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Research paper

Teacher well-being in the classroom: A micro-longitudinal study

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HIGHLIGHTS

- Teachers reported on lessons during one calendar week.
- Perceived student disruptive behaviour predicted teachers' negative emotions.
- Perceived student engagement predicted higher positive and lower negative emotions.
- Lesson-specific positive emotions predicted teachers' daily and general well-being.
- Lesson-specific negative emotions predicted teachers' exhaustion at the day-level.

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ABSTRACT

Given the high stress and attrition rate among teachers, there is a need to expand knowledge on situational experiences that contribute to teacher well-being. We investigated the links between student lesson-specific behaviour (disruptive behaviour, engagement), teachers' lesson-specific (positive, negative) emotions, daily (morning and end-of-working), and personal general well-being of 20 Taiwanese primary school teachers using a micro-longitudinal approach. By specifying multilevel structural equation models (MSEM), we found student behaviour predicts teachers' lesson-specific emotions, and this association varied across days and teachers. Teachers' lesson-specific positive emotions predict teachers' well-being, suggesting positive emotions can be a protective factor for teachers.

1. Introduction

Research has shown that teaching is a high-stress profession, in which burnout is a prevalent phenomenon (Aloe et al., 2014; Buric et al., 2019; Pillay et al., 2005). With the increasing research interest in the topic of teacher well-being in recent years, teacher well-being has been recognised as a significant factor for students' well-being, student learning outcomes (Frenzel et al., 2018; Harding et al., 2019; Jennings & Greenberg, 2009; Roffey, 2012), and teachers' commitment to their teaching career (Chang et al., 2017). Yet, many studies mainly focus on the "dark side" of teacher well-being (e.g., exhaustion, burnout, or turnover rate) using the between-individual approach (Hagenauer et al., 2015; Simbula, 2010), and little is known about what contributes to teachers' well-being considering the classroom context where teachers interact with students in real-time, from one lesson to the other, day to day.

Insight into the dynamic (e.g., daily ups-and-downs) mechanism of teacher well-being in the classroom has far-reaching implications for creating a positive classroom climate and intervention applications. Teacher well-being, identified as organised at momentary and personal levels (Nettle, 2005) and proven to be changeable (Diener et al., 2017), could be manifested by its momentary feelings, namely emotions, such as joy (also referred to as "discrete emotions"). If teachers' situational experiences and momentary emotions in the classroom are shown to play an important role, programmes and strategies could be tailored to focus on how to support teachers in the school settings. Although momentary emotions are the situational form of well-being and contribute to one's satisfaction, it is not simply the sum of the positive emotional experiences minus the negative emotional experiences. To date, research on teacher emotions and teacher well-being is relatively fragmented concerning this process and how it relates to teachers' experiences in the classroom (Carson, Weiss, & Templin, 2010; Diener, 2017). Only a few studies have focused on

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two to three discrete teachers' emotions or the antecedents of teacher well-being in class using the momentary method (see Becker et al., 2015; Frenzel et al., 2015; Goetz et al., 2015).

Given the relatively limited understanding of teachers' momentary experiences and their relation to their well-being, this study aims to examine our modified teacher well-being model and goes beyond previous cross-sectional and longer-term longitudinal studies to investigate teacher well-being from a micro perspective. To this end, we investigated the relationship between situational in-class antecedents (students' behaviour: disruptive behaviour and engagement) and teachers' momentary emotions in real-time classroom experiences and then explore whether teachers' emotions can predict their day-level and personal general well-being. Therefore, we employed a micro-longitudinal study method with multiple assessments over lessons. A micro-longitudinal approach (e.g., experience sampling, momentary ecological assessment) reduces recall biases as it measures in-class behaviour and emotional elements directly at the end of each lesson. Moreover, it can elucidate and assess the micro-process of teacher well-being in an ecological context, enhancing contextual closeness (Bolger et al., 2013; Hamaker, 2012; Hamaker & Wichers, 2017).

1.1. The context of teaching in Taiwan

This study investigated teacher well-being in Taiwan. Teaching and education in Taiwan are largely influenced by Confucianism. Education is not a personal pursuit but related to social obligations, and teachers are expected to meet the social expectations of their roles and moral standards (Yen & Hwang, 2011). In other words, teaching in Taiwan is a calling in which teachers transmit knowledge, share a philosophy of life, are role models for students, and devote themselves to education. Therefore, teachers are under scrutiny by the public regarding their teaching skills and conduct.

As a result of the large education reform in 2001, called the Grade 1–9 Curriculum Reform, primary school teachers' roles have experienced a tremendous change. Teachers' status and authority have been reduced, the importance of interpersonal relationships and communication has risen, teaching methods have become more varied and complex, and the requirements for teachers' expected characteristics have become higher (Guo, 2006). As a result, teachers are feeling more stressed because of the higher expectations from society (Guo, 2006).

Primary education is the first part of compulsory education in Taiwan. Public primary school homeroom teachers teach multiple subjects (e.g., Mandarin, Mathematics, Integrative Activity, and other subjects) and spend almost all their day with the same group of students in schools. They are also important role models for children. It is worth noting that according to the report from Campus Security Report Center (2017, 2018, 2019), a centre that is responsible for dealing with events and contingencies on campus, there is an increasing trend of self-harm and suicide cases in teachers in recent years. However, the understanding of how teachers' well-being is related to their in-class experiences is relatively limited. Therefore, it is important to understand teachers' real-time teaching experience and emotions with children, and how to promote or at least maintain teachers' well-being.

1.2. Theoretical Underpinnings

To enable a holistic understanding of the dynamics of teacher well-being, this study used the multi-level structure to integrate different constructs of teacher well-beingbased on the broaden-and-build theory (Fredrickson, 1998) and the contributions of previous studies regarding emotions and teacher well-being (e.g., Cohn et al., 2009; Frenzel, 2014; Spilt et al., 2011).

An emotion starts with an individual's conscious or unconscious appraisal of an antecedent event, which then triggers a series of response tendencies that can be observed through subjective experience, facial expression, cognitive processing, and physiological changes (Fredrickson, 2001). The broaden-and-build theory of positive emotions (Fredrickson, 1998) posits that in contrast to negative emotions, positive emotions broaden a person's momentary thought-action repertoire and further build various personal resources to deal with challenges (Fredrickson, 1998, 2013). Negative emotions have been seen to narrow the attention of people (Fredrickson, 2013). They have the adaptive function ofpromoting specific actions, especially under immediate threats to survival. Unlike negative emotions, positive emotions benefit individuals' development and resource building through micro-moment accumulation in the long run. Additionally, positive emotions may loosen the aftereffects of negative emotions aroused by circumstances and further promote individuals' mental well-being and health (Fredrickson, 2013; Fredrickson & Levenson, 1998).

