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## Teachers' emotional experiences in response to daily events with individual students varying in perceived past disruptive behavior



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### ABSTRACT

Students' disruptive behavior during classroom events can elicit strong emotions in teachers and impact teachers' occupational wellbeing. This research was the first to test the proposition that teachers' emotional responses depend not solely on the specific classroom events themselves, but also on the perceived history of disruptive behavior of the student involved. Two complimentary studies examined whether teachers' perceptions of students' past disruptive behavior moderated the link between teachers' valence appraisals (i.e., how positive or negative an event was) and emotions in response to the event (i.e., enjoyment, anger, anxiety, self-, and other-related emotions). It was expected that teachers would be more emotionally reactive to events involving students whom they perceived as more disruptive in the past. Study 1 ( $N = 218$  teachers) examined one teacher-selected relevant event of a workday with an individual student. Study 2 ( $N = 37$  teachers) examined multiple events collected through daily diaries across the school year regarding two target students ( $N = 77$ ) varying in perceived disruptive behavior. Both studies showed that teachers reacted more emotionally negative to students they perceived as more disruptive in the past compared to similarly appraised events with students perceived as less disruptive. Findings were most consistent for teachers' anger. In addition, Study 1 examined whether teachers' event-related emotions were related to their occupational wellbeing that workday. Teachers' anger was the only emotion associated with both teachers' emotional exhaustion and dedication. Intervention efforts to increase teachers' occupational wellbeing may profit from focusing on specific anger-evoking teacher-student dyads and try changing teachers' underlying judgments and associated emotions about disruptive students.

Dealing with students who display disruptive behaviors is challenging for many teachers. Researchers point to the everyday handling of student misbehavior as an important driver of teachers' occupational wellbeing (Aldrup et al., 2018; Aloe et al., 2014; Friedman, 2006; Kokkinos, 2007; Tsouloupas et al., 2010). Examining teachers' daily emotional experiences, including their appraisals or subjective interpretations, and emotions in response to real-life teaching situations, could help to understand how disruptive behavior impacts wellbeing (Chang, 2013; Schutz & Pekrun, 2007; Spilt et al., 2011). To date, most studies have focused on behavior of the whole class measured in response to a lesson or workday (e.g., Aldrup et al., 2018; Becker et al., 2015; Frenzel et al., 2009) and have provided valuable insights in teachers' perceptions of classroom behavior and associated emotional experiences. However, they have not taken into account the history of shared experiences between teacher and specific students involved in the

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emotional encounters. Yet, Lazarus (2006) argued that shared experiences largely influence the emotions experienced.

When a student repeatedly misbehaves in class, teachers may come to perceive the student as “disruptive.” Over time, teachers may become sensitive to certain students' misbehavior, which might amplify (i.e., moderate) their emotional responses to classroom events with students who have a history of misbehavior (Spilt et al., 2011). Although theorized, this assumption has never been put to an empirical test. Therefore, in two complimentary studies, the current research will examine the possible moderating role of teachers' perceptions of students' past disruptive behavior in their emotional responses to daily events. When teachers are more emotionally reactive to students they perceive as disruptive, even in response to similar events, interactions with some students (i.e., those perceived as disruptive in the past) may be more relevant for teachers' occupational wellbeing than interactions with other students. This knowledge is important from a theoretical perspective but could also help school psychologists apply targeted interventions that focus on specific teacher-student dyads.

## 1. Teachers' emotional experiences in response to events with disruptive students

The job demands-resources model (Bakker & Demerouti, 2014; Demerouti et al., 2001) is a popular model in explaining how teachers' occupational wellbeing is influenced by multifaceted work characteristics, while taking into account personal characteristics (e.g., self-efficacy and personality characteristics). The model distinguishes between two categories of work characteristics: job demands and job resources. Job demands are aspects of the job that require physical and/or psychological effort, whereas job resources are aspects that help achieve work goals, reduce job demands or the consequences of job demands, and stimulate personal growth and development. Empirical studies examining the job demands of teaching consistently point to dealing with students' disruptive behaviors as one of the largest stressors (e.g., Aloe et al., 2014; Boyle et al., 1995; Fernet et al., 2012; McCormick & Barnett, 2011).

The current study is inspired by two theoretical models that target the possible cognitive processes at play behind the link between student disruptive behavior and teacher wellbeing (Chang & Davis, 2009; Spilt et al., 2011). The models posit that teachers' occupational wellbeing is influenced by their everyday emotional responses to student behavior during classroom events. The type and intensity of the emotions experienced are theorized to depend on teachers' appraisals (i.e., subjective interpretations) of the event. Only events that are appraised to be relevant to one's goals, values, or needs will elicit emotions (Lazarus & Folkman, 1987). Appraisals of goal congruence determine the valence of a particular event (i.e., how positive or negative the event is for the teacher; Frenzel et al., 2009; Frijda et al., 1989): When a relevant classroom event is aligned with the teacher's goals (i.e., goal congruent), they will appraise the event as positive; whereas they will appraise the event as negative when it is not aligned with those goals (i.e., goal incongruent). For example, if a teacher's goal for their students is to understand a certain topic, a student paying attention during instruction is considered a goal congruent event, whereas a student chatting with a peer is considered a goal incongruent event. Note that a student chatting with a peer could be considered goal congruent, when the teacher's goal is to foster cooperation. Generally, positively appraised events will trigger positive emotions and negatively appraised events will evoke negative emotions (Frenzel, 2014).

Empirical evidence supports the assumption that teachers' valence appraisals or goal congruence appraisals of events predict their emotions and occupational wellbeing. In a study exploring teachers' appraisals of disruptive classroom behavior events, teachers reported higher levels of anger and frustration when they rated the disruptive behavior as more goal incongruent (Chang, 2013). Higher levels of anger and frustration during the memorable classroom event were associated with teachers' general feelings of burnout, highlighting the importance of classroom events for occupational wellbeing. A diary study including different types of events (both inside and outside the classroom) found that on days for which teachers reported more positively appraised events, they reported lower levels of daily emotional exhaustion than their usual level (Schmidt et al., 2017). On days for which teachers reported more negatively appraised events, they reported higher levels of emotional exhaustion.

There is tentative empirical evidence that students who are perceived by teachers as disruptive elicit more intense negative emotions. McGrath and Van Bergen (2017) analyzed speech samples and found that teachers expressed a more negative emotional tone when speaking about students they nominated as disruptive compared to students they nominated as well-behaved. Another study found that teachers expressed more anger towards and felt more helpless about students they perceived as disruptive as compared to nondisruptive students (Spilt & Koomen, 2009). Similarly, in diary research examining teachers' negative emotions on a daily level (Koenen et al., 2019), perceived disruptive students were more often involved in interactions that evoked a higher intensity of negative emotions (i.e., anger, irritation, and tension). What remains unclear is whether teachers' negative emotional experiences can be attributed fully to the behavior of the student during the event itself or whether teachers respond differently towards students who are disruptive compared to students who are not disruptive, even in similarly appraised events. The current study will examine this premise.

## 2. The moderating role of teachers' perceptions of individual students' past disruptive behavior

Teachers' emotional responses to classroom events may not solely depend on the specific event itself, but also on their past judgments of events with the student(s) involved (cf. Chang & Davis, 2009; Lazarus, 2006; Spilt et al., 2011). These past judgments are reflected in teachers' perceptions of an individual student's level of past disruptive behavior. Spilt et al. (2011) posited that teachers may become more reactive to negative events involving specific students because their unfavorable perceptions of students increase the likelihood of appraising their behavior as more challenging and threatening. Moreover, teachers may perceive negative behavior of such students as something intentional that the students can and should control (cf. interpersonal attribution theory;

Weiner, 1985), thereby impacting teachers' emotional experiences (Nemer et al., 2019). This is similar to what Hymel et al. (1990) described as “reputational bias” in peer research: Even though disruptive students display more problem behaviors than non-disruptive students, these behaviors do not account for 100% of the variance in peer rejection. Translating this principle to teachers, teachers' perception of a student may have a strong influence on how they experience events with this student. Teachers may come to experience higher levels of negative emotions when a disruptive student is involved in a negative classroom event (i.e., moderating role). In other words, when teachers appraise events with a student negatively, they are likely to experience anger. However, when a student perceived as more disruptive in the past is involved, teachers would experience higher levels of anger compared to experiencing the same event with a student whom they perceive as less disruptive. This anger may in turn affect teachers' occupational wellbeing (Chang, 2013).

Spilt et al. (2011) elaborated only on negative indicators of student behavior and teachers' emotions but argued that it is also important to examine positive indicators. Therefore, in the current research, we also will examine teachers' emotions in response to positive events. Experiencing a positive event involving a student who is perceived as often misbehaving may come as an unexpected, but welcome surprise for teachers. Consequently, teachers may experience higher levels of positive emotions in response to positive events with students they perceive as having a history of disruptive behavior compared to similar events with less disruptive students. There is some empirical support for this idea. Hargreaves (2000) concluded from interviews that the most frequently cited sources of positive emotions among teachers were difficult or demanding students whom they “had managed to turn around against the odds” (p. 818). Another qualitative study found that teachers identified the same students as the ones causing trouble and bringing joy (Rytivaara & Frelin, 2017). One quantitative study asking teachers to describe the most relevant event of that workday with an individual student found that disruptive students were overrepresented in both negatively and positively appraised relevant classroom events (de Ruiter et al., 2019). These results suggested that students perceived as more disruptive in the past may evoke stronger emotional responses than students perceived as less disruptive in similarly appraised events (i.e., equally positive or equally negative).

### 3. Present study

The aim of the present paper was to gain a deeper understanding of teachers' daily emotional experiences in response to specific events involving individual students differing in their levels of past disruptive behavior. We conducted two complimentary studies using two different samples of upper-level elementary school teachers. In Study 1, each teacher reported once about the most relevant classroom event of that day with an individual student. The cross-sectional study provided important information about the emotional experiences of a large sample of teachers in response to a single event they themselves marked as relevant. In Study 2, each teacher reported on multiple events in response to two individual students across one school year. The daily diary study offered the opportunity to capture different events of a smaller sample of teachers with individual students and to study the variation in teachers' emotional experiences within a teacher-student dyad. We investigated whether teachers' perceptions of students' past disruptive behavior moderated the link between the valence appraisal of the event (how negative or positive the event was according to the teacher) and the emotions experienced in response to the event.

