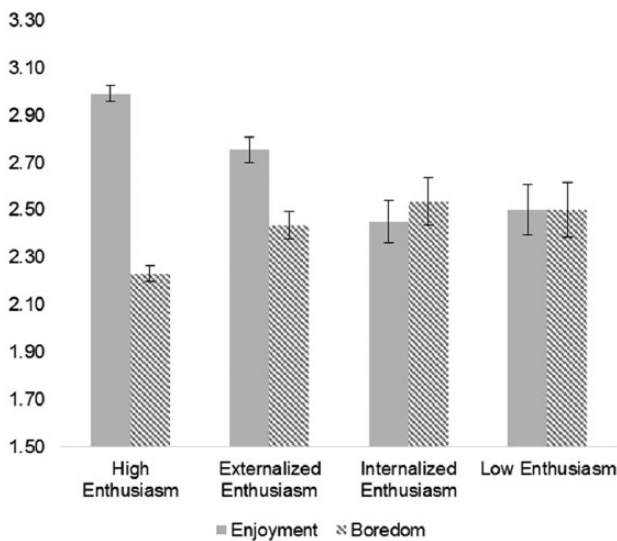


FIGURE 4. Differences in lesson profiles with regard to students' affective learning experiences. The whiskers denote SEM in each lesson profile. For better visibility, the y-axis covers an adapted range.

Externalized enthusiasm—a profile in which teachers reported below-average levels of experienced enthusiasm but students perceived them as enthusiastic

Internalized enthusiasm—a profile in which teachers reported above-average levels of experienced enthusiasm that was not translated into behaviors perceptible to students

Low enthusiasm—a profile in which teachers reported below-average experienced enthusiasm and the students did not perceive them as enthusiastic

Of these four profiles, only high enthusiasm and low enthusiasm can be considered authentic; externalized enthusiasm and internalized enthusiasm are characterized by an imbalance in the two enthusiasm components and thus can be considered inauthentic enthusiasm. In a clear majority of the observed lessons, teachers authentically expressed their high enthusiasm; that is, the two components were coinciding at a

high level. Yet in a sizable number of lessons, enthusiasm was internalized or externalized; in only a very small number of lessons, experienced enthusiasm and enthusiastic teaching coincided at low levels.

In addition, we found that dispersion of enthusiasm profiles across lessons and within teachers was more uneven (i.e., clustered into fewer categories) than among teachers, indicating that despite lesson-to-lesson fluctuations, there is also substantial stability in enthusiasm. Specifically, the pattern of internalized enthusiasm was found within only a small number of teachers.

We also found that these differing constellations of teacher self-reported experienced enthusiasm and student-perceived enthusiastic teaching behaviors were differently related to students' experiences of enjoyment and boredom. In comparison with students in lessons where both enthusiasm components were high (i.e., high enthusiasm), students in internalized enthusiasm lessons experienced less enjoyment and more boredom. This implies that experiencing enthusiasm alone is insufficient: It needs to be translated into behavior to unleash its potential with regard to students' emotions. Students in externalized enthusiasm lessons also experienced less enjoyment and more boredom than students in high enthusiasm lessons. As such, for students as for teachers themselves (Taxer & Frenzel, 2018), it does matter whether the teachers only appear enthusiastic or if they really feel that way.

Limitations

The current study was the first to investigate teachers' experienced and displayed enthusiasm on a lesson level via teacher and student reports. However, the study was not without limitations. Our chosen study design of lesson diaries and data from teachers and their entire classes implied a nested data structure, which resulted in a very large number of individual student ratings ($N = 5,328$) on the lowest level but a rather small sample size on the highest level ($N = 39$). This small sample size limits generalizability of our findings regarding intra- and interindividual variability of the lesson profiles. Although it seems that one profile, the internalized

enthusiasm profile, is rather teacher specific, we cannot with certainty claim as much, because of the small number of teachers included in the study. The stability of certain types of profiles, just like the existence thereof, warrants further investigation. Also, perhaps because of a participation bias, the high enthusiasm profile—in which the two components were above average—was by far the most frequent profile. The comparatively small number of cases in the other profiles limited our power to detect differences in student experiences across these profiles and needs to be further investigated.

Relatedly, our study design precluded determining a causal link between teacher enthusiasm and students' emotions. However, based on current findings (see Keller et al., 2016) a recursive relationship between teacher enthusiasm and student outcomes seems likely. As such, future studies could utilize study designs that allow examining how teacher enthusiasm profiles influence students' outcomes and behavior and are in turn influenced by them.