Although interwoven together, positive emotions and negative emotions have their own respective self-perpetuating cycles (Garland et al., 2015). The cycle of negative emotions narrows self-focus and leads to socially isolating thought-action tendencies, leading to subsequent negative emotions in turn. Thus, negative emotions trigger downward spirals. Positive emotions, on the other hand, trigger upward spirals by broadening individuals' mindsets and building resources, which in turn increase later positive emotions and enhance well-being and health. Upward spirals and downward spirals caused by positive emotions and negative emotions have significant differences in structure, not simply the opposite of each other. Despite the transient and fluctuating nature, positive emotions can have a long-term impact on enhancing well-being (Garland et al., 2010).

Empirical evidence supports the concept of the broaden-and-build theory that positive emotions undo or buffer the impact of negative emotions on detrimental physiological responses (e.g., Ong et al., 2006; Tugade & Fredrickson, 2004). Furthermore, positive emotions build resources, such as resilience and well-being (Cohn et al., 2009; Johnson et al., 2021; Nalipay et al., 2019), serving as indicators of optimal well-being (Fredrickson, 2001).

1.3. Unwrap teacher well-being

Teacher well-being, which captures teachers' professional fulfilment and happiness (Acton & Glasgow, 2015), is conceptualised as multifaceted with multiple layers (Diener et al., 2017). The concept of well-being includes individuals' overall satisfaction, domain-specific well-being, and emotional experiences (Diener, 2000, 2017). Teacher well-being research frequently focuses on teachers' job satisfaction or assesses overall well-being, especially how individual traits and school factors are associated with teacher well-being (Vorkapić & Peloza, 2017; Bermejo-Toro et al., 2016; Collie & Martin, 2017; Fernandes et al., 2019; Yildirim, 2014). However, based on the broaden-and-build theory (Fredrickson, 1998) and the insight from previous teacher well-being models (Cohn, 2009; Frenzel, 2014; Nettle, 2005; Spilt et al., 2011), momentary emotional experiences (positive and negative emotions) are first appraised by the antecedents, and power or depower personal resources. Then, momentary emotional experiences increase or decrease individuals' domain-specific well-being and then have an impact on their overall evaluation of life. We expanded previous research to modify well-being models and

examined it by assessing the constructs separately with three time-specific levels (situation, day, person) and presuming that momentary positive and negative emotions predict teachers' daily work-related well-being. Further, the accumulation of emotions impacts their general well-being, namely their overall life satisfaction.

Growth in stress does not require an absence of positive emotions and increases in resources do not require the non-existence of negative emotions (Fredrickson, 2013; Garland et al., 2010). Upward spirals caused by positive emotions and downward spirals caused by negative emotions are two distinctive cycle systems; thus individuals could experience positive and negative emotions simultaneously in everyday life (Trampe et al., 2015). When a teacher is experiencing positive emotions in school settings, resources can be built to deal with the challenges from work or boost their positive evaluation of their teaching work. In contrast, when a teacher is experiencing negative emotions in school settings, this then contributes to a repeated cycle of negative emotions and leads to emotional exhaustion or less engagement in work. As the accumulation of the positive and negative emotions, positive and negative emotions may have different impacts on domain-specific evaluations through their cycle systems and eventually lead to an increase or decrease in life satisfaction.

One function of positive emotions is the potential “undo effect,” which indicates that positive emotions could help people recuperate from stress (Fredrickson, 2013). We then proposed that positive emotions and negative emotions individuals experience during their work predict their daily evaluation of work-related (domain-specific) well-being differently. The accumulation of negative emotions leads to downward spirals and mainly has implications for the negative evaluations of individuals' work. The accumulation of positive emotions leads to upward spirals and has implications for the positive evaluations of individuals' workand it is protective in decreasing the negative evaluations of their work. In turn, the accumulation of emotions leads to an increase or decrease in general evaluations of life. Our statistical methodology enabled us to take account of these complex associations at the situational, daily, and personal levels.

1.4. Teacher emotion in class

Pekrun et al. (2002) pointed out that the emotions experienced during learning and instruction in school settings can be categorised as academic emotions. Chang and Cherng (2017) indicated that teachers, similar to students, have academic emotions regarding teaching, such as enjoyment, pride, and anxiety. Thus, students experience academic emotions from a learning aspect and teachers experience teaching emotions from lesson to lesson.

Research on teachers' emotions, especially teachers' emotional regulation, is not new (e.g., Jiang et al., 2016; Lee et al., 2016). These studies have investigated teachers' emotional management strategies. However, as Frenzel (2014) argued, existing literature is mainly based on interviews and not many studies have explicitly focused on teachers' emotions. Research that focuses on teachers' academic emotions, unlike students' emotions in school (Goetz et al., 2013; Pekrun et al., 2011; Schutz, 2014), is even more scarce. The existing body of literature has largely reported specific emotions instead of exploring multiple or general positive and negative emotions. The most common emotions used to investigate teachers’ teaching emotions are enjoyment, anger, and anxiety. However, evidence has shown that teachers may also experience other emotions such as pride and disappointment during teaching (Brígido et al., 2013; Prosen et al., 2011).

Research on emotions assumes that teachers' emotional experience has an impact on their well-being, especially occupational well-being. According to Fredrickson (2013), negative emotions are distinctive in their adaptive value, while positive emotions broaden a person's mindset and enhance one's well-being. However, less is known about how teachers' lesson-specific emotions are associated with their well-being and exhaustion.

1.5. Student behaviour as an antecedent of teacher emotions

Teachers' emotions are likely to be evoked in interaction with their students in class. Appraisal theory suggests that individuals' emotions are triggered by situations or events but caused by individuals' judgement about situations. In Frenzel's model, teachers' perceptions about student behaviour shape their emotions in class (Frenzel, 2014). In a momentary class situation, student behaviour such as their motivational behaviour (student engagement) and social-emotional behaviour (abide by the rules, student disruptive behaviour) may be the most obvious for teachers. When teachers perceive a higher level of student engagement that is consistent with their goals, they may experience positive emotions such as enjoyment. Conversely, if teachers perceive a low level of student engagement that is inconsistent with their goals, they may experience negative emotions such as anger. Additionally, when students misbehave in class, teachers may experience negative emotions such as anger or anxiety.

Empirical studies have provided some evidence that teachers' emotions are related to students' positive and negative behaviour in class, especially the connection between student disruptive behaviour and teachers' negative emotions. Student disruptive behaviour or lack of discipline is a key factor that arouses teachers' negative emotions, evokes responses such as anger or anxiety (de Ruiter et al., 2020; Hagenauer et al., 2015), and reduces teachers' level of enjoyment (Becker et al., 2015). Additionally, student disruptive behaviour has also been found to be a factor further heightening the risk of teachers' exhaustion over time (Aldrup et al., 2018; Aloe et al., 2014).