We expected that teachers would be more emotionally reactive to disruptive students than to non-disruptive students, i.e., that students perceived by teachers as more disruptive in the past - compared to students perceived as less disruptive - would evoke stronger emotions during events that teachers appraised similarly (e.g., equally negative or equally positive: Fig. 1, dashed line).

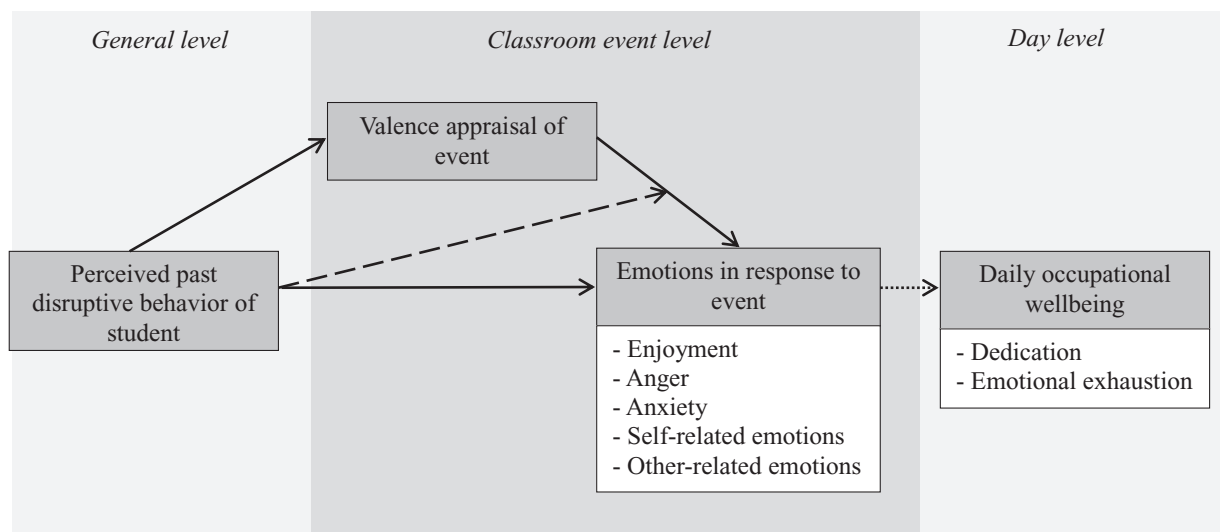


Fig. 1. Examined conceptual model.

More specifically, we expected that for similarly appraised events on the negative side (i.e., equally negative), teachers would report higher levels of negative emotions (i.e., anger and anxiety) for more disruptive students than for less disruptive students, as behaviors of disruptive students may be viewed as more challenging and threatening than behaviors of their non-disruptive peers. For similarly appraised events on the positive side (i.e., equally positive), we expected that teachers would report higher levels of positive emotions (i.e., enjoyment, self-, and other-related emotions) for more disruptive students than for less disruptive students, because of the unexpected nature of positive events with a student that often misbehaves.

Because teachers' daily emotional experiences are considered relevant for their wellbeing (Chang, 2013; Spilt et al., 2011), Study 1 also examined whether teachers' event-related emotions were related to daily occupational wellbeing (i.e., their emotional exhaustion and dedication; Fig. 1, dotted line). Based on research investigating teachers' anger and frustration during one memorable disruptive classroom event (Chang, 2013), we expected that the intensity of anger during one relevant classroom event would positively predict emotional exhaustion on that day. For the other emotions and for associations with teachers' dedication, our hypotheses were derived from studies that found associations between different negative and positive state emotions on the one hand, and different aspects of wellbeing on the other hand (Bower & Carroll, 2017; Evans et al., 2019; Ouweneel et al., 2012). We expected that teachers' positive emotions (i.e., their enjoyment, self-, and other-related emotions) would positively predict dedication and negatively predict emotional exhaustion on that day. In addition, teachers' negative emotions (i.e., their anger and anxiety) would negatively predict dedication and positively predict emotional exhaustion on that day.

#### 4. Study 1: most relevant event during a single workday

In Study 1, we investigated the role of teachers' perceptions of students' past disruptive behavior in the link between teachers' valence appraisals of events and their emotions. More precisely, we examined whether disruptive students (predictor) were more likely to be involved in negatively appraised events (mediator) and, in turn, elicit more negative teacher emotions (outcome). Most importantly, we considered disruptive behavior as a moderator of the link between our mediator (i.e., valence appraisals) and our outcome (emotions). In addition, we examined whether teachers' intensity of emotions during one relevant event was related to teachers' occupational wellbeing (i.e., dedication and emotional exhaustion) on that day.

##### 4.1. Method

###### 4.1.1. Participants

A convenience sample of 218 regular elementary school teachers (80% female) participated in Study 1. They taught Grades 3–6 (students aged 9–13,  $M = 10.58$ ,  $SD = 0.96$ ) for at least two days a week ( $M = 3.56$ ,  $SD = 1.17$ ) in Dutch publicly funded schools. Their average age was 38.49 years ( $SD = 12.09$ ) and average teaching experience was 13.91 years ( $SD = 11.00$ ).

###### 4.1.2. Procedure

Teachers were recruited from schools all over the Netherlands via phone, e-mail, calls on social media, and posts on public social media pages by the first author or research assistants (no response rate could be calculated due to this recruitment strategy). After agreeing to participate and providing informed consent, teachers received an email asking them to complete a single online questionnaire at the end of the workday. Most of the teachers (90%) filled out the questionnaire in the afternoon and evening, whereas the remaining teachers completed the questionnaire the next morning. Three percent of the teachers had to be reminded and completed the questionnaire on a later day that week. Only completed questionnaires were recorded by the online survey tool used. As a result, there were no missing data.

In the 20-minute questionnaire, teachers first reported on daily occupational wellbeing (see measures). Second, they recalled and described the most relevant event of that workday in which an individual student played a leading part ("The next part of this questionnaire is about an event of today that you remember and that you consider relevant. The event needs to be related to one individual student in your class and may be positive or negative. Please select one concrete event, not a longer period"). Third, participants responded to questions regarding the event, including the appraisal of valence of the event and the intensity of different emotions experienced during the event (see measures). Last, teachers reported on their perception of the level of past disruptive behavior of the student involved in the event. Two thirds of the teachers ( $N = 149$ ) described events with a male student.

Ethical approval was granted prior to the start of the research by the Ethics Review Board of the Faculty of Social and Behavioral Sciences of the University of Amsterdam (project no. 2015-CDE-178). Parts of the data were used for another study with the aim of identifying relevant classroom events with individual students (de Ruiter et al., 2019). The current paper extends this study by examining teachers' emotional experiences in response to the students.

###### 4.1.3. Measures

**4.1.3.1. Teachers' perceptions of students' past disruptive behavior.** Teachers' perceptions of the past disruptive behavior of the student involved in the event were measured using the broad externalizing behavior scale of the Dutch version of the Strengths and Difficulties Questionnaire (SDQ; Van Widenfelt et al., 2003). The broad scale combines the conduct problems (5 items) and hyperactivity-inattention (5 items) subscales and consists of 10 items in total. The broad scale has more adequate psychometric properties compared to the original SDQ subscales in low-risk samples when examining broad constructs, such as students' disruptive behavior, in low-risk samples (Goodman et al., 2010). Moreover, several studies have provided evidence for the construct validity of the broad scale (e.g., Goodman et al., 2010; Van Leeuwen et al., 2006). Teachers responded to items such as "Often has temper



tantrums or hot tempers” on a 5-point Likert scale, ranging from 1 (*not true*) to 5 (*certainly true*). In the present study, Cronbach's alpha for the scale was 0.87.<sup>1</sup>

**4.1.3.2. Teachers' valence appraisal.** Teachers' valence appraisal of the event was measured by asking the teachers how they rated the most relevant event they had described on a 6-point Likert scale ranging from 1 (*very negative*) to 6 (*very positive*).

**4.1.3.3. Teachers' emotions.** Teachers' state emotions were measured using five scales: enjoyment, anger, anxiety, self-related emotions, and other-related emotions. Teachers' enjoyment, anger, and anxiety were chosen because of their high relevance and frequency during teaching (Frenzel et al., 2016). For these emotions, teachers were presented with a list of emotion terms (de Ruiter et al., 2019) and were asked: “Please rate the intensity of the emotions felt during the event” on a 5-point Likert Scale ranging from 1 (*not at all*) to 5 (*very strongly*). Teachers' enjoyment scale was measured with the emotion terms enjoyment, enthusiasm, and contentment. Teachers' anger scale was measured with the three emotion terms anger, annoyance, and frustration. Teachers' anxiety was measured with the emotion terms anxiety, tension/nervousness, and worry. This scale did not reach acceptable reliability ( $\alpha = 0.55$ ). Consistent with previous research (e.g., Becker et al., 2014; Frenzel et al., 2009), the item “anxiety” was low in intensity and had the lowest variance of all emotions ( $M = 1.12$ ,  $SD = 0.47$ ), indicating that this emotion term might be too strong for many of the events. In addition, closer inspection by reading the content of the described events revealed that the item “worry” was interpreted ambiguously since participants could not only worry about the event, but also about the future or family of the student described in the event. Therefore, the single item “tension/nervousness” was chosen for further analysis.