Furthermore, the current study is limited, as it focused on only one subject domain (mathematics). Previous research found that while students' achievement emotions are organized largely by domain (Goetz, Frenzel, Pekrun, Hall, & Lüdtke, 2007), relations between teaching characteristics and students' emotions are similar across domains (Goetz et al., 2013). We therefore expect that our findings on the relationship between teacher enthusiasm and student outcomes would generalize across domains; yet, this would need empirical support through future research.

Finally, construct measurement was challenging in our study: as in existing experience sampling and diary studies (e.g., Ahmed et al., 2010; Goetz et al., 2013), state questionnaire space was highly limited, since a range of constructs of interest should be assessed at the situation level without grossly altering the situation. A resulting limitation of our study was that one enthusiasm component (experienced enthusiasm) was assessed only by teacher self-report and the other component (enthusiastic teaching behavior) only via aggregated students' perceptions. This approach is in line with previous investigations that relied on similar assessment methods for the two enthusiasm components (see Keller et al., 2016). Nevertheless, future research could assess teachers' and students' perspectives for each enthusiasm component and determine the extent to which—if at all—they converge (for doubts on the reliable assessment of emotions through the other's perspective in the classroom, see Praetorius, McIntyre, & Klassen, 2017). Also due to time restrictions in the state assessment, only two or single items were used to assess each construct of interest. Future studies aiming to replicate the present findings could utilize a broader range of indicators to assess these constructs. This might be particularly interesting regarding the assessment of components beyond the affective component of students' emotions (e.g., the expressed

component). Arguably, students' expressed emotions, especially their enjoyment, might be important fuel for teachers' enthusiasm (Stenlund, 1995). In addition, one of the items to assess experienced enthusiasm was highly cognitive ("In this lesson I often thought that things were going great"). It was taken from the Enjoyment Scale of the AEQ-M, where it demonstrated high item-total correlation; thus, we consider its use in conjunction with the second item ("I enjoyed teaching this lesson") as a valid way to assess teachers' experienced enthusiasm. However, future research will need to clarify the role of different emotion components (i.e., affective, cognitive, motivational) when it comes to assessing experienced as well as expressed enthusiasm.

Implications and Future Research Directions

Despite these limitations, the present study provided new insight into a rather old subject (see first review by Rosenshine, 1970)—teacher enthusiasm. In lesson diaries (Bolger et al., 2003), we were able to study the two enthusiasm components—namely, experienced enthusiasm and enthusiastic teaching. Both components, as well as the lesson profiles of these components, are variable to a differing extent. Experienced enthusiasm can be represented by teaching-related enjoyment. Emotions such as enjoyment are thought to be highly dynamic phenomena; supporting this, a previous study found that the majority of variance in teachers' enjoyment lies on the lesson level (Frenzel et al., 2015). In line with this finding, we found that the experiential component of enthusiasm varied a great extent from lesson to lesson. In contrast, enthusiastic teaching behaviors, the other enthusiasm component, seemed to be rather stable across lessons. This might be partially attributable to the different approaches applied in assessing the two components (teacher self-report vs. class-aggregated student perceptions): The comparably high stability in student ratings could be a result of higher reliability due to aggregation, as well as a result of the way that students evaluate their teacher, which could be rooted in sympathy for a teacher in general or one's popularity rather than in a fine-grained day-to-day evaluation of the teacher's concrete behaviors (e.g., Shevlin, Banyard, Davies, & Griffiths, 2000). Yet, our findings also imply that there is considerable variability in teachers' observable enthusiastic behaviors, which raises the question, to what extent do teachers consciously employ enthusiastic teaching in the sense of an instructional strategy, and if so, what are their motives?

Independent of the differing levels of variability in the two enthusiasm components, our key proposition was supported—namely, that the two enthusiasm components do not always co-occur. This is in line with findings from Taxer and Frenzel (2018), who, through solely examining teacher self-reports and trait assessments, found distinct profiles in the