Compared to research on teachers' emotions and students' disruptive behaviour, research on how positive student behaviour in class predicts teachers' emotions is sparse. In Austria, Hagenauer et al. (2015) examined the effect of students' motivational behaviour (engagement) on teachers' emotions, including enjoyment, anger, and anxiety. They indicated that students' engagement in class contributes to teachers' positive emotions. Frenzel et al. (2020) addressed four types of student attainments (performance, motivation, discipline, and relationship attainment) and found that student engagement predicts teachers' enjoyment and anxiety, while the necessity to discipline students predicts teachers' anger and anxiety. This indicates that student engagement is a positive predictor of teachers’ positive and negative emotions.

The existing body of literature on teachers' emotions mainly focuses on limited emotions such as enjoyment, anger, and anxiety, but not a broader perspective that examines the entire range of positive and negative emotions (Frenzel, 2014). Interestingly, Becker et al.’s (2015) study revealed that teachers' positive emotions and negative emotions may be triggered through different pathways in which positive emotions were mainly induced by students' positive reactions in the class, while negative emotions were mainly induced by students' negative behaviour in the class. Thus, an unresolved issue is whether students' disruptive behaviour lessens teachers' positive emotions while student engagement decreases teachers' negative emotions.

1.6. The present study

We posed a modified theoretical model of teacher emotions and well-being in the teacher-student interaction context (see Fig. 1). In

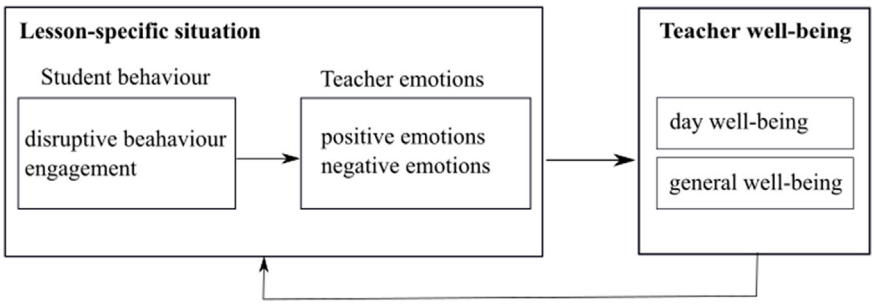

Fig. 1. Theoretical model.

this model, teachers' perceptions of student behaviour in lessons link with their situational emotions (lesson-specific). Teachers' emotions then further link with their well-being, including their daily work-related well-being and general well-being. In this study, we aimed to investigate how teachers' moment-to-moment emotions are related to students' behaviour. Additionally, the relationship between teachers' lesson-specific emotions, teachers' end-of-working well-being, and general well-being was investigated. We posed the following research questions that guided this study:

1. Do students' lesson-specific disruptive behaviour and engagement predict teachers' lesson-specific emotions? (lesson level)
2. Does the association between students' disruptive behaviour and teachers' emotions vary across days and teachers?
3. Does the association between students' engagement and teachers' emotions vary across days and teachers?
4. Does teachers' morning well-being (sleep quality and tiredness) moderate the relationship between students' behaviour (disruptive behaviour and engagement) and teachers' emotions?
5. How do teachers' emotions predict teachers' end-of-working well-being and general well-being?

We expected that lesson-specific student behaviour (student engagement, student disruptive behaviours) would predict teachers' emotions in class, and that student engagement mainly predicts teachers' positive emotions positively while student disruptive behaviour mainly predicts teachers' negative emotions positively. Also, teachers' morning well-being (sleep quality and tiredness) would moderate the relationship between students' behaviour and teachers' emotions. Further, we expected that teachers' momentary emotional experience would predict their end-of-working day well-being and their general well-being. However, we also expected that the way that positive emotions and negative emotions predict teachers' well-being would be different to some extent.

2. Method

We conducted a quantitative micro-longitudinal study to address the research questions. By using the micro-longitudinal method, we could capture teachers' momentary experiences such as academic emotions (e.g., Becker et al., 2014; Goetz et al., 2013) and perceptions of behaviour (e.g., Becker et al., 2014) through a sequence of repeated measurements in the classroom while reducing retrospective bias (Bamberger, 2016; Bolger et al., 2013; Hamaker, 2012). This section describes our sample, the measurements used, and the data analysis procedure.

2.1. Participant and procedure

In this study, participants were 20 homeroom teachers[1] (90% females) across eight public primary schools in Taiwan based on purposive and convenience sampling (see Table 1). In Taiwan, the percentage of primary school female teachers is over 70%, and those who are homeroom teachers are approximately 80% (Department of Statistics, 2021). Thus, the number of male and female participants in this study to some extent reflected the gender proportion of teachers in primary schools in Taiwan. Teachers taught either Year 4 or Year 5[2] (45% taught Year 4 and 55% taught Year 5) and their ages ranged from 28 to 55 ($M = 43.05$ years, $SD = 9.01$ years). Their teaching experience ranged from 2 years to 30 years ($M = 16.13$ years; $SD = 8.56$ years). In total, 308 students (46.8% females) participated in the study with their teachers. 132 students were in Year 4, and 176 students studied in Year 5 (57.1%) with an average age of 10.39 years (SD = 0.66, Range = 9.08 to 12.25, n = 306). Students' average academic performance in Mandarin was M = 86.71 (SD = 10.36; Range 43–100, skewness = −1.24, kurtosis = 1.81) and Mathematics was M = 81.51, SD = 14.80; Range 17–100, skewness = −1.39, kurtosis = 2.58). In general, Year 4 students perform better than Year 5 students in Mathematics ($t = 5.76$, $p < .001$) but not Mandarin ($t = 1.32$, $p = .19$.). Intraclass correlations showed that there were student-group differences in performance in Mandarin ($\rho_{ICC} = 0.25$) and mathematics ($\rho_{ICC} = 0.30$).

After obtaining university ethical approval, participants were invited through the headteacher to join the study for a calendar week during term time with written informed consent. An induction session was provided for each teacher in which the researcher fielded questions and the teacher filled in a brief paper-and-pencil questionnaire (n = 20) in order to understand background information and general well-being. Teachers were also instructed how to fill in the electronic day and lesson questionnaire on a tablet during the data collection period. They were asked to complete a morning questionnaire before starting work each morning and an afternoon questionnaire upon completion of each working day (90% compliance). Teachers were asked to report on each lesson during the last 5–10 min of each lesson or during the 10-min break afterwards if reporting during the lesson could not be completed. The median response time for completing lesson-specific questionnaires was less than 3 min (146 s). However, teachers were not always able to fill in the questionnaire during this interval because they were too busy with the students or the contingencies in the

[1] In primary schools in Taiwan, a homeroom teacher is attached to a certain homeroom of a group of students and in charge of looking after this group of students. Homeroom teachers teach multiple subjects, mainly including mathematics, Mandarin, and Integrative Activity.

[2] Children start primary school at the age of 6 in Taiwan.

Table 1
Teacher and student characteristics.