Besides teachers' enjoyment, anger, and anxiety, the study also included two scales measuring self- and other-related emotions on the same 5-point Likert Scale (de Ruiter et al., 2019). The two emotions were chosen because they align with the basic duality of human experience, consisting of “the striving for self-enhancement” and “longing for contact and union with the other” (Hermans et al., 1985; cf. Van Geel & De Mey, 2003). The distinction of emotions directed towards the self and towards the other (i.e., the student) might be relevant in teacher-student interactions. For teachers' *self-related emotions*, teachers were asked: “How did you feel about yourself during the event? Please rate the intensity of the emotions.” They were presented with the emotion terms effectiveness, self-confidence, and powerlessness (reverse scored), which were inspired by emotion terms identified in Van Geel and De Mey (2003). For teachers' *other-related emotions*, teachers were asked: “How did you feel towards the student during the event? Please rate the intensity of the emotions.” They were presented with the emotion terms caring, connectedness, and distance (reverse scored). These terms were inspired by emotion terms identified in teachers by Chang and Davis (2009). Cronbach's alphas for the four emotion scales (minus anxiety, which included only one item) ranged from 0.78 to 0.95 (see Table 1).

**4.1.3.4. Teachers' occupational wellbeing.** Last, two aspects of teachers' daily occupational wellbeing were measured. First, daily *dedication* was assessed with three adapted items (e.g., “Today, my job inspired me”) of the dedication subscale of the Utrecht Work Engagement Scale (UWES; Schaufeli et al., 2006). Items of the UWES are regularly adapted to a daily measure of occupational wellbeing (e.g., Tims et al., 2011; Xanthopoulou et al., 2009). The three adapted items from the dedication subscale were used because this dimension of work engagement proves less stable over time compared to the other two subscales vigor and absorption of the UWES (Mauno et al., 2007) and therefore most suitable for assessing daily work engagement. Second, daily *emotional exhaustion* was assessed with three adapted items (e.g., “Today, I felt emotionally drained by my work”) of the emotional exhaustion subscale of the Maslach Burnout Inventory – the Dutch Educator Survey (MBI-NL-ES; Schaufeli & van Horn, 1995). Adapted items of the MBI are regularly used as daily measure of occupational wellbeing in research (e.g., Aldrup et al., 2017; Simbula, 2010). Items for both dedication and emotional exhaustion were adapted to a daily version and measured on a 7-point Likert scale ranging from 1 (*completely disagree*) to 7 (*completely agree*). Cronbach's alpha for dedication was 0.84 and for emotional exhaustion it was 0.87.

#### 4.1.4. Data analytic strategy

A hypothesized path model was analyzed using Mplus Version 7.31 (Muthén & Muthén, 1998-2018). First, direct and indirect effects (via teachers' valence appraisal) of perceived past disruptive behavior on teachers' emotions were examined. Mediation was investigated by examining bootstrap confidence intervals for the indirect effects (Preacher & Hayes, 2008). Using this approach, we determined whether the indirect effect was significantly different from zero, which is the case when zero does not lie within the 95% confidence interval. A recently developed measure was used to evaluate the effect sizes of the indirect effects: the *upsilon* measure (Lachowicz et al., 2018). Lachowicz et al. (2018) argued that *upsilon* can be evaluated in terms of Cohen's benchmarks for proportions of explained variance (small = 2%, medium = 15%, and large = 25%). Second, moderated-mediation was tested to examine whether perceived past disruptive behavior – besides being a predictor – modified the relationship between teachers' appraisal of goal congruence of the event and the experienced emotions during the event. For this moderated-mediation analysis, we followed example syntax (model 74; Stride et al., 2015) for Mplus (Muthén & Muthén, 1998-2018) based on Preacher, Rucker, and Hayes (2007, model 1). To ease interpretation of interaction effects, all variables were grand-mean centered prior to the analysis (Hayes, 2013). Following Hayes' (2013) recommendation, significance tests for the moderation of the indirect effects (i.e., the conditional indirect effects) were conducted testing the hypotheses that the conditional indirect effects are zero at certain values of perceived disruptive behavior ( $\pm 2 SD$ ,  $\pm 1 SD$ ,  $M$ ), using biased-corrected bootstrapping. Last, daily dedication and emotional

<sup>1</sup> To interpret Cronbach's alpha coefficients we used the personal standards for research provided by DeVellis (2003): unacceptable ( $\alpha < 0.60$ ), undesirable ( $\alpha = 0.60-0.65$ ), minimally acceptable ( $\alpha = 0.65-0.70$ ), respectable ( $\alpha = 0.70-0.80$ ), very good ( $\alpha \geq 0.80$ ).

**Table 1**  
Alpha reliabilities, descriptive statistics, and intercorrelations of variables (Study 1).

Variable	Descriptive statistics				Correlations								
	# Items	$\alpha$	M	SD	1	2	3	4	5	6	7	8	9
1. Disruptive behavior <sup>a</sup>	10	0.87	2.72	0.92	–								
2. Valence	1		3.70	1.91	–0.37**	–							
3. Enjoyment	3	0.95	2.45	1.58	–0.32**	0.87**	–						
4. Anger	3	0.89	2.23	1.25	0.39**	–0.80**	–0.70**	–					
5. Anxiety	1		1.50	0.90	0.19**	–0.33**	–0.29**	0.43**	–				
6. Self-related emotions	3	0.78	3.38	1.06	–0.27**	0.67**	0.65**	–0.59**	–0.39**	–			
7. Other-related emotions	3	0.86	3.48	1.15	–0.36**	0.70**	0.68**	–0.64**	–0.24**	0.53**	–		
8. Daily dedication	3	0.84	4.56	1.07	–0.26**	0.35**	0.27**	–0.37**	–0.17*	0.32**	0.31**	–	
9. Daily emotional exhaustion	3	0.87	2.10	1.65	0.24**	–0.48**	–0.42**	0.46**	0.32**	–0.47**	–0.30**	–0.39**	–

\* Correlations significant at  $p < .05$ .

\*\* Correlations significant at  $p < .001$ .

<sup>a</sup> Teachers' perceptions of the students' past disruptive behavior.

exhaustion were added as outcomes to the model to examine the effects of emotions on daily occupational wellbeing.

## 4.2. Results

### 4.2.1. Descriptive analyses

Descriptive statistics, Cronbach's alpha reliabilities, and correlations between all relevant variables are presented in Table 1. On average, teachers reported higher levels of daily dedication ( $M = 4.56, SD = 1.07$ ) than daily emotional exhaustion ( $M = 2.10, SD = 1.65$ ). Prevalence of anxiety during the described events was low ( $M = 1.50, SD = 0.90$ ) compared to the other emotions. Teachers' other-related emotions were highest in intensity of all reported emotions ( $M = 3.48, SD = 1.15$ ).

### 4.2.2. Perceived past disruptive behavior predicting teacher emotions through valence appraisals

First, a simple mediation model was set up in which the five emotions were regressed on perceived past disruptive behavior mediated by the valence appraisal of the event. Perceived past disruptive behavior predicted the mediator, teachers' appraisal of valence ( $B = -0.76, SE = 0.12, p < .001$ ), indicating that teachers rated the most relevant classroom event of their workday as more negative when they perceived the student involved in the event as more disruptive in the past. Next, we found that the mediator, teachers' appraisal of valence, predicted the outcome variables, teachers' emotions during the event (enjoyment:  $B = 0.73, SE = 0.03, p < .001$ ; anger:  $B = -0.49, SE = 0.03, p < .001$ ; anxiety:  $B = -0.14, SE = 0.03, p < .001$ ; self-related emotions:  $B = 0.36, SE = 0.03, p < .001$ ; other-related emotions:  $B = 0.39, SE = 0.03, p < .001$ ). Thus, teachers who appraised their event as more positive also reported a higher intensity of enjoyment, self-, and other-related emotions and a lower intensity of anger and

**Table 2**  
Total effects, indirect effects, and direct effects for the mediation model with teachers' perceptions of students' past disruptive behavior as predictor, teachers' appraisal of valence as mediator, and five teacher emotions as outcomes.

	$R^2$	$\beta$	SE	B	95% CI	p
Enjoyment	0.76					
Total effect		–0.31	0.06	–0.54	[–0.73, –0.32]	< 0.001
Indirect effect		–0.32	0.05	–0.55	[–0.72, –0.37]	< 0.001
Direct effect		–0.01	0.04	0.01	[–0.11, 0.13]	> 0.05
Anger	0.65					
Total effect		0.39	0.06	0.52	[0.35, 0.64]	< 0.001
Indirect effect		0.28	0.05	0.38	[0.24, 0.48]	< 0.001
Direct effect		0.11	0.05	0.14	[0.02, 0.27]	< 0.05
Anxiety	0.12					
Total effect		0.19	0.06	0.19	[0.07, 0.31]	< 0.001
Indirect effect		0.11	0.03	0.11	[0.06, 0.17]	< 0.001
Direct effect		0.08	0.06	0.08	[–0.04, 0.21]	> 0.05
Self-related emotions	0.44					
Total effect		–0.27	0.06	–0.31	[–0.45, –0.15]	< 0.001
Indirect effect		–0.24	0.05	–0.28	[–0.39, –0.18]	< 0.001
Direct effect		–0.03	0.06	–0.03	[–0.17, 0.09]	> 0.05
Other-related emotions	0.50					
Total effect		–0.36	0.05	–0.45	[–0.58, –0.32]	< 0.001
Indirect effect		–0.24	0.04	–0.30	[–0.41, –0.19]	< 0.001
Direct effect		–0.12	0.05	–0.15	[–0.28, –0.01]	< 0.05

Note. CI = confidence interval. Confidence intervals and standard errors were calculated based on a bootstrap estimation with 1000 samples.

**Table 3**

All examined path coefficients for Study 1 - the effect of teachers' perceptions of students' past disruptive behavior on teachers' daily occupational wellbeing through appraisal of valence and teachers' emotions in response to the described event.