two enthusiasm components and differences in teachers' occupational well-being across profiles. Taxer and Frenzel reported that an individual profile characterized by relatively high levels of expressed teaching enthusiasm coupled with relatively low levels of experienced teaching-related enjoyment—and thus similar to the externalized lesson profile in the present study—was related to lower occupational well-being among teachers than a profile characterized by authentic levels of high teaching-related enjoyment and expressed teaching enthusiasm. The present study adds to this picture by providing a lesson-specific perspective to this question and incorporating student-level outcomes. We found that in lessons characterized by externalized or internalized enthusiasm—that is, in lessons of inauthentic enthusiasm—in comparison with both enthusiasm components being high, students reported less enjoyment and more boredom during the lesson. As such, teachers seem to upregulate their enthusiastic behaviors while teaching regardless of their affective state, despite this likely being detrimental to their well-being (Taxer & Frenzel, 2018)—and in so doing, they are only moderately successful, as students' emotional experiences in the corresponding lessons are less positive than in lessons where teachers are authentically enthusiastic. Then again, it is worth noting that teachers' efforts to show enthusiasm pay off in some respect, as our findings clearly showed that students' enjoyment was higher in lessons characterized by externalized enthusiasm than in lessons where teachers' enthusiasm was less visible to students (internalized enthusiasm). Although both profiles are considered inauthentic, they differentially affect students who benefit when teachers make an effort to appear enthusiastic. Because students' emotions are generally related to their learning and achievement (e.g., Pekrun, Lichtenfeld, Marsh, Murayama, & Goetz, 2017), the effect of teacher enthusiasm profiles on students' achievement could stem from students' emotional responses. Whether this is the case and what the relevant mechanisms are in the relationship of teacher enthusiasm profiles, student emotions, and student achievement needs to be addressed in future studies.

Finally, we found a lesson profile—namely, internalized enthusiasm—in which teachers' affective experience of enthusiasm was less visible to students. The mechanisms in teacher enthusiasm that allow or hinder transfer of affect into behavior are not easily understood, yet they could be embedded in research on individual differences in emotion

regulation (for a summary on emotion regulation, see Gross, 2015). Individual differences in experienced and expressed emotions as well as in the transfer of affect into expression could be explained by a number of individual characteristics; likely candidates include emotional expressivity (defined as the “extent to which people outwardly display their emotions”; Kring, Smith, & Neale, 1994, p. 934), affect intensity (defined as the “strength with which individuals experience their emotions”; Larsen & Diener, 1987, p. 2), or personality traits such as extraversion (e.g., John & Srivastava, 1999).

The existence of the externalized enthusiasm profile could be explained through the concept of emotional labor, which entails regulating emotions with others as part of one's work role (Grandey & Gabriel, 2015; Hochschild, 1983). For teachers, emotional labor involves presenting a positive emotion image to students even in instances when they do not experience these positive emotions. Taxer and Frenzel (2018) found that pretending to be enthusiastic when experiencing relatively diminished levels of enjoyment was connected to reduced occupational well-being, a finding that aligns with previous research on the depletion of self-regulatory resources that results from surface acting as an emotional labor strategy (Hülshager & Schewe, 2011). Thus, although the two profiles internalized and externalized enthusiasm would both be considered inauthentic, they may actually be quite different in how they develop and how they affect teachers themselves but also their students.

Future research could examine how individual characteristics influence the enthusiasm components and teachers' enthusiasm profiles. Additionally, future research could include contextual factors to examine the conditions under which teachers' individual characteristics play out in the experience and expression of enthusiasm and the formation of enthusiasm profiles in the classroom. A question of practical relevance would be how teachers can display their experienced enthusiasm in a way that it is perceived by students (which was not the case for the internalized enthusiasm profile in the present study): What are the expressive behaviors and instructional strategies that teachers can employ to transport their experienced enthusiasm to students? Can these strategies be learned by teachers and consciously employed? Such a research program could, in the long run, result in applicable findings when it comes to fostering teachers' enthusiasm.

Appendix

TABLE A1

Item Wordings for the Assessment of Teacher Enthusiasm

	Experienced enthusiasm component (teachers' self-report, teacher diary)
stjoy1	I enjoyed teaching this lesson. <i>In dieser Stunde machte mir das Unterrichten Freude.</i>
stjoy2	In this lesson I often thought that things were going great. <i>In dieser Stunde habe ich mir oft gedacht: Das läuft ja prima!</i>
	Behavioral enthusiasm component (students' perception, student diary)
ssstent	In this lesson, our teacher was teaching with enthusiasm. <i>In dieser Stunde unterrichtete unser/e Lehrer/in mit Begeisterung.</i>