	Variables	*N (%)*	*M*	*SD*	Range	Skewness	Kurtosis
Teacher (n=20)	Gender						
	Male	2 (10.0%)					
	Female	18 (90.0%)					
	Age (year)	20 (100%)	43.05	9.01	28-55	−0.53	−1.17
	Teaching experience	20 (100%)	16.13	8.56	2-30	−0.22	−1.13
Student (n=308)	Gender						
	Male	164 (53.2%)					
	Female	144 (46.8%)					
	Grade						
	Year 4	132 (42.9%)					
	Year 5	176 (57.1%)					
	Age (year)	306 (99.4%)	10.39	0.66	9.08-12.25	0.04	−0.90

classroom. At the end of the research period, teachers filled in another brief paper-and-pencil questionnaire. All 20 teachers completed both paper-and-pencil questionnaires and electronic questionnaires. The feasibility of the procedure and the face-validity of all measures were piloted prior to the main study. On average, teachers reported on 13.15 lessons (SD = 1.95; range = 9–16) for 4.5 days (SD = 0.61; range = 3–5) within the research period, giving 249 lesson-specific reports included in analysis in total.

2.2. Measures

Measures in this study include questionnaires at three different levels (lesson, day, and teacher level). All measures were assessed on a 5-point Likert scale and are presented according to the different levels, as below.

2.2.1. Lesson-specific measurements

Student behaviour. Teachers reported their perceived student behaviour at the end of each lesson. In order to capture the positive and negative dimensions of student behaviour, we included student disruptive behaviour and student engagement. Drawing on the concept of students' disruptive behaviour from Kunter and Baumert (2006), teachers were asked how often students show disruptive behaviour in each lesson in 3 items (e.g., "In this lesson, to what extent did students disturb the instruction?", Aldrup et al., 2018). For overall student engagement, we used a single item to assess student engagement ("To what extent did students engage in this lesson?") to understand teachers' perceptions during the short transition between lessons to reduce the burden on participants. Internal consistencies (Cronbach's α, 0.84–0.87) and McDonald's omega (ω, 0.66 – 0.89) at each level (lesson, day, teacher) of student disruptive behaviour are shown in Table 2.

Teachers' emotions. We select emotions to be examined in the present study based on some selection criteria. First, we wanted to examine discrete emotions that are particularly related to classroom settings based on existing research (Pekrun et al., 2002, 2007; Goetz et al., 2013). Second, we take the results of our pilot examination of the emotions that teachers and students have in the culture-specific context (Taiwanese primary school teachers and students) into account. Teachers' emotions in class were measured by eight positive and negative emotions. Enjoyment, relaxation, pride, and calm were included to understand teachers' positive emotions, and disappointment, anxiety, anger, and boredom were included as negative emotions (Pekrun et al., 2002, 2007; Goetz et al., 2013; Watson & Tellegen, 1985). Two positive (enjoyment, pride) and two negative emotions (anger, anxiety) are categorised as activating emotions, and others are deactivating emotions (Pekrun et al., 2007). For each emotion, to limit the administration time and lower the burden on participants, we used a single item (Frenzel, 2015). Teachers were asked to rate how much they agreed with the sentences (e.g., This lesson, I felt relaxed) about their emotions in each lesson on a five-point Likert Scale ranging from 1 (not at all) to 5 (very much). Internal consistency (Cronbach's α) and the McDonald's omega (ω) of positive emotions and negative emotions were between 0.59 and 0.92 (see Table 2).

2.2.2. Day-level measurement

Morning well-being. We included two indicators (sleep quality and tiredness) that reflect teachers' emotional exhaustion state in the morning labelled as morning well-being in this study for their potential effect on emotions (Hülsheger, 2016). These indicators complete the loop of teachers' daily work-related well-being. Teachers were asked to respond to two single items on a five-point scale indicating teachers' morning status. Sleep quality was measured with the item "Did you sleep well last night?" (1 = very bad, 5 = very good). Tiredness in the morning was measured with the item "I feel tired this morning when I have to face another day at work" (1 = not at all, 5 = very much).

Teachers' end-of-working well-being. To understand teachers' domain-specific (work-related) well-being that covers both the positive and negative indicators, We integrated two negative and two positive work-related well-being that both reflect emotional-oriented (work enjoyment, burnout) and task-oriented (work buoyancy, work disengagement) according to the structure of previous research (for work enjoyment, buoyancy and disengagement, please see Collie et al., 2017; for emotional exhaustion, please see Maslach & Jackson, 1986). Teachers reported their work enjoyment in 4 items (e.g., "On the whole, I enjoy my work"; Martin, 2009), work buoyancy (capacity to deal with challenges effectively) in 4 items (e.g., "I think I'm good at dealing with work pressure"; Martin & Marsh, 2008), and their work disengagement in 3 items (e.g., "I've pretty much given up being involved in things at work"; Martin, 2010) at the end of their teaching work each day on a 5-point Likert Scale. The last element, emotional exhaustion, was measured with 8 items of the emotional exhaustion subscale of the Maslach Burnout Inventory (Maslach & Jackson, 1986). Teachers were asked to report the extent to which they agreed with each statement on that day (e.g., I feel emotionally drained from my work). Internal consistencies (Cronbach's α from 0.75 to 0.97) and McDonald's omegas (0.58–0.99) at different levels are shown in Table 2.

2.2.3. Teacher-level measurement

Teacher characteristics. We included a measure of teacher harmony belief adopted from Lu et al. (2001) as a covariate to

Table 2
Intercorrelations of variables.

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
1. PE	1												
2. NE	−0.61***	1											
3. DB	−0.15*	0.28***	1										
4. EN	0.51***	−0.51***	−0.28***	1									
5. SQ	0.24***	−0.31***	0.01	0.16*	1								
6. TR	−0.29***	0.27***	−0.02	−0.19**	−0.43***	1							
7. WE	0.58***	−0.46***	0.03	0.42***	0.38***	−0.46***	1						
8. WB	0.65***	−0.48***	−0.11	0.40***	0.29***	−0.31***	0.80***	1					
9. WD	−0.39***	0.40***	0.15*	−0.27***	−0.15*	0.16*	−0.52***	−0.42***	1				
10. EE	−0.34***	0.55***	0.08	−0.46***	−0.39***	0.38***	−0.59***	−0.49***	0.39***	1			
11.PrLS	0.57***	−0.67***	−0.22***	0.37***	0.32***	−0.21***	0.50***	0.57***	−0.58***	−0.48***	1		
12.PoLS	0.43***	−0.40***	0.13*	0.28***	0.28***	−0.39***	0.72***	0.50***	−0.38***	−0.56***	0.50***	1	
13. HB	0.44***	−0.48***	−0.30***	0.22***	0.30***	−0.26***	0.31***	0.34***	−0.48***	−0.19**	0.80***	0.33***	1
M	3.62	1.86	1.51	3.97	3.57	2.21	3.81	3.86	1.56	2.13	3.91	3.79	3.93
SD	0.62	0.69	0.53	0.63	1.06	1.28	0.74	0.58	0.54	0.72	0.77	0.76	0.49
ICC(L1)	0.33	0.34	0.39	0.45	–	–	–	–	–	–	–	–	–
ICC(L2)	0.09	0.09	0.08	0.08	0.61	0.40	0.14	0.26	0.32	0.30	–	–	–
ICC(L3)	0.59	0.56	0.52	0.46	0.39	0.60	0.86	0.74	0.68	0.70	–	–	–
α/ω (L1)	0.76/0.59	0.82/0.67	0.84/0.66	–	–	–	–	–	–	–	–	–	–
α/ω (L2)	0.77/0.79	0.82/0.84	0.87/0.77	–	–	–	0.94/0.69	0.87/0.65	0.75/0.58	0.91/0.83	–	–	–
α/ω (L3)	0.85/0.88	0.87/0.92	0.87/0.89	–	–	–	0.97/0.99	0.96/0.98	0.85/0.89	0.95/0.96	0.94/0.93	0.95/0.94	0.89/0.86