Variable	B	SE	β
Students' past disruptive behavior → Valence	−0.76**	0.12	−0.37
Valence → Enjoyment	0.73**	0.03	0.87
Valence → Anger	−0.49**	0.03	−0.76
Valence → Anxiety	−0.14**	0.03	−0.30
Valence → Self-related emotions	0.36**	0.03	0.65
Valence → Other-related emotions	0.39**	0.03	0.65
Students' past disruptive behavior → Enjoyment	0.01	0.06	0.01
Students' past disruptive behavior → Anger	0.15	0.06	0.11
Students' past disruptive behavior → Anxiety	0.08	0.06	0.08
Students' past disruptive behavior → Self-related emotions	−0.04	0.07	−0.03
Students' past disruptive behavior → Other-related emotions	−0.15	0.07	−0.12
Students' past disruptive behavior × Valence → Enjoyment	−0.05	0.03	−0.05
Students' past disruptive behavior × Valence → Anger	−0.06*	0.03	−0.09
Students' past disruptive behavior × Valence → Anxiety	−0.05	0.03	−0.09
Students' past disruptive behavior × Valence → Self	0.08	0.03	0.13
Students' past disruptive behavior × Valence → Other	0.03	0.03	0.04
Enjoyment → Dedication	−0.07	0.07	−0.10
Anger → Dedication	−0.24**	0.09	−0.28
Anxiety → Dedication	0.01	0.09	0.01
Self-related emotions → Dedication	0.17	0.09	0.17
Other-related emotions → Dedication	0.10	0.08	0.11
Enjoyment → Emotional exhaustion	−0.14	0.11	−0.14
Anger → Emotional exhaustion	0.32**	0.12	0.24
Anxiety → Emotional exhaustion	0.18	0.14	0.10
Self-related emotions → Emotional exhaustion	−0.39**	0.14	−0.25
Other-related emotions → Emotional exhaustion	0.15	0.13	0.11

Note. SE = standard error.

\* Coefficients significant at  $p < .05$ .

\*\* Coefficients significant at  $p < .001$ .

anxiety during the event. Significant indirect effects were found of perceived past disruptive behavior on all teachers' emotions through the appraisal of valence (see Table 2), indicating mediation (enjoyment:  $B = -0.55, SE = 0.09, p < .001, v = 0.10$ ; anger:  $B = 0.38, SE = 0.07, p < .001, v = 0.08$ ; anxiety:  $B = 0.11, SE = 0.03, p < .001, v = 0.01$ ; self-related emotions:  $B = -0.28, SE = 0.06, p < .001, v = 0.06$ ; other-related emotions:  $B = -0.30, SE = 0.06, p < .001, v = 0.06$ ). In addition to the significant indirect effects, significant direct effects of perceived past disruptive behavior on teachers' anger ( $B = 0.14, SE = 0.06, p = .018$ ) and other-related emotions ( $B = -0.15, SE = 0.07, p = .027$ ) were found, indicating partial mediation. The results indicate that students perceived as more disruptive in the past are involved in more negatively appraised classroom events, which in turn are negatively related to teachers' positive emotions (enjoyment, self- and other-related emotions) and positively related to teachers' negative emotions (anger and anxiety).

#### 4.2.3. Moderated mediation with perceived past disruptive behavior as moderator

For the moderated mediation model, the simple mediation model was extended by adding an interaction effect of perceived past disruptive behavior and appraisal of valence as predictor of teachers' emotions. This allowed us to determine whether the mediation effects depended on the perceived level of past disruptive behavior of the student involved in the event. Significant moderation effects were found for two of the five emotions: anger ( $B = -0.06, SE = 0.03, 95\% \text{ CI } [-0.12, -0.01], p = .039$ ) and self-related emotions ( $B = 0.08, SE = 0.03, 95\% \text{ CI } [0.02, 0.15], p = .027$ ). For the remaining emotions, no significant moderation effects were found (see Table 3). To test the proposed conditional indirect effect, significance tests were conducted based on bias-corrected bootstrapping for certain levels of the moderator perceived past disruptive behavior ( $\pm 2 \text{ SD}, \pm 1 \text{ SD}, M$ ). For both anger and self-related emotions, the conditional indirect effects were significant with  $p < .05$  at each level of the moderator (see Table 4). Table 4 shows that the conditional indirect effects were stronger for students perceived as more disruptive in the past, indicating that the relationship between teachers' anger and self-related emotions via teachers' valence appraisal of the event were stronger.

#### 4.2.4. Event-related emotions predicting daily occupational wellbeing

Finally, the moderated mediation model was extended with two outcome variables. Daily dedication and daily emotional exhaustion were regressed on the five teacher emotions. Teachers' emotions during the most relevant event of that day explained 16% of the variance in teachers' dedication and 28% of the variance in emotional exhaustion on that workday. Significant coefficients indicated that when teachers reported higher levels of anger during the relevant event, they also reported lower levels of dedication ( $B = -0.24, SE = 0.09, 95\% \text{ CI } [-0.42, -0.09], p = .007$ ) and higher levels of emotional exhaustion ( $B = 0.32, SE = 0.12, 95\% \text{ CI } [0.07, 0.54], p = .008$ ). In addition, teachers reported higher levels of emotional exhaustion when they reported lower levels of self-related emotions, that is, when they were feeling less effective during the most relevant event ( $B = -0.39, SE = 0.13, 95\% \text{ CI } [-0.65, -0.13], p = .001$ ).



**Table 4**

Conditional indirect effects of teachers' perceptions of students' past disruptive behavior on teachers' anger and self-related emotions via valence of event based on bias-corrected bootstrapping technique.

Emotion/perceived past level of disruptive behavior	Indirect effects	SE	p	95% CI
<b>Anger</b>				
-2 SD	0.28	0.07	< 0.001	[0.16, 0.45]
-1 SD	0.33	0.07	< 0.001	[0.21, 0.47]
Mean	0.38	0.07	< 0.001	[0.25, 0.51]
1 SD	0.42	0.07	< 0.001	[0.28, 0.57]
2 SD	0.47	0.09	< 0.001	[0.31, 0.65]
<b>Self-related emotions</b>				
-2 SD	-0.16	0.07	< 0.05	[-0.33, -0.03]
-1 SD	-0.22	0.06	< 0.001	[-0.35, -0.12]
Mean	-0.28	0.05	< 0.001	[-0.39, -0.18]
1 SD	-0.33	0.06	< 0.001	[-0.46, -0.22]
2 SD	-0.39	0.08	< 0.001	[-0.57, -0.25]

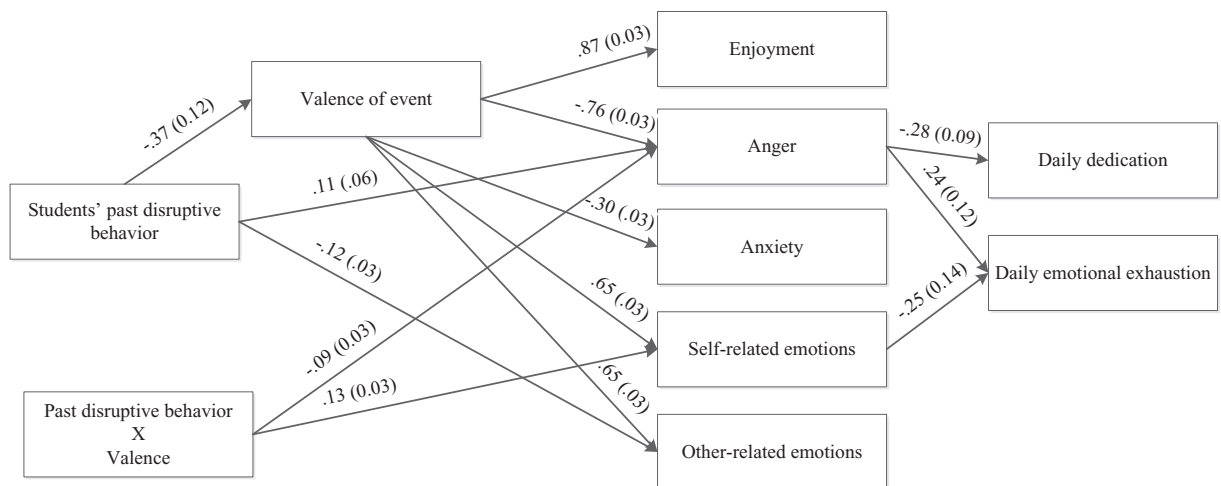
Note. SE = standard error, CI = confidence interval. The conditional indirect effect (moderated mediation) for different values of X (disruptive behavior) can be quantified by  $f(\hat{\beta} | X) = \hat{a}_1(\hat{b}_1 + \hat{b}_2X)$ .

[-0.63, -0.10],  $p = .004$ ). All other paths between teachers' emotions and teachers' occupational wellbeing were not significant (see Table 3). The final model with all significant paths is displayed in Fig. 2.

4.3. Discussion

Study 1 examined teachers' emotional experiences in response to relevant events with individual students and linked teachers' emotions to their daily occupational wellbeing. We found that teachers were more likely to appraise events negatively when a student was involved whom they perceived as more disruptive in the past, as compared to events with a student perceived as less disruptive. The more negative appraisals of events subsequently predicted higher levels of negative emotions (i.e., anger and anxiety) and lower levels of positive emotions (i.e., enjoyment, self-related emotions, and other-related emotions) during the events (mediation). For teachers' anger and self-related emotions, the association between the valence of an event and teachers' emotional responses were stronger when the event involved a student perceived as more disruptive in the past (moderation). When teachers reported higher levels of anger in response to the most relevant event, they also reported lower levels of dedication and higher levels of emotional exhaustion that workday. Moreover, when teachers reported higher levels of self-related emotions, they reported lower levels of emotional exhaustion.