TABLE A2

Item Wording for the Assessment of Students' Learning Experiences

	Enjoyment
ssjoy1	I had fun during this mathematics lesson. <i>In dieser Stunde hat mir der Mathematikunterricht Spaß gemacht.</i>
ssjoy2	In this lesson, I enjoyed myself. <i>In dieser Stunde habe ich mich gefreut.</i>
	Boredom
ssbore01	I found this mathematics lesson boring. <i>In dieser Stunde fand ich den Mathematikunterricht langweilig.</i>
ssbore02	During this lesson, I was bored. <i>In dieser Stunde habe ich mich gelangweilt.</i>

ORCID iD

M. M. Keller  <https://orcid.org/0000-0003-0877-9779>

Notes

1. Keller, Goetz, et al. (2014) conceptualized and operationalized this in the form of positive emotional expressivity, a trait construct defined as an individual's tendency to outwardly express positive emotions (see, e.g., Gross & John, 1998). The expression can occur through expressive behavior such as laughter, and the items directly tapped the extent to which the inner feelings were displayed in class and perceived by students. Thus, this construct comes closest in the literature to assessing enthusiastic teaching behaviors via teachers' self-report.

2. The concept of emotional labor emerged (Hochschild, 1983) and, for teachers, has predominately been studied in Western cultures (e.g., Brackett, Palomera, Mojsa-Kaja, Reyes, & Salovey, 2010; Keller, Chang et al., 2014; Näring, Briët, & Brouwers, 2006). However, a number of recent studies corroborated that emotional labor and related processes play out similarly for teachers in countries such as China (Yin & Lee, 2012), Turkey (Çukur, 2009), or Iran (Ghanizadeh & Royaei, 2015).

3. Dispersion index H indicates how evenly or unevenly the observations are distributed across the categories in a given nominal variable. It is calculated as follows:

$$H = -\frac{1}{\ln k} \cdot \sum_{j=1}^k h_j \cdot \ln h_j$$

with k being the number of categories (four in the case of enthusiasm profiles) and h_j being the relative frequencies of observations in category j .

References

- Ahmed, W., van der Werf, G., Minnaert, A., & Kuyper, H. (2010). Students' daily emotions in the classroom: Intra-individual variability and appraisal correlates. *British Journal of Educational Psychology, 80*(Pt. 4), 583–597. doi:10.1348/00709910X498544
- Asparouhov, T., & Muthén, B. (2008). Multilevel mixture models. In G. R. Hancock & K. M. Samuelson (Eds.), *Advances in latent variable mixture models* (pp. 27–52). Charlotte, NC: Information Age.
- Asparouhov, T., & Muthén, B. (2013). *Auxiliary variables in mixture modeling: A 3-step approach using Mplus* (Mplus Webnotes No. 15). Retrieved from https://statmodel.com/examples/webnotes/AuxMixture_submitted_corrected_webnote
- Asparouhov, T., & Muthén, B. (2014). Auxiliary variables in mixture modeling: Three-step approaches using Mplus. *Structural Equation Modeling: A Multidisciplinary Journal, 21*(3), 329–341. doi:10.1080/10705511.2014.915181
- Bettencourt, E. M., Gillett, M. H., Gall, M. D., & Hull, R. E. (1983). Effects of teacher enthusiasm training on student on-task behavior and achievement. *American Educational Research Journal, 20*(3), 435–450. doi:10.3102/00028312020003435
- Bolger, N., Davis, A., & Rafaeli, E. (2003). Diary methods: capturing life as it is lived. *Annual Review of Psychology, 54*, 579–616. doi:10.1146/annurev.psych.54.101601.145030
- Brackett, M. A., Palomera, R., Mojsa-Kaja, J., Reyes, M. R., & Salovey, P. (2010). Emotion-regulation ability, burnout, and job satisfaction among British secondary-school teachers. *Emotion, 47*(4), 406–417.
- Brigham, F. J., Scruggs, T. E., & Mastropieri, M. A. (1992). Teacher enthusiasm in learning disabilities classrooms: Effects on learning and behavior. *Learning Disabilities Research and Practice, 7*(2), 68–73.
- Chang, M.-L. (2013). Toward a theoretical model to understand teacher emotions and teacher burnout in the context of student misbehavior: Appraisal, regulation, and coping. *Motivation and Emotion, 37*(4), 799–817. doi:10.1007/s11031-012-9335-0
- Collishaw, M. A., Dyer, L., & Boies, K. (2008). The authenticity of positive emotional displays: Client responses to leisure service employees. *Journal of Leisure Research, 40*(1), 23–46.
- Cui, G., Yao, M., & Zhang, X. (2017). The dampening effects of perceived teacher enthusiasm on class-related boredom: The mediating role of perceived autonomy support and task value. *Frontiers in Psychology, 8*, 400. doi:10.3389/fpsyg.2017.00400
- Çukur, C. (2009). The development of the Teacher Emotional Labor Scale (TELS): Validity and reliability. *Educational Sciences: Theory and Practice, 9*, 559–574.
- Daschmann, E. C., Goetz, T., & Stupnisky, R. H. (2011). Testing the predictors of boredom at school: Development and validation of the precursors to boredom scales. *British Journal of Educational Psychology, 81*, 421–440. doi:10.1348/000709910X526038
- Eid, M., Gollwitzer, M., & Schmitt, M. (2010). *Statistik und Forschungsmethoden* [Statistics and research methods]. Weinheim, Germany: Beltz.
- Feldman, K. A. (2007). Identifying exemplary teachers and teaching: Evidence from student ratings. In R. P. Perry & J. C. Smart (Eds.), *The scholarship of teaching and learning in higher education—An evidence-based perspective* (pp. 93–143). Dordrecht, Germany: Springer.
- 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. doi:10.1371/journal.pone.0129630
- Frenzel, A. C., Becker-Kurz, B., Pekrun, R., Goetz, T., & Lüdtke, O. (2017). Emotion transmission in the classroom revisited: A reciprocal effects model of teacher and student enjoyment.