Note: ***p < .001, **p < .01, *p < .05. PE = positive emotions, NE = negative emotions, DB = student disruptive behaviour, EN = student engagement, SQ = sleep quality, TR = tiredness, WE = work enjoyment, WB = work buoyancy, WD = work disengagement, EE = emotional exhaustion, PrLS = Pre-Life satisfaction, PoLS = Post life satisfaction, HB = harmony belief, α = Cronbach's α, ω = McDonald's omega.

understand teachers' interpersonal beliefs that comes from the cultural context (values interpersonal harmony). Teachers' harmony belief is seen as a predictor of well-being in Chinese culture (Lu et al., 2001). Teachers were asked to report on a five-point scale (1 = strongly disagree, 5 = strongly agree) to what extent they agreed with 9 harmony belief items to examine their culture-specific beliefs about interpersonal relationships (e.g., I believe that people should have self-restraint). Cronbach's α for harmony belief is 0.89, and the McDonald's omega (ω) is 0.86 (Table 2).

Teacher general well-being. To understand teachers' general well-being, the Satisfaction with Life Scale (SWLS) developed by Diener et al. (1985) to examine individual subjective well-being (life satisfaction) was used. Teachers were asked to respond on a 5-point scale (1 = strongly disagree, 5 = strongly agree) on the extent to which they agreed with five statements (e.g., "In most ways my life is close to my ideal") at the beginning and at the end of the research. Cronbach's α of SWLS are 0.94 and 0.95 at two assessments, and the McDonald's omega (ω) are 0.93 and 0.94 at two assessments (Table 2).

2.3. Data analysis

The data for this study were conceptualised as a three-level model; comprised of lesson-specific ratings at the first level (L1), between-day ratings at the second level (L2), and between-individual ratings at the third level (L3). The hierarchical data were analysed using the Bayesian estimator (Asparouhov & Muthén, 2020; Muthén & Asparouhov, 2012) under the framework of multilevel structural equation models (MSEM) in Mplus 8 (Muthén & Muthén, 1998-2017). We centred predictors specified at a certain level in fixed effect models at the grand mean (CGM), and centred predictors for random slope models at the group mean (CWC) to provide meaningful interpretations.

The Bayesian approach uses the probability distribution over hypotheses to estimate a model (P(hypothesis | data)) in contrast to null hypothesis testing in frequentist paradigms (Van De Schoot et al., 2014). It better accommodates conditions (e.g., small sample size) that may lead to estimation problems in Maximum Likelihood (Hox et al., 2012; Zitzmann et al., 2016) which is suitable for the relatively small sample size (n = 20) in the present study. Using Bayesian estimation enables researchers to gain robust and accurate estimations of parameters in small sample size situations with diffuse priors (e.g., as few as 13 units at higher-level) or incorporate admissible-range-restricted prior (e.g., 15 units at higher-level with 25 timepoints at lower-level) for multilevel SEM analysis (Hox, 2012; McNeish, 2019; Zitzmann, 2016). We specified uninformative prior for the parameters in this study (Heemskerk & Malmberg, 2020).

We started by investigating the variance components of emotions to evaluate how large variation in emotions could be attributed to the lesson (L1), the day (L2), and the teacher (L3). To answer the first research question 'Do students' lesson-specific disruptive behaviour and engagementpredict teachers' lesson-specific emotions', we specified Model 1(M1) to analyse the fixed-effect of lesson-specific characteristics on teacher emotions. Following the fixed-effect model, we conducted a set of random intercept, random slope models (M2) to investigate whether there are day or individual differences in the association between student

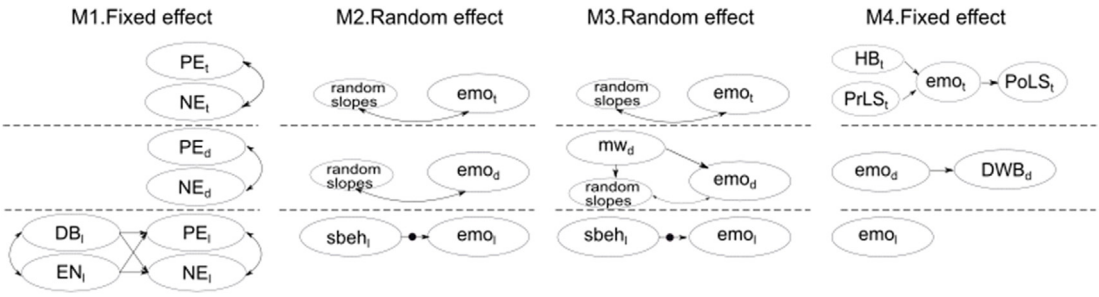

Fig. 2. Hypothetical models for analysis.

behaviour variables and teacher emotions (Research questions 2 and 3). We then investigated the potential cross-level interaction based on the random intercept, random slope model (M3) to investigate the moderating role of daily morning well-being (Research question 4). Finally, we included end-of-working well-being variables (L2) and general well-being variables (L3) in Model 4 to investigate the relationship between teachers' lesson-specific emotions and end-of-working well-being and general well-being (Research question 5). The hypothetical models of each step are shown in Fig. 2.

3. Results

3.1. Descriptive statistics

On average, teachers have a more positive evaluation of their general well-being and end-of-working well-being. Teachers' positive emotions are above the midpoint of the scale ($M = 3.62$, $SD = 0.62$), while teachers reported a relatively low level of negative emotions ($M = 1.86$, $SD = 0.69$). Consistent with previous studies that mainly focused on enjoyment, anger, and anxiety (e.g., Frenzel et al., 2015; 2016, using a 4-point Likert scale), the negative emotions were low while the positive emotions were above the midpoint of the scale (e.g., the score of enjoyment in Frenzel et al. (2015) was 3.10 in the 4-point Likert scale.). Intercorrelations of study variables on the lesson level are given in Table 2.