The associations between relevant event-related emotions and daily occupational wellbeing hint at the importance of investigating specific classroom events. Moreover, our findings help in pinpointing which discrete state emotions are related to both negative and positive aspects of occupational wellbeing. Previous research investigating event-related emotions only showed a positive association between teachers' anger and frustration and teachers' emotional exhaustion (Chang, 2013). The current study



**Fig. 2.** Final moderated mediation model of Study 1. Standardized regression coefficients ( $\beta$ s) are reported, with the standard error in parentheses. Only significant paths are displayed. For all examined paths see Table 3.

replicates this finding and adds that anger is also negatively related to teachers' dedication. Related to research on teachers' self-efficacy (Skaalvik & Skaalvik, 2010) and in accordance with our hypothesis, the current study shows that when teachers feel more confident during events, they report lower levels of emotional exhaustion that workday. A limitation that should be acknowledged is that our study design precludes any causal or directional conclusions, as all constructs were measured within a single questionnaire. There is evidence from previous research that the relationship between teachers' emotions and teachers' occupational wellbeing is reciprocal, such that teachers who feel exhausted also tend to experience more negative emotions (Brouwers & Tomic, 2000; Keller et al., 2014). A related limitation of Study 1 is that it may be possible that the described event primed teachers' ratings of the student's past disruptive behavior, meaning that the described event and associated emotions may have resulted in teachers rating the past behavior of the student in line with the current behavior in the event (Podsakoff et al., 2003).

The moderation results seem to indicate that teachers experience different intensities of emotions (i.e., higher levels of anger and lower levels of self-related emotions) in response to events with students perceived as more disruptive in the past, compared to similarly appraised events with students perceived as less disruptive. We accounted for the mediation finding that students perceived as more disruptive in the past are more involved in negatively appraised events, which in turn evokes higher levels of negative emotions (i.e., anger and anxiety) and lower levels of positive emotions (i.e., enjoyment, self-related emotions, and other-related emotions). The moderation results suggest that teachers react with more anger and less confidence to an event with a student they perceive as more disruptive in the past, compared to a similar event with a student perceived as less disruptive. This may also affect their emotional responses in future events with the student (Spilt et al., 2011).

It is, however, worth noting that the effect sizes for the mediation effects as well as the path coefficients were small, which prohibits any firm conclusions. It is therefore important that the results of this study are replicated. To see whether daily events with individual students have an effect beyond other potentially important determinants of teacher emotions, it may be worthwhile to consider job resources (e.g., autonomy support; Klassen et al., 2012) or personal resources (e.g., teacher efficacy in handling student misbehavior; Tsouloupas et al., 2010) at the same time. Moreover, future studies are advised to use a representative teacher sample, as another limitation is that the current study did not include extensive demographic information about the participating teachers or schools. Consequently, the generalizability of the findings remains unknown.

Study 1 focused only on one event with an individual student. The cross-sectional design did not provide information whether this event is typical for the student involved or for the teacher. Teachers are probably involved in a wide variety of both positive and negative events with each of their students. Examining teachers' emotional responses to events that may be unexpected for certain students, for example a student perceived as highly disruptive in the past involved in a positive event or a non-disruptive student involved in a negative event, provides more insight into teachers' emotions during specific events with different students. By using daily diaries in response to a series of events with two students varying in perceived past disruptive behavior, Study 2 allowed us to take the mean valence appraisal of events with each student into account. Subsequently, it was possible to examine how deviations in valence appraisals for a specific student corresponded to deviations in teacher emotions in response to events with the student. This approach allowed for important insight in the emotional dynamics in teacher-student dyads.

## 5. Study 2: repeated events with two target students

Study 2 complements the first study by collecting multiple events in diaries from a smaller sample of teachers regarding two target students in their classes who vary in their perceived past disruptive behavior. Applying diaries enabled us to examine associations between fluctuating valence appraisals of events and fluctuating emotions of teachers. We inspected the moderating influence of perceived past disruptive behavior in two different ways. First, conducting analyses at the between-student level allowed us to examine whether an individual student for whom the teacher reports more negative events overall also elicits more negative emotions on average across all events. In addition and most importantly, analyses at the between-level answer the question as to whether the link between average valence rating and teachers' average emotional experience with the student is stronger depending on the perceived level of past disruptive behavior of the student. Second, we investigated moderation on the within-level to provide a more stringent test of the theory. This could determine whether the strengths of teachers' emotions in response to daily events with an individual student depend on the student's level of past disruptive behavior while accounting for the appraisal of the events. We expected that teachers would report higher levels of negative emotions when they appraise events with the individual student as more negative than usual for the student, in particular, when the student involved was perceived as more disruptive in the past. Likewise, we hypothesized that teachers would report higher levels of positive emotions when experiencing an unusual positive event with the specific student, in particular, when the student was perceived as more disruptive in the past.

### 5.1. Method

#### 5.1.1. Participants

Study 2 involved a different sample of upper-level Dutch elementary school teachers. After obtaining ethical approval from the Ethics Review Board of the Faculty of Social and Behavioral Sciences of the University of Amsterdam (project no. 2016-CDE-7254), the first author and research assistants approached 427 public elementary schools across the Netherlands via phone. Some of the schools ( $N = 74$ ) received flyers before being called. When teachers expressed interest, they received more information about the research project via email. Thirty-eight teachers from 35 schools (8.2% of the approached 427 schools) provided informed consent and agreed to participate. One teacher dropped out after two weeks because of workload issues; diary entries were not included in the data analyses.

The final sample contained 37 teachers (70% female), teaching grade 3–6 (students aged 8–13,  $M = 10.39$ ,  $SD = 1.03$ ) for at least two days a week ( $M = 3.80$ ,  $SD = 0.99$ ) in Dutch publicly funded regular elementary schools. The sample of schools closely paralleled the larger population of schools in the Netherlands in terms of geographical region (6% North, 19% East, 13% South, and 62% West) and urbanicity (CBS Statline, 2019). Average age of the teachers was 40.32 years ( $SD = 11.43$ ) and average teaching experience was 14.92 years ( $SD = 10.43$ ). The teachers' demographics in Study 2 ( $N = 37$ ) did not significantly differ from those in the sample of Study 1 ( $N = 218$ ): age ( $F(1,254) = 0.13$ ,  $p > .05$ ), experience ( $F(1,254) = 0.00$ ,  $p > .05$ ), and gender ( $\chi^2(1) = 2.77$ ,  $p > .05$ ).

### 5.1.2. Procedure

Study 2 used data from a longitudinal research project on teachers' emotional processes and student adjustment. In this project, teachers filled out daily diary questionnaires in response to classroom events with two target students (see below for a description of the selection procedure and characteristics of target students). In addition, teachers filled out several trait-level questionnaires during classroom visits at three time points across one school year (beginning, middle, and end of the school year). Parents of all students received information letters about the study and consent forms. Out of 889 students, 20 students (2.25%) were not allowed to participate and were therefore excluded (i.e., they were not selected as target students for the diaries). In the current study, only teacher-reported daily diary data and teacher-reported perceptions of students' past disruptive behavior were included.

Twice a week, teachers received emails with a link to an online diary during 15 weeks across the school year (i.e., 10 emails at the beginning, 10 in the middle, and 10 at the end of the school year). Depending on their own preference, teachers received additional reminders via text messages (23 teachers selected this option). In the online diary questionnaire, teachers were asked to recall and describe the most relevant event of that workday *in relation to one of the target students*. In the accompanying email, teachers were informed which student they needed to focus on that day. Teachers completed 15 diaries in response to events with one target student and 15 diaries in response to events with the other target student. The instructions for the description of the event were identical to Study 1 (see procedure for Study 1). When teachers failed to complete a scheduled diary, they received an email on another workday until they reached the desired 15 diaries per student. When teachers missed more than two consecutive diaries, they were contacted and reminded via email or phone. When teachers indicated that they could not complete diaries or did not respond well to the reminders, the data collection was paused and continued later in consultation with the teacher. At the end of the school year, all teachers were rewarded with a 30 Euro voucher or gift of their own choice.

### 5.1.3. Selection and description of target students

Teachers completed up to 30 diaries during the school year, with half of the diaries ( $n = 15$ ) in response to self-selected relevant classroom events with one target student and the other half ( $n = 15$ ) in response to self-selected relevant events with the other target student. For the general aim of the longitudinal research project, it was important to select two students varying in classroom behavior for each teacher. Because filling out behavioral questionnaires for all students would be too time-consuming, we developed two quick sorting forms, in which teachers were asked to assign their students to three behavior categories at the beginning of the school year (1–3 months after the school year had started).

In the first sorting form, teachers assigned each of their students to one of three categories based on the frequency of “disruptive, undesirable, rule-breaking behavior the student displayed.” Students were assigned to either the (a) *regularly* disruptive, (b) *occasionally* disruptive, or (c) *rarely* disruptive category. We then randomly selected one student from the first category (regularly disruptive students) as one of the target students. Teachers assigned on average 12.65% of their students to the first category ( $SD = 7.70$ ). Five teachers (13.51% of the total sample) did not assign any student to the first category. For them, we randomly selected a student from the second category (occasionally disruptive students). In the second sorting form, teachers assigned each of their students to one of three categories based on how often “the classroom behavior of the student provided the teacher with positive energy.” Students were assigned to either the (a) *(almost) always* providing positive energy, (b) *regularly* providing positive energy, or (c) *occasionally* providing positive energy category. We then randomly selected the second target student from the first category (students providing almost always positive energy). The two target students were not allowed to be in both the regularly disruptive category and the almost always providing the teacher with positive energy category. Teachers assigned on average 39.25% of their students to the first category ( $SD = 13.37$ ). The two sorting forms were tested in a pilot study ( $N = 80$  teachers) and proved valid in differentiating students in terms of disruptive behavior.

In total, 74 students were selected for the 37 participating teachers. However, three target students changed schools after the first five diary entries. When these students changed schools after the first five diary entries, a third target student was selected based on teachers' allocation of students at the beginning of the school year, for whom the remaining diary entries were completed. Target students ( $N = 77$ ) were between 8 and 12 years old ( $M = 10.45$ ,  $SD = 1.10$ ) at the start of the school year. A slight majority of the target students were of male gender ( $N = 44$ , 57.10%). Based on student reports about their parents' country of origin, most students were considered of Dutch origin ( $N = 62$ , 80.50%).