- Journal of Educational Psychology*. Advance online publication. doi:10.1037/edu0000228
- Frenzel, A. C., Goetz, T., Lüdtke, O., Pekrun, R., & Sutton, R. E. (2009). Emotional transmission in the classroom: Exploring the relationship between teacher and student enjoyment. *Journal of Educational Psychology, 101*(3), 705–716. doi:10.1037/a0014695
- Frenzel, A. C., Goetz, T., Pekrun, R., & Watt, H. M. G. (2010). Development of mathematics interest in adolescence: Influences of gender, family, and school context. *Journal of Research in Adolescence, 20*(2), 507–537. doi:10.1111/j.1532-7795.2010.00645.x
- Frenzel, A. C., Pekrun, R., Goetz, T., Daniels, L. M., Durksen, T. L., Becker-Kurz, B., & Klassen, R. M. (2016). Measuring enjoyment, anger, and anxiety during teaching: The Teacher Emotion Scales (TES). *Contemporary Educational Psychology, 46*, 148–163. doi:10.1016/j.cedpsych.2016.05.003
- Ghanizadeh, A., & Royaei, N. (2015). Emotional facet of language teaching: Emotion regulation and emotional labor strategies as predictors of teacher burnout. *International Journal of Pedagogies and Learning, 10*(2), 139–150. doi:10.1080/22040552.2015.1113847
- Goetz, T., Frenzel, A. C., Pekrun, R., Hall, N. C., & Lüdtke, O. (2007). Between- and within-domain relations of students' academic emotions. *Journal of Educational Psychology, 99*(4), 715–733. doi:10.1037/0022-0663.99.4.715
- Goetz, T., Lüdtke, O., Nett, U. E., Keller, M., & Lipnevich, A. (2013). Characteristics of teaching and students' emotions in the classroom: Investigating differences across domains. *Contemporary Educational Psychology, 38*, 383–394.
- Gogol, K., Brunner, M., Goetz, T., Martin, R., Ugen, S., Keller, U., . . . Preckel, F. (2014). "My questionnaire is too long!" The assessments of motivational-affective constructs with three-item and single-item measures. *Contemporary Educational Psychology, 39*(3), 188–205. doi:10.1016/j.cedpsych.2014.04.002
- Grandey, A. A. (2003). When "the show must go on": Surface acting and deep acting as determinants of emotional exhaustion and peer-rated service delivery. *Academy of Management Journal, 46*(1), 80–96.
- Grandey, A. A., & Gabriel, A. S. (2015). Emotional labor at a crossroads: Where do we go from here? *Annual Review of Organizational Psychology and Organizational Behavior, 2*(1), 323–349. doi:10.1146/annurev-orgpsych-032414-111400
- Gross, J. J. (2015). Emotion regulation: Current status and future prospects. *Psychological Inquiry, 26*(1), 1–26. doi:10.1080/1047840X.2014.940781
- Gross, J. J., & John, O. P. (1998). Mapping the domain of expressivity: Multimethod evidence for a hierarchical model. *Journal of Personality and Social Psychology, 74*(1), 170–191. doi:10.1037/0022-3514.74.1.170
- Hochschild, A. R. (1983). *The managed heart: Commercialization of human feelings*. Berkeley: University of California Press.
- Hülshager, U. R., & Schewe, A. F. (2011). On the costs and benefits of emotional labor: A meta-analysis of three decades of research. *Journal of Occupational Health Psychology, 16*(3), 361–389. doi:10.1037/a0022876
- Jackson, D. L., Teal, C. R., Raines, S. J., Nansel, T. R., Force, R. C., & Burdsal, C. A. (1999). The dimensions of students' perceptions of teaching effectiveness. *Educational and Psychological Measurement, 59*(4), 580–596. doi:10.1177/00131649921970035