We then inspected intraclass correlations (ICC)[3] to assess the extent teacher emotions varied within lessons, between days, and between teachers. The ICC showed that a large proportion of variance of emotion lay at the teacher level: positive emotions were 0.59 (teacher), 0.09 (day), and 0.33 (lesson). Negative emotions were 0.56 (teacher), 0.09 (day), and 0.34 (lesson).

3.2. Lesson-specific student behaviour and teachers' lesson-specific emotions

Following model 1 (M1), we inspected fixed effects of teacher perceived lesson-specific student disruptive behaviour and student engagement on teachers' positive and negative emotions. The effect of teacher-rated student disruptive behaviour on teachers' negative emotions was significant ($\beta = 0.19$, 95% credibility interval (C.I.) [0.02, 0.35]), showing that the more student disruptive behaviour the teachers perceived, the higher the negative emotions. Additionally, the effect of student engagement on teachers' negative emotions was significant negatively ($\beta = -0.44$, C.I. [−0.57, −0.31]), indicating that the more the students were involved in class, the fewer negative emotions teachers experienced.

[3] ICC(teacher) = $s^2_{(t)}/s^2_{(t)}+s^2_{(d)}+s^2_{(l)}$, ICC(day) = $s^2_{(d)}/s^2_{(t)}+s^2_{(d)}+s^2_{(l)}$, ICC(lesson) = $s^2_{(l)}/s^2_{(t)}+s^2_{(d)}+s^2_{(l)}$, where t = teacher, d = day, and l = lesson.

However, there was no significant effect of student disruptive behaviour on teachers' positive emotions ($\beta = -0.00$, C.I. [−0.16, 0.17]). Student engagement predicted teachers' positive emotions ($\beta = 0.53$, C.I. [0.41, 0.64]), showing that the more students engaged in the lesson, the more teachers experienced positive emotions.

3.3. Day and individual differences in the association between student disruptive behaviour and teachers' emotions

Following Model 2 (M2), we specified random terms (positive/negative emotions regressed on student disruptive behaviour in separate models) at the lesson level. We inspected the variance of the slope at the day level, and the mean and variance of the slope at the teacher level.

In terms of positive emotions, the average slope at the teacher level was $B = -0.06$ (C.I. [−0.28, 0.18]) with a variance of $\psi = 0.05$ (C.I. [0.00, 0.19]). The variance at the day level was $\psi = 0.09$ (C.I. [0.00, 0.22]). The steepness of the slope was not related to the day average positive emotions ($\rho = 0.04$, C.I. [−0.02, 0.10]) or teacher average positive emotions ($\rho = -0.01$, C.I. [−0.19, 0.19]).

For negative emotions, the average slope at the teacher level was $B = 0.19$ (C.I. [−0.16, 0.58]) with a variance of $\psi = 0.27$ (C.I. [0.00, 0.87]). The variance at the day level was $\psi = 0.37$ (C.I. [0.08, 0.78]). The steepness of the slope was related to the day average negative emotions ($\rho = 0.11$, C.I. [0.01, 0.22]), but not to the teachers' average negative emotions ($\rho = -0.13$, C.I. [−0.50, 0.20]). This means that when the day average negative emotions are higher, the slope is steeper (i.e., disruptive behaviour predicts relatively more negative emotions for a particular teacher). Thus, the results show that the association between student disruptive behaviour and negative emotions varies across both days and teachers.

Overall, the results show that the association between student disruptive behaviour and negative emotions varies across both days and teachers. The association between student disruptive behaviour and positive emotions also varies across days or teachers.

3.4. Day and individual differences in the association between student engagement behaviour and teachers' emotions

Similarly, following Model 2 (M2), we then specified random terms (positive/negative emotions regressed on student engagement in separate models) at the lesson level, and inspected the variance of the slope at the day level, and the mean and variance of the slope at the teacher level.

For positive emotions, the average slope at the teacher level was $B = 0.34$ (C.I. [0.18, 0.51]) with a variance of $\psi = 0.03$ (C.I. [0.00, 0.11]). The variance at the day level was $\psi = 0.06$ (C.I. [0.00, 0.17]). The steepness of the slope was not related to the day average positive emotions ($\rho = 0.01$, C.I. [−0.02, 0.05]), nor to teacher average positive emotions ($\rho = -0.03$, C.I. [−0.17, 0.08]). The results

show there is a significant deviation of individual slope from the average slope across days and teachers.

In terms of negative emotions, the average slope at the teacher level was $B = -0.32$ (C.I. [−0.49, −0.13]) with a variance of $\psi = 0.03$ (C.I. [0.00, 0.13]). The variance at the day level was $\psi = 0.05$ (C.I. [0.00, 0.16]). These indicate a significant deviation of individual slope from the average slope across days and teachers. The steepness of the slope was not significantly related to the day average negative emotions ($\rho = -0.02$, C.I. [−0.07, 0.03]), nor the teacher average negative emotions ($\rho = -0.01$, C.I. [−0.17, 0.13]).

Overall, the results show that the association between student engagement and teacher emotions (positive and negative) varies across both days and teachers.

3.5. The moderating role of teachers' morning tiredness and the quality of sleep on the association between student behaviour and teachers' emotions

Following Model 3 (M3), we included day-level moderators (morning well-being: sleep quality and tiredness) of the association between student behaviour (student disruptive behaviour and student engagement) and teachers' emotions (positive and negative).

First, the positive/negative-emotions-on-student-disruptive-behaviour slopes were regressed on teachers' morning well-being, respectively. We found a moderation effect that teachers' morning quality of sleep predicted the slope ($B = -0.43$, C.I. [−0.74, −0.10]). In other words, the higher the morning quality of sleep, the less steep the slope. However, we do not find a moderation effect regarding the relationship between student disruptive behaviour and positive emotions ($B = 0.15$, C.I. [−0.10, 0.34]).

Next, the positive/negative-emotions-on-student-disruptive-behaviour slopes were regressed on teachers' tiredness in the morning. No moderation effect was found regarding positive emotions ($B = -0.02$, C.I. [−0.20, 0.17]) or negative emotions ($B = 0.08$, C.I. [−0.17, 0.33]).

When the positive/negative-emotions-on-student-engagement slopes were regressed on teachers' sleep quality in the morning, there is no other significant moderation effect of sleep quality on the positive-emotions-on-student-engagement slopes ($B = -0.06$, C.I. [−0.18, 0.13]) as well as the negative-emotions-on-student-engagement slopes ($B = 0.04$, C.I. [−0.12, 0.24]). Similarly, no other moderation effect was found of tiredness on the association between student engagement and teachers' positive emotions ($B = 0.05$, C.I. [−0.06, 0.17]) or negative emotions ($B = -0.08$, C.I. [−0.13, 0.12]).