### 5.1.4. Measures

Study 2 applied the same measures as were used in Study 1 to assess *perceived past disruptive behavior*, *teachers' valence appraisal of events*, and *teachers' emotions during the event* (see description of measures used in Study 1). In Study 2, perceived past disruptive behavior was measured in a separate questionnaire three months after the school year had started, whereas in Study 1 it was measured within the same questionnaire as teachers' description of the most relevant event. In Study 2, teachers' valence appraisal of and emotions during the described events were assessed repeatedly through diaries, whereas in Study 1 this was assessed once.

**Table 5**  
Reliabilities, descriptive statistics, and intercorrelations of variables (Study 2).

Variable	Correlations								
	# Items	$\alpha/R_c$	1	2	3	4	5	6	7
1. Disruptive behavior <sup>a</sup>	10	0.89	–						
2. Valence	1		–0.64**	–					
3. Enjoyment	3	0.95	–0.67**	0.96**	–				
4. Anger	3	0.88	0.59**	–0.87**	–0.83**	–			
5. Anxiety	1		0.56*	–0.31*	–0.43**	0.50**	–		
6. Self-related emotions	3	0.74	–0.47**	0.74**	0.85**	–0.61**	–0.34	–	
7. Other-related emotions	3	0.84	–0.48**	0.92**	0.90**	–0.88**	–0.30	0.72**	–
Grand mean			2.25	4.40	2.89	1.58	1.16	3.65	3.71
Between-teacher variance (L3)			0.01	0.06	0.18	0.01	0.05	0.15	0.09
Between-student variance (L2)			0.92	0.66	0.30	0.22	0.02	0.09	0.32
Within-student variance (L1)				2.43	1.82	0.64	0.16	0.60	0.66
ICC level 2 (student)			0.98	0.16	0.10	0.21	0.06	0.10	0.24
ICC level 3 (teacher)			0.02	0.07	0.11	0.05	0.23	0.20	0.15

Note.  $N$  = between-student level correlations are given below the diagonal; within-student level correlations are given above the diagonal.

\* Correlations significant at  $p < .05$ .

\*\* Correlations significant at  $p < .001$ .

<sup>a</sup> Teachers' perceptions of the students' past disruptive behavior.

Reliability characteristics were examined for all measures. Perceived past disruptive behavior showed acceptable reliability (Table 5). For the daily measures, we examined whether within-subject changes in the constructs measured in the diaries could be assessed reliably. This was done by detecting within-subject changes (reliability of change,  $R_C$ ; see Cranford et al., 2006) with SPSS MIXED (Bolger & Laurenceau, 2013). The size of  $R_C$  can be interpreted similarly to reliability coefficients (Cranford et al., 2006).  $R_C$  was satisfactory for all scales except one. Similar to Study 1, the anxiety scale (measured with the items anxiety, tension/nervousness, and worry) did not reach acceptable reliability ( $R_C = 0.37$ ). Again, the item tension/nervousness was chosen to reflect teachers' anxiety.  $R_C$  for the other scales ranged from  $R_C = 0.74$  for self-related emotions to  $R_C = 0.95$  for enjoyment (Table 5).

### 5.1.5. Data structure and strategy of data analyses

Each teacher completed diaries on up to 30 different days across one school year in response to events with two target students differing in perceived past disruptive behavior. Half of the diaries were in response to the first and the other half in response to the second target student. The three teachers for whom three target students were selected (see Selection and Description of Target Students) completed 30 diaries for three students in total. On average, teachers completed 13 diaries per student (range: 5–16 diary entries). We only included the diaries of days when teachers participated. The total number of diary entries was 975 (88% of expected amount of diary entries). Seven teachers (18.92%) completed less than 20 diaries in total, due to limited time ( $n = 4$ ), protracted illnesses ( $n = 2$ ), or switching jobs ( $n = 1$ ). Diary entries (Level 1,  $N = 975$ ) were nested within target students (Level 2,  $N = 77$ ), who were nested within teachers (Level 3,  $N = 37$ ). Additionally, in this study the online diary tool was programmed in such a way that teachers were forced to answer all questions. Therefore, there were no further missing data for individual variables. Multilevel modeling was used to account for the dependence of observations and to handle the unequal number of diaries per target student or per teacher (Hox, 2013). Furthermore, multilevel modeling allowed us to examine moderation of students' level of perceived past disruptive behavior at two conceptually different levels of analyses (i.e., between-student and within-student).

It was evaluated whether the association between teachers' valence appraisals and teachers' emotions (both Level 1) was different for students varying in perceived past disruptive behavior (Level 2, see Fig. 3). Because we wanted to examine the moderation effect of perceived past disruptive behavior on both the between-student level and the within-student level, we followed Bolger and Laurenceau's (2013) approach in creating two versions of the valence variable. First, we subtracted the grand mean of the valence appraisal across teachers, students, and events ( $M = 4.39$ ) from the raw scores of valence (i.e., grand-mean centering). This new variable was then split into two components: a between-students means component (i.e., the valence mean for that student across all events) and a within-student deviation from those means components.

Multilevel models were specified separately for each of the five teacher emotions. We followed the multilevel model building process steps described by Aguinis et al. (2013). First, we estimated intra-class correlations based on intercept-only models to investigate how much of the variance in emotions was attributed to the different levels of analysis. Second, we established a fixed slope model with the between-students means valence on the between-level and the within-student valence on the within-level as (fixed) predictors of teachers' emotions. The between-level indicates how the average valence (i.e., the average of how positive or negative all the events with this student were according to the teacher) was related to teacher emotions. The within-student level indicates how the event-specific deviation of the valence (i.e., how much more positive or negative the event was compared to other events with the student) was related to teacher emotions. We compared the random slope models with the fixed slope models using chi-square difference tests based on log likelihood values and scaling correction factor obtained with the MLR estimator (Satorra & Bentler, 2010). Third, we examined the possible moderation of perceived past disruptive behavior on the association between valence and teachers' emotion. This was done by including an interaction term of the between-students means valence variable and perceived

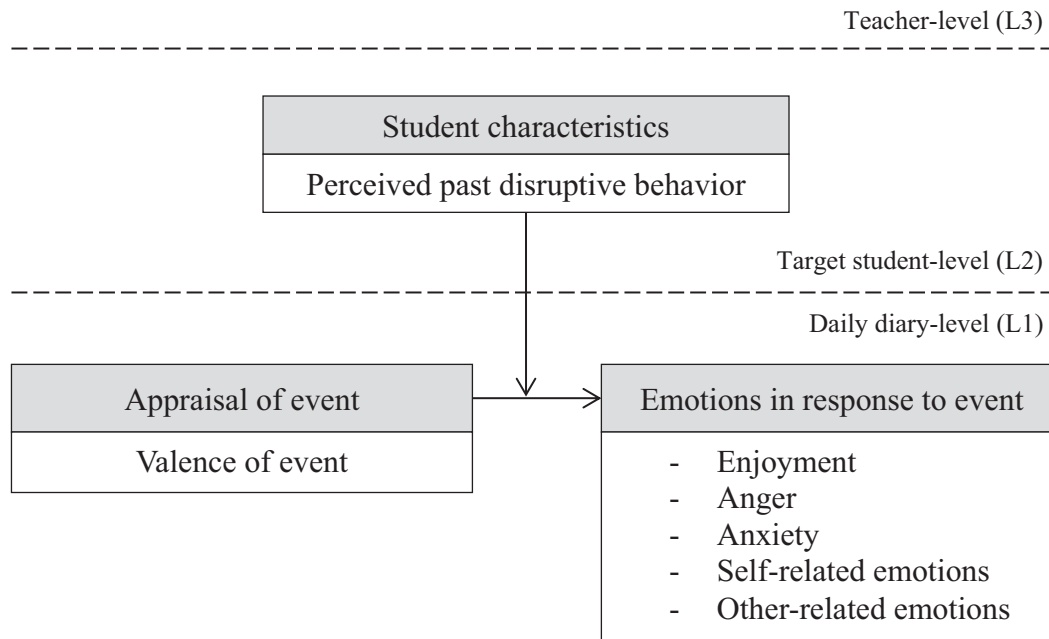


Fig. 3. Hierarchical structure of research question in Study 2 (diary study).

past disruptive behavior as predictor of the different emotions. This moderation effect was thus modeled at Level 2. In addition, we included perceived past disruptive behavior on the between-level as a predictor of the Level 1 slopes (i.e., cross-level interaction) to explain statistically significant slope variances.

As students differ in the emotions they evoke in teachers, all specified multilevel models were random intercept models. In addition, all models were estimated by maximum likelihood with robust standard errors (MLR) in Mplus Version 7.31 (Muthén & Muthén, 1998-2018). We took the three-level nature of the data into account by using the TYPE = COMPLEX TWOLEVEL command. The COMPLEX part was used to adjust standard errors for non-independence within teachers. As such, non-independence within teachers was accounted for but not explicitly modeled. In contrast, non-independence within students was explicitly included into the model using the TWOLEVEL part.

## 5.2. Results

### 5.2.1. Descriptive analyses

Descriptive statistics of all relevant variables are presented in Table 5. On average, teachers appraised their described relevant events averaged over the target students (Study 2) as more positive than when they could describe the most relevant event with an individual student of one workday (Study 1). Teachers also reported higher levels of enjoyment, self- and other-related emotions in Study 2 as compared to Study 1.

Additionally, Table 5 displays the correlations between the relevant variables at both the between-student level and the within-student level. Similar to Study 1, significant between-student correlations were found between students' level of perceived past disruptive behavior and teachers' emotions experienced during the event. This shows that aggregated over all events, teachers seem to report a higher intensity of negative emotions (i.e., anger and anxiety) and a lower intensity of positive emotions (i.e., enjoyment, self-related emotions, and other-related emotions) during events with a student they also rated as higher on perceived past disruptive behavior. Correlations between valence and teachers' emotions were in the same direction on both the between-student level and the within-student level. This indicated that both the average valence (i.e., how negative or positive the teacher perceived the events with a specific student across all days on average) and the event-specific deviation of the valence (i.e., how much more positive or negative the event was compared to other events with the student) were related to teachers' emotions.