- John, O. P., & Srivastava, S. (1999). The Big Five taxonomy: History, measurement, and theoretical perspectives. In L. A. Pervin & O. P. John (Eds.), *Handbook of personality: Theory and research* (pp. 102–138). New York, NY: Guilford Press.
- Johnson, Z. D., & LaBelle, S. (2017). An examination of teacher authenticity in the college classroom. *Communication Education, 13*, 1–17. doi:10.1080/03634523.2017.1324167
- Johnston, L., Miles, L., & Macrae, C. N. (2010). Why are you smiling at me? Social functions of enjoyment and non-enjoyment smiles. *British Journal of Social Psychology, 49*, 107–127. doi:10.1348/014466609X412476
- Keller, M. M., Chang, M.-L., Becker, E., Goetz, T., & Frenzel, A. C. (2014). Teachers' emotional experiences and exhaustion as predictors of emotional labor in the classroom: An experience sampling study. *Frontiers in Psychology, 5*, 1442. doi:10.3389/fpsyg.2014.01442
- Keller, M. M., Goetz, T., Becker, E., Morger, V., & Hensley, L. (2014). Feeling and showing: A new conceptualization of dispositional teacher enthusiasm and its relation to students' interest. *Learning and Instruction, 33*, 29–38. doi:10.1016/j.learninstruc.2014.03.001
- Keller, M. M., Neumann, K., & Fischer, H. E. (2014). Enthusiastic teaching and its impact on students' interest and self-concept: Investigating German physics classrooms. In H. E. Fischer, P. Labudde, K. Neumann, & J. Viiri (Eds.), *Quality of instruction in physics: Findings from a tri-national video study* (pp. 129–143). Münster, Germany: Waxmann.
- Keller, M. M., Woolfolk Hoy, A. E., Goetz, T., & Frenzel, A. C. (2016). Teacher enthusiasm: Reviewing and redefining a complex construct. *Educational Psychology Review, 28*(4), 743–769. doi:10.1007/s10648-015-9354-y
- Keltner, D., & Haidt, J. (1999). Social functions of emotions at four levels of analysis. *Cognition & Emotion, 13*(5), 505–521. doi:10.1080/026999399379168
- Kreber, C., Klampfleitner, M., McCune, V., Bayne, S., & Knottenbelt, M. (2016). What do you mean by "authentic"? A comparative review of the literature on conceptions of authenticity in teaching. *Adult Education Quarterly, 58*(1), 22–43. doi:10.1177/0741713607305939
- Kring, A. M., Smith, D. A., & Neale, J. M. (1994). Individual differences in dispositional expressiveness: Development and validation of the Emotional Expressivity Scale. *Journal of Personality and Social Psychology, 66*(5), 934–949. doi:10.1037/0022-3514.66.5.934
- Kunter, M., Frenzel, A. C., Nagy, G., Baumert, J., & Pekrun, R. (2011). Teacher enthusiasm: Dimensionality and context specificity. *Contemporary Educational Psychology, 36*, 289–301. doi:10.1016/j.cedpsych.2011.07.001
- Kunter, M., & Holzberger, D. (2014). Loving teaching: Research on teachers' intrinsic orientations. In P. W. Richardson, S. A. Karabenick, & H. M. G. Watt (Eds.), *Teacher motivation: theory and practice* (pp. 83–99). New York, NY: Routledge.
- Kunter, M., Klusmann, U., Baumert, J., Richter, D., Voss, T., & Hachfeld, A. (2013). Professional competence of teachers: Effects on instructional quality and student development. *Journal of Educational Psychology, 105*(3), 805–820. doi:10.1037/a0032583