3.6. Teachers' lesson-specific emotions and teachers' end-of-working well-being and general well-being

Following Model 4 (M4), we then included fixed effects of teachers' end-of-working well-being and teacher-level general well-being (life satisfaction) into the model to examine whether teachers' positive and negative emotions further predict their well-being at the day level and teacher level. Results show that a higher level of teachers' daily average positive emotions significantly predicted more work enjoyment ($\beta = 0.60$, C.I. [0.15, 0.90]), and a higher level of work buoyancy ($\beta = 0.76$, C.I. [0.39, 0.97]), with a marginal effect of emotional exhaustion ($\beta = -0.39$, C.I. [−0.72, 0.01]) at the end of working but not work disengagement ($\beta = -0.12$, C.I. [−0.50, 0.36]). This means that a teacher who experiences a higher level of positive emotions on a particular day has a higher level of work-related well-being, especially in work enjoyment and buoyancy. In a similar vein, when teachers experience higher levels of positive emotions during the day, it is likely that they have lower levels of exhaustion at the end of that working day. At the teacher level, we also found that teachers' positive emotions were significantly predicted by teachers' general well-being (life satisfaction) before the research period ($\beta = 0.72$, C.I. [0.14, 1.20]) and then predicted life satisfaction at the end of the research period ($\beta = 0.58$, C.I. [0.15, 0.88]). However, there was no significant relationship between teachers' positive emotions and teachers' harmony belief ($\beta = 0.07$, C.I. [−0.52, 0.63]) when controlling for life satisfaction (correlation (r) between harmony belief and positive emotion was 0.44, see Table 2).

Teachers' daily negative emotions only predicted teachers' end-of-working exhaustion ($\beta = 0.60$, C.I. [0.14, 0.95]) at the day level. Also, teachers' negative emotions had a significant relationship with teachers' life satisfaction (general well-being) at the beginning ($\beta = -0.98$, C.I. [−1.35, −0.59]) and predicted teachers' life satisfaction at the end ($\beta = -0.55$, C.I. [−0.86, −0.13]) of the research period. Thus, if teachers have higher levels of life satisfaction, they tend to have lower levels of negative academic emotions during the research period, and then have higher life satisfaction at the end of the research week.

4. Discussion

This research extends the previous research on the role of teacher emotions in real-time during one calendar week. Particular attention was given to how teacher emotions were predicted by student behaviour in real-time classrooms, the variability across days and teachers, and how teacher emotions further predict teachers' daily and individual level well-being.

4.1. Intraindividual variability

Inconsistent with previous studies on teacher emotions (Becker et al., 2015; Frenzel et al., 2015) who found that approximately 15%–30% of the variance in emotions (specifically enjoyment, anger, and anxiety) lies at the teacher level, we found that the majority of variance in teachers' positive and negative emotions between teachers (59% and 56%). However, we also found a considerable amount of variance in teachers' emotions due to different lessons (33%–34%). Therefore, teacher emotions are different between individual teachers and also fluctuate across different lessons. Interestingly, to some extent, the results of this study reflect the findings of de Ruiter (2020), despite the fact that their definitions for levels in their research (within students, between students, and between teachers) differ from this study. They found that the majority of variance for anger was due to students (teacher reports of students, student level ICC = 0.21), and that the variance for self-related emotions (Teacher level ICC = 0.20) and anxiety (Teacher level ICC = 0.23) were mainly due to teacher characteristics. In the studies by Becker et al. (2015) and Frenzel et al. (2015), participants were mainly secondary school teachers in Germany and the data had a two-level structure (lessons nested in teachers), while de Ruiter et al. (2020) used the day reconstruction focussing on teachers' perceptions toward specific students (students nested in teachers). Unlike previous studies, we grouped teacher emotions into positive and negative emotions and analysed teacher emotions based on a three-level structure (lesson, day, and teacher). It is worth noting that the participants in our study were primary school homeroom teachers in Taiwan and cultural differences do exist regarding emotion intensity and expression (Jack et al., 2012).

Based on the findings of previous cross-cultural research (Sims et al., 2015), one possible explanation is that Taiwanese teachers may have lower arousal and intensity of emotions and have less variability from one lesson to another. This may reflect the implicit

"emotion rules" in the culture that teachers are expected not to express negative emotions or even "bring no emotion to the student" (Yin & Lee, 2012). Therefore, Taiwanese teachers may not express such fluctuated emotions as teachers in previous research across lessons.

4.2. Students' situation-specific behaviour and teachers' academic emotions

Results of this study showed that students' situation-specific behaviours, including disruptive behaviour and engagement, were significant predictors of teachers' emotions. When teachers perceived more student disruptive behaviour during teaching, they tended to have higher levels of negative emotions in class. This result reflects the findings of previous studies that student disruptive behaviour predicts teachers' anger and anxiety (de Ruiter et al., 2020; Hagenauer et al., 2015). Previous research indicates that student disruptive behaviour is correlated to teachers' emotional exhaustion and work enthusiasm, and the link between student disruptive behaviour and emotional exhaustion exists even if the teacher-student relationship was taken into consideration (Aldrup et al., 2018). Regarding teachers' positive emotions, no significant relationship between student disruptive behaviour and teachers' positive emotions was found in the current study. This indicates that students' disruptive behaviour in real-time lessons does not derail teachers' positive emotions but is mainly related to teachers' negative emotions such as anger.

In line with previous cross-sectional research on student motivational behaviour and teacher emotions (Hagenauer et al., 2015), we found a significant effect of student engagement on teachers' positive emotions as well as negative emotions. Thus, when teachers feel that students engage in the lesson emotionally and behaviourally, they tend to experience more positive emotions and fewer negative emotions. Previous research only included teachers' anger, joy, and anxiety as teacher emotions, and the results indicated that joy and anger, but not anxiety were predicted by student engagement (Hagenauer et al., 2015). Further research is needed on the potential discrepancies between different discrete emotions.

4.3. The variability of student behaviour and teachers' emotions and moderating effects

Our findings suggest that the effect of disruptive behaviour on teachers' positive emotions varied across days and individuals, and the effect of student disruptive behaviour on teachers' negative emotions also varied across both days and teachers. In addition, we found the effect of student engagement on teachers' positive and negative emotions varied across both days and individuals. That means, for some days, student behaviour (including student disruptive behaviour and engagement) has a large effect on teachers' positive and negative emotions, and for some teachers, student disruptive behaviour has a large effect on their negative emotions. Our findings regarding student behaviour and teachers' emotions reflect the fluctuation of the lesson and day-based nature of teacher emotions, as well as the differences between individual teachers.