Last, Table 5 shows the between-level variances and the within-level variances as well as the intraclass correlations (ICC), which reflect the amount of variance in variables that is due to the student involved in the diary (L2) or due to the teacher completing the diary (L3). All variables shared the largest amount of variance on the diary level (L1). This may indicate that constructs as valence appraisals and emotions tend to vary most due to the event described, although it should be noted that the variances at this level also contain measurement error. There was a considerable amount of variance for anger (ICC = 0.21) and other-related emotions (ICC = 0.24) due to the student involved in the described event. In contrast, variance for self-related emotions and anxiety were more due to teacher characteristics (ICC = 0.20 and 0.23, respectively) than to student characteristics (ICC = 0.10 and 0.06, respectively).

5.2.2. Valence of events predicting emotions during events

In five separate models, we modeled a fixed effect of teachers' valence appraisals of events on both the within- and between-student level as predictor of each of the emotions in response to the events. On the within-student level, teachers' appraisal of valence positively predicted teachers' enjoyment ( $B = 0.71, SE = 0.02, 95\% \text{ CI } [0.66, 0.75], p < .001$ ), self-related emotions ( $B = 0.26, SE = 0.03, 95\% \text{ CI } [0.21, 0.32], p < .001$ ), and other-related emotions ( $B = 0.35, SE = 0.03, 95\% \text{ CI } [0.30, 0.40], p < .001$ ) and negatively predicted teachers' anger ( $B = -0.36, SE = 0.03, 95\% \text{ CI } [-0.42, -0.31], p < .001$ ) and anxiety ( $B = -0.04, SE = 0.01, 95\% \text{ CI } [-0.10, -0.05], p = .003$ ). Thus, when teachers appraised an event with a target student as more positive than on average for that student, they also reported a higher intensity of enjoyment, self-, and other-related emotions and a lower intensity of anger and anxiety during the event.

On the between-student level, teachers' appraisal of valence positively predicted teachers' enjoyment ( $B = 0.70, SE = 0.05, 95\% \text{ CI } [0.60, 0.80], p < .001$ ), self-related emotions ( $B = 0.31, SE = 0.06, 95\% \text{ CI } [0.19, 0.44], p < .001$ ), and other-related emotions ( $B = 0.54, SE = 0.06, 95\% \text{ CI } [0.42, 0.65], p < .001$ ) and negatively predicted teachers' anger ( $B = -0.40, SE = 0.06, 95\% \text{ CI } [-0.52 \text{ to } -0.29], p < .001$ ). Thus, when teachers appraised events with a target student on average as more positive, they also reported a higher intensity of enjoyment, self- and other-related emotions and a lower intensity of anger in response to this student. Teachers' anxiety was not significantly predicted by the between-student level appraisal of valence ( $B = -0.03, SE = 0.04, p > .05$ ).

Next, significant slope variance was found for the relations between valence and four teacher emotions: anger ( $\chi^2_{diff} = 59.66, \Delta df = 1, p < .001$ ), anxiety ( $\chi^2_{diff} = -136.04, \Delta df = 1, p < .001$ ), self-related emotions ( $\chi^2_{diff} = 18.71, \Delta df = 1, p < .001$ ), and other-related emotions ( $\chi^2_{diff} = 232.22, \Delta df = 1, p < .001$ ). This indicates that the relations between teachers' valence appraisal and teachers' anger, anxiety, self-related emotions, and other-related emotions were not the same for each target student. For enjoyment, there was no significant slope variance ( $\chi^2_{diff} = -3.28, \Delta df = 1, p > .05$ ). However, as the  $\chi^2$  critical value is overly conservative, especially in small samples and the other information criteria (e.g., AIC and BIC) in the enjoyment random slope model indicated improved model fit, we followed the recommendation by Aguinis et al. (2013) of proceeding with cross-level interaction tests even though the null hypothesis of no slope variance was retained.

5.2.3. Perceived past disruptive behavior as moderator

Last, perceived past disruptive behavior was included in the models as both between-student and within-student moderator. Table 6 displays results of the final models. At the between-student level, no significant moderation effects of perceived past disruptive behavior were found. At the within-student level, cross-level interactions were found for three emotions. Perceived past disruptive behavior explained the slope variances in the effect of appraisal on teachers' enjoyment ( $B = -0.05, SE = 0.02, 95\% \text{ CI } [-0.10, -0.01], p = .025$ ), anger ( $B = -0.06, SE = 0.02, 95\% \text{ CI } [-0.11, -0.01], p = .025$ ), and anxiety ( $B = -0.04, SE = 0.02, 95\% \text{ CI } [-0.07, -0.01], p = .017$ ). Fig. 4 shows that for teachers' anger and anxiety, the slope was steepest for students with higher levels of perceived past disruptive behavior. The anger and anxiety graphs within Fig. 4 show that teachers reported higher levels of these emotions in response to events that are more negatively appraised than their average valence appraisal, in particular, when students perceived as more disruptive in the past were involved. In contrast, the enjoyment graph in Fig. 4 shows that the slope is steepest for students with lower levels of perceived past disruptive behavior, suggesting that teachers are less emotionally reactive in terms of enjoyment for students they perceive as more disruptive in the past compared to students perceived as less disruptive. Furthermore, Fig. 4 shows that teachers experience relatively less enjoyment in response to an event that is more positive than usual for a student perceived as more disruptive in the past, compared to a student perceived as less disruptive.

**Table 6**  
Multilevel models with random intercepts and random slope.

	Enjoyment model		Anger model		Anxiety model		Self-related emotions model		Other-related emotions model	
	B	SE	B	SE	B	SE	B	SE	B	SE
Intercept	2.87**	0.10	1.58**	0.06	1.16**	0.04	3.64**	0.08	3.70**	0.09
Within-student level (L1)										
Within Valence	0.83**	0.06	-0.21**	0.06	0.05	0.03	0.19**	0.06	0.25**	0.07
Within Valence × Disruptive behavior <sup>a</sup>	-0.05*	0.02	-0.06*	0.03	-0.04*	0.02	0.02	0.02	0.04	0.03
Between-student level (L2)										
Disruptive behavior <sup>a</sup>	-0.01	0.06	0.13**	0.04	0.08*	0.04	0.02	0.05	0.00	0.05
Between Valence	0.77**	0.15	-0.35**	0.10	0.10	0.10	0.32**	0.12	0.56**	0.12
Between Valence × Disruptive behavior <sup>a</sup>	-0.04	0.05	0.01	0.04	-0.04	0.04	-0.00	0.05	-0.02	0.04
R <sup>2</sup> Level 1	0.68		0.62		0.13		0.34		0.54	
R <sup>2</sup> Level 2	0.74		0.55		0.20		0.29		0.57	

Note. Models are random intercept models;  $N = 77$  at the student level. Average number of diary entries for each student = 12.75.

\*  $p < .05$  (two-tailed).

\*\*  $p < .01$  (two-tailed).

<sup>a</sup> Teachers' perceptions of the students' past disruptive behavior.



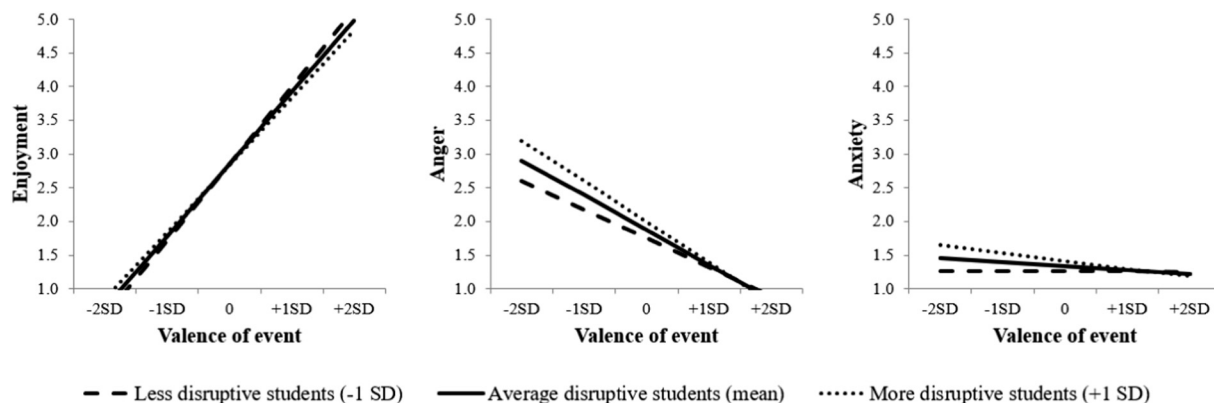


Fig. 4. Cross-level interaction plots of the significant moderating effects of perceived past disruptive behavior of the student on the within-student level associations of teachers' valence appraisal and teachers' enjoyment, anger, and anxiety.

### 5.3. Discussion

Study 2 was designed to examine teachers' emotional experiences in response to multiple events regarding two students who varied in their past disruptive behavior. The daily diary design allowed us to examine how variations in valence appraisal for a specific student corresponded to variations in teacher emotions in response to events with that student. We found that for events appraised as more negative than on average for the student, teachers reported higher levels of anger and anxiety when the student was perceived as more disruptive in the past compared to when the student was perceived as less disruptive.

Contrary to our expectations, we found that when a student perceived as more disruptive in the past was involved in more positively appraised events than usual for this specific student, teachers reported relatively low levels of enjoyment (compared to events in which a student perceived as less disruptive was involved). This seems to suggest that even when good things happen with a disruptive student, teachers do not seem to get joy out of this. In contrast, Hargreaves (2000) concluded that teachers cited demanding students whose problem behaviors they had turned around as most important source of positive emotions. However, Hargreaves (2000) interviewed teachers about emotional episodes with all their students during their teaching years and noted that some individual cases were spectacular and therefore stuck to the teacher.