- Kunter, M., Tsai, Y.-M., Klusmann, U., Brunner, M., Krauss, S., & Baumert, J. (2008). Students' and mathematics teachers' perceptions of teacher enthusiasm and instruction. *Learning and Instruction, 18*(5), 468–482. doi:10.1016/j.learninstruc.2008.06.008
- Larsen, R. J., & Diener, E. (1987). Affect intensity as an individual difference characteristic: A review. *Journal of Research in Personality, 21*(1), 1–39. doi:10.1016/0092-6566(87)90023-7
- Locke, L. F., & Woods, S. E. (1982). Teacher enthusiasm. *Journal of Teaching and Physical Education, 1*(3), 3–14.
- 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 multi-level modeling. *Contemporary Educational Psychology, 34*(2), 120–131. doi:10.1016/j.cedpsych.2008.12.001
- Lüdtke, O., Trautwein, U., Kunter, M., & Baumert, J. (2006). Reliability and agreement of student ratings in the classroom environment: A reanalysis of TIMSS data. *Learning Environment Research, 9*, 215–230. doi:10.1007/s10984-006-9014-8
- Magdison, J., & Vermunt, J. K. (2004). Latent class models. In D. Kaplan (Ed.), *Handbook of quantitative methodology for the social sciences* (pp. 345–368). Newbury Park CA: Sage.
- Maringer, M., Krumhuber, E. G., Fischer, A. H., & Niedenthal, P. M. (2011). Beyond smile dynamics: Mimicry and beliefs in judgments of smiles. *Emotion, 11*(1), 181–187. doi:10.1037/a0022596
- Marsh, H. W. (2007). Students' evaluations of university teaching: Dimensionality, reliability, validity, potential biases and usefulness. In R. P. Perry & J. C. Smart (Eds.), *The scholarship of teaching and learning in higher education* (pp. 319–383). Dordrecht, Germany: Springer.
- McLellan, T., Johnston, L., Dalrymple-Alford, J., & Porter, R. (2010). Sensitivity to genuine versus posed emotion specified in facial displays. *Cognition & Emotion, 24*(8), 1277–1292. doi:10.1080/02699930903306181
- Minor, L. C., Onwuegbuzie, A. J., Witcher, A., & James, T. L. (2002). Preservice teachers' educational beliefs and their perceptions of characteristics of effective teachers. *Journal of Educational Research, 96*(2), 116–127.
- Morris, J. A., & Feldman, D. C. (1996). The dimensions, antecedents, and consequences of emotional labor. *Academy of Management Review, 21*(4), 986–1010. doi:10.5465/AMR.1996.9704071
- Muraven, M., Tice, D. M., & Baumeister, R. F. (1998). Self-control as a limited resource: Regulatory depletion patterns. *Journal of Personality and Social Psychology, 74*(3), 774–789. doi:10.1037/0022-3514.74.3.774
- Murray, H. G. (2007). Low-inference teaching behaviors and college teaching effectiveness: Recent developments and controversies. In R. P. Perry & J. C. Smart (Eds.), *The scholarship of teaching and learning in higher education* (pp. 145–200). Dordrecht, Germany: Springer.
- Muthén, B. (2009). Latent variable mixture modeling. In G. A. Marcoulides & R. E. Schumacker (Eds.), *New developments and techniques in structural equation modeling* (pp. 1–33). Mahwah, NJ: Erlbaum.
- Näring, G., Briët, M., & Brouwers, A. (2006). Beyond demand-control: Emotional labour and symptoms of burnout in teachers. *Work & Stress, 20*(4), 303–315. doi:10.1080/02678370601065182
- Nylund, K. L., Asparouhov, T., & Muthén, B. O. (2007). Deciding on the number of classes in latent class analysis and growth mixture modeling: A Monte Carlo simulation study. *Structural Equation Modeling: A Multidisciplinary Journal, 14*(4), 535–569. doi:10.1080/10705510701575396
- Pastor, D. A., Barron, K. E., Miller, B. J., & Davis, S. L. (2007). A latent profile analysis of college students' achievement goal orientation. *Contemporary Educational Psychology, 32*(1), 8–47. doi:10.1016/j.cedpsych.2006.10.003
- Patrick, B. C., Hisley, J., & Kempler, T. (2000). "What's everybody so excited about?" The effects of teacher enthusiasm on student intrinsic motivation and vitality. *Journal of Experimental Education, 68*(3), 217–236. doi:10.1080/00220970009600093
- Pekrun, R. (2006). The control-value theory of achievement emotions: Assumptions, corollaries, and implications for educational research and practice. *Educational Psychology Review, 18*(4), 315–341.
- Pekrun, R., Goetz, T., & Frenzel, A. C. (2005). *Academic Emotions Questionnaire—Mathematics (AEQ-M): User's manual*. Munich, Germany: University of Munich.
- Pekrun, R., Goetz, T., Frenzel, A. C., Barchfeld, P., & Perry, R. P. (2011). Measuring emotions in students' learning and performance: The Achievement Emotions Questionnaire (AEQ). *Contemporary Educational Psychology, 36*(1), 36–48. doi:10.1016/j.cedpsych.2010.10.002
- Pekrun, R., Lichtenfeld, S., Marsh, H. W., Murayama, K., & Goetz, T. (2017). Achievement emotions and academic performance: Longitudinal models of reciprocal effects. *Child Development, 88*(5), 1653–1670. doi:10.1111/cdev.12704
- Pogue, L. L., & Ahyun, K. (2007). The effect of teacher nonverbal immediacy and credibility on student motivation and affective learning. *Communication Education, 55*(3), 331–344. doi:10.1080/03634520600748623
- Praetorius, A.-K., McIntyre, N. A., & Klassen, R. M. (2017). Reactivity effects in video-based classroom research: An investigation using teacher and student questionnaires as well as teacher eye-tracking. *Zeitschrift für Erziehungswissenschaft, 20*(S1), 49–74. doi:10.1007/s11618-017-0729-3
- Rosenshine, B. (1970). Enthusiastic teaching: A research review. *The School Review, 78*(4), 499–514.
- Shevlin, M., Banyard, P., Davies, M., & Griffiths, M. (2000). The validity of student evaluation of teaching in higher education: Love me, love my lectures? *Assessment & Evaluation in Higher Education, 25*(4), 397–405. doi:10.1080/713611436
- Stenlund, K. V. (1995). Teacher perceptions across cultures: The impact of students on teacher enthusiasm and discouragement in a cross-cultural context. *Alberta Journal of Educational Research, 41*(2), 145–161.
- Surakka, V., & Hietanen, J. K. (1998). Facial and emotional reactions to Duchenne and non-Duchenne smiles. *International Journal of Psychophysiology, 29*(1), 23–33. doi:10.1016/S0167-8760(97)00088-3
- Sutton, R. E. (2004). Emotional regulation goals and strategies of teachers. *Social Psychology of Education, 7*(4), 379–398. doi:10.1007/s11218-004-4229-y
- Taxer, J., & Frenzel, A. C. (2018). Inauthentic expression of enthusiasm: Exploring the cost of emotional dissonance in teachers. *Learning and Instruction, 53*, 74–88.
- 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. doi:10.1016/j.tate.2015.03.003