Apart from the variability, we also found a moderating effect of teachers' self-rated sleep quality in the morning (morning well-being) on the relationship between student disruptive behaviour and their negative emotions. This indicates that teachers' morning well-being (sleep quality) has a positive effect on teachers' emotions in reacting to students' disruptive behaviour. Teachers' sleep quality appears to help teachers manage their negative emotions when students misbehave in the classroom. Poor sleep quality could increase teachers' stress and irritability when they interact with students (Poon et al., 2019). This implies that teachers' recuperation at the beginning of a new day plays an important role in their interaction with students.

4.4. Teacher emotions predict teacher well-being

The findings of the current study show that teachers who have higher levels of positive emotions are more likely to have higher work enjoyment and work buoyancy at the end of the working day. However, teachers' negative emotions only predict teachers' emotional exhaustion at the end of the working day. In other words, the more intense the negative emotions teachers experience during the day, the more exhausted they feel. This is in line with the idea that positive emotions build up resources and help to increase an individual's well-being (Cohn et al., 2009; Fredrickson, 2003, 2013). Teachers' positive emotions and negative emotions may work as two pathways. While negative emotions contribute to their judgement about how exhausted they are during work, positive emotions in lessons increase teachers' feeling of work-related well-being.

At the individual level, analyses showed that teachers' emotional experience in class (lesson-specific well-being) is reflected in teachers' overall level of life satisfaction (general well-being). The more positive emotions and fewer negative emotions teachers have in class, the more they are satisfied with their life as a whole. The present study shows the link between teachers' situational emotions and their daily work-related well-being as well as their general well-being.

4.5. Limitations and suggestions for future research

The findings of this study should be taken with the following limitations in mind. Firstly, the sample size at the teacher level was relatively small and the sample consisted of mostly females. Although the gender distribution in our research reflects the gender distribution in Taiwanese primary schools and our initial analyses showed no gender effects on teachers' general well-being, this may be due to the limited sample of male teachers. The second limitation is that in this study participants were recruited voluntarily. This could lead to bias if generally teachers who have high well-being with better classroom management experiences were more willing to participate in the research. Motivating a variety of teachers to participate in research with a larger sample size to validate findings would be beneficial in future research.

Third, we only used teachers' self-report data to analyse the relationship between student behaviour, teacher emotions, and teachers' well-being. Additionally, to lower the burden on participants, we only used a single item to assess the teachers' overall perceptions of their students' engagement in each lesson. Although the main aim of the current research is to understand teachers' momentary experiences regarding interaction with students and their well-being, it would be desirable to use multiple items for measurements and integrate other methods, such as external observations or student-report, to understand classroom conditions and teachers' response in class.

Moreover, despite the advantages of the Bayesian paradigm in mitigating the limitation of the Maximum Likelihood (ML) estimator and its robust estimation for small samples (Asparouhov & Muthén, 2020), it is not without limitations. One main limitation of a Bayesian paradigm is the potential subjectivity in selecting priors (Van De Schoot et al., 2014), thus it is crucial to specify priors based on informative prior knowledge. In this study, to mimic ML estimates, we specified diffuse priors (Heemskerk and Malmberg, 2020; Zitzmann et al., 2016), while it would be even more beneficial for future research to specify weakly informative priors

(McNeish, 2019).

Finally, it is worth noting that the current research was conducted in a specific cultural context. Future studies are needed to understand teacher well-being from micro perspectives in different cultural contexts. In this study, we included individuals' belief in interpersonal harmony conducted based on Chinese culture, which is recognised as a cultural specificity element that relates to personal well-being (Lu et al., 2001). Our results show that as a cultural backdrop, teachers' harmony belief is related to different aspects of teachers' appraisal of their experiences and well-being. It would be beneficial for future studies to take cultural specificity and the corresponding measurements into account.

4.6. Practical implications for practitioners

The ultimate goal of this study is to increase understanding of how teachers' real-time experience contributes to well-being. Such understanding will help teachers develop an awareness of their own emotional experiences when interacting with students, for example, the effect of student behaviour on teachers' emotions. In turn, this study could urge educators and policymakers to identify the potential ways to effectively support teachers in cultivating well-being.

An implication arising from this study echoes previous research on teacher enjoyment (e.g., Becker et al., 2015; Keller et al., 2014). Teachers report emotional exhaustion but also feel that their work is rewarding at the end of their working day, and this is related to their emotions in the classroom. In line with the theory (Fredrickson, 1998), the positive emotional experience could increase the personal resource with the existence of negative emotions. Thus, supporting teachers to be aware of their emotions and accumulate small positive emotions in the classroom could be beneficial to teachers' work-related well-being, and eventually increase their evaluation of life in general.

Another implication of the findings is that teachers' perceptions of student motivational (engagement) and discipline behaviour (disruptive behaviour) contribute to the variability of teacher emotions in the real-time classroom. Among them, a higher level of students' motivational behaviour relates to both higher positive emotions and lower negative emotions. This is especially true in primary schools, as primary homeroom teachers connect with the same group of students in a stronger way. Interventions that help teachers to develop effective classroom management strategies, such as elevate students' engagement while decreasing disruptive behaviour (e.g., behaviour-specific praise) in the classroom are needed (Gage & MacSuga-Gage, 2017; Larson et al., 2021).

Additionally, our findings also revealed that teachers' well-being is a cycle system that ties the teachers' situational experiences in school settings and their lives together (e.g., sleep quality, cultural context). There are approximately one-third of Taiwanese primary school teachers feel stressed in their work and about one-fifth feel that their work has negative impacts on their physical or psychological health (Ko et al., 2019). Changing teachers' situational experiences in school settings could help these teachers. Thus, training projects that guide teachers to accumulate positive experiences and recuperate from work stress or exhaustion could spark off a positive loop in the classroom.

5. Conclusion

The present study was designed to integrate teachers' teaching and emotional experiences in class and their overall well-being, to point out how different layers of teacher well-being are connected with each other by utilising a micro-longitudinal approach. The results of this study are important in expanding the understanding of teachers' positive and negative academic emotions, and their empirical relationships with daily occupational well-being and their judgement of their life as a whole.

Teachers' perceptions of student behaviour, including both disruptive behaviour and engagement are important for their emotional experiences in class. Teachers experience more negative emotions in lessons with more student disruptive behaviour such as chatting and other off-task behaviours, or if students do not actively engage in the lesson. However, when teachers perceive that students are involved in class overall, this not only increases their positive emotions but also decreases teachers' negative emotions. The results of the current study also suggest that teachers' academic emotions in class indeed predict their evaluation of their work-related well-being at the end of the working day, as well as how satisfied they are with their life as a whole.

This study provides a first step in studying teacher well-being from their momentary academic emotions to their life-satisfaction as a process. This expands previous research on teacher well-being from a trait perspecitve and teachers' emotions from a state perspective. The findings of this study imply that teacher support programmes should focus on teachers' experiences and emotions when teaching. Studying the relationship between teacher-stated emotional experiences related to students, evaluation about work, and judgements about life helps to expand our knowledge about the dynamic of teaching and learning and different ways to support teachers.

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