Our data suggest that in daily teaching, cognitive biases may be at play. It is possible that teachers may be inclined to mainly register behavior that is in agreement with their negative perception (i.e., confirmation bias; Nickerson, 1998) of a student. Moreover, even when they do register the student being involved in an event that is more positive than usual for the student, teachers are not likely to change their perception or attitudes towards that student (i.e., reputational bias; cf. Hymel et al., 1990). These biases may have consequences for the student, as a recent empirical study has shown that especially students who are disruptive seem to be very sensitive to teacher praise and reprimands, compared to their peers who are non-disruptive (Downs et al., 2019). Teachers' praise and reprimands are, in turn, related to student engagement.

## 6. General discussion

Teachers' emotional responses to daily events with students are key in understanding their occupational wellbeing (Chang, 2013; Spilt et al., 2011). The main aim of the present studies was to examine whether teachers were emotionally more reactive to students they perceived as more disruptive in the past. Our results partly support our hypothesis that students perceived as more disruptive in the past evoke stronger emotions during events that teachers appraised similarly. We found evidence for teachers reacting more emotionally negative to students perceived as more disruptive in the past, especially in more negatively appraised events. In both studies, our findings are consistent for teachers' anger. For teachers' anxiety and self-related emotions, findings are less conclusive. Study 1 identified perceived past disruptive behavior as moderator of the association between teachers' valence of the event and teachers' self-related emotions, whereas this moderation was not found in Study 2. For teachers' anxiety, the moderation was found in Study 2, but not in Study 1. Our descriptive results of Study 2 regarding variance decomposition (ICCs) indicate that compared to other teacher emotions, anxiety and self-related emotions vary more due to teacher characteristics than to student characteristics. Similar conclusions were drawn in research examining the person and context specificity of teacher anxiety (Frenzel et al., 2015). Possibly, differences in teacher characteristics in the two samples in this study accounted for the different results in Studies 1 and 2. Overall though, our findings provide initial evidence for the theoretical assumption that during classroom events teachers experience a higher intensity of negative emotions when they have a more negative perception of the student involved (Spilt et al., 2011).

Besides shedding light on the moderation effects in which we were interested, our studies provide evidence for what Chang and Davis (2009) call the short circuiting of the appraisal process as a consequence of teachers' perceptions of disruptive students. In Study 1, we found direct effects of perceived past disruptive behavior on teachers' anger and other-related emotions, even when the valence of the event was included in the model. Similarly, results from Study 2 showed that perceived past disruptive behavior had a direct effect on teachers' anger and anxiety beyond the valence of events. Again, the effect of anger was most pronounced in both

studies. These findings seem to indicate that no matter what exactly happens in an event (indicated by teachers' valence appraisal of the event), teachers report higher levels of anger in response to events with students perceived as more disruptive in the past than with students perceived as less disruptive. In other words, teachers seem to short circuit their appraisal process by not appraising the demands of the event itself but by drawing on their past negative experiences with the student (Pianta, 1999).

Consistent with theoretical models on teacher wellbeing (Chang & Davis, 2009; Spilt et al., 2011) which posit that daily emotions are key in understanding associations between student behavior and teachers' occupational wellbeing, we found a link between teachers' event-related anger and both teachers' emotional exhaustion and work dedication on that workday. Teachers' self-related emotions were associated with teachers' emotional exhaustion only, showing that teachers who felt less effective during the event also reported higher levels of emotional exhaustion on that workday. Overall, our studies seem to have identified teachers' state experiences of anger in interaction with students perceived as disruptive as most important in understanding the emotional experiences at play in the frequently found association between teachers' dealings with student misbehavior and teachers' stress and burnout (Aldrup et al., 2018; Friedman, 2006; Kokkinos, 2007; Tsouloupas et al., 2010).

### 6.1. Limitations and directions for future research

The current study has several limitations. First, limitations associated with our teacher sample should be addressed. Both studies relied partly on a convenience sample of teachers, thereby limiting the generalizability of results. It is possible that research on teachers' emotional experiences primarily attracts teachers who consider their job an either low or high emotional burden. Moreover, the research load for teachers in Study 2 was rather high, which could have prevented teachers already experiencing high levels of daily negative emotions from participating. Related to generalizability issues, the teacher sample in Study 2 is rather small with only 37 teachers. Given that we only predict relations on the within-student level (975 diaries) and between-student level (77 students), our sample should nevertheless yield reliable results (Maas & Hox, 2004). Still, future studies are needed to replicate our findings with a larger teacher sample. Replications should also be conducted in different societies, as culture can play an important role in shaping social attitudes and tolerances towards children's behaviors (Chen & Liu, 2016).

Second, the current study focused exclusively on teachers' perceptions of students' disruptive behavior influencing teachers' emotional experiences. Although disruptive behavior is considered a stressful job demand for many teachers (e.g., Fernet et al., 2012), there are also other job demands that deserve attention, such as workload (Chaplain, 2008). Moreover, we have no information about job resources or personal resources of participating teachers that may buffer the negative effects of disruptive behavior. Some teachers may be better able to cope with disruptive behavior than others. For example, having received behavior management training (e.g., Dicke et al., 2015) and/or a higher sense of self-efficacy (Tsouloupas et al., 2010; Zee & Koomen, 2016) might enable teachers to handle behavior problems more confidently. Furthermore, emotion regulation and mindfulness skills could support teachers in remaining calm and change their emotional response (e.g., Jennings et al., 2017; Kumschick et al., 2018). Future studies on student disruptive behavior are encouraged to take such personal resources into account to gain a broader understanding of the relationship between disruptive behavior and emotional experiences. In addition, they could include school psychologists' ratings or conduct classroom observations to obtain a broader and more objective view of students' disruptive behavior.

A third limitation pertains to the specific appraisal component we focus on in the present studies. As a consequence of the study design incorporating both relevant positive and negative events, we only focused on the primary appraisal process, with the valence of the event as indicator of this process. When an event is appraised as important or relevant and goal congruent, which are the two components of primary appraisal, it is considered a positive event (Schutz et al., 2009). In contrast, when an event is appraised as important and goal incongruent, it is considered a negative event. Although secondary appraisals such as coping potential are also relevant for teachers' emotions (Becker et al., 2015; Chang, 2013), examining coping potential in the context of positive events, for example by asking teachers how they coped with a compliment of a student, seems confusing for teachers. Future studies focusing on negative events could incorporate secondary appraisals that might help to further differentiate between teachers' experiences of negative emotions (Chang & Davis, 2009; Schutz, 2014).

A last limitation pertains to the chosen analyses for assessing moderation across levels conducted for Study 2. Recently, statisticians have recommended multilevel structural equation modeling (MSEM) for conceptualizing and estimating multilevel moderation (Preacher et al., 2016). In this approach, random coefficients and/or latent moderated structural equations are used to overcome biases due to observed cluster averages. However, due to our complex model and the small sample size that led to difficulties in model estimation, we chose to use an observed means approach, despite its potential bias. As recommended by Preacher et al. (2016), we separated the valence of the event into a lower- and higher-level component and thus examined level-specific moderation effects (Bolger & Laurenceau, 2013). In doing so, we tried to limit conflation and model misspecification.

### 6.2. Conclusions and implications for research and practice

Teachers' perceptions of a student's past disruptive behavior are important for their emotional experiences in current events in which this student is involved. Teachers experience more anger in response to events with students perceived as more disruptive in the past and they experience higher levels of anger during similar negative events with students perceived as more disruptive in the past than with students perceived as less disruptive. These anger-evoking daily events are likely to deplete teachers of their emotional resources and diminish their psychological involvement in their work.

Our results have several implications for research and practice. For research, our findings align with recent trends in emotion research investigating the highly variable nature of emotions (Augustine & Larsen, 2012). Previous research has demonstrated that

teachers' emotions fluctuate from moment to moment (e.g., Becker et al., 2015; Koenen et al., 2019) and from context to context, depending on the subject and group of students taught (Frenzel et al., 2015). Our paper shows that there is also considerable student-specific variation in teacher emotions, especially when it comes to teachers' anger.

For practice, it may be important to reduce teachers' anger during daily events with students they perceive as disruptive. Our research shows that teachers' anger varies considerably between students. Moreover, teachers' perceptions of a student's past disruptive behavior amplify their already angrier reactions towards events with the student. Therefore, it is important that assessments and interventions are more tailored to specific anger-evoking teacher-student dyads. One approach would be to focus on improving the disruptive behavior of the student so that teachers no longer perceive the student as disruptive. For example, individualized positive behavior support (IPBS) interventions at school seem promising in reducing problem behaviors of individual students (Goh & Bambara, 2012).

Another approach would be to try to change teachers' emotional responses to a student. Teaching is often marked by a focus on day-to-day-events, with little time for reflection (Fullan as cited in Chang, 2009). Moreover, qualitative research has shown that teachers find it hard to critically reflect on their emotions (Cross & Hong, 2012; Zembylas et al., 2011). Therefore, there is a vital role for school psychologists in helping teachers to become aware of their underlying judgments and associated emotions regarding students they perceive as disruptive (Chang & Davis, 2009). Our finding that teachers do not seem to get joy out of positive events with disruptive students suggests that these underlying judgments may be hard to change. A promising intervention that may help in this respect is Teacher Student Interaction Coaching (LLInC; Leerkracht Leerling Interactie Coaching in Dutch), previously referred to as the Relationship-Focused Reflection Program (RFRP; Spilt et al., 2012). This intervention is based on the Teacher Relationship Interview (TRI; Pianta, 1999; Spilt & Koomen, 2009) and helps teachers reflect on their relationships with individual students. The program and TRI address, among other aspects, teachers' internalized negative affect in relation to a (disruptive) student (Bosman et al., 2019; Koenen et al., 2018; Spilt et al., 2012; Stuhlman & Pianta, 2001). Teachers who become aware of their negative emotions in relation to a specific student may be able to reappraise upcoming negative daily events by focusing on the event itself as being the problem and not the student involved (Chang & Davis, 2009), thereby reducing the anger experienced. Accordingly, teachers may not only improve their own wellbeing, but also their adverse teaching behaviors towards the student (Stuhlman & Pianta, 2001).

## Declaration of competing interest

None.

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