- Tsouloupas, C. N., Carson, R. L., Matthews, R., Grawitch, M. J., & Barber, L. K. (2010). Exploring the association between teachers' perceived student misbehaviour and emotional exhaustion: The importance of teacher efficacy beliefs and emotion regulation. *Educational Psychology, 30*(2), 173–189. doi:10.1080/01443410903494460
- van Kleef, G. A. (2010). The emerging view of emotion as social information. *Social and Personality Psychology Compass, 4*(5), 331–343. doi:10.1111/j.1751-9004.2010.00262.x
- Wanous, J. P., Reichers, A. E., & Hudy, M. J. (1997). Overall job satisfaction: How good are single-item measures? *Journal of Applied Psychology, 82*(2), 247–252. doi:10.1037/0021-9010.82.2.247
- Yin, H.-B., & Lee, J. C.-K. (2012). Be passionate, but be rational as well: Emotional rules for Chinese teachers' work. *Teaching and Teacher Education, 28*(1), 56–65. doi:10.1016/j.tate.2011.08.005
- Zembylas, M. (2002). Constructing genealogies of teachers' emotions in science teaching. *Journal of Research in Science Teaching, 39*(1), 79–103.

Authors

MELANIE M. KELLER is a postdoctoral researcher at the Leibniz Institute for Science and Mathematics Education at the University of Kiel, Germany. Her research addresses emotions of teachers, with a focus on teachers' enthusiasm.

EVA S. BECKER is a postdoctoral researcher at the Department of Education at the University of Zurich, Switzerland. In her research, she investigates teachers' emotions and emotional exhaustion.

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.

